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TUS MART Web Commerce Design as A Digital Marketing Effort For Urban Farming Products Using Kansei Engineering

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ABSTRACT

This study focused on agricultural products, utilizing the Kansei Engineering methodology to enhance user experience and align with digital marketing strategies. Kansei Engineering is applied to transform users' emotional needs into concrete design elements, creating a website interface that meets both functional and emotional requirements. By emphasizing attributes like engagement, transparency, interactivity, and ease of use, the website aims to provide a personalized, intuitive, and satisfying experience, fostering user connection and loyalty. The results demonstrate that Kansei Engineering significantly enhances emotional satisfaction and functional effectiveness, positively impacting customer engagement and retention—key elements in digital marketing. In this study, the "Refreshing" concept is tested by considering elements such as engagement, dynamism, transparency, interactivity, and ease of use to ensure that the designed interface provides an intuitive, adaptive, and enjoyable user experience. The testing process involves analysis using the Semantic Differential method as well as validity and reliability tests to ensure the accuracy and representativeness of the data obtained. The results show that the application of Kansei Engineering significantly enhances the quality of the e-commerce interface, both in terms of emotional satisfaction and functional effectiveness, resulting in a more holistic user experience. This study offers valuable insights for future e-commerce interface design, suggesting that integrating emotionally responsive design elements can boost the success of digital marketing efforts, especially in the competitive agriculture e-commerce sector.

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Introduction

Technology has become one of the main factors driving transformation in various sectors of life (Purba & Defriyanto, 2021). Technological advances driven by supporting infrastructure and regulations have accelerated the growth and development of digital-based businesses (Laudon & Traver, 2009). The shift in consumption patterns from offline to online shopping has become an unavoidable phenomenon along with advances in information technology. Flexibility, financial benefits, and broader market coverage are the main reasons behind the rapid growth of online shopping (Alwendi, 2020). Based on Bain & Company and Facebook predictions, Indonesia's online shopping sector is expected to grow 3.7 times to US\$ 48.3 billion in 2025 compared to US\$ 13.1 billion in 2017 (Faulina, 2021). This prediction shows bright prospects for the e-commerce industry in Indonesia. Based on data from the Central Statistics Agency (BPS) in 2022, the food, beverage, and food ingredients group dominates the e-commerce market with a percentage of 43.02% of all e-commerce businesses (Badan Pusat Statistik, 2023). The marketplace is the leading platform for this transaction, where sellers and consumers meet in one place (Irawati & Prasetyo, 2022). In addition, although social media is the leading choice, with 41.30% of e-commerce businesses, website platforms only reach 2.09% of all businesses (Badan Pusat Statistik, 2023). This data shows that although social media has an important

role, the potential of the website platform has yet to be fully utilized. Although the ITTS Mart application has contributed to simplifying the transaction process, there is an urgent need to improve the user interface's design and functionality to suit users' emotional and functional needs better (Zunaidi et al., 2024). Websites offer significant advantages over applications, such as broader reach without requiring a download or installation process and more accessible access from various devices via a browser (Fithriyaningrum et al., 2021).

Therefore, the development of the TUS Mart website, as a continuation of the ITTS Mart application, is not just a strategic step, but a leap into the future (Mardhiana et al., 2022; Zunaidi, Purbantari, Syafani, et al., 2023). It has the potential to expand accessibility and enhance the overall user experience (Zunaidi et al., 2021; Zunaidi, Purbantari, & Mardhiana, 2023). This development is not just about a website, but a gateway to digitizing urban agricultural products in the Telkom University Surabaya Campus environment. It's a digital marketing effort that promises to introduce urban agricultural products more widely, not only in the city of Surabaya, but throughout Indonesia (I Putu Agus Eka Pratama, 2015; Laudon & Traver, 2009).

The development of web commerce plays a significant role in supporting digital marketing efforts, especially in today's competitive digital landscape. Businesses can create a more integrated and personalized sales channel through a dedicated website designed for online transactions. Web commerce allows brands

to showcase products in detail, provide clear information, and deliver an interactive shopping experience for consumers. This contributes to increased consumer trust, which drives purchases and customer loyalty. Research shows that 70% of consumers feel more comfortable transacting on professionally managed websites, highlighting the importance of a credible website in a digital marketing strategy (Ali, 2023).

In digital marketing, web commerce enables businesses to implement various digital marketing strategies more effectively, such as SEO, content marketing, and digital advertising campaigns (Y. Yang et al., 2022). With web commerce, businesses can optimize organic product searches through SEO, making it easier for consumers to find similar products (Z. Yang et al., 2015). Additionally, this platform facilitates the integration of analytics to monitor consumer behaviour, essential for designing more targeted marketing strategies (Lin et al., 2021). Through the data collected, businesses can tailor content, offers, and campaigns to meet customer preferences, making digital marketing efforts more efficient and relevant (Guo et al., 2023; Hossain et al., 2020).

