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User Experience Design of Web-Based BPKAD Asset Mapping using Kansei Engineering

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ABSTRACT

User Experience (UX) is an integral part of software development, one of which is web-based mapping. Several factors that affect that UX is acceptable to users include visual aesthetics, ease of menu hierarchy, component layout and display coloring. There are several things that are not implied in UX development, namely the psychological factor of the user in which there is emotion and feeling. This research is located at BPKAD Palembang City which has purposing to 1) Analyzing user psychological factors in terms of feelings and emotions in designing web-based UX for the Palembang City BPKAD Regional Asset Mapping, 2) Interpreting user psychological factors into web-based design elements of the Palembang City BPKAD Regional Asset Mapping. The research stages include determining Kansei Word; Structuring SD Scale; Collecting and Validating Web-Based Mapping Specimen; Category and Item Design Classification; Participant Data Evaluation; Data Analysis and Defining Design Elements. The final result is 5 emotion concepts, these are dynamic & well-organized concept, refreshing concept, spacious concept, professional concept and nautical-look concept. The DEs generated from PLS analysis for dynamic & well-organized concepts are 27 DEs, refreshing concept is 15 DEs, spacious concept is 17 DEs, professional concept is 18 DEs and nautical-look concept is 18 DEs.

Keywords : User Experience, Web-based Mapping, Kansei Engineering, Emotion Factor

1. INTRODUCTION

User Experience (UX) is an important factor in interface web design. This is because UX is a process of increasing user satisfaction (application users or website visitors) in the interaction between users and the system. Basically, in building UX, it needs to be adjusted to the characteristics and segmentation of users. Several factors that affect that UX is acceptable to users include visual aesthetics, ease of menu hierarchy, component layout and display coloring (Ritter & Winterbottom, 2017). However, there are other factors that are difficult to understand, especially in the UX design parameters of an application, that is the psychological factor of the user both emotionally and emotionally. The user's interpretation of the comfort of the application when determining whether the visual aesthetic is good or not, the menu that is applied is easy or not, or the layout of the layout is comfortable or not, is influenced by psychological factors of the user. So that in designing the UX of an application, whether web-based or mobile, a user psychological approach is needed. One method to explore the psychological factors of users is Kansei Engineering (KE). KE is a method that combines Kansei, which means feeling and emotion factors with engineering disciplines (Nagamachi & Lokman, 2011). The application of KE can be implemented in the field of information systems to design UX based on the psychological factors of the user, both feelings and emotions (Hadiana et al., 2019). The KE method has systematic stages starting from determining participants, determining Kansei words, collecting specimens, evaluating participants, multivariate analysis, to interpreting the results of multivariate analysis into the Kansei matrix.

This research focuses on developing a web-based UX for mapping the assets of the Palembang City BPKAD area by involving the psychological factors of the user through the KE method. The use of geospatial provides convenience in implementing governance, especially in government institutions, both in terms of data/information publication and data/information processing. Of course, in this case, the system is not focused on the usability aspect, but how persuasively it can provide comfort for users so as to increase the positive image of the government as a data source. Processing of regional assets such as buildings and land represented on web-based mapping is very helpful for the government and

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the community. The problem that occurs today is that there is no informative data representation presented in mapping regional assets in government institutions, where the information in the mapping does not pay attention to UX aspects based on user psychological factors, ergonomic values and user comfort in using the system (Lew et al., 2010). So that the problem formulations in this study are: 1) How are the emotion and feeling factors of users that appear in the UX design of Web-based BPKAD Regional Asset Mapping in Palembang City?, 2) How are the interpretations of user psychological factors into design elements as a reference in building a web-based mapping of Regional Assets BPKAD Palembang City

Specifically, the research objectives are 1) Analyzing user psychological factors in terms of feelings and emotions in designing web-based UX for the Palembang City BPKAD Regional Asset Mapping, 2) Interpreting user psychological factors into web-based design elements of the Palembang City BPKAD Regional Asset Mapping. The urgency of the proposed research involves user psychological factors in building a web-based mapping of Palembang City's regional assets through the implementation of Kansei Engineering. In general, the system that is built focuses on the usability aspect only, but in this study is not only focus on usability aspect, but how to persuasively attract user interest to use a system that is represented by UX based on the recommendations of the Kansei matrix which is based on the user's psychological factors.

