Advancing Sustainability: Mapping Traditional Food Culture Through Web-Based Apps

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Abstract. Traditional food culture is a cornerstone of cultural heritage and sustainability, yet its integration into modern contexts faces significant gaps. This research presents the development and evaluation of the Traditional Food Mapping App, a web-based system designed to promote the sustainability of traditional food culture in Yogyakarta, Indonesia. The study aimed to assess the app's impact on user satisfaction, engagement, usability, and their attitudes towards sustainability. Employing a comprehensive methodological approach, the research integrated functionality testing, System Usability Scale (SUS), and the Technology Acceptance Model (TAM) to evaluate the app. The findings revealed that key features such as detailed information display, traditional food category-specific map views, and user-friendly interface significantly correlated with user satisfaction and engagement. The app was generally well-received, with moderate to high scores in usability and positive user perceptions. However, complexities in the interface and certain usability issues were noted. Functionality tests and TAM analysis demonstrated the app's potential in fostering a sustainable mindset and encouraging responsible consumption patterns. This study contributes to the discourse on the role of technology in cultural preservation, demonstrating how web-based applications can effectively support traditional food culture sustainability. By integrating traditional values with modern technology, the app offers an engaging platform for exploring Yogyakarta's rich culinary heritage.
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1 Introduction

Traditional food culture is a repository of culinary heritage that transcends generations, encapsulating the essence of diverse societies. Yet, in an era marked by rapid globalization and urbanization, the sustainability of traditional food culture faces unprecedented challenges. The intersection of traditional and modern food systems has raised questions about the continued existence of these rich culinary traditions [1]. Traditional food items, often passed down through oral traditions, are at risk of being lost forever. This pressing issue has spurred extensive research into the sustainability of traditional food culture, but a significant research gap remains in the development of actionable solutions that promote its preservation and integration into contemporary contexts.

A multitude of studies have delved into the precarious situation of traditional food culture worldwide. Research has explored the sociocultural, economic, and environmental dimensions of traditional food sustainability. Traditional food systems in Asia have elucidated the multifaceted challenges faced by these systems, ranging from changing dietary preferences to the threat of food insecurity. The significance of traditional food culture in shaping cultural identity and the need for strategies to safeguard it in a rapidly changing world. While these studies have contributed valuable insights, they primarily diagnose the issues at hand, leaving a void in terms of practical solutions.

The existing research landscape underscores the need for a holistic approach to address the research gap. While some studies have suggested policy interventions to protect traditional food culture [2], there is a dearth of research on innovative technological solutions that engage and empower communities to actively participate in preserving their culinary heritage [3]. To bridge this gap, we propose the development of a web-based mapping application tailored to the context of Yogyakarta, Indonesia. This application aims to provide a platform for the documentation, promotion, and sustenance of traditional food culture by leveraging user-generated content and interactive mapping features.

In pursuit of this objective, this research poses three pivotal research questions. Firstly, How does the user interface and functionality of the Traditional Food Mapping App correlate with user satisfaction and engagement in promoting traditional food culture in Yogyakarta? Secondly, What are the perceptions of users regarding the usability of the web-based Traditional Food Mapping App, and how do these perceptions align with the app's objective of promoting sustainability in traditional food locations? Lastly, How do the functionalities of the Traditional Food Mapping App correlate with users' attitudes towards sustainability and their behavioral intentions to support traditional food culture?

The sustainability of traditional food culture is an imperative concern in an increasingly globalized world. While the existing body of research has illuminated the challenges faced by traditional food systems, there exists a critical gap in the development of practical, technology-driven solutions. This research proposes a web-based mapping application as a novel approach to address this gap, facilitating the documentation and promotion of traditional food culture in Yogyakarta. Through comprehensive internal and external evaluations, along with an exploration of user perceptions, this study aims to demonstrate the potential of technology to preserve and promote cultural heritage. By embarking on this journey, we endeavor to contribute not only to the preservation of culinary traditions but also to the broader discourse on the sustainable coexistence of tradition and modernity.