To optimize the website interface design, we are applying the Kansei engineering approach. This method is all about the user-it captures and translates the emotional aspects of users into relevant design parameters. Kansei engineering is a method that focuses on translating user feelings and emotions into specific and measurable design parameters (Nagamachi & Lokman, 2016). The Kansei engineering

process begins with determining the relevant Kansei words to describe the user's feelings towards the product (Matsubara & Nagamachi, 1997). Data is then collected and processed using Semantic Differential, Principal Component Analysis, and Partial Least Square techniques, as well as analysis and discussion of data results to produce a design that resonates with the emotional needs of users (Matsubara & Nagamachi, 1997). The Kansei engineering approach is expected to produce an interface design that is not only functional but also in accordance with user preferences and feelings, increasing satisfaction and effectiveness of using the TUS Mart website (Lokman, 2011).

By designing an e-commerce website that appeals to users' emotions—such as trust, excitement, or satisfaction—the overall user experience improves (Phong et al., 2018). This emotional engagement is essential in digital marketing, as it helps businesses build a stronger brand identity, foster consumer loyalty, and increase conversion rates (Straker & Wrigley, 2016). Research shows that emotionally driven design can significantly impact purchase decisions, making Kansei Engineering a valuable tool in e-commerce (Vilano & Budi, 2020).

Incorporating Kansei Engineering into e-commerce website design also enhances the effectiveness of digital marketing strategies by providing a platform that better aligns with consumer expectations and preferences. When consumers feel that a website design reflects their tastes or evokes positive emotions, they are more likely to engage with the brand and spend more time exploring the products (Yu et al.,

2024). This synergy between user experience and emotional design amplifies the results of digital marketing campaigns, such as email marketing, social media ads, or content marketing, as consumers are more likely to respond to and interact with marketing efforts on a well-designed platform (Straker & Wrigley, 2016). Therefore, integrating Kansei Engineering in e-commerce website development improves the website's overall aesthetic and functional quality and enhances the impact of digital marketing initiatives (Nagamachi & Lokman, 2016).

Literature Review

In recent years, significant advancements have been made in e-commerce website design; however, a critical research gap persists in addressing users' emotional aspects within these designs. Based on research over the past ten years, few studies have explored the emotional dimensions of e-commerce website interface design (Naim & Ibrahim, 2020). This gap underscores the need for approaches like Kansei engineering, which specifically focus on users' emotional responses to interface design.

The design of the TUS MART website employs the Kansei engineering method, known for its strength in translating user emotions and feelings into design parameters (Fahmi & Sumarni, 2023). Despite the widespread recognition of user-centered design, many existing studies on e-commerce interfaces primarily emphasize functionality and usability, often neglecting the emotional experiences that can significantly influence user satisfaction and

engagement (Suratno & Shafira, 2022). This oversight highlights a substantial gap in the literature.

Research on Kansei engineering has shown its effectiveness in product design and development by addressing users' emotional reactions (Fahmi & Sumarni, 2023). For example, research that demonstrated that integrating emotional aspects into the design could enhance user satisfaction, emphasizing that designs focusing on emotional experiences are more likely to resonate with users (Redzuan et al., 2019).

E-commerce websites, which function as the primary medium for online transactions, must integrate various elements, including text, images, and animations, to present information effectively and attractively (Ashafil et al., 2020). However, the focus has traditionally been on functionality rather than the emotional resonance of these elements. This research gap is critical because emotional engagement can significantly impact users' overall experience and their willingness to return to a platform.

Moreover, understanding Business-to-Consumer (B2C) and Consumer-to-Consumer (C2C) transactions is vital to ensure the platform's responsiveness to user needs and preferences (Rerung, 2018). Kansei engineering's role in aligning design with users' emotional preferences can lead to increased satisfaction and engagement (Redzuan et al., 2019). Applying concepts such as "Refreshing," which emphasizes engagement, dynamism, transparency, and interactivity, has also proven effective in meeting user expectations (Fahmi & Sumarni, 2023).

Kansei Engineering, as a design approach that focuses on translating users' emotional needs into concrete design elements, has proven effective in creating a more personal and enjoyable user experience. In digital marketing, this approach can enhance the effectiveness of marketing strategies by strengthening users' emotional engagement with products or services offered online. Applying Kansei Engineering in digital interfaces enables the creation of more intuitive and adaptive designs, ultimately increasing user satisfaction (Nagamachi & Lokman, 2016). In e-commerce, where user experience is a critical factor in purchasing decisions, designs that address these emotional needs significantly drive conversions and enhance customer loyalty (Lokman, 2011).

