

Culturicon Design Model: A Case of Designer's Validation Process

Model Reka Bentuk Culturicon: Satu Kajian Proses Pengesahan Reka Bentuk

Mohd Zhafri Mohd Zukhi¹, Husniza Husni², Azham Hussain²

¹ *College of Computing, Informatics and Media, Universiti Teknologi MARA (UiTM), 08400 Merbok, Kedah*

² *School of Computing, Universiti Utara Malaysia, 06010 Bukit Kayu Hitam, Kedah*

**Corresponding author: zhafri319@uitm.edu.my*

Received 13 January 2023

Accepted 14 April 2023, Available online 1 June 2023

ABSTRACT

As more people own smartphones, using visual elements like emoticons, emojis, and stickers in mobile messaging applications has become popular. Smartphone users have grown accustomed to using these visual elements because of their positive effects on communication through applications. Even Oxford Dictionary named one of these visual elements the word of the year. However, due to cultural differences, these visual elements have limitations such as limited selection, misinterpretation, and misuse. To overcome the limitations, this study presented a Culturicon Design Model combining cultural dimensions and Human-Computer Interaction icon design principles. In doing so, the model must be validated before its efficacy can be established. This paper aims to outline the designer's validation process. The designer developed Culturicon samples based on the model as part of the validation process. Then, they validated the model by responding to the validation form. The findings revealed that all designers agreed that the model is understandable and practical for designing Culturicon.

Keywords: Cultural-based emoticon, Culturicon, human-computer interaction, validation

ABSTRAK

Seiring dengan lebih ramai orang memiliki telefon pintar, menggunakan elemen visual seperti emotikon, emoji, dan stiker dalam aplikasi pesanan mudah alih telah menjadi popular. Pengguna telefon pintar telah terbiasa menggunakan elemen visual ini kerana kesan positifnya terhadap komunikasi melalui aplikasi. Malah, Oxford Dictionary menamakan salah satu elemen visual ini sebagai perkataan yang popular. Namun, disebabkan perbezaan budaya, elemen visual ini mempunyai batasan seperti pilihan yang terhad, salah tafsir, dan penyalahgunaan. Untuk mengatasi batasan ini, kajian ini menyediakan Model Reka Bentuk Culturicon yang menggabungkan dimensi budaya dan prinsip reka bentuk ikon Interaksi Manusia-Komputer. Dengan berbuat demikian, model ini perlu disahkan sebelum keberkesannya dapat ditetapkan. Kertas ini bertujuan untuk menggariskan proses pengesahan reka bentuk. Pereka membangunkan sampel-sampel Culturicon berdasarkan model sebagai sebahagian daripada proses pengesahan. Kemudian, mereka mengesahkan model

tersebut dengan memberikan respon kepada borang pengesahan. Dapatan kajian menunjukkan bahawa semua pereka bersetuju bahawa model ini adalah mudah difahami dan praktikal untuk merekabentuk Culturicon.

Kata kunci: Ciri emosi berdasarkan budaya, Culturicon, interaksi manusia-komputer, pengesahan

INTRODUCTION

The use of visual components in Computer-Mediated Communication (CMC) has increased due to the rapid growth of users of mobile messaging apps like WhatsApp, Telegram, WeChat, Facebook Chat, and LINE (Cha et al. 2018). Emoticons, emojis, stickers, and memes are widely used visual elements in these mobile messaging applications. All of these visual elements fall into the same category, with the invention of the emoticon serving as the trailblazer (Cao & Ye 2009). As technology becomes more advanced, it also evolves due to modernization that led to the development of emojis, stickers, and memes.

Wang et al. (2019) reported that in 2014 alone 533 billion emojis were sent while they are using WeChat, while Cha et al. (2018) mentioned that billions of stickers were exchanged every day in LINE. The increase popularity of visual elements is because it can convey a wealth of emotions and concepts that would take many words to express (Wiseman & Gould 2018). Several words or sentences can be represented just by using a single emoticon, emoji, sticker, and meme. This may reduce the time needed for the sender to type the message and the recipient to read and understand it.