2 Literature Review

2.1 Sustainability in Traditional Food

Sustainability, a multifaceted and pivotal concept in today's world, extends its influence into the domain of traditional food culture. The preservation and sustainability of traditional food culture have emerged as critical concerns in the face of globalization, urbanization, and changing dietary preferences. This literature review delves into the heart of sustainability in traditional food, drawing from a wide array of scholarly research, valid books, and reputable journals to provide a comprehensive overview.

Traditional food culture, a rich tapestry of culinary practices passed down through generations, holds deep cultural significance for communities worldwide [4]. Sustainable traditional food systems encompass a balance between the environment, society, and culture. Sustainability in traditional food involves addressing numerous interrelated aspects, including the environmental impact of food production, the socio-cultural importance of traditional dishes, and the economic viability of traditional food producers [5].

The sustainability of traditional food culture is intrinsically tied to the environment. Studies such as [4] emphasize the need for sustainable food production practices that minimize environmental degradation. Traditional food systems often rely on locally sourced, seasonal ingredients, reducing the carbon footprint associated with transportation and refrigeration [6]. Furthermore, sustainable practices in traditional agriculture, such as crop rotation and agroforestry, have the potential to enhance ecosystem health [7].

Social and cultural aspects also play a vital role in the sustainability of traditional food culture. Traditional dishes are not merely sources of sustenance but embodiments of cultural identity [8]. Sustainable traditional food culture fosters a sense of belonging and preserves cultural heritage [9].

Economic sustainability is another dimension to consider. Traditional food producers, often small-scale and local, face economic challenges due to the dominance of industrialized food systems. Strategies to enhance economic sustainability may involve supporting local producers and markets, as proposed by [4]. This can stimulate the economic viability of traditional food systems while ensuring fair compensation for producers.

However, despite the increasing awareness of the importance of sustainability in traditional food culture, significant challenges persist. Research by [10] highlights the threat of food insecurity in traditional food systems due to changing dietary patterns and globalized food markets. The erosion of traditional knowledge and practices is another concerning trend [6]. As younger generations shift towards modern diets, traditional food culture faces the risk of being marginalized and forgotten.

Traditional food culture is a multifaceted concept that encompasses environmental responsibility, cultural preservation, and economic viability. Sustainable traditional food systems mitigate environmental impacts, strengthen cultural identity, and support local economies. However, challenges such as food insecurity and the loss of traditional knowledge persist. As we delve deeper into the discourse of traditional food culture sustainability, it becomes increasingly evident that practical solutions are required to address these challenges. The subsequent section will explore the role of technology, particularly web-based mapping applications, as a promising avenue to bolster the sustainability of traditional food culture.

2.2 Technology Usability to Enhance Traditional Food Sustainability

In an era marked by rapid technological advancements, the integration of technology into the preservation and sustainability of traditional food culture has emerged as a transformative force. This literature review critically examines the role of technology, specifically web-based mapping applications, in enhancing the sustainability of traditional food systems.

Drawing from a wealth of scholarly research and reputable sources, we delve into the nuanced relationship between technology usability and the preservation of culinary heritage. Traditional food culture, deeply rooted in communities worldwide, faces a myriad of challenges ranging from changing dietary preferences to environmental degradation. Embracing technology as a tool for sustainability, particularly through web-based mapping applications, has garnered attention as a promising avenue. These applications enable the documentation, promotion, and preservation of traditional food culture in innovative ways.

One of the key strengths of web-based mapping applications is their ability to engage users in the process of cultural documentation. Users can actively contribute content, such as photographs, stories, and descriptions of traditional dishes, thereby enriching the cultural repository. This user-generated content not only fosters a sense of ownership and cultural pride but also ensures the continuous flow of information necessary for sustainability [11].

