Adaptation of the meCUE 2.0 Version for User Experience(UX) Measurement Approach into Indonesian Context

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***Abstract*— The user experience (UX) of an item must be evaluated by assessing its user experience as a key feature of product growth. There are several frameworks for user experience assessment questionnaires, one of which is very popular: meCUE. However, the meCUE framework was originally developed in German, then in English, and no research has yet been conducted to develop the Indonesian version of the meCUE framework. This study aims to adapt the meCUE 2.0 framework into the Indonesian version using cross-cultural adaptation and reliability testing. The meCUE 2.0 framework is a user experience questionnaire consisting of 33 questions detailed in Modules I and II, on Perception of instrumental and non-instrumental product qualities, Module III on Emotions, and Module IV on Consequences. This adaptation version is then tested against the Smart Regency Service Application, namely Pamekasan Smart Mobile Application (PSMA), involving 15 respondents from technical and non-technical backgrounds who will be given facial validity and 60 respondents to verify the validity of the Indonesian version of meCUE 2.0 for the various populations. The test results of Cronbach's Alpha from the adaptation version in Indonesian for the meCUE 2.0 framework are 0.868 for module I, 0.870 for module II, 0.894 for module III, and 0.841 for module IV, which concludes that this version can be relied on for use by user experience practitioners. This adaptation version is expected to help researchers and user experience practitioners in Indonesia evaluate product user experiences.**

Keywords—smart regency, user experience, meCUE

I. Introduction

The User Experience (UX) is now commonly regarded as an essential part of effective digital system implementation. This includes "all expectations and reactions of users before, during and after a product or service interaction" as specified in ISO 9241-210(2010) standards[1]. While the conventional view of human-computer interaction places a high premium on instrumental factors such as accessibility and usability, User Interface Design specifically seeks to provide meaningful user interactions and emotions through fulfilling psychological needs[2], [3]. To accomplish this task, it is essential to conduct an initial UX evaluation during the User-Centered Design (UCD) phase and track it during the overall development process.

A questionnaire is commonly used to collect qualitative data concerning users' attributes, emotions, feelings, beliefs, behaviors, or behaviors with the assessment tool for user experience[4]. Questionnaires offer valuable information accurately, cost-effectively, and practically. The meCUE framework is a fairly new user experience measurement questionnaire by integrating fundamental aspects of human-computer interaction required by ISO 9241-210 (2010) standards. The meCUE 2.0 framework is a relatively new and consistent framework for assessing the user experience of an application service, ensuring high levels of performance and adaptability[5]. The meCUE 2.0 file integrates a user experience evaluation questionnaire focused on five fields: Perceiving the quality of the tools, emotions, implications, and the overall value of global products. Product experience, consumer emotion, impact, and overall assessment with 33 declaration products[5], [6].

However, the meCUE system was developed initially in German and then in English[5], [7], and no research has been undertaken to create an Indonesian version of the framework. This research is intended to adapt the meCUE 2.0, using cross-cultural adaptation and reliability tests, to Indonesia. These adaptation versions will then be tested using the Pamekasan Smart Mobile Application (PSMA) Smart Service Application, which includes fifteen technically and non-technically sensitive respondents and 60 respondents to ensure the meCUE 2.0 in Indonesia is accurate in the different population. This adaptation could aid researchers and user experience professionals in Indonesia in analyzing product user experiences.

II. Literature Review

A. User Experience(UX) Assessment

There is a range of well-known methods for evaluating the user experience (UX) of popular applications. The System Usability Scale (SUS) is a commonly used, well-validated, and dependable method for quickly assessing the functionality and relevance of systems used with applications and websites[8]. Another quite accurate but costly software Usability Measurement Inventory (SUMI) captures user satisfaction in a comprehensive assessment, thus gaining more insight into UX communication than other measurements[9][10]. The most recent instrument, the

Standardized User Experience Percentile Rank Questionnaire Mobile (SUPR-Qm), aims to assess the user experience of an application that involves the usefulness, involvement, and practicality of this application[11]. In the past decade, progress has been made concerning mobile interfaces, such as apps, to understand specific norms better. The methods of heuristic assessment published in recent literature include a comprehensive analysis of mobile interfaces that concentrate on UX but are designed by experts and designers during the stage of application development[12], [13].