In digital marketing strategies, the emotional engagement fostered by Kansei Engineering has the potential to strengthen brand connection and increase user interaction with digital marketing campaigns. Users who feel emotionally connected to a website or application interface are more likely to respond to ads, promotions, or marketing content offered. Designs that align emotionally with user preferences can enhance digital interaction and boost marketing campaign effectiveness (Straker & Wrigley, 2016). Thus, integrating Kansei Engineering in digital marketing improves the aesthetic and functionality of digital platforms and optimizes user engagement, a crucial indicator of successful digital marketing campaigns across various industries, including e-commerce.

This research aims to fill the gap in the

existing literature by focusing on the emotional aspects of e-commerce website design using Kansei engineering. The findings from this study will provide valuable insights for developing future e-commerce interfaces that are not only functional but also emotionally resonant, ultimately enhancing user satisfaction. Additionally, designing an e-commerce website that aligns with users' emotions or preferences can significantly enhance digital marketing efforts for urban agricultural products. By applying a design that understands and responds to users' emotional needs, such as comfort, accessibility, and informativeness, urban agricultural products can create a deeper connection with consumers. This is important because websites responsive to emotional preferences boost user engagement, making them more likely to explore products, interact with content, and ultimately purchase.

Method, Data, and Analysis

Fig 1 illustrates the research flowchart, with the study commencing at the planning stage. The research kicks off with problem formulation and the establishment of research objectives, which are geared towards creating an interface that is not only functional but also capable of evoking a positive emotional experience for users. This stage's significance lies in its ability to set the research's trajectory, ensuring that the resultant design can effectively cater to the emotional needs of users (Nagamachi & Lokman, 2016).

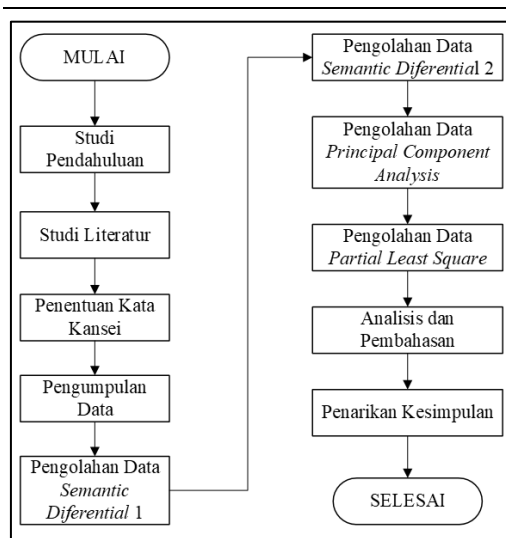


Fig.1 Research Flowchart

The preliminary study stage is instrumental in gathering initial information to comprehend users' needs and preferences (Isa & Ariyanti, 2021). This data, acquired through interviews, observations, and initial questionnaires focusing on user behaviour in the e-commerce context, aids in identifying design attributes that users consider crucial in terms of functionality and emotional aspects (Taheri et al., 2024). The stage's importance lies in its role as the bedrock for the subsequent research stages, ensuring that the research is underpinned by a robust empirical foundation, instilling confidence in the research process (Wu et al., 2021).

The subsequent stage involves a comprehensive literature review to unearth theories and previous studies pertinent to Kansei Engineering and user interface design (Putra et al., 2024). This review, which delves into various scientific journals, books, and other publications discussing aspects of interface design,

Kansei Engineering, and related research methodologies, is crucial in providing a robust theoretical foundation for this study (Faisal et al., 2021). It ensures that the approach used is not only tested but also relevant in the context of e-commerce interface design (Ilham et al., 2021). Additionally, the review serves to identify research gaps that this study can fill.

The next stage is the determination of Kansei words, which aim to represent users' emotions and perceptions of interface design elements (Matsubara & Nagamachi, 1997). These Kansei words are obtained through a combination of literature review and user interviews, where users are asked to describe their feelings towards various interface elements (Nagamachi & Lokman, 2016). These Kansei words will later be used in the first questionnaire, Semantic Differential 1, to collect data related to users' emotional perceptions of the interface design (Nagamachi & Lokman, 2016). The use of the Semantic Differential method allows researchers to capture complex emotional nuances in a structured and systematic way (Putra & Suzianti, 2020).

Semantic Differential 1 data processing is carried out to identify the most relevant Kansei words that strongly relate to specific interface design elements (Nagamachi & Lokman, 2016). The data processing results will be used to prepare the second questionnaire, Semantic Differential 2, which aims to assess the relationship between Kansei words and design elements in competitors' products (Lokman, 2011). This stage is essential to ensure that the TUS MART interface design is not only

aligned with user preferences but also competitive in the increasingly competitive e-commerce market, providing reassurance about the product's potential success.

