

ANALYSIS OF CANOE MODEL'S EXTENT OF SATISFACTION AND EXTENT OF DISSATISFACTION IN THE IMPLEMENTATION OF AUGMENTED REALITY LEARNING IN BALINESE SCRIPT

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ABSTRACT

This study aims to analyze the implementation of Augmented Reality (AR-Learning) in the learning of Balinese Script in elementary school age students. The Balinese script as one of the regional scripts that has become one of the regional writings to be introduced compulsorily to school children from elementary school through high school in the province of Bali. The conventional learning model introducing Balinese Script is often unsuccessful due to the lack of interesting process of introducing and learning the Balinese Script. For this reason, alternative learning methods using technology can be implemented, one of which uses Augmented Reality, or better known as AR-Learning. By utilizing Android-based smartphones, learning Balinese script will certainly be more fun for elementary school students. In this study, students of grade 3 SDN 1 B.B Agung used a case study in this research. For this reason, the Extent of Satisfaction and Extent of Dissatisfaction methods in the Kano model are used in the analysis of this study. The results of this study are the scatterplot of each satisfaction index and dissatisfaction index on the implementation of Balinese Android-based learning with Augmented Reality technology using the Kano Model to categorize the attributes of AR-Learning user satisfaction.

Keywords: Balinese Script, Augmented Reality, Extent of Satisfaction, Extent of Dissatisfaction, Canoe Model

INTRODUCTION

As one of the cultural heritages that is still introduced to this day and regional writing that must be submitted to school children both from elementary to high school level in the Province of Bali, interest in reading and writing Balinese script, in order to increase spending. It is interesting not only that the Balinese script learning method is less interesting in the process of introducing Balinese script, but also the media used still relies on books. The learning process that is currently being implemented at SDN 1 B.B Agung can be seen in Figure 1 below.

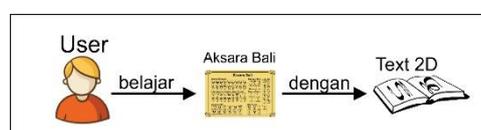


Figure 1. Balinese Script Learning Method at SDN 1 B.B Agung

Along with the development of technology, in addition to books that contain text and images, there are currently also types of books that can be integrated with technology, one of which is Augmented reality (AR). The first time the idea of AR was applied to a book called Magic Book that was researched by Bilinghurst, Kato and Poupyrev [1]. Augmented reality (AR) is a technology that combines two-dimensional and three-dimensional virtual objects into a real three-dimensional environment and then projects these virtual objects into real time [2]. AR is used to increase user perception in reality and help users to perform certain tasks. Currently there are many

AR applications used in various fields, such as education, entertainment. The development of media to introduce Balinese script has attracted several researchers with the aim that the Balinese script is more interesting, easy to read, and studied in the form of a mobile application. One of them is a mobile application for introducing Balinese script into Latin letters based on Augmented Reality developed by Pande Putu Gede Putra Pertama [3]. In this study, the authors used the Extent of Satisfaction and Extent of Dissatisfaction methods in the Kano model in the analysis so that it can be seen is the scatterplot of each satisfaction index and dissatisfaction index on the implementation of Android-based Balinese Script learning with Augmented Reality technology using the Kano Model to categorize the attributes of the AR-Learning user satisfaction attributes.

METHODS

Method of collecting data

The types of data collection used in the study are as follows:

1. Observation
2. Interview
3. Literature Study

Types of Data Used

1. Primary data: The authors take data about the Balinese script on the website <http://www.babadbali.com>. This website contains an explanation of the Balinese script and form of writing. The writer of this website is also from the Balinese script experts, Ida Bagus Adi Sudewa. The research is focused on general information about Balinese Script.
2. Secondary Data: In this study the authors used books and journals about Balinese Script, Augmented Reality, Android, Canoe Model, USE Questionnaire Model.

Characteristics of Respondents

In this study the respondents were grade 3 students and Balinese language teachers for the 2017/2018 school year at SDN 1 Baler Bale Agung with a population of 41 people.

Sample Determination

Determination of the sample in this study using the number of population with the formula Slovin [5].

$$n = \frac{N}{1 + Ne^2} = \frac{42}{1 + 42(0,1)^2} = 29,6 = 30 \text{ samples}$$

Note:

n = sample size

N = population size

E = the level of fault tolerance, in this study determined 10%

The sample size of the Kano model that must be met in this study is a minimum of 30 sample users. Characteristics of respondents can be seen in Table 1 below.