B. The meCUE 2.0 Version

The meCUE frame is structured on the Thuringia and Mahlke user experience part (CUE model)[14]. This model makes a distinction between instrumental and non-instrumental consistency standards[15]. While instruments include unique aspects of usability and utility, they include visual aesthetics and recognition characteristics as non-instrumental features. In understanding all attributes, interaction characteristics directly affect (i.e., product, user features, and context). Perception can include feelings and a consistent idea (e.g., Facility of the target, standard compatibility). Emotions are a key part of UX as hopeful emotions hold UX positive overall[16]. The CUE model recognizes its significance through its central position and its connection to all expectations of product quality (see Fig. 1). Emotions stem from these suppositions, but they can also respond, as revisionist relationships demonstrate.

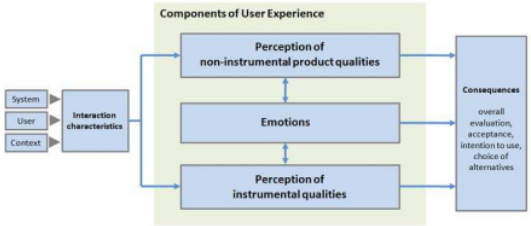

Fig. 1. Component of User Experience (CUE) Model[7]

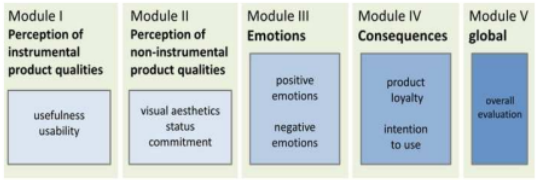

Fig. 2. The meCUE 2.0 Framework Module [5]

C. Cross-Cultural Adjustment

The instrument adaptation is based on international principles of cross-cultural adaptation to ensure the accuracy of the translation results and the coherence of the context between this version and the original[17]. In the current research on multicultural adaptation, the following steps are explained:

1. Primary conversion from the original version to the target language version has been performed and marked as forwarding translation. Bilingual interpreters have produced both separate translations with a language as their mother tongue. The report also outlined its reasons for its decisions.
2. To summarize the outcomes of the translations, the two translators and one observer met. Initially, a synthesis was made of these translations, each problem was dealt with and solved.
3. The questionnaire was then returned to the language of origin by a translator. The translation is called this point.
4. The Expert Group has examined translation findings. The Committee of Experts compiled all the questionnaire versions and created the pre-final version of the field test questionnaire.
5. Pretests are the last stage of the adjustment process. The questionnaire was completed by each topic and interviewed to clarify the meaning of each questionnaire and the selected response. The significance of the things and the answers were examined.

Fig. 3. Pamekasan Smart Mobile Apps (PSMA)is one of the Smart Regency Apss Service in Indonesia

D. Smart Regency Mobile-Apps Services

Smart Regency was established to effectively manage regional resources through the use of an ICT district planning concept. While this concept is similar to that of an intelligent city, it is distinct in terms of government structures, area, subsistence variations, population, economy, and sociocultural background[18]. Various studies on smart development growth have been performed in Indonesia, including evaluations of e-services' efficacy[19], Promotion of tourism[20], The people's participation in the online community[21], Intelligent netizens provide public services[22], trafficking[23], the efficiency in which information systems operate[24], community readiness assessment[25], Numerous uses[26], the Village as a Model for a Smart Rural Society[27], Adoption of new technologies[28], A study of the electronic services' efficiency[29], Smart regency templates and frames[18], Identifying and classifying operation maturity[30], variables affecting results[31], Determine and prioritize essential factors[32]. Subsequently, numerous previous studies have been conducted, including those on the introduction of a smart economy[33], Toilet management simultaneity, synergy, and bureaucracy in public services[34], Intelligent