1.1. Kansei Engineering

Kansei which means sensitivity or how the subjective impression of something involves the sense of sight, hearing, smell, feeling (taste), and touch which is interpreted as an element of feeling and emotion (Lokman, 2013). Kansei involves sensitivity, sensibility, feelings and emotions that are harmonized through the five senses; vision, hearing, smell, feeling, touch (skin sensation). The term Kansei was then translated into an engineering method called Kansei Engineering. In its development KE can be implemented in software development, especially KE focuses on user psychological factors which ultimately support the UX development of a system (Isa, 2018). Through KE, implied things such as feeling and emotion are addressed to the UX design, which has an impact on the value and benefits of the system built by (Lokman & Noor, 2006). Several previous studies involving KE in system development include the implementation of Kansei Engineering in the Design of Mobile Website Interfaces for News Information Portal for Education and Children's Health (Ginanjar & Supendi, 2017), where this research resulted in 6 recommendations for display design of the children's news portal website with the following details: 3 main recommendations using 1 kansei word in 1 recommendation and 3 alternative recommendations for combining 2 kansei words in 1 recommendation. (Song et al., 2012) develops a prototype website using the Kansei methodology that integrates technical expertise and practical considerations. The result of this research is that Kansei Engineering has a significant influence in website design in terms of satisfying the emotional needs of users. Broadly speaking, there are 3 main stages in KE, beginning with Kansei Investigation, Kansei Data Analysis Process, and Kansei Product Creation (Lokman & Nagamachi, 2010):

Figure 1. The Stage of KE (Lokman & Nagamachi, 2010)

1.2. Kansei Engineering Type 1 (KEPack)

Kansei Engineering Type 1 or called KEPack is one of the methods in KE, which has the following stages (Lokman, 2013):

1. **Determine the Strategy.** This is the initial stage in KEPack, the undestanding of the theory and concepts of Kansei Engineering is carried out at this stage. “Determining Strategy” also means determining how many Kansei Words (KW) and specimens are needed, how many participants are involved and the Kansei method used.
2. **Determine *Kansei Word* (KW)** which in the form of keywords related to human emotional or affective. Determining KW greatly influences the success of Kansei's research. There will be differences in the scope of KW, for example, researching processed toys products will be different

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from conducting research on clothing materials. KW is related to the user's emotional and psychological factors on the assessment of something. To get KW, it can be done by consulting expert web designers and UX/UI experts, users, and programmers. KW is in the form of expression words related to feelings and emotions, for example dynamic, formal, professional.

3. **Translating KW to the Semantic Differential (SD) scale structure.** After Kansei's investigation through the selection of KW related to the research under study, the next step is to arrange the KW into a Semantic Differential (SD) scale structure. The SD scale is used to facilitate participants in filling out the questionnaire through 5 scales, where 1 is the lowest value and 5 is the highest score.
4. **Collecting the valid specimen** that using stages: Initial specimen identification, design element investigation, item specimen classification and specimen finalization (which be done in the next stage)
5. **Specimen Element Classification**, where the specified specimen is defined into specimen elements, as in the following example:

Table 1 Specimen Element Classification Example

Design Element	Values
Background Color	Black
Existence of Header	Yes
Main menu Background Color	Light Green
Existence of Header Picture	Yes
...	...

6. **Evaluating participant of *Kansei* questionnaire,** with 20-30 participants [12]. Participants were given a questionnaire and then filled in based on the sensation what they felt in seeing and using the specimen and it took at least 5 seconds for each KW question [14].
7. **Multivariate Statistic Analysis** which analyzes Kansei's recapitulation so as to produce the concept of what feelings and emotions will be highlighted in UX/UI development [9]. Consists of 3 analysis processes, namely Coefficient Correlation Analysis (CCA), Principal Component Analysis (PCA) and Factor Analysis (FA).
8. **Data Analysis Interpretation** that using Partial Least Square (PLS) was carried out to identify the relationship between emotions and design elements.
9. **Developing Design Element Kansei Matrix** which has a purpose for guidance to the web designer and programmer in UX/UI designing

2. RESEARCH METHOD

2.1. Research Object and Participant

The research was conducted in Kecamatan Ilir Barat I District by selecting public assets under BPKAD Palembang City. The participants involved in the Kansei data were 50 people consisting of 25 men and 25 women; The Kansei Engineering method used is KEPack; The Kansei Word (KW) used in the questionnaire was 20 KW; Analysis of data calculations using multivariate statistical analysis which includes PCA, FA, PLS. The study used 10 specimens of web-based mapping.