Table 1. Characteristics of Respondents

No.	Characteristics	Amount	Percentage (%)
1	Gender :		
	Male	14	46,7%
	Female	16	53,3%
		30	100%

From the results of filling out the questionnaire, the authors used 10 samples to test the validity and reliability of the questionnaire statements that the authors used in

this study using the IBM SPSS Statistics V.25 tool. In this validity test, if the Pearson correlation is positive and the magnitude is more than 0.3 then the item in question is declared valid, if the value is less than 0.3 then the item in question is declared invalid and removed from the questionnaire or replaced with a statement of improvement. From the results of the validity test it was found that all the questionnaire statements were valid R. Critical above 0.3 and the reliability test found that all the questionnaire statements were reliable with Cronbach's alpha above 0.7 which was 0.989.

FINDINGS AND DISCUSSIONS

To determine the attributes of the application that need to be upgraded and which attributes were satisfactory in using the application, questionnaires were distributed to the 30 respondents, from whom the authors obtained the results of the recapitulation of the Kano model in Table 2.

Table 2. Recapitulation of the Canoe Model

Dimension	Atribute	Grade
Speed	S1	I
	S2	O
	S3	A
	S4	M
Homepage	H1	I
	H2	I
	H3	I
	H4	M
Content	C1	I
	C2	M
	C3	I
Context	K1	I
	K2	I
	K3	M
Usability	U1	I
	U2	I
	U3	I
Readibility	R1	I
	R2	I
	R3	I
Data Mobility	DM1	I
	DM2	A
	DM3	I
Accuracy	A1	I
	A2	I
	A3	I
Public Service	PS1	I
	PS2	I
	PS3	I
Platform Usage	UP1	I
	UP2	I
	UP3	I
Hits	HI1	M
	HI2	I
	HI3	I

From the results of the Kano Model tabulation in table 2, it is known that the level of satisfaction with the application of Android-based Augmented Reality in learning Balinese Script as shown in Table 3.

Table 3. Satisfaction Level of Application of Android-Based Augmented Reality

Attribute	Canoe Model Category
A. Open the start of the application	<i>Indifferent</i>
B. Open the application content	<i>Indifferent</i>
C. Information search results	<i>Must-be</i>
D. Download data	<i>Attractive</i>
A. Application Name	<i>Indifferent</i>
B. Menu Structure and Display	<i>Indifferent</i>
C. Application Functions	<i>Indifferent</i>
D. User interaction with the application	<i>Must-be</i>
A. Application Quality	<i>Indifferent</i>
B. Relevant Application	<i>Must-Be</i>
C. Benefits of application content	<i>Indifferent</i>
A. Have a link with other related applications	<i>Indifferent</i>
B. Application content according to purpose	<i>Indifferent</i>
C. There is information about using the application	<i>Must-Be</i>
A. There is a communication room	<i>Indifferent</i>
B. Quality of Service Interaction	<i>Indifferent</i>
C. Easy to understand display (user friendly)	<i>Indifferent</i>
A. Easy to read, understand (information available)	<i>Indifferent</i>
B. Color and layout of the text	<i>Indifferent</i>
C. Using Indonesian	<i>Indifferent</i>
A. Information and data are always in accordance with the Balinese script taught	<i>Indifferent</i>
B. Balinese Script Data	<i>Must-be</i>
A. Sharp and reliable scan results	<i>Indifferent</i>
B. The Scan Results of the Content can be Responsible	<i>Indifferent</i>
C. Right on target	<i>Indifferent</i>
A. Application Information	<i>Indifferent</i>
B. Complete information	<i>Indifferent</i>
C. Application Services and Complaints	<i>Indifferent</i>
A. Smartphone Device Support	<i>Indifferent</i>
B. Support the Android operating system	<i>Indifferent</i>
A. Number of Visitors	<i>Must-Be</i>
B. There is an Interaction with the Author	<i>Indifferent</i>
C. There is a Author account	<i>Indifferent</i>

After calculating and analyzing the classification of the canoe category, the number / value of the canoe category obtained for each respondent is obtained. The next step is to determine the highest requirements of each item, then calculate the percentage and extent of satisfaction / dissatisfaction of each item by using the following formula:

$$\text{Presentase} : \frac{\text{Grade} \times 100 \%}{\text{Total}}$$

$$\text{Extent of satisfaction} : \frac{A + O}{A + O + M + I}$$

$$\text{Extent of dissatisfaction} : \frac{O + M}{(A + O + M + I) \times (-1)}$$

So that the calculation results are obtained as shown in Table 4.