Moreover, these applications offer interactive features that enhance user experiences. Through interactive maps, users can explore traditional food culture geographically, facilitating a deeper understanding of its regional variations. Interactive elements, such as virtual tours of traditional markets or cooking demonstrations, provide an immersive and educational experience [3].

However, the usability of technology in traditional food sustainability extends beyond user engagement. It encompasses technical robustness, user-friendliness, and adaptability to diverse user needs. Internal evaluations, as discussed by [12], are essential to assess the reliability and efficiency of web-based mapping applications. Ensuring that the technology functions smoothly and can handle a diverse range of traditional food data is crucial for sustainability.

External evaluations provide insights into the usability and relevance of these applications in real-world scenarios. Studies such as [13] underscore the importance of external assessments to validate the effectiveness of technology in preserving cultural heritage. Feedback from users and stakeholders helps refine the applications and align them with the needs and expectations of the community.

Assessing user perception and acceptance is another critical dimension of technology usability [14]. The 4-dimensional Technology Acceptance Model (TAM) encompasses perceived ease of use, perceived usefulness, perceived enjoyment, and social influence [12]. It evaluates how well users perceive the technology, its utility in cultural preservation, their overall satisfaction, and the influence of social factors on adoption.

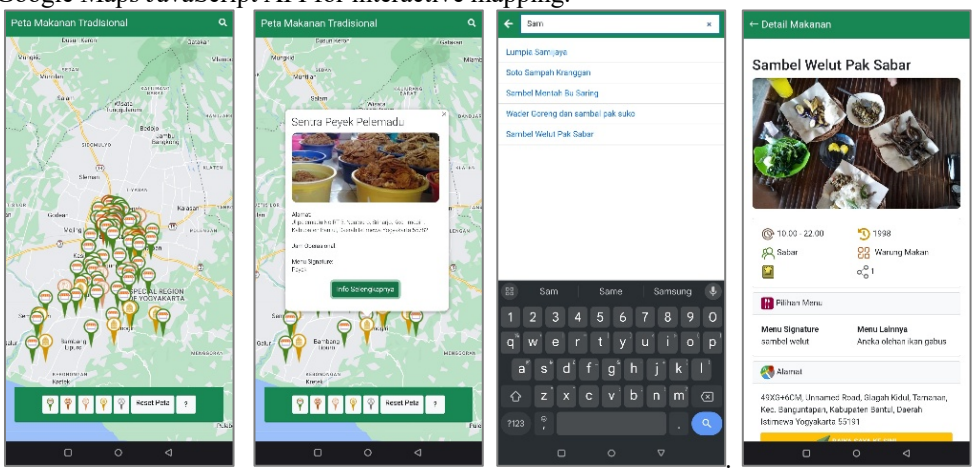
In conclusion, the integration of technology, particularly web-based mapping applications, has the potential to revolutionize the sustainability of traditional food culture. These applications engage users in the documentation process, provide interactive educational experiences, and offer valuable insights into usability through internal and external evaluations. User perception and acceptance, as measured by the 4-dimensional TAM, are pivotal in ensuring the success of technology-driven solutions in preserving culinary heritage. As the subsequent section will explore, the development and implementation of a web-based mapping application tailored to the context of Yogyakarta, Indonesia, hold great promise in enhancing the sustainability of traditional food culture.

3 Method

3.1 The Traditional Food Mapping App

The Traditional Food Mapping App developed for this research is a web-based system designed to support the sustainability of traditional food culture in Yogyakarta, Indonesia.

The system was built using PHP 7.4, CodeIgniter 3 as the PHP framework, Bootstrap 5 for frontend development, and Google Maps JavaScript API for mapping functionality. This web-based system is accessible through web browsers, making it widely available to users with internet connectivity, regardless of their device or operating system. It utilizes PHP 7.4 and CodeIgniter 3 for structured development, Bootstrap 5 for a responsive interface, and Google Maps JavaScript API for interactive mapping.