2.2. Research Tools

The tools used in this study is XLStat 2019, while the statistical analysis used includes Coefficient Correlation Analysis, Principal Component Analysis, Factor Analysis and Partial Least SquareTool

2.3. Research Stages

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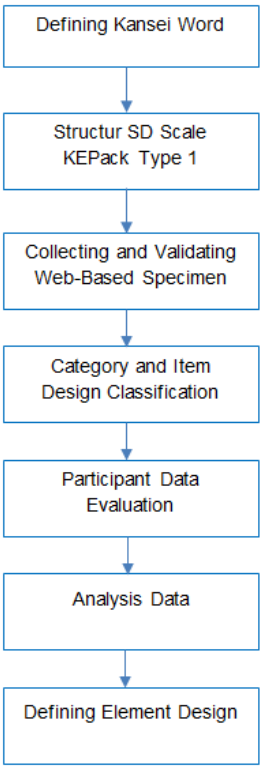

Figure 2. The Stages of Research

The following is the explanation of figure 2 above:

1. Determining Kansei Word
   The initial stage is the determination of 20 Kansei Words (KW) to be used in the research. The formulation of KW is done in consultation with graphic design experts, programmers, web designers, users of government institutions, and community users. Before determining KW, first collect KW as much as possible by asking participants for input, what feelings and emotions they are felt after seeing some of the specimens given. After that, re-validation is carried out to determine 20 KW which is valid and relevant to the context of web-based mapping
2. Structuring SD Scale
   In structuring the SD Scale uses a Likert scale of 1 – 5 by giving the word "Not" for the lowest value or 1 and the word "Very" for the highest value or 5. The SD Scale was developed using google form.
3. Collecting and Validating Web-Based Mapping Specimen
   Web-Based Mapping Specimen which is collected by considering the characteristics, design and appearance of the system. There were 10 specimens that were validated based on the specimens collected.
4. Category and Item Design Classification
   After 10 specimens are declared valid, the next step is to structure the specimens into design elements which are divided into basic categories, namely Body, Page, Header, Main, Top Menu, Right Menu, Left Menu, Footer, Picture, Others and Map.
5. Participant Data Evaluation
   This stage was carried out by involving 50 participants consisting of 25 female participants and 25 male participants. The participant evaluation technique is by distributing google forms that are guided online through virtual meetings.
6. Analysis Data and Defining Design Elements
   Kansei questionnaire data processing with multivariate analysis using Principal Component Analysis (PCA) and Factor Analysis (FA) to see which emotional factors are significant. While the

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interpretation of PCA and FA results into a design element structure with Partial Least Square (PLS)

3. RESULTS AND DISCUSSION

3.1. Kansei Word (KW)

In determining KW, it is done by gathering as many feelings or emotions as possible related to web-based mapping. Technically, the discovery of KW was done by giving some sample figures of web-based mapping to participants such as internet users, web-based mapping developers and computer students to explore what feelings or emotions first appeared when they saw the pictures. From these observations, 50 KW is generated as follows:

Table 1. Kansei Word Candidate

Code	Kansei Word	Code	Kansei Word
KW1	Sharp	KW 26	Useful
KW 2	Formal	KW 27	Wonderful
KW 3	Simple	KW 28	Beautiful
KW 4	Informative	KW 29	Elegant
KW 5	Gloomy	KW 30	Brilliant
KW 6	Dynamic	KW 31	Impressive
KW 7	Rigid	KW 32	Authentic
KW 8	Natural	KW 33	Not-Easy-to-Measure
KW 9	Calm	KW 34	Empty
KW 10	Sad	KW 35	Sophisticated
KW 11	Prestigious	KW 36	Easy
KW 12	Masculine	KW 37	Vivid
KW 13	Bright	KW 38	Colorful
KW 14	Fresh	KW 39	Complex
KW 15	Catchy	KW 40	Bored
KW 16	Nautical-Look	KW 41	Complete
KW 17	Wide	KW 42	Global
KW 18	Well-Arranged	KW 43	Melancholic
KW 19	Accurate	KW 44	Free
KW 20	Cool	KW 45	Stiff
KW 21	Awesome	KW 46	Modern
KW 22	Trustworthy	KW 47	Confusing
KW 23	Cold	KW 48	Common
KW 24	Cute	KW 49	Creepy
KW 25	Classic	KW 50	Look-Tired