However, past studies have shown that the usage of visual elements also has its shortcoming, such as misinterpret and misuse the actual meaning of the visual elements used in CMC, especially when it comes to intercultural communication (Feng et al. 2020; Goh & Kulathuramaiyer 2020; Kimura-Thollander & Kumar 2019; Wijeratne 2016; Wiseman & Gould 2018). The misinterpretation and misuse of these elements could lead to a conflict or breakdown of the CMC. Besides that, the current selection list of these visual elements also are unbalanced where most of the emoji selection portrayed the culture from Japan, United States, United Kingdom, China, France and Mexico (Feng et al. 2020; Kimura-Thollander & Kumar 2019). As a result, users from other countries are unable to express their intentions about their own culture and instead resort to misusing visual elements from other cultures that they are unfamiliar with.

In providing one of the solutions to solve these shortcomings, this study proposes a Culturicon Design Model (CDM) that consist of cultural dimension and Human-Computer Interaction (HCI) icon design principles to be used by designer to design the Culturicon. The term "culturicon" is a combination of the words "culture" and "icon," and it denotes that the icon represents a element of culture. The proposed model has gone through a verification process and has been approved by experts (Zukhi, Hussain, & Husni 2020). The model must then be validated by the user, who is the designer. The validation process for the model is discussed in this paper. It is structured as follows: First, the background of study and related work are reviewed. This is followed by an explanation of the Culturicon Design Model and its components. After that, the methodology section is presented showcasing how the validation process was performed. Next, is the result section followed by discussion.

BACKGROUND OF STUDY

Validation process play a vital role in establishing the confidence in its usefulness, in relation to an objective (Pedersen et al. 2000). The usefulness in the design method context means that whether the design method provides correct design solutions. In their study, they validated their proposed validation square by validating its internal consistency and external relevance. When the validation process has been done to a method or model, it develops confidence for others to use it in their study.

In addition, Chen, Ma, Cerezo, and Pu (2014), and Hofstede (2011) agreed that validation process makes it possible to gather insightful opinions from domain experts, and it is a very dependable technique for doing so. Martakis and Daneva (2013) also added that this approach is one of the convenient ways to collect data from the practitioners. A study by Abubakar, Hashim, and Hussain (2016) performed a validation process on their proposed m-banking application usability model to validate the accuracy and completeness of the model by which produces a significance result.

For emoticon previous study, Chen et al. (2014) used the validation method before introducing their latest emoticon concept, which they called as Empatheticon in GroupFun, a group music recommender. The validation method was carried out by hiring a variety of participants, who are experienced and beginner users of emoticons. They presented a list of new emoticons and a selection of choices that include the exact sense of the emoticons. Participants need to align the emoticons with the collection of options offered. After the validation process was completed, the findings were analyzed and the input from the participants was categorized in terms of the design and speech of the emoticons.

Before presenting their most recent emoticon concept, which they named Empatheticon in GroupFun, a group music recommender, Chen et al. (2014) employed the validation process for their earlier work on emoticons. A variety of volunteers, both experienced and inexperienced emoticon users, were recruited for the validation approach. They provided a list of brand-new emoticons as well as a menu of options that correspond to each one's precise meaning. Participants must match the emoticons with the range of available choices. Following the validation procedure, the results were examined, and participant feedback was grouped according to the design and pronunciation of the emoticons.

CULTURICON DESIGN MODEL

The model consists of 3 phases: 1) Identify cultural element; 2) Design Culturicon; and 3) Produce Culturicon. In identifying cultural element (phase 1), the model provided cultural dimensions by which user needs to select at least one trait from a cultural dimension to be embedded in the design. As the model is intended to embed the culture of Asian countries, the cultural dimension's level provided in the model are based on the study by Hofstede (2011) that stated that Asian countries such as East Asian countries, Japan, Korea, China, India, Malaysia, and Indonesia possess high power distance, high collectivism, low uncertainty avoidance, moderate masculinity and femininity, and long-term relationship. In the detailed version of the model as described in Table 1, these cultural dimensions have the category of social norm, national, political, religion, work, school, and family, followed by detail traits for each category. These traits are intended to direct and provide the user with an idea for choosing the appropriate cultural element they are intended to develop.