(a) (b) (c) (d)

Fig. 1. The screenshot of the App: (a) Main screen of the app; (b) traditional food information modal; (c) traditional food search page; (d) traditional food information detail information page

Key features of the app include a Traditional Food Map that allows users to explore traditional food locations, a Traditional Food Search function for specific dish or cuisine searches, and dedicated Traditional Food Information Pages providing detailed descriptions and images of traditional dishes. The system also integrates with popular online food delivery platforms like Go-Food, Shopee-Food, and Grab-Food, streamlining the ordering process for users who prefer food delivery. Furthermore, users can seamlessly connect to native maps applications to obtain directions to their chosen traditional food venues, enhancing their culinary exploration experience. The Traditional Food Mapping App aims to preserve and promote traditional food culture in Yogyakarta while leveraging modern technology. Its user-friendly interface, mapping features, and integrations with online delivery and navigation apps contribute to a richer and more accessible traditional food experience for users in the region.

3.2 Participant

A total of forty participants were selected randomly from diverse academic backgrounds at a university in Indonesia. These participants played essential roles in the study, focusing on evaluating the web-based mapping application's functionality and its acceptance based on the Technology Acceptance Model (TAM). The participant selection aimed to encompass a wide range of academic disciplines, including engineering, social sciences, humanities, and natural sciences, ensuring a comprehensive assessment of the application. Random sampling was employed to avoid bias and ensure the sample's representativeness within the university population.

In their roles, participants engaged in two main activities. Firstly, they conducted functionality testing of the web-based mapping application, identifying technical issues and

providing feedback on usability. Secondly, participants assessed the application's acceptance through the TAM, offering insights into their perceptions regarding ease of use, usefulness, enjoyment, and social factors influencing its adoption. Before their involvement, all participants received detailed informed consent forms outlining the study's purpose, tasks, and their rights. They were given the opportunity to review and ask questions, ensuring their voluntary participation and adherence to ethical considerations.

This diverse group of participants, selected through random sampling, and their active engagement were pivotal in evaluating the web-based mapping application's functionality and its potential adoption within the context of sustaining traditional food culture. Their informed consent ensured ethical standards were met throughout the study.

3.3 Data Collection

Data collection in this study encompassed multiple aspects, enabling a comprehensive evaluation of the web-based mapping application and its impact on traditional food culture sustainability. Traditional food data collection involved gathering information such as food names, store details (if applicable), owner or maker information, instance dates, detailed food descriptions, physical locations, and latitude and longitude coordinates. Additionally, photographs of the food or the store were collected to visually document traditional food culture. To evaluate the system's functionality, participants were given a structured questionnaire and tasked with performing specific actions within the web-based mapping application. These tasks included searching for traditional food locations, content uploads, and interactive map navigation. Data collected from these tasks included completion times, encountered errors, and user feedback on usability and functionality.

Participants' perceptions of the system were assessed through the Technology Acceptance Model (TAM) questionnaire. This questionnaire covered four dimensions: perceived ease of use, perceived usefulness, perceived enjoyment, and the influence of social factors on their intention to use the application. Participants' responses provided insights into their acceptance and attitudes toward the technology. Internal system evaluation was conducted through a series of automated web testing procedures. These included functional testing, compatibility testing, performance testing, security testing, and usability testing. These tests ensured the system's technical robustness, reliability, compatibility across various browsers and devices, performance under different loads, security measures, and user-friendliness.

The combination of these data collection methods provided a comprehensive dataset for evaluating the web-based mapping application's effectiveness, both technically and in terms of user usability and acceptance. This holistic approach facilitated a robust analysis of the system's impact on traditional food culture sustainability.

3.4 Data Analysis

Data analysis in this study involves a range of quantitative methods to gain insights from the collected data. Traditional Food Data Analysis will involve geographical analysis conducted using Geographic Information System (GIS) tools to examine the spatial distribution of traditional food locations based on latitude and longitude coordinates. Spatial analysis techniques, including clustering and density mapping, will help identify patterns and concentrations of traditional food establishments within the study area.