Further data processing is carried out using Principal Component Analysis (PCA), a statistical method used to identify patterns and structures in data (Nagamachi & Lokman, 2016). PCA helps simplify complex data by reducing the number of variables without losing significant information. This allows researchers to understand the main dimensions influencing users' emotional perceptions of the interface design (Zhafira et al., 2018).

After that, further analysis is conducted with Partial Least Squares Regression (PLS-R), a multivariate regression method used to evaluate how design elements affect users' emotional factors and the website's usability. PLS-R is well-suited for this study as it can handle data with a large number of independent variables and allows for testing complex relationships between design and user emotions (Nagamachi & Lokman, 2016).

The results are analysed and discussed in-

Table 1-

Research Kansei Word

No	Kansei Word	Definition
1	Engaging	Providing an engaging and engaging experience for users, combining interactive elements and informative content (Vilano & Budi, 2020).
2	Dynamic	Presenting changing content and responding quickly to user actions, creating a lively and engaging experience (Alfansuri et al., 2024).
3	Comprehensive	Providing complete and comprehensive information about the product, while maintaining the responsiveness of the website (Fahmi & Sumarni, 2023).

depth in the final stage of the research. The findings from data analysis are evaluated to understand how certain design elements can influence users' emotions and how effective the proposed interface design is in meeting user expectations. Conclusions are drawn based on the results of this analysis, followed by the preparation of recommendations related to the optimal user interface design for TUS MART.

Result and Discussion

Kansei Word

The primary step in determining Kansei words is distributing the first semantic differential questionnaire to 196 respondents to obtain relevant Kansei words in this study. These Kansei words are based on respondents' perceptions of the displayed website. Kansei words are collected through user opinions and then compared with Kansei word terms found in journal literature (Alfansuri et al., 2024; Vilano & Budi, 2020). This aims to represent user emotions towards the displayed specimens. The number of Kansei words used is twelve, as seen in Table 1.

No	Kansei Word	Definition
4	Interactive	Providing features that allow users to interact with content and products, increasing engagement and shopping experience (Alfansuri et al., 2024).
5	Transparent	Display information clearly and openly, including prices, return policies, and stock availability, while maintaining good responsiveness (Vilano & Budi, 2020).
6	Adaptive	Responds well to changes in screen size and device, while still providing access to sufficient information (Alfansuri et al., 2024).
7	Informative	Providing clear, relevant, and useful information about products, prices, and features, while maintaining high responsiveness (Vilano & Budi, 2020).
8	Responsive	Ensuring the website responds quickly to user actions such as navigation, search, and product interactions (Alfansuri et al., 2024).
9	User-Friendly	Presenting an easy-to-use interface with intuitive interactive features to make it easier for users to find information (Fahmi & Sumarni, 2023).
10	Engrossing	Providing a deep and immersive experience for users, with the right combination of interactivity and informative content (Alfansuri et al., 2024).
11	Effortless	Minimizing user effort in navigating the website while still providing sufficient information and good responsiveness (Vilano & Budi, 2020).
12	Seamless	Providing a seamless and integrated experience across the website, with smooth transitions between different pages and interactive elements (Fahmi & Sumarni, 2023).

The twelve Kansei words obtained will be the focus when designing a website-based e-commerce user interface. A semantic difference will be made to test whether these Kansei words are necessary in the design. The scale of one to five, ranging from 'Strongly disagree' to 'Strongly agree', will be used for this purpose (Isa & Ariyanti, 2021). The results of this study, after being subjected to statistical tests, will provide practical insights into the application of these Kansei words in the

design process.

Validity and Reliability Test

The purpose of the validity and reliability test is to determine how well the measurement instrument or questionnaire is reliable and accurate in measuring the construct to be measured and how consistent the measurement results are. The following is a recapitulation of the validity and reliability tests on 196 respondents.

The statement is considered valid if $r_{test} > r_{table}$, as can be seen in Table 2.