The next phase is design Culturicon (phase 2). In designing Culturicon, user needs to fulfill all the HCI icon design principles provided. There are 8 HCI icon design principles – familiar, understandable, attractive, coherent, informative, distinct, memorable, and legible. The detail version of HCI icon design principles is presented in Table 2, that consist of the design principles followed by its criteria. These HCI icon design principles are essential in ensuring that the design meets the specifications in HCI perspective. After the user has identified the cultural element and the design of the Culturicon, the next phase is to produce the Culturicon (phase 3).

The CDM is shown in Figure 1, and the detailed CDM is shown in Table 1 and 2. All the figures and tables have been updated in light of the verification results from the HCI, culture, art, and graphic design experts.

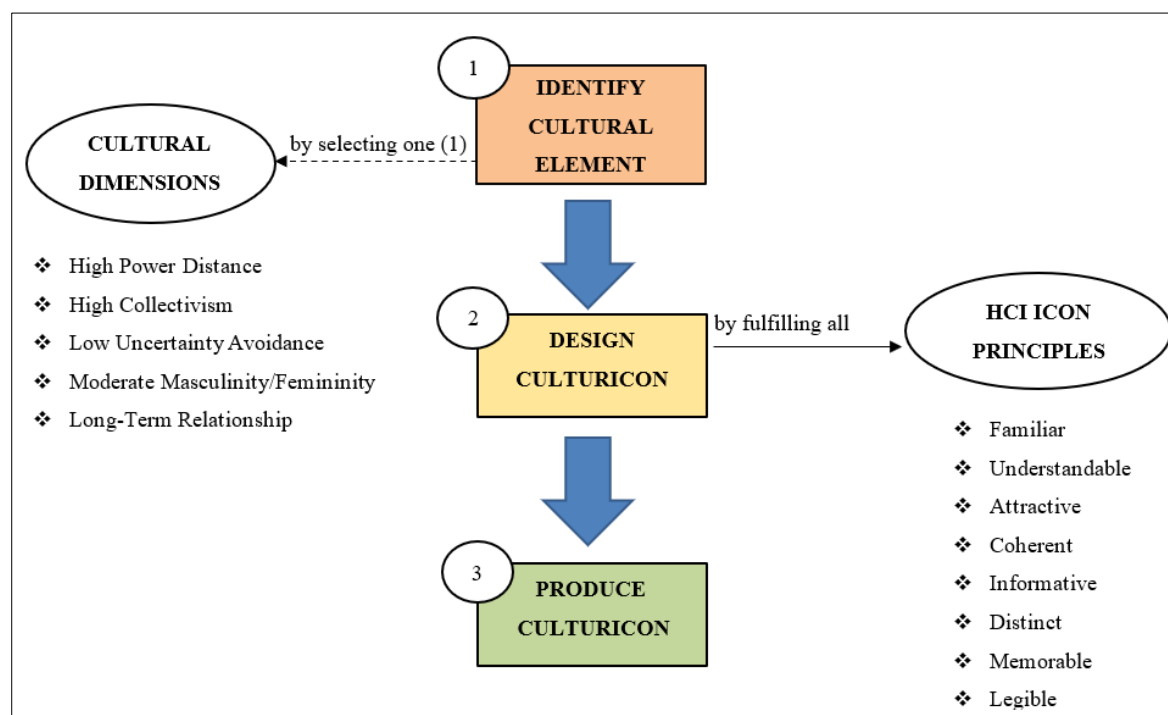


FIGURE 1. Culturicon Design Model

TABLE 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	
Low Uncertainty Avoidance	Education	Learning in group Students respect teachers.	
	Family	Extended family and tribe	
	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.	
Moderate Masculinity/ Femininity	Work	Less loyalty At ease with changing jobs	
	Education	Open-ended learning	
	Family	Fewer gender roles	
	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 2. HCI icon design principles of 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.
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