System Functionality Test Data Analysis will entail applying quantitative performance metrics to data obtained from participants' functionality testing. Descriptive statistics such as mean, median, standard deviation, and error frequency distributions will be computed to objectively assess the system's performance. User Perception Data Analysis will focus on

the data from the Technology Acceptance Model (TAM) questionnaire, including conducting reliability analysis using Cronbach's alpha coefficient to assess the internal consistency of the questionnaire. Additionally, statistical techniques, including Pearson Correlation, will be employed to explore relationships between variables. This analysis will focus on understanding the relationships between perceived factors (perceived ease of use, perceived usefulness, perceived enjoyment, and social influence) and users' intentions to use the application.

Internal Evaluation System Data Analysis for functional testing will categorize detected issues by severity and frequency, guiding prioritization for resolution. Compatibility and performance testing data will be quantitatively analyzed to identify performance bottlenecks and discrepancies. Security testing results will undergo quantitative evaluation to determine the severity of vulnerabilities, while usability testing analysis will measure the system's usability through standardized metrics.

The combination of these quantitative data analysis methods will provide comprehensive insights into the web-based mapping application's functionality, user perception, and internal system evaluation. This holistic approach aims to offer objective and statistically significant findings regarding the system's performance and its potential impact on sustaining traditional food culture.

4 Findings

The Traditional Food Mapping App is a web-based platform designed to sustain and promote Yogyakarta's traditional food culture. Built using PHP 7.4, CodeIgniter 3, and Bootstrap 5, it ensures robust, scalable development and a responsive, user-friendly interface. The Google Maps JavaScript API enhances its functionality, enabling seamless location mapping. Accessible via standard web browsers, the app caters to diverse users across devices and operating systems. Key features include a Traditional Food Map for exploring locations, a search function for targeted queries, and detailed information pages to deepen appreciation of culinary heritage. Integration with food delivery platforms like Go-Food and navigation apps further simplifies food exploration and ordering.

By merging traditional values with modern technology, the app aims to preserve Yogyakarta's culinary heritage while aligning with contemporary user needs. Usability and functionality evaluations, including System Usability Scale (SUS) and Technology Acceptance Model (TAM) assessments, highlight its commitment to delivering a practical and engaging user experience.

4.1 Functionality Testing

The functionality testing of the web-based application focused on evaluating user satisfaction with various features related to the sustainability of traditional food culture. Users rated different aspects of the system on a scale from 1 to 5, where 1 represented low satisfaction and 5 indicated high satisfaction. The descriptive table below summarizes the results for each functionality item:

Table 1. Descriptive Statistics of Functionality Testing. (n = 148)

Item	Mean	Std. Dev.
Display Help Marker by pressing the "?" button.	3.38	1.426
Show the traditional food map screen with all markers.	3.33	1.468
Display the traditional food map screen with the "Street Food" category by pressing the "Street Food" marker button.	3.46	1.477

Display the traditional food map screen with the "Warung Makan" category by pressing the "Warung Makan" marker button.	3.53	1.449
Display the traditional food map screen with the "Restoran" category by pressing the "Restoran" marker button.	3.36	1.517
Display the traditional food map screen with the "Tempat Oleh-Oleh" category by pressing the "Tempat Oleh-oleh" marker button.	3.64	1.434
Display the traditional food map screen with the "Tempat Produksi" category by pressing the "Tempat Produksi" marker button.	3.44	1.526
Reset the map view by pressing the "Reset Peta" button.	3.57	1.356
Show location information modal by pressing the marker.	3.51	1.317
Display detailed information by pressing the "Info Selengkapnya" button.	3.38	1.500
Access the Search Page by tapping the Search function in the top right corner of the application.	3.33	1.514
Search for a specific location or food by typing keywords into the search input.	3.65	1.452
Results automatically update as keywords are typed into the search input.	3.50	1.468
Display detailed information by selecting a location or food on the search page.	3.42	1.462

One of the features tested was the "Help Marker" functionality, accessed by pressing the "?" button, which achieved an average satisfaction score of 3.38. The standard deviation of 1.426 in this score indicates a diverse range of user experiences with this feature, suggesting it is helpful to some users while others may not find it as intuitive or useful.