From the 50 KW above, a preliminary analysis was carried out to see how high the level of correlation coeffition among the KW was to several participants. The KW was structured into a questionnaire with a likert scale of 1 – 5. Then participants were given some specimens of web-based asset mapping, participants filled out the KW questionnaire based on the specimens they saw. The results of filling out the questionnaire were then averaged to be calculated using Coefficient Correlation Analysis (CCA). The results of the CCA there are top 20 KW which have a threshold value above 0.85 which will later be used for the KE stage. The 20 KW is shown in the following table:

Table 2. Top 20 Kansei Word

Code	Kansei Word	Code	Kansei Word	Code	Kansei Word	Code	Kansei Word
KW1	Sharp	KW6	Rigid	KW11	Natural	KW16	Prestigious
KW2	Calm	KW7	Bright	KW12	Well-arranged	KW17	Masculine
KW3	Formal	KW8	Informative	KW13	Gloomy	KW18	Accurate
KW4	Dynamic	KW9	Fresh	KW14	Catchy	KW19	Sad
KW5	Simple	KW10	Cool	KW15	Wide	KW20	Nautical-look

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3.2. Specimen of Web-Based Mapping

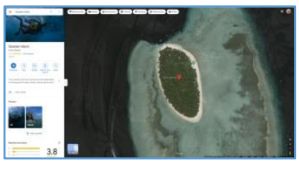
The next stage is to collect web-based mapping specimens, where there are 24 specimens which will be further analyzed to see which specimens are valid. The steps taken are to break down the web-based mapping into design elements, then see which specimens have similar tendencies. if it has a high similarity tendency then the specimen is not recommended (Novianti et al., 2022). The 24 specimens are in table 3 below:

Table 3. 24 Web-Based Specimens

No.	Description	No.	Description
1.	Peta Sebaran COVID-19 Indonesia	13.	Malaysia COVID-19 Dashboard
2.	COVID-19 Data Explorer: Global Humanitarian Operations	14.	USGS. National Water Information System: Mapper
3.	WHO Coronavirus (COVID-19) Dashboard	15.	Sabah Tourism – Sipadan Island
4.	Open Street Map	16.	NT Atlas and Spatial Data Directory
5.	Peta Online ATR / BPN (Badan Pertanahan Nasional)	17.	Esri Map Gallery
6.	Portal Peta Indonesia	18.	Atlas Online
7.	Pemetaan Kementerian ESDM Indonesia	19.	Geography of clean water
8.	Land Portal	20.	Florida Department of Environmental Protection
9.	Science for a changing world	21.	TNB's asset (power plant, transmission networks, distribution networks, fiber optics cable and customers' meter) to be pinned down on digital map
10.	National Cancer Institute	22.	Peta Hospital Rujukan COVID-19, Pusat Kuarantin dan Kemudahan Awam
11.	MAGIC Website (UK)	23.	GeoBencana Pejabat Setiausaha Kerajaan Negeri Pulau Pinang
12.	Sea Grant University of Winconsin	24.	Waze – Navigation & Life Traffic

In general, design elements are divided by body, main menu, header, top menu, left menu, right menu, footer and map attributes. The results of the analysis of the design elements of 24 specimens resulted in 10 web-based specimens, which are listed in table 4 below:

Table 4. 10 Specimen Valid

No	Website Description	Screenshot	No	Website Description	Screenshot
1	COVID-19 Data Explorer: Global Humanitarian Operations		6	MAGIC Website (UK)	
2	Peta Online ATR / BPN (Badan Pertanahan Nasional)		7	Sabah Tourism – Sipadan Island	

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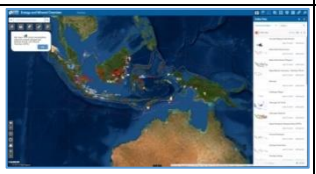
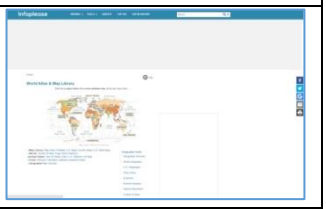
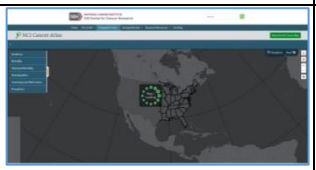
No	Website Description	Screenshot	No	Website Description	Screenshot
3	Pemetaan Kementerian ESDM Indonesia		8	NT Atlas and Spatial Data Directory	
4	Land Portal		9	Atlas Online	
5	National Cancer Institute		10	Geography of clean water	