METHODOLOGY

To begin the validation process, the users who are the designers were identified. These designers were sent a letter of nomination through email as the method of communication in order to inform them briefly about the CDM and request their permission to participate in this study. In accordance with Nielsen and Molich's (1990) criteria, which specified that 3 to 5 experts with experience longer than 5 years are sufficient to carry out the validation procedure, 5 of the 15 designers who were identified agreed to participate.. In order to give a complete explanation on the model, an appointment was made with each one of them. During the meeting, a thorough explanation regarding the research and the proposed model was given. Once they understood the research that is being conducted, the validation document was given to them. The content of the document includes the following: 1) Introduction of the research;

2) Designer Demography; 3) Introduction of the Culturicon Design Model; 4) The Culturicon Design Model; and 5) Validation Form.

Based on the demographic information from these designers, 3 of them are from industry while the other 2 are freelancers. On their qualification, 4 of them possess degree qualification while the other 1 possess a diploma. In section 2 of the document, there is information about CDM that explain on the cultural dimensions and HCI icon design principles used as the components of CDM. There are also instructions and guidelines on how the designer can use CDM. The designers are required to develop at least 1 Culturicon for each cultural dimension in the model. Since there are 5 dimensions, the designers need to develop 5 Culturicon samples at least.

After they finished creating the Culturicon, they need to answer the validation form in section 3 of the validation document to complete the validation process.

RESULTS

The findings of the validation process are shown in Tables 3 - 10 in the following sections, that are organized by cultural dimensions, HCI icon principles, overall validation, and comment and suggestion.

CULTURAL DIMENSION

Table 3 shows the result for High Power Distance dimension. In High Power Distance, the criteria that got 100% score are national, ruler & historical building, privilege of authority & those in power and religious building or holy places. While the rest of the criteria that scored 80% are the power of royal institution & military, government & organization hierarchy, school hierarchy and young people respect elderly.

TABLE 3. High Power Distance

Cultural Dimension	Trait	Criteria	Score (%)
High Power Distance	National	National, ruler & historical	100
	Social norm	Privilege of authority & those in power	100
	Political	Power of royal institution & military (modern/traditional)	80
	Religion	Religious building or holy places	100
	Work	Government & organization hierarchy (modern/traditional)	80
	Education	School hierarchy	80
	Family	Young people respect elderly	80

Table 4 shows the results for High Collectivism dimension. In High Collectivism, the criteria that scored 100% are traditional games & agriculture, national outfit & culinary, obedient to custom & rule, maintain harmony environment, learning in group, student respect teacher and extended family & tribe. Other criteria in High Collectivism dimension that scored 80% are the value interpersonal harmony, law depends on ruler or group, celebrations & ceremonies, and work in group & support each other.

TABLE 4. High collectivism

Cultural Dimension	Trait	Criteria	Score (%)
High Collectivism	National	Traditional games & agriculture	100
		National outfit & culinary	100
	Social Norm	Obedient to custom & rule	100
		Value interpersonal harmony	80
	Political	Law depends on ruler or group	80
	Religion	Celebrations & ceremonies	80
	Work	Work in group & support each other	80
		Maintain harmony environment	100
	Education	Learning in group	100
		Student respect teacher	100
	Family	Extended family & tribe	100

Table 5 shows the results for Low Uncertainty Avoidance dimension. In Low Uncertainty Avoidance, 4 criteria scored 100% which are tolerance for diversity, high interest in politics, many religions and each religion respect each other. The other 6 criteria scored 80% are open to change & innovation, government changes are accepted, less loyalty, at ease with changing job, open-ended learning, and fewer gender roles.