Table 2-

Validity and Reliability Test For Research Kansei Words On Semantic Differential 1

Kansei Word	R_{table}	r_{test} validity	r_{test} reliability	Notes
Engaging	0,140	0,615	0,580	Valid and Reliable
Dynamic	0,140	0,684	0,670	Valid and Reliable
Comprehensive	0,140	0,669	0,671	Valid and Reliable
Interactive	0,140	0,734	0,722	Valid and Reliable
Transparent	0,140	0,630	0,643	Valid and Reliable
Adaptive	0,140	0,756	0,696	Valid and Reliable
Informative	0,140	0,677	0,637	Valid and Reliable
Responsive	0,140	0,746	0,698	Valid and Reliable
User-Friendly	0,140	0,743	0,706	Valid and Reliable
Engrossing	0,140	0,774	0,731	Valid and Reliable
Effortless	0,140	0,804	0,763	Valid and Reliable
Seamless	0,140	0,784	0,732	Valid and Reliable

Table 2 summarises the validity and reliability test results for twelve observed Kansei words. Each Kansei word has a fixed r_{table} value (0.140), r count validity value, and r_{test} reliability value calculated based on data obtained from the research. The validity test result shows that all Kansei words have a more significant r count validity value than the r_{table} value (0.140), so the data is valid. It is considered valid because $r_{test} > r_{table}$, based on significant test 0.05. The result of the reliability test can be seen in Table 3.

Table 3-

Reliability Test for Semantic Differential 1

Cronbach 'Alfa	N of Items
0,927	12


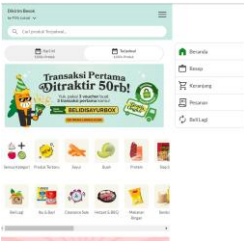
Furthermore, the reliability test obtained the result of 0.927 from the Cronbach alpha value, which is pretty reliable. A construct or variable is reliable if it provides

a Cronbach Alpha value > 0.60 (Faisal et al., 2021). If alpha approaches one, the reliability of the data is increasingly reliable. This shows that the measurements are consistent and reliable (Sugiyono, 2014).

Benchmark Product

After the twelve Kansei words are identified, a product comparison will be conducted with two similar products or websites, Segari and Sayurbox, as shown in Table 4. The next step is to collect data using semantic differential two, which assigns the lowest value to negative Kansei words and the highest value to positive Kansei words, as detailed in Table 5. The results of this semantic differential two will reinforce the Kansei engineering analysis, ensuring that the interface design is not only functional but also geared towards creating a positive and expected user experience, thereby enhancing the overall user satisfaction.

Table 4-
Benchmark Product

Picture	Website	Viewer	Rating	Link
	Segari.id	122.500	4,8	https://segari.id/
	Sayurbox.com	466.800	4,8	https://www.sayurbox.com/

Once the benchmarking product is obtained, the next step is to collect data using semantic differential two, which compares negative Kansei words for the lowest scores and positive Kansei words for the highest scores, as described in Table 5. The results of semantic differential two strengthen the Kansei engineering analysis, ensuring that the interface design is not only functional but also creates a positive and expected user experience.

Table 5-
Semantic Differential 2 Questions

No	Negative Words	1	2	3	4	5	Positive Words
7	Boring						Engaging
8	Static						Dynamic
9	Incomplete						Comprehensive
10	Passive						Interactive
11	Opaque						Transparent
12	Rigid						Adaptive

No	Negative Words	1	2	3	4	5	Positive Words
7	Uninformative						Informative
8	Unresponsive						Responsive
9	User-Unfriendly						User-Friendly
10	Distracting						Engrossing
11	Difficult						Effortless
12	Disjointed						Seamless

Based on Table 5, which shows the arrangement of semantic differential two, the author concludes that ease of feature is a critical factor in designing website-based e-commerce, affecting user perception of interface design. After obtaining the results of twelve Kansei words through semantic differential two, the next step is to conduct statistical tests to ensure the validity and reliability of the data, which are essential to ensure the accuracy of the e-commerce

interface design. The following is a recapitulation of the results of the validity and reliability tests on 240 respondents; the

statement is considered valid if $r_{test} > r_{table}$ can be seen in Table 6.

Table 6-

Validity and Reliability Test For Research Kansei Words On Semantic Differential 2

Kansei Word	r_{table}	r_{test} validity	R_{test} reliability	Notes
Engaging	0,126	0,585	0,503	Valid and Reliable
Dynamic	0,126	0,645	0,557	Valid and Reliable
Comprehensive	0,126	0,645	0,562	Valid and Reliable
Interactive	0,126	0,741	0,670	Valid and Reliable
Transparent	0,126	0,646	0,560	Valid and Reliable
Adaptive	0,126	0,627	0,534	Valid and Reliable
Informative	0,126	0,644	0,561	Valid and Reliable
Responsive	0,126	0,557	0,458	Valid and Reliable
User-Friendly	0,126	0,722	0,646	Valid and Reliable
Engrossing	0,126	0,647	0,569	Valid and Reliable
Effortless	0,126	0,616	0,521	Valid and Reliable
Seamless	0,126	0,707	0,635	Valid and Reliable

Based on the validity and reliability tests in Table 6 above, each Kansei word has an r_{table} value of 0.1267 using a significant test of the 0.05 level. The reliability test results show an r_{test} value of 0.875, with a Cronbach's alpha value of greater than 0.6. This indicates that the value is reliable because a good test is recommended to have a Cronbach's alpha value of more than or equal to 0.6 (Putra & Suzianti, 2020).