The application also allowed users to view a traditional food map with all markers displayed, which garnered an average satisfaction score of 3.33. The slightly higher standard deviation of 1.468 for this feature implies variability in user satisfaction, reflecting the different preferences and needs of users in navigating the app to explore traditional food options. Moreover, the app provided category-specific displays for various types of traditional foods, such as "Street Food," "Warung Makan," "Restoran," and others. These categories scored satisfaction levels ranging from 3.36 to 3.64, indicating a moderate to high level of satisfaction among users. This range of scores, along with the corresponding standard deviations, suggests that while most users found these features useful, there are differences in how each category meets the specific interests and needs of different users.

An important functionality in the app was the ability to reset the map view, which scored 3.57 in user satisfaction with a standard deviation of 1.356. This relatively high score indicates that users generally found this feature useful, allowing them to efficiently navigate and reset their location on the app to explore different areas and food categories. The app also offered a feature to display detailed information about traditional foods and locations. This feature achieved an average satisfaction score of 3.50, with a standard deviation of 1.468, highlighting its importance in providing users with comprehensive information about traditional food choices.

Search functionality was another crucial aspect of the app, with features like accessing the search page and typing keywords into the search input scoring 3.38 and 3.33, respectively. Interestingly, the results automatically updating as keywords were typed into the search input received a higher satisfaction score of 3.65. The higher score for this feature reflects its significance in enhancing the user experience by providing real-time, relevant search results. The functionality testing, overall, suggests a moderate to high level of user satisfaction across different aspects of the app. While there is a general trend of positive feedback, the range in standard deviations across these features indicates a diversity in user experiences and preferences. This variability is crucial for further development and refinement of the app, as

it provides insights into areas where the app is performing well and aspects that might require enhancements to better meet the needs and expectations of a broader user base.
In essence, the results from the functionality testing provide valuable feedback on user satisfaction with various features of the app, highlighting its potential to enhance the sustainability of traditional food culture while also pinpointing areas for further improvement.

4.2 System Usability Scale (SUS) Testing

The System Usability Scale (SUS) testing further complements the functionality testing by providing insights into the overall usability of the web application designed to promote traditional food locations and sustainability. Each SUS item was rated on a scale from 1 to 5, with higher scores indicating better usability. The results from a sample of 148 users offer a nuanced perspective on how users interact with and perceive the application. The descriptive table below summarizes the results for each SUS item:

Table 2. Descriptive statistics of System Usability Scale (n = 148)

Item	Mean	Std. Dev.
I think that I want to use this web application regularly because it helps promote traditional food locations and sustainability.	3.32	1.341
I find this web application too complicated when displaying traditional food locations.	2.94	1.361
I find this web application easy to use when searching for traditional food locations.	3.47	1.382
I think that I need technical assistance to be able to use this web application effectively.	3.29	1.381
I feel that various functions in this web application are well integrated when exploring traditional food locations and sustainability features.	3.34	1.450
I feel there is too much inconsistency in the layout and design of this web application when promoting traditional food locations.	3.25	1.319
I assume that most people will be able to learn to use this web application very quickly to support traditional food and sustainability.	3.48	1.387
I find this web application awkward when interacting with information about traditional food locations and sustainability features.	3.16	1.390
I feel very confident using this web application to explore traditional food locations and support sustainability.	3.43	1.351
I feel the need to learn a lot before I can start using this web application for traditional food and sustainability.	3.34	1.407