TABLE 5. Low uncertainty avoidance

Cultural Dimension	Trait	Criteria	Score (%)
Low Uncertainty Avoidance	Social norm	Open to change and innovation	80
		Tolerance for diversity	100
	Political	High interest in politic	100
		Government changes are accepted	80
	Religion	Many religions	100
		Each religion respect each other	100
	Work	Less loyalty	80
		At ease with changing job	80
	Education	Open-ended learning	80
	Family	Fewer gender roles	80

Table 6 shows the results for Moderate Masculinity & Femininity dimension. In Moderate Masculinity & Femininity, there are 2 criteria that scored 100% which are M: Prefer high pay, F: Prefer fewer working hour and M: Prefer fewer women in management, F: Prefer more women in management. While 4 criteria that scored 80% are M: High priority for economic growth, F: High priority for environment protection, M: Ego oriented, F: Relationship oriented, M: Conflict are solved through force, F: Conflict are solved through negotiation and M: Girl can cry, F: Both girl & boy can cry. While criteria M: Emphasis on money & things, F: Emphasis on quality of life & people score 40% and criteria M: Failing is seen as disaster, F: Failing is seen as minor accident score only 20%.

TABLE 6. Moderate masculinity & femininity

Cultural Dimension	Trait	Criteria	Score (%)
Moderate Masculinity & Femininity	Social Norm	M: Emphasis on money & things	40
		F: Emphasis on quality of life & people	
		M: High priority for economic growth	80
		F: High priority for environment protection	
		M: Ego oriented	80
		F: Relationship oriented	
	Political	M: Conflict are solved through force	80
		F: Conflict are solved through negotiation	
	Work	M: Prefer high pay	100
		F: Prefer fewer working hour	
		M: Prefer fewer women in management	100
		F: Prefer more women in management	
Education	M: Failing is seen as disaster	20	
	F: Failing is seen as minor accident		
Family	M: Girl can cry	80	
	F: Both girl and boy can cry		

Table 7 shows the results for Long-Term Relationship dimension. In Long-Term Relationship, 2 criteria scored 100% which are personal adaptability is important and emphasis on persistence, while criteria relationship are ordered by status and be thrifty scored 80%. Criteria leisure time not too important scored 60%.

TABLE 7. Long-term relationship

Cultural Dimension	Trait	Criteria	Score (%)
Long term relationship	Social Norm	Personal adaptability is important	100
		Relationships are ordered by status	80
	Work	Emphasis on persistence	100
		Leisure time not too important	60
	Family	Be thrifty	80

HCI ICON DESIGN PRINCIPLES

There are 8 principles and 23 criteria that make up HCI Icon principles – Familiar, Understandable, Attractive, Coherent, Informative, Distinct, Memorable and Legible. Table 8 shows the result for HCI Icon principle. According to the validation results, each element of the HCI icon design principles received a perfect score.

TABLE 8. HCI icon design principles

Principle	Criteria	Score (%)
Familiar	User familiar with the design	100
	Design are common in user's environment	100
	Applicable in real world	100
Understandable	Spontaneously suggest the intended concept	100

	Strong association between Culturicon and its concept	100
	Meaning are based from direct association	100
Attractive	Visually balance and stable	100
	Proportioned to fit available space	100
Coherent	Used harmonious colors, patterns and values	100
	It is clear where one Culturicon ends and another begins	100
	Focus and hold attention on subject matter of the icon	100
Informative	Secondary design elements clearly subdued relative to primary subject matter	100
	Design concept are important	100
	Design do belong to a category	100
	User are able to interact by using it in CMC	100
Distinct	Assist user in expressing their intentions	100
	Design are distinct to other to avoid confusion	100
Memorable	Distinguishing characteristics are clear among set of alternatives	100
	Clearly identified by user	100
Legible	Striking and vivid	100
	Placed in the scheme of interface is clear	100
	Design is legible at reading distance	100
	Sufficient foreground and background contrast	100

OVERALL VALIDATION

Table 9 shows the overall validation. The overall validation comprises of criteria gain satisfaction, interface satisfaction and task support. The predefined criteria were adapted from previous studies (Abubakar et al., 2016; Al-Tarawneh, 2014; Kunda, 2003). In gain satisfaction criteria, there are 3 variables which are relevancy to the intended application, perceived usefulness, and clarity. According to Kunda (2003), these 3 variables were measured to reveal on the accuracy of the model. The percentage of agree for those 3 variables are 100%.