Tourism Destination Management[35], Model-identification and preparation[36], [37], Conscious knowledge of the purposes of the applications[38], from a communal standpoint, comprehensive social facets[39], Assessing the factors that affect the Adoption of sustainability[40], Defining the direction of regional growth[41], Village development and the philosophy of intelligent tourism[42], Creating smart villages to aid in the development of smart cities[43], SME's that are forward-thinking[44] and SOA for implementation of e-government[45], also its Knowledge Management[46].

E. The Assessment of Reliability

An instrument is not regarded as accurate without reliability. An instrument's ability to provide accurate measurements is called its reliability[47]. To establish the accuracy of an investigation or other measurement, a reliability test is used. The reliability coefficient is the statistics that show whether a test or an examination is accurate or not. The coefficient refers to the association between the survey variables[48]. Cronbach's Alpha is a single test reliability estimation technique that requires only one test. It was designed to calculate the internal accuracy of a test or scale. Interior consistency refers to the measurement of the same principle or structure across all test objects. It should be determined to ensure its validity before using a study test[49]—the coefficient of Cronbach Alpha reliability coefficient ranges from 0 to 1. The closer the Alpha coefficient of Cronbach is to one, the more consistently the objects are evaluated internally. If it is greater than or equal to 0.7, Cronbach Alpha is considered confidential. Thus the alpha value of Cronbach is increased by the combination of two tests[49].

III. METHODOLOGY

First, translation into Indonesian with two translators is completed by translating the English version of meCUE 2.0. Another translator knows the concepts checked at meCUE 2,0, whereas other translators do not understand the quantified concepts or know them. The first translator in this study was a writer and the second was a trained professional translator. Each translator generates a translation report. After discussion by the two translators, the difference between the two translations was synthesized into a single translation. Additional translation then returns to the original language, the forward meCUE 2.0 translation. In this step, the translated version is validated, representing the same item content as the original. Translators are native speakers who know or do not know the concepts discussed, both in English and Indonesian. Experts then compare the results of the back translation to obtain equivalence. The specialist examined the interpretation and agreed on the inconsistencies between the original and the translated versions. Target users were checked with face validity in the pre-final version of meCUE 2.0 Indonesia.

Validity of face is a subjective evaluation to quantify an instrument according to the respondent's perception [50]. Fifteen respondents who were asked to provide insight into the interpretable meCUE 2.0 items of technical and non-technical context were therefore allowed face validity. The scale has five points, number 1 is unanimous, and five is very unanimous. Face validity findings have been evaluated by estimating the average scale and translated with an expert guide to the final version of meCUE 2.0 Indonesia. Furthermore, a questionnaire was used with 60 respondents to ensure that the Indonesian version of meCUE 2.0 was correct and used in various populations. The reliability test is based on the meCUE 2.0 version from Indonesia. The measure of reliability In the Cronbach alpha score, SmartPLS analyzes the results of the questionnaire.

The following are the dimensions and items in the meCUE 2.0 framework questionnaire in the English and German versions. The translation in both languages was done by Michael Minge (&) and Manfred Thüring, who initiated the meCUE 1.0 model and its revised version (meCUE 2.0)[5].