Design Elements

After the factor analysis to reduce the twelve Kansei words, the next step was to

design the design elements based on the rotated component matrix. This process simplified the significant factors and removed the less relevant ones, focusing on the influential design elements. The e-commerce interface design was developed following the Google Material Design guidelines and considering the comparative products from the benchmarking stage. The design results presented in Table 7 show how the interface elements were designed to reflect the factor analysis findings, aiming to create an effective interface that meets user needs.

Table 7-

Design Elements Lists

Category	SubCategory	Variabel
Before app	landing page awal	Confirmation User - Yes
		Confirmation User - No
Top App Bar	Top App Bar Color	Top App Bar Color-Based on Banner
		Top App Bar Color- White
	Top App Bar Shortcut	Top App Bar Shortcut-Favorite List
		Top App Bar Shortcut-Chat List

Category	SubCategory	Variabel
Body	Top App Bar Search	Top App Bar Search-Sering, Laris, Dan Populer
		Top App Bar Search-Populer Dan Kategori
	Body Support and Policy	Body Support and Policy-Yes
		Body Support and Policy-No
	Body Font Style	Tanseek Modern Arabic Medium
		Awan Zaman Light
	Pop Up	Product Name and Picture
		Product Name, Desc, Pict
	Urutan Homepage	Kategori, Promo, Produk
		Promo, Produk, Promo, Produk
Pilih Produk	Pop Up	
	New Page	
Menubar Pane	Menubar Pane - Yes	
	Menubar Pane - No	
Menu Navigation	Icon Style - Round	
	Icon Style - Square	
Menu Resep	Resep - Yes	
	Resep No	
Menu Wishlist	Wishlist - Yes	
	Wishlist - No	
Bottom	Bottom Navigation Pane	Bottom Navigation Pane-Yes
		Bottom Navigation Pane-No
	Bottom Promo	Bottom Promo-Yes
Bottom Promo-No		
Setting	Login	Account - Hp
		Account - Hp, Fb Gmail
	Foto Profil	Foto - Yes
		Foto - NO

Principal Component Analysis (PCA)

Principal Component Analysis (PCA) aims to identify latent patterns in data by reducing its complexity into interpretable principal components without losing essential information (Ayu & Wijaya, 2023; Haryono & Bariyah, 2014). This study used PCA to analyze the relationship between Kansei words and product benchmarking specimens.

Table 8-

Result of PCA

Rotated Component Matrix	
Kansei Word	Component 1
Engaging	0.659
Dynamic	0.771
Comprehensive	0.788
Interactive	0.791
Transparent	0.711
Adaptive	0.700
Informative	0.732
Responsive	0.756

Rotated Component Matrix	
Kansei Word	Component 1
User-Friendly	0.777
Engrossing	0.722
Effortless	0.728
Seamless	0.765

The PCA results presented in Table 8 reveal the refreshing concept characterized by significant values in several main components. For example, the Interactive component has a high value of 0.791, indicating its essential role in increasing user engagement. The Seamless component, with a value of 0.765, emphasizes the importance of smooth and uninterrupted transitions in the website interface. In addition, the Comprehensive (0.788) and User-Friendly (0.777) components also show high values, indicating that these factors are very influential in forming a practical and satisfying user experience. Overall, the PCA results emphasize the importance of developing an attractive, adaptive, and user-friendly user interface with smooth and intuitive functionality. This Refreshing

Table 9-

PLS Result

Category	SubCategory	Range Average	0.0014297
		Range	Element
Before app	Confirmation User	0.0014297	Yes
	Top App Bar Color	0.0014297	White #FFFFFF
Top App Bar	Top App Bar Shortcut	0.0014297	Chat List
	Top App Bar Search	0.0014297	Popular and Categories
	Body Support and Policy	0.0014297	Yes
	Body Font Style	0.0014297	Awan Zaman Light
Body	Pop Up	0.0014297	Product Name and Picture
	Homepage Order	0.0014297	Promos, Products, Promos, Products
	Select Product	0.0014297	New Page
	Menubar Pane	0.0014297	No
	Menu Navigation	0.0014297	Icon Style - Square

concept reflects an effort to meet users' emotional and functional needs through an efficient website interface design that is responsive to user needs and preferences.