For the second criteria, which is interface satisfaction, there are variables ease of use and organization. These variables were used to measure the practicality of the model in designing Culturicon. Both variables also scored 100% of agree by all designers.

For the last criteria which is task support, there are variables practicality, completeness, understandability, and ability to produce expected result. All these criteria got 100% of score by all designers.

TABLE 9. Overall validation

Criteria	Variable	Score (%)
Gain satisfaction	Relevancy to the intended application	100
	Perceived usefulness	100
	Clarity	100
Interface Satisfaction	Ease of use	100
	Organization	100
Task support satisfaction	Practicality	100
	Completeness	100
	Understandability	100
	Ability to produce expected result	100

COMMENTS AND SUGGESTIONS

The comments and suggestions from the designers are shown in Table 10. These comments and suggestions will be used as feedback from the user to express their opinion during performing the validation for the proposed model.

TABLE 10. Comment & Suggestion

Designe	Comment/Suggestion
D1	This model is helpful especially when it comes to narrowing down the scope of culture to be designed. However, the 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 needs. 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 and 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 designers 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 terms are a little bit hard to understand. Maybe can use more user-friendly term.

DISCUSSION

According to Clarke and Warwick (2001), if an item received an average score of at least 60%, it should be taken into consideration because it has a great chance of producing significant outcomes. Based on the validation results for cultural dimension, all of the components scored 60% and above except for 2 components that are M: Emphasis on money & things, F: Emphasis on quality of life & people that scored 40% and criteria M: Failing is seen as disaster, F: Failing is seen as minor accident that scored only 20%. Both are from the moderate masculinity and femininity dimension.

The results of moderate level for masculinity and femininity cultural dimension for Asian countries including Malaysia was obtained by Gould, Zakaria, and Yusof (2000) and Heimgärtner (2017) that used Hofstede culture model in their studies. In order to collect the findings, Hofstede did comprehensive analysis (Hofstede 2011). Notwithstanding the fact that not all Asians were included in Hofstede's study, the finding can be used as a foundation for the cultural dimensions. It does not necessarily follow that the finding is incorrect just because one individual disagreed with it. Depending on their life experiences, other people may have a different perspective on the culture.

The remaining cultural dimensions, however, with scores more than 60%, demonstrate that the cultural dimensions did indeed reflect the cultures of the Asian countries. This confirms that the cultural dimensions of high power distance, high collectivism, low uncertainty avoidance, and long term relationship dimensions as reported by Eune and Pyo (2009), Gould et al.,

(2000), Heimgärtner (2017), Karreman and Romeo (2016), Miehle et al. (2016), and Oh and Moon (2011) are fairly correct.

As for HCI icon design principles, all components received perfect scores, demonstrating that all designers concur that these elements are crucial for creating the Culturicon. All principles and its criteria need to be considered during the design process.

For the overall validation, the 3 variables for gain satisfaction criteria are relevancy to the intended application, perceived usefulness and clarity scored 100%. This shows that all designers agreed that the model is relevant to be used in the intended application which is mobile messaging application. All designers concurred that the model is useful and practical by the designer in developing Culturicon based on their experience using it to develop Culturicon during the validation process.

For the second criteria which is interface satisfaction, all designers agreed that the model is easy to use though at first, most of them stated that the model looks complex. After receiving a briefing on the model's operation, they were able to adapt to it without difficulty. They all concurred that the model's structure and organisation are both well-defined. This shows that the model is appropriate and easy to be understood and used by the designer in real environment as the model follows the design process suggested by Kaneko, Ikemoto, and Kusui (1991). The design process suggested by Kaneko et al. (1991) consist of 4 steps which are: 1) functional decision stage; 2) object selection stage; 3) object design stage; and 4) develop stage.

For the third criteria which is task support, The model is feasible to be implemented in the real-world development context of designing Culturicon, as evidenced by the 100% result for the practicality criteria. For completeness criteria, all of them also agreed that the model is adequate and suitable for designing Culturicon that consist of the culture element of Asian countries. For understandability and ability to produce expected result, both criteria got 100% agreed by designers. This demonstrates that the designers can read and understand the model. It demonstrates that the model is able to offer the idea of cultural elements when creating Culturicon for the intended user, which is Asian people.