TABLE I. DIMENSIONS AND ITEMS OF MECUE 2.0 FRAMEWORK MODULES IN ENGLISH AND GERMAN VERSIONS[5]

Module	Dimension	Item in English Versions	Item in German Versions
Module I *(Perception of instrumental product qualities)*	Usefulness	With the help of this product, I will achieve my goals	Mithilfe des Produkts kann ich meine Ziele erreichen
		I consider the product extremely useful	Ich halte das Produkt für absolut nützlich
		The functions of the product are exactly right for my goals	Die Funktionen des Produkts sind genau richtig für meine Ziele
	Usability	The product is easy to use	Es wird schnell klar, wie das Produkt zu bedienen ist
		The operating procedures of the product are simple to understand	Die Bedienung des Produkts ist verständlich
		It is quickly apparent how to use the product	Das Produkt lässt sich einfach benutzen
Module II *(Perception of non-instrumental product qualities)*	Visual Aesthetic	The design looks attractive	Das Design wirkt attraktiv
		The product is creatively designed	Das Produkt ist kreativ gestaltet
		The product is stylish	Das Produkt ist stilvoll
	Status (Social Identity)	By using the product, I would be perceived differently	Durch das Produkt werde ich anders wahrgenommen
		The product would enhance my standing among others	Das Produkt verleiht mir ein höheres Ansehen
		I would not mind if my friends envied me for this product	Meine Freunde dürfen ruhig neidisch auf das Produkt sein
	Commitment (Social Identity)	I could not live without the product	Ohne das Produkt kann ich nicht leben
		The product is like a friend to me	Wenn ich das Produkt verlieren würde, würde für mich eine Welt zusammenbrechen
		If I ever lost the product, I would be devastated	Das Produkt ist wie ein Freund für mich
Module III *(Emotions)*	Positive Emotion	The product relaxes me	Das Produkt entspannt mich
		The product exhilarates me	Durch das Produkt fühle ich mich ausgeglichen

		The product makes me happy	Durch das Produkt fühle ich mich fröhlich
		The product makes me feel euphoric	Das Produkt beruhigt mich
		The product calms me	Das Produkt beschwingt mich
		When using the product, I feel cheerful	Das Produkt stimmt mich euphorisch
	Negative Emotion	The product annoys me	Das Produkt frustriert mich
		The product angers me	Das Produkt nervt mich
		The product frustrates me	Das Produkt macht mich müde
		When using this product, I feel exhausted	Das Produkt verärgert mich
		The product makes me tired	Durch das Produkt fühle ich mich erschöpft
		2 e product makes me feel passive	1 rch das Produkt fühle ich mich passiv
Module IV *(Consequences)*	Intention to Use	I would not swap this product for any other 2	Ich würde das Produkt gegen kein anderes 1 tauschen
		In comparison to this product, no others come 2 se	Im Vergleich zu diesem Produkt wirken andere 1 odukte unvollkommen
		I would get exactly this product for myself (again) 2 anytime	Ich würde mir genau dieses Produkt jederzeit 1 ieder) zulegen
	Product Loyalty	I can hardly wait to use the product again 2	Ich kann es kaum erwarten, das Produkt erneut 1 verwenden
		If I could, I would use the product daily 2	Wenn ich könnte, würde ich das Produkt täglich 1 tzen
		When using this product, I lose track of time	Wenn ich mit dem Produkt zu tun habe, vergesse ich schon mal die Zeit
Module V *(Global)*	Overall evaluation		

IV. Result

The cross-cultural adjustments resulted in 33 products being traded in Indonesian from meCUE 2.0, which were considered similar in English and German to meCUE 2.0. (See Table 2).