Partial Least Square (PLS)

After determining the Principal Component Analysis (PCA), as explained in the previous paragraph, the Partial Least Square (PLS) method was applied to identify key design elements by reducing complex data into principal components (Ginanjar & Supendi, 2018). PLS was used to analyze the relationship between the identified design elements and the Kansei words selected by the respondents and to evaluate the extent to which these design elements influence user perceptions of the website interface (Purnama & Rinandi, 2023). This method identifies the most effective design elements in creating the desired user experience. It helps determine the elements that significantly influence the dependent variable (Haryono & Bariyah, 2014).

Category	SubCategory	Range	0.0014297
		Average	Element
		Range	Element
	Recipe Menu	0.0014297	No
	Wishlist Menu	0.0014297	No
Bottom	Bottom Navigation Pane	0.0014297	No
	Bottom Promo	0.0014297	No
Setting	Login	0.0014297	account - hp, fb gmail
	Profile picture	0.0014297	yes

The results of the PLS analysis provide insight into the design elements that best fit the developed concept. Table 9 presents the results of the PLS analysis depicting the design elements and their relationship to the Kansei words. The design elements obtained from the PLS analysis reflect the Refreshing Concept, which focuses on a user-friendly, clear, and attractive interface. For example, the “Top App Bar” features a clean white background (#FFFFFF) with functional shortcuts such as Chat List and search options for Popular and Categories. The “Body” uses the Awan Zaman Light font and includes pop-ups with product names and images, arranged in a layout that alternates between promos and products. Some features, such as the Menu Panel, Recipe Menu, Wish List Menu, Bottom Navigation Panel, and Bottom Promo, are excluded to maintain simplicity and focus on essential user interactions. These design decisions ensure that the website provides an intuitive and seamless user experience, aligns with the identified Kansei words, and enhances the overall usability and appeal of the TUS Mart platform (Priyatama & Abidin, 2021).

Prototyping

The prototyping stage is vital in developing a design based on a predetermined concept.

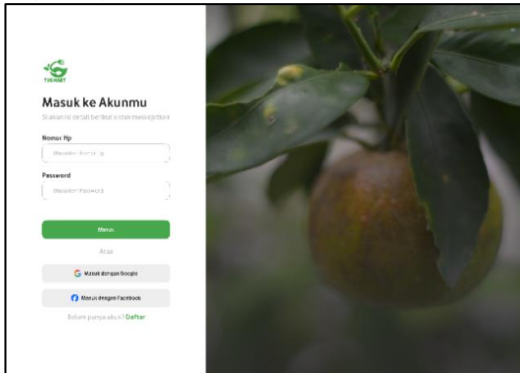
In this study, researchers utilized the powerful Figma design tool to create a TUS Mart e-commerce website prototype. This prototype is designed to enable user interaction with the planned interface, enhance user accessibility to the site, and gather valuable feedback (Priyatama & Abidin, 2021). The prototyping process is applied with a High Fidelity Prototyping approach, meaning the prototype is designed to accurately reflect the final product (Alfansuri et al., 2024; Soedewi, 2022). In the early stages, a wireframe is developed as a simple and schematic visual representation of the user interface. This wireframe describes the basic structure and layout of the main elements without involving graphic details or colours, focusing on composition and navigation (Milda Puspita & Apriyanti, 2023).

Furthermore, a mock up is created as a complete visual representation. It approaches the final appearance of the product, including design elements such as colour, typography, and graphics (Anwar et al., 2022). This mock up provides a more realistic picture of the appearance and functionality of the TUS Mart website. This prototype design can be accessed through the following link: Prototype TUS Mart Website. This prototyping is expected to

facilitate user evaluation and feedback and ensure compliance with the established design guidelines. Fig 2 and Fig 3 are examples of the TUS Mart website user interface.

Figure.2

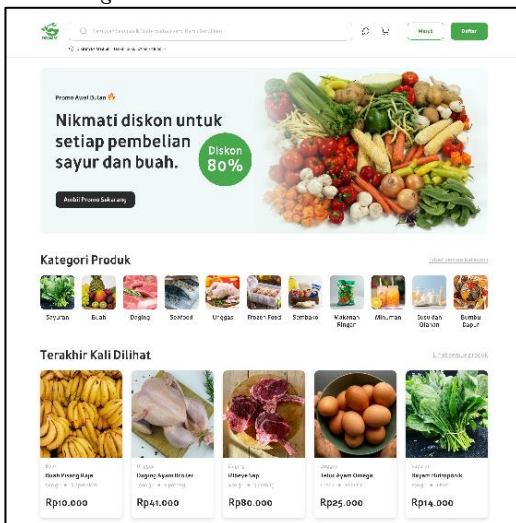
Login Page



designing the TUS MART website has significantly enhanced the user experience by aligning the website's interface with users' emotional and functional needs. The analysis shows that engagement, transparency, interactivity, and ease of use are vital in creating an intuitive and enjoyable user experience. These design elements foster emotional connections between users and the website, which, in turn, strengthens user engagement, satisfaction, and loyalty. This result aligns with previous research indicating that designs that appeal to users' emotions are more likely to influence purchasing decisions and brand loyalty (Nagamachi & Lokman, 2016). The "Refreshing" concept implemented in the design—focused on user engagement and seamless functionality—further proves that websites that respond to emotional needs tend to attract and retain more users.