LIMITATION

As in any research, this research also has its limitations. The level of cultural elements used to construct the model is based on that of Asian countries, which is a limitation for this study as it draws on Asian cultural elements and dimensions, making it unique. However, this limitation makes it inappropriate for the model to be used in a particular area outside Asia as the level may be different. Nonetheless, it opens a new perspective on culturicon design.

CONCLUSION

To make sure the proper model was developed, the validation process was carried out. The designer in this study was the user of this model. The model served as the designer's direction while creating the Culturicon, an icon embedded with a cultural element. The end user will then utilise this Culturicon in a mobile messaging application via CMC. It is necessary to test the Culturicon in the actual CMC environment to make sure it is useful and suitable to the end user. For upcoming work, the end user will be exposed to the developed Culturicon sample and granted permission to use it in everyday contact via CMC for a predetermined period of time. After that, there will be a focus group discussion to gather their feedback.

ACKNOWLEDGEMENT

This study was funded by Universiti Utara Malaysia under University Grant (SO Code: 13375).

REFERENCE

- Abubakar, H. I., Hashim, N. L., & Hussain, A. (2016). Usability Evaluation Model for Mobile Banking Applications Interface: Model Evaluation Process using Experts' Panel. *Journal of Telecommunication, Electronic and Computer Engineering (JTEC)*, 8(10), 53–57.
- Al-Tarawneh, F. H. (2014). *A Framework for Cots Software Evaluation and Selection for Cots Mismatches Handling and Non- Functional Requirements* (Universiti Utara Malaysia). Retrieved from <http://etd.uum.edu.my/4488/>.
- Cao, Z., & Ye, J. (2009). Attention Savings and Emoticons Usage in BBS. *ICCIT 2009 - 4th International Conference on Computer Sciences and Convergence Information Technology*, (Iv), 416–419. <https://doi.org/10.1109/ICCIT.2009.112>.
- Cha, Y., Kim, J., Park, S., Yi, M. Y., & Lee, U. (2018). Complex and Ambiguous. *Proceedings of the ACM on Human-Computer Interaction*, 2(CSCW), 1–22. <https://doi.org/10.1145/3274299>.
- Chen, Y., Ma, X., Cerezo, A., & Pu, P. (2014). Empatheticons : Designing Emotion Awareness Tools for Group Recommenders. *Interacción '14: Proceedings of the XV International Conference on Human Computer Interaction*, 1–8. <https://doi.org/https://doi.org/10.1145/2662253.2662269>.
- Clarke, K. R., & Warwick, R. M. (2001). *An Approach to Statistical Analysis and Interpretation* (2nd Editio). Plymouth: PRIMER-E, Ltd., Plymouth Marine Laboratory.
- Eune, J., & Pyo, K. (2009). Analysis on Intercultural Differences through User Experiences of Mobile Phone for Glocalization. *International Association of Societies of Design Research*, 1–12.
- Feng, Y., Lu, Z., Zhou, W., Wang, Z., & Cao, Q. (2020). New Emoji Requests from Twitter Users: When, Where, Why, and What We Can Do About Them. *ACM Transactions on Social Computing*, 3(2), 1–25. <https://doi.org/10.1145/3370750>.
- Goh, C. H., & Kulathuramaiyer, N. (2020). Developing an indigenous cultural values based emoji messaging system: A socio-technical systems innovation approach. *WebSci 2020 - Companion of the 12th ACM Conference on Web Science*, 32–36. <https://doi.org/10.1145/3394332.3402826>
- Gould, E. W., Zakaria, N., & Yusof, S. A. M. (2000). Applying Culture to Website Design: A Comparison of Malaysian and US Websites. *Proceedings of IEEE Professional Communication Society International Professional Communication Conference and Proceedings of the 18th Annual ACM International Conference on Computer Documentation: Technology & Teamwork*, 161–171. Retrieved from <http://dl.acm.org.ezproxy.brighton.ac.uk/citation.cfm?id=504826>
- Heimgärtner, R. (2017). Using Converging Strategies to Reduce Divergence in Intercultural User Interface Design. *Journal of Computer and Communications*, 05(04), 84–115. <https://doi.org/10.4236/jcc.2017.54006>.
- Hofstede, G. (2011). Dimensionalizing Cultures : The Hofstede Model in Context. *Online Readings in Psychology and Culture*, 2(1), 1–26. <http://dx.doi.org/10.9707/2307-0919.1014>.
- Kaneko, S., Ikemoto, H., & Kusui, Y. (1991). Approach to Designing Easy-to-Understand Icons. *Proceedings 1991 IEEE Workshop on Visual Languages*. <https://doi.org/10.1109/WVL.1991.238825>.
- Karreman, J., & Romeo, P. (2016). *Cross-Cultural HCI and UX Design : A Comparison of*