TABLE II. Adaptation meCUE 2.0 Framework into Indonesian Context

Module	Dimension	Item in Indonesian Versions
Module I *(Perception of instrumental product qualities)*	Usefulness	Dengan bantuan aplikasi ini, saya akan mencapai tujuan saya
		Saya menganggap aplikasi ini sangat berguna
		Fungsi aplikasi ini tepat untuk tujuan saya
	Usability	Aplikasi ini mudah digunakan
		Prosedur pengoperasian aplikasi ini mudah dipahami
		Dengan cepat terlihat, bagaimana cara menggunakan aplikasi ini
Module II *(Perception of non-instrumental product qualities)*	Visual Aesthetic	Desain aplikasi ini terlihat menarik
		Aplikasi ini dirancang secara kreatif
		Aplikasi ini bergaya
	Status (Social Identity)	Dengan menggunakan aplikasi ini, saya akan dianggap berbeda
		Aplikasi ini akan meningkatkan posisi saya di antara rekan-rekan
		Saya tidak akan keberatan jika teman-teman saya iri pada saya untuk aplikasi ini
	Commitment (Social Identity)	Saya tidak bisa hidup tanpa aplikasi ini
		Aplikasi ini seperti teman bagi saya
		Jika saya kehilangan aplikasi ini, saya akan hancur
Module III *(Emotions)*	Positive Emotion	Aplikasi ini membuat saya rileks
		Aplikasi ini membuat saya senang
		Aplikasi ini membuat saya merasa sangat senang
		Aplikasi ini membuat saya merasa gembira
		Aplikasi ini menenangkan saya
		Saat menggunakan aplikasi ini, saya merasa ceria
		Aplikasi ini mengganggu saya
	Negative Emotion	Aplikasi ini membuat saya marah
		Aplikasi ini membuat saya frustrasi
		Saat menggunakan aplikasi ini, saya merasa lelah
		Aplikasi ini membuat saya lelah
		Aplikasi ini membuat saya merasa pasif
Module IV *(Consequences)*	Intention to Use	Saya tidak akan menukar aplikasi ini dengan yang lain
		Dibandingkan dengan aplikasi ini, tidak ada aplikasi lain yang mendekati
		Saya akan mendapatkan aplikasi ini untuk diri saya sendiri (lagi) kapan saja
	Product Loyalty	Saya sudah tidak sabar untuk menggunakan aplikasi ini lagi
		Jika saya bisa, saya akan menggunakan aplikasi ini setiap hari
		Saat menggunakan aplikasi ini, saya lupa waktu
Module V *(Global)*	Overall evaluation	

As discussed in the previous section, this version of meCUE 2.0 has also been validated with 60 respondents. This instrument has semantic equivalence before the original meCUE 2.0, and the translated version does not have grammatical problems.

TABLE III. Total Item Statistics and Cronbach Alpha Value meCUE 2.0

Module	Reliability	Cronbach Alpha	Indicators	Validity
Module I	0.954	0.872	Usefulness	0.782
			Usability	0.896
Module II	0.976	0.868	Visual Aesthetic	0.852
			Status	0.799
			Commitment	0.898
Module III	0.936	0.870	Posistive Emotion	0.840
			Negative Emotion	0.728
Module IV	0.971	0.894	Intention to Use	0.896
			Product Loyalty	0.925

The statistical results of total items involving 60 respondents show that the Indonesian version of the meCUE 2.0 framework is considered reliable with a value> 0.69. The results also show that the instrument is reliable because the Cronbach alpha value is> 0.8, and the score does not change significantly and remains consistent. While all indicators can be declared valid because they have a validity score> 0.69, the lowest score is the Negative Emotion indicator with a value of 0.728. The Product Loyalty Indicator owns the highest score with a value of 0.925.

V. Conclusion And Discussion

This study is aimed at translating and adapting to Indonesian the meCUE 2.0 system. In this study, a validation using a Smart Regency mobile service was performed. meCUE 2.0, to ensure the correct and acceptable Indonesian language to different populations and cultures, is subject to validity changes. The translated artifacts will be assessed for reliability after validation. To calculate the Cronbach alpha score, reliability test data were analyzed using SmartPLS. The results show that the Indonesian meCUE 2.0 version is stable to an alpha score of Cronbach higher than 0.841. As a result, usability practitioners can use this tool for both usability evaluation and analysis.

Further research is therefore essential for optimizing the Indonesian version of meCUE 2.0 on other systems like e-learning, e-commerce, government systems, and news websites. The tool will compare the English and German versions of meCUE 2.0 when testing the device to determine the differences and verify the contribution of the adapted version. In addition, more studies of the psychometric properties of meCUE 2.0 in Indonesia may be carried out in the future. The usability of the meCUE 2.0 adaptation version also needs to be improved.

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