Fig.3

Home Page



From a managerial perspective, the implications are significant, particularly for businesses aiming to leverage e-commerce platforms as part of their digital marketing strategies. A well-designed e-commerce website that reflects users' emotional needs serves as a transactional platform and a powerful tool to enhance brand identity and foster deeper customer relationships (Taheri et al., 2024). For instance, Kansei Engineering allows businesses to translate abstract emotional responses like trust and satisfaction into concrete design elements like intuitive navigation, aesthetic appeal, and interactive features (Matsubara & Nagamachi, 1997). This can result in higher engagement, as consumers are more likely to explore and interact with a platform that feels familiar and emotionally fulfilling. This emotional connection can boost customer retention and enhance brand loyalty as two critical metrics in digital marketing success (Omar et al., 2021).

Discussion

The findings of this study demonstrate that the application of Kansei Engineering in

In digital marketing, a thoughtfully

designed e-commerce website can serve as a core component of a broader strategy, directly influencing the effectiveness of campaigns across various channels (Z. Yang et al., 2015). For example, SEO and content marketing efforts benefit from websites that are optimized for search engines and offer positive user experiences. Websites designed with Kansei Engineering principles can increase organic traffic and dwell time, two factors that improve search engine rankings. Additionally, emotionally engaging designs can lead to higher click-through rates on email campaigns and better performance on social media ads, as users are more inclined to engage with content that mirrors their emotional preferences (Bashirzadeh et al., 2022). The seamlessness and ease of use emphasized by the Kansei Engineering approach also mean higher conversion rates, as customers are more likely to complete their transactions on platforms that provide intuitive, enjoyable user experiences.

Furthermore, integrating data analytics into website design enables businesses to continually improve their digital marketing efforts by providing insights into user behaviour and preferences (Qiu et al., 2024). Through data collected on user interactions, businesses can refine their marketing strategies, tailoring personalized offers and promotions that cater to specific emotional triggers identified during the design process (Guan et al., 2024). This feedback loop enhances the customer experience and optimizes marketing efficiency, making campaigns more relevant and targeted, thereby increasing return on investment (ROI).

In conclusion, this study's findings highlight that developing e-commerce websites through methodologies such as Kansei Engineering can significantly enhance digital marketing efforts. By creating emotionally responsive, user-

centred platforms, businesses can differentiate themselves in competitive markets, such as urban agricultural products, while fostering more robust connections with consumers. The strategic implications are clear: Businesses investing in user-centric, emotionally engaging e-commerce platforms will see better marketing outcomes, excellent customer retention, and a more decisive competitive advantage.

Conclusion

In this study, Kansei Engineering was applied to design the user interface of TUS Mart's e-commerce website, primarily focusing on the emotional aspects that influence user perception of design elements. The process began with collecting relevant Kansei words, followed by analysis using the Semantic Differential method to evaluate how users perceive the site design. In addition, data validity and reliability testing were conducted to ensure that the results obtained were accurate and reliable. Principal Component Analysis (PCA) and Partial Least Squares Regression (PLS-R) showed that design elements such as 'Interactive,' 'Seamless,' and 'User-Friendly' significantly impact creating a practical and satisfying user experience. This proves the importance of integrating these elements in developing a responsive and intuitive interface. The 'Refreshing' concept proposed in this study seeks to create an adaptive, attractive, and intuitive interface, considering the user's functional and emotional aspects. With this approach, users are expected to experience more comfortable and efficient interactions, ultimately increasing their satisfaction and effectiveness with the TUS Mart website.

The use of emotional design elements has proven essential in creating a holistic user experience that aligns with digital marketing goals, making the platform more attractive and functional for the urban agriculture sector.

Potential Future Research could focus on expanding the application of Kansei Engineering across different industries and product categories, exploring how emotional design influences user engagement on a broader scale. Additionally, future research can delve deeper into integrating data analytics with emotional design to refine digital marketing strategies. By analyzing user behaviour and emotional responses, businesses could develop more targeted and personalized marketing campaigns, increasing the overall effectiveness of their digital marketing efforts. This approach would enable continuous optimization of user interfaces and marketing content, driving higher conversion rates and long-term customer loyalty

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