The statement "I think that I want to use this web application regularly because it helps promote traditional food locations and sustainability" scored an average of 3.32, reflecting a moderate inclination of users towards regular use of the app due to its role in promoting traditional food and sustainability. This suggests that while the app has a positive impact, there might be room for enhancements to increase regular user engagement. Conversely, users found the app somewhat complicated when displaying traditional food locations, as indicated by a score of 2.94. This below-average score points to complexities in the application's interface or functionality when dealing with the display of traditional food locations, signaling a need for simplification or improved user guidance in these areas. The ease of use for searching traditional food locations scored higher, with an average of 3.47. This indicates that users generally find the search functionality user-friendly, an essential aspect for an app aiming to connect users with traditional food options.

A slightly lower score was observed for the statement "I think that I need technical assistance to be able to use this web application effectively," averaging 3.29. This suggests

that while some users feel confident using the app, a significant portion may require additional guidance or support, highlighting the importance of accessible user support and clear instructions. The integration of various functions in the app, particularly for exploring traditional food locations and sustainability features, was rated at 3.34. This indicates a moderate level of satisfaction with how different features and functions are combined within the app, suggesting that the app is relatively coherent in its design and function integration.

Users also perceived some inconsistency in the layout and design of the app, as reflected in the score of 3.25 for the statement about inconsistency in promoting traditional food locations. This points to a need for more streamlined and consistent design elements to enhance the overall user experience. Most users assume that the app can be learned quickly, as indicated by the score of 3.48 for the statement regarding the ease of learning to use the app. This is a positive indicator of the app's user-friendliness, suggesting that new users can become proficient with the app with minimal effort. However, the app was found to be somewhat awkward in interacting with information about traditional food locations and sustainability features, scoring 3.16. This highlights potential issues in how information is presented or interacted with, necessitating a review of the user interface design. Confidence in using the web application scored 3.43, suggesting that most users feel confident in navigating and utilizing the app to explore traditional food locations and support sustainability. This level of confidence is crucial for the app's long-term adoption and effectiveness. Lastly, the need for learning before using the app for traditional food and sustainability was rated at 3.34. While this indicates some requirement for initial learning, it is not excessively high, suggesting that users do not find it overly challenging to start using the app.

The SUS scores provide valuable insights into the overall usability of the web application. While some aspects like the ease of searching and user confidence are rated favorably, other areas such as interface complexity and layout consistency highlight opportunities for improvement. Addressing these areas could enhance the user experience, making the app more effective in promoting traditional food culture and sustainability.

4.3 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) assessed users' perceptions of the system's usefulness (PU), ease of use (PEOU), attitude (ATT), and behavioral intention to use (BHV). Each construct was evaluated using five items, and the results are summarized below:

Table 3. Descriptive statistics of the Technology Acceptance Model.

Item	Mean	Std. Dev.
To what extent are you confident that using this web application to find traditional food locations contributes to increasing sustainability?	3.37	1.290
How valuable do you consider this web application in promoting sustainability practices related to traditional food locations?	3.49	1.343
Using this web application helps me identify sustainable choices for traditional food.	3.45	1.396
I find this web application beneficial in supporting environmentally friendly food choices.	3.41	1.438
This web application enhances my awareness of sustainability in traditional food locations.	3.39	1.402
Using this web application makes it easier for me to make environmentally friendly food choices at traditional food locations.	3.49	1.317

How easy is it for you to navigate and use this web application to find traditional food locations?	3.20	1.436
Do you find it easy to use this web application to access information about traditional food locations and sustainability efforts?	3.36	1.391
Using this web application to explore traditional food locations and sustainability feels effortless.	3.50	1.412
The web application interface is intuitive and user-friendly for discovering traditional food locations.	3.49	1.412
I feel comfortable using this web application to support traditional food locations and sustainability.	3.47	1.337
How positive are your feelings about using this web application to support traditional food locations and sustainability?	3.36	1.443
Would you describe using this web application to advance sustainability in traditional food locations as a rewarding experience?	3.44	1.449
I have a positive attitude toward using this web application to find environmentally friendly traditional food choices.	3.35	1.452
How likely are you to continue using this web application to explore traditional food locations and support sustainability in the future?	3.39	1.333
Do you intend to recommend this web application to others interested in promoting sustainability through traditional food locations?	3.28	1.355
I predict that I will use this web application regularly to make sustainable food choices.	3.41	1.359
I believe I will actively use this web application to support sustainability efforts in traditional food.	3.29	1.316