3.3. Structuring SD Scale into Questionnaire Form

The 20 KW were then structured into a google form questionnaire with a Likert scale of 1-5. Figure 3 shows the questionnaire of Kansei, where the specimen and specimen link are attached to the questionnaire to make it easier for the user to fill in and explore deeper in assessing the feelings what they felt based on the questionnaire of Kansei.

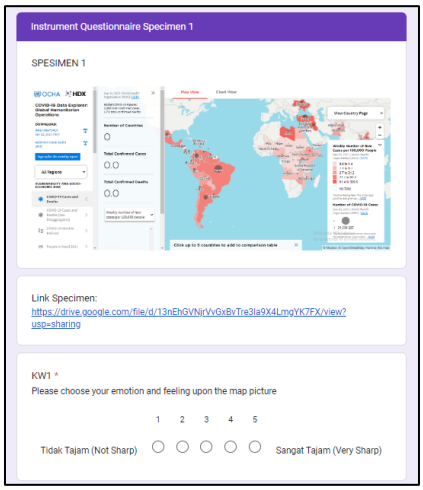


Figure 3. Questionnaire of Kansei

Next stage is the participant evaluation process where the questionnaire is distributed to 50 participants consisting of 25 male participants and 25 female participants. The participant evaluation method is carried out online through a google form with instructions given through the zoom meeting.

3.4. Kansei Analysis

The results of the participants' evaluation answers are then averaged so that the results are shown in table 5 below:

Table 5. The Average Results of Participants' Evaluations

	KW1	KW2	KW3	KW4	KW5	KW6	KW7	KW8	...	KW20
Spesimen 1	3,94	3,70	3,70	3,74	3,70	3,72	3,40	3,80	...	3,14

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	KW1	KW2	KW3	KW4	KW5	KW6	KW7	KW8	...	KW20
Spesimen 2	4,18	3,58	3,80	4,08	3,66	3,78	3,44	3,70	...	3,08
Spesimen 3	4,00	3,68	3,72	3,72	3,68	3,76	3,62	3,58	...	3,30
Spesimen 4	4,22	4,18	4,30	4,14	4,14	3,92	4,18	3,96	...	3,50
Spesimen 5	3,76	3,42	3,28	3,72	3,66	3,12	3,24	3,56	...	3,18
Spesimen 6	4,00	3,64	4,14	3,86	3,88	3,58	3,84	3,80	...	3,26
Spesimen 7	4,20	4,10	3,94	3,90	3,76	3,54	4,18	3,62	...	3,14
Spesimen 8	3,82	3,30	3,64	3,60	3,64	3,40	3,36	3,46	...	3,04
Spesimen 9	4,12	3,50	3,82	3,66	3,88	3,56	3,86	3,70	...	3,14
Spesimen 10	4,16	4,14	3,88	3,80	4,10	3,62	3,98	3,80	...	3,30

Principal Component Analysis (PCA) is then implemented to calculate the average results of participant evaluation, where in figure 4 it can be seen the distribution of emotions, namely on the x axis it can be seen that on the far right side there are several emotions including fresh, informative and sharp; While on the left side there is Masculine. On the y axis on the top side there is emotion accurate and on the bottom side there is emotion masculine.

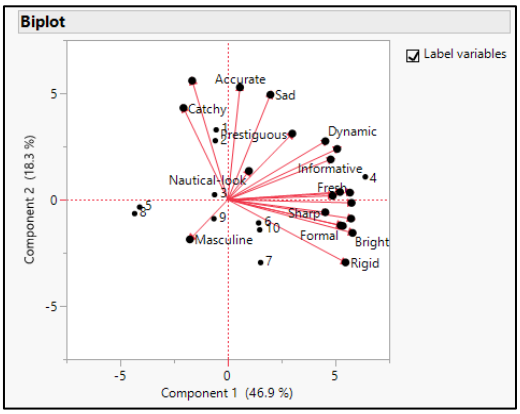

Figure 4. Principal Component Analysis Result

Factor Analysis (FA) was conducted to see which emotion had a significant value. FA is done with 5 factors where the factor variables consist of F1 to F5. Table 6 below is the result of Factor Analysis with a threshold 0.75:

Table 6. Factor Analysis Sorted List Result

F1		F2		F3		F4		F5	
Sharp	0,96	Fresh	0,87	Catchy	0,91	Accurate	0,92	Nautical-look	0,96
Calm	0,78	Cool	0,76	Wide	0,90				
Formal	0,77								
Dynamic	0,75								

In table 6 it can be seen that the emotion in factor 1 or F1 which has a significant value is Sharp, Calm, Formal and Dynamic, where in this study the label for F1 is Dynamic & Well-Organized Concept. Emotion on F2 is fresh and cool which can be concluded to be labeled Refreshing Concept for F2. Emotion on F3 consists of Catchy and Wide which can be concluded with the Spacious Concept. F4 can be concluded with the label Professional Concept and F5 concluded with Nautical-Look Concept. From the emotion concept, it needs to be translated into Design Elements to see how the nuances or concepts of emotion are technically in terms of UX. So the next step is to translate emotion into Design Element through Partial Least Square (PLS).

3.5. Design Elements (DEs)

Partial Least Square is involved to translate emotion into design elements. The steps taken are to divide the web-based mapping into 8 main categories, namely body, main menu, header, top menu, left menu, right menu, footer and attribute map. Each of these categories is categorized into its derivative parts. For example, in the body category there are sub-categories of Background Color, Body-

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Style, Background Style, Font Style and Font Color. Furthermore, by looking at the specimens, specific details were carried out. For example, in 10 specimens, the visible background colors are dark blue, blue, white and gray. So that the dark blue background color is one of the elements. The total design elements used are 111 DEs, one of which is shown in table 7 below:

Tabel 7. Design Element Web-Based Mapping

BODY	Background Colour	Dark Blue
		Blue
		White
		Gray
	Body-Style	one Column
		two Column
		three column
	Background Style	Solid
		Picture
	Font Style	Sans Serif
		Serif
	Font Colour	Black-Blue
		White-Blue
		White-Red
		White-Black
		White-Gray-Black-Orange
		Gray-Black-Blue
MAIN MENU	Background Color	White
		Blue
		Dark Blue
		Gray
	Advertisement Existence	Exist
		None
…		

In PLS analysis, design elements need to be transformed into relevant variables with 10 specimens. Variable naming is done by combining the names of categories, sub categories and elements so that they represent the element in question. For example the Body Category, Background color sub-category and Dark Blue element, the design element variable becomes BodyBGColorDarkBlue. So based on a total of 111 design elements, there are 111 variable columns. Next is data entry with a value of 1 if the element appears on the specimen and a value of 0 if the element does not appear on the specimen, as shown in table 8 below:

Table 8. Design Element Variable

	BodyBGColor DarkBlue	BodyBG ColorBlue	BodyBG ColorWhite	BodyBG ColorGray	BodyStyle OneColumn	…	BodyFont StyleSan s Serif
Spesimen 1	0	0	1	0	1		1
Spesimen 2	0	0	1	0	0		1
Spesimen 3	1	0	0	0	0		1
Spesimen 4	0	0	1	0	0		1
Spesimen 5	0	0	0	1	0		1
Spesimen 6	0	1	0	0	0		1
Spesimen 7	0	0	1	0	0		1
Spesimen 8	0	0	1	0	0		1
Spesimen 9	0	0	1	0	1		1
Spesimen 10	1	0	0	0	1		0

3.6. Kansei Concept

PLS analysis is carried out by calculating the average results of participant evaluation (as figured in table 5) as dependent variable and DE variable which already contains values of 1 and 0. The output of the analysis is the DE value which is correlated with Emotion. As in table 9, it can be seen that

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the Map Style: Digital value is -0.0457 for the Dynamic emotion, while the Professional emotion is 0.028115. The next step is to calculate DE with a significant value. Furthermore, in table 10, there is a significant DE after sorting. It can be seen, for example, that in emotion Professional, there are 18 significant KE, which means that to build a web-based mapping, at least 18 DE is required. As in number 1 LeftMenuPictureYes, it means that in designing the design when collaborating with web designers, a picture in left menu is required. Or at number 2 LeftMenuPicSizeSmallYes, it requires a small image on the Left Menu. Likewise with the other emotions where in each emotion there is DE which is a reference to the Design Element web-based mapping based on the emotion in question.