Chinese and Western User Interfaces Investigating Cultural Factors Behind WeChat and Its Western Counterparts.

- Kimura-Thollander, P., & Kumar, N. (2019). Examining the “global” language of emojis: Designing for cultural representation. *Conference on Human Factors in Computing Systems - Proceedings*, 1–14. <https://doi.org/10.1145/3290605.3300725>.
- Kunda, D. (2003). STACE: Social technical approach to COTS software evaluation. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 2693, 64–84. https://doi.org/10.1007/978-3-540-45064-1_4.
- Martakis, A., & Daneva, M. (2013). Handling requirements dependencies in agile projects: A focus group with agile software development practitioners. *Proceedings - International Conference on Research Challenges in Information Science*. <https://doi.org/10.1109/RCIS.2013.6577679>.
- Miehle, J., Yoshino, K., Pragst, L., Ultes, S., Nakamura, S., & Minker, W. (2016). Cultural Communication Idiosyncrasies in Human-Computer Interaction. *Proceedings of the 17th Annual Meeting of the Special Interest Group on Discourse and Dialogue*, (September), 74–79. Retrieved from <http://www.aclweb.org/anthology/W16-3610>.
- Nielsen, J., & Molich, R. (1990). Heuristic Evaluation of User Interfaces. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, (April), 249–256. <https://doi.org/10.1145/97243.97281>.
- Oh, J. M., & Moon, N. M. (2011). A Cultural Dimensions Model based on Smart Phone Applications. *Journal of Information Processing Systems*, 7(1), 209–220. <https://doi.org/10.3745/JIPS.2011.7.1.209>.
- Pedersen, K., Bailey, R., Allen, J. K., & Mistree, F. (2000). Validating Design Methods & Research: The Validation Square. *Proceedings of DETC '00 2000 ASME Design Engineering Technical Conferences*, 12. ASME.
- Wang, Y., Li, Y., Gui, X., Kou, Y., & Liu, F. (2019). Culturally-embedded visual literacy: A study of impression management via emoticon, emoji, sticker, and meme on social media in China. *Proceedings of the ACM on Human-Computer Interaction*, 3(CSCW). <https://doi.org/10.1145/3359170>.
- Wijeratne, S., Lakshika, B., Sheth, A., & Doran, D. (2016). EmojiNet: Building a Machine Readable Sense Inventory for Emoji. *8th International Conference on Social Informatics (SocInfo 2016)*, (October), 15. <https://doi.org/10.1081/E-ELIS>.
- Wiseman, S., & Gould, S. J. J. (2018). Repurposing Emoji for Personalised Communication: Why means “i love you.” *Conference on Human Factors in Computing Systems - Proceedings, 2018-April*, 1–10. <https://doi.org/10.1145/3173574.3173726>.
- Zukhi, M. Z. M., Hussain, A., & Husni, H. (2020). Culturicon Design Model for Social Mobile Application. *Journal of Interactive Mobile Technologies (IJIM)*, 14(Cmc), 16–31. <https://doi.org/https://doi.org/10.3991/ijim.v14i05.13313>.