In terms of perceived usefulness, users rated various aspects related to sustainability and traditional food locations. For example, the confidence in the app's contribution to sustainability, its value in promoting sustainable practices, and its role in enhancing awareness of sustainability in traditional food locations were rated with means ranging from 3.37 to 3.49. These scores indicate a moderate to high perception of the app's usefulness in promoting sustainability, suggesting that users recognize the app's potential to contribute positively to environmental and cultural sustainability.

Regarding the perceived ease of use, items assessing the ease of navigation, access to information, and overall effortlessness of the app were rated, with scores ranging from 3.20 to 3.50. These scores reflect a moderate level of ease of use, with the highest score given to the app's effortlessness in exploring traditional food locations and sustainability. This suggests that while the app is generally user-friendly, there could be specific areas where navigational and informational aspects could be enhanced for better user experience.

The attitude towards the application was measured by assessing users' comfort in using the app, their positive feelings towards supporting sustainability through the app, and whether they found the experience rewarding. The scores in this construct ranged from 3.36 to 3.47, indicating a generally positive attitude among users towards the application. This positivity is crucial for long-term engagement and use of the app.

Behavioral intention to use the app was evaluated through items like the likelihood of continued use, recommendations to others, and regular use for making sustainable food choices. These items scored between 3.28 and 3.41, showing a moderate intention among

users to continue using and promoting the app. This intention is a critical factor for the app's success in fostering sustainable practices in traditional food locations.
The user's belief in actively using the app to support sustainability efforts scored 3.29, reinforcing the moderate to high intention to engage with the app in the context of sustainability.

The Technology Acceptance Model results provide valuable insights into how users perceive the app's functionality, usability, and overall acceptance. While there are clear strengths in the app's ability to promote sustainability and traditional food locations, mixed results in some areas highlight the need for continuous refinement. Addressing areas of lower scores, such as certain aspects of ease of use and behavioral intention, will be crucial in enhancing user satisfaction and fostering a more substantial impact on sustainability efforts in traditional food culture. This comprehensive assessment underlines the importance of understanding user perspectives for the successful deployment and adoption of technology solutions aimed at cultural and environmental sustainability.

4.4 Contribution to Sustainability

The advancement of technology, particularly in the form of web-based applications, has shown promising potential in enhancing the sustainability of traditional food culture. The analysis of Pearson correlation provides insightful revelations into this relationship. Due to limit space, we provide the full variable and the Pearson Correlation in the appendix.

One notable correlation is observed between the feature of "Displaying traditional food map layers with all markers" and the perception of the application's interface as intuitive and user-friendly ($r = .301^{**}$; $P < .01$). This high positive correlation suggests that when users find it easy to navigate through different food options using the map with all markers, their overall experience with the application is enhanced. This ease of use is crucial in promoting the sustainability of traditional foods, as it encourages users to explore and potentially patronize a wider variety of traditional food outlets.

Similarly, a strong positive correlation is found between the functionality of "Automatically updating search results as keywords are typed" and the intuitive nature of the app's interface ($r = .237^{**}$; $P < .01$). This indicates that real-time responsiveness of the app to user inputs significantly improves the user experience, making it easier for them to find sustainable food options. In essence, this feature aids in bridging the gap between traditional food lovers and the diverse options available, fostering a sustainable food culture.
Another significant relationship is seen with the feature "Displaying detailed information by pressing the 'More Info' button" ($r = .395^{**}$; $P < .01