Table 9. PLS Analysis Result

Design Element	Dynamic	Professional	Refreshing	Spacious	Nautical-Look
Map Style : Digital	-0,0457	0,028115	-0,02714	0,019695	0,007775
Map Style : Satelite	0,0474	-0,03357	0,019973	-0,03129	0,006833
Map Color : Black Gray	0,0053	0,035833	-0,00513	0,077417	-0,00977
Map Color : BlueGray	-0,0025	-0,01783	0,019612	-0,02424	0,011124
Map :Color : DarkGray	-0,0304	-0,01477	-0,00587	0,007756	0,015934
Map Zoom Scroll : Yes	0,0277	0,004428	0,02299	0,031619	0,007992
Map Zoom Scroll : No	-0,0277	-0,00443	-0,02299	-0,03162	-0,00799
Map Zoom Button : Yes	0,0277	0,004428	0,02299	0,031619	0,007992
Map Zoom Button : No	-0,0277	-0,00443	-0,02299	-0,03162	-0,00799
Map Google Earth : Yes	0,0321	-0,06287	-0,01486	-0,02048	-0,01671
Map Google Earth : No	-0,0321	0,062867	0,014863	0,020484	0,016706
Map Clickable : Yes	0,0246	0,024446	-0,01031	0,012362	-0,02029
Map Clickable : No	-0,0246	-0,02445	0,010309	-0,01236	0,020294
Map Source Data Info : Yes	0,0057	-0,03019	-0,00579	0,006652	0,058006
Map Source Data Info : No	-0,0057	0,030193	0,005794	-0,00665	-0,05801
Map Lat/Lon : Yes	-0,0085	0,028587	0,032451	-0,02973	-0,04761
Map Lat/Lon : No	0,0085	-0,02859	-0,03245	0,029733	0,047611

Table 10. The Significant DE of Kansei

NO	DYNAMIC AND WELL-ORGANIZED	NO	PROFESSIONAL
1	MapStyleDigital	1	LeftMenuPictureYes
2	MapColorBlackGray	2	LeftMenuPicSizeSmallYes
3	MapDynamicAutoFocusLocation	3	MapGoogleEarthYes
4	LeftMenuPictureYes	4	TopMenuPosLeft
5	LeftMenuPicSizeSmallYes	5	TopMenuShapeRoundedRec
6	MapGoogleEarthYes	6	MapDynamicAutoFocusLocation
7	HeaderFontSizeSmall	7	BodyFontColorBlackBlue
8	BodyBGStyleSolid	8	MapColorBlackGray
9	FooterExistYes	9	MapStyleDigital
10	FooterFontStyleSansSerifYes	10	MapSourceDataInfoYes
11	HeaderFontStyleSansSerif	11	TopStyleIcon
12	TopMenuBGColorGray	12	MapLat/LonYes
13	RightMenuExistYes	13	RightMenuExistYes
14	RightMenuPictureYes	14	RightMenuPictureYes
15	RightMenuPicSizeSmallYes	15	RightMenuFontStyleSansSerifYes
16	RightMenuFontStyleSansSerifYes	16	RightMenuFontColWhBlackBlueYes
…	…	17	RightMenuPicSizeSmallYes
27	BodyBGColorDarkBlue	18	FooterFontColWhite

4. CONCLUSIONS

The Kansei Engineering methodology has been implemented in User Experience design through PCA and FA analysis to determine the significant emotion factors used to build User Experience Design of Web-Based BPKAD. There are 5 emotion concepts generated, namely dynamic & well-organized concept, refreshing concept, spacious concept, professional concept and nautical-look concept. The emotion concept needs to be translated into Design Elements (DEs) through PLS analysis

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so that it can technically be understood by the UX Designer, for example in terms of the type and color of the letters used for the dynamic & well-organized concept, background color in main menu, the existence of left menu, etc. The DEs generated from PLS analysis for dynamic & well-organized concepts are 27 DEs, refreshing concept is 15 DEs, spacious concept is 17 DEs, professional concept is 18 DEs and nautical-look concept is 18 DEs.

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