Table 4. Extent of Satisfaction and Extent of Dissatisfaction

Attribute	SI (%)	DI (%)
S1	0,03	-0,37
S2	0,63	-1
S3	0,63	-0,27
S4	0	-0,67
H1	0	-0,47
H2	0	-0,4
H3	0	-0,3
H4	0	-0,6
C1	0	-0,37
C2	0	-0,57
C3	0	-0,37
K1	0	-0,4
K2	0	-0,23
K3	0	-0,6
U1	0,03	-0,23
U2	0	-0,33
U3	0	-0,27
R1	0	-0,23
R2	0	-0,17
R3	0	-0,17
DM1	0	-0,3
DM2	0	-0,43
DM3	0	-0,23
A1	0	-0,2
A2	0	-0,27
A3	0	-0,33
PS1	0	-0,2
PS2	0	-0,23
PS3	0,03	-0,3
UP1	0	-0,17
UP2	0,03	-0,17
UP3	0	-0,27
HI1	0,23	0,73
HI2	0,03	0
HI3	0	0

The results of the Extent of Satisfaction and Extent of Dissatisfaction tables are then compared in the form of scatterplot charts as shown in Figure 2.

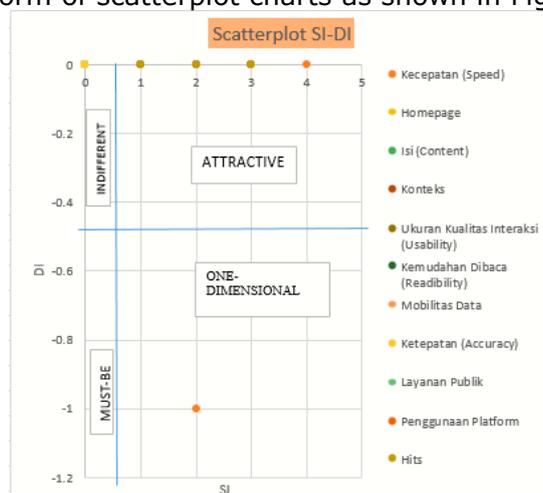


Figure 2. Canoe Model Attribute Diagram

CONCLUSION

For the Kano model, none of the attributes are in the must-be category, where the application can be categorized as fulfilling the user's needs. For attribute speed in scatterplot, it is categorized as one-dimensional or performance needs, so when it is expected that the speed in translating markers from cards into the Augmented Reality animation that appears on a smartphone does not require a long time. For other attributes included in the attractive category, where the level of user satisfaction has reached the highest satisfaction on application performance and will not affect the user's opinion even though there is a decrease in application performance.

REFERENCES

- [1] A. K. Wahyudi, R. Ferdiana and R. Hartanto, "Pengujian Dan Evaluasi Buku Interaktif Augmented Reality ARca 3D," 2014.
- [2] I. G. A. Nugraha and I. K. G. D. Putra, "Rancang Bangun Aplikasi Android AR Museum Bali : Gedung Karangasem dan Gedung Tabanan," 2016.
- [3] P. P. G. P. Pertama, Suyoto and T. Suselo, "Pengembangan Aplikasi Mobile Pengenalan Aksara Bali Kedalam Huruf Latin Dengan Augmented Reality," in *Seminar Nasional Teknologi Informasi dan Komunikasi 2015 (SENTIKA 2015)*, Yogyakarta, 2015.
- [4] P. D. Arista, "Pengembangan Brosur Interaktif "ARYappi" Berbasis Augmented Reality Sebagai Media Iklan SMK Yappi Wonosari," 2016.
- [5] Y. N. Jayanti and M. L. Singgih, "Peningkatan Kualitas Layanan Pengujian Dan Kalibrasi Peralatan Kesehatan Dengan Menggunakan Integrasi Servqual Method, Kano Model Dan Quality Function Deployment (QFD) (Studi Kasus : Balai Pengamanan Fasilitas Kesehatan Jakarta)," in *Prosiding Seminar Nasional Manajemen Teknologi XVI*, Surabaya, 2012.
- [6] I. W. Pantiyasa, "Jurnal Ilmiah Hospitality Management," 1 Juli - Desember 2013. [Online]. Available: <http://ejournal.stpbi.ac.id/index.php/JIHM/article/viewFile/48/46>. [Accessed 10 Maret 2019].
- [7] S. Defiyanti and D. C. Pardede, "Perbandingan Kinerja Algoritma ID3 Dan C4.5 Dalam Klasifikasi Spam-Mail," 2014.
- [8] Jogiyanto, Analisis dan Desain, Yogyakarta: Andi, 2005.
- [9] Witarto, Memahami Pengolahan Data, Jakarta: Bumi Aksara, 2008.
- [10] C. P. Yanti, "Aplikasi Augmented Reality Untuk Informasi Kebudayaan Bali Berbasis Android," 2016.
- [11] J. Han and M. Kamber, Data Mining Concept and Tehniques, Berlin: Springer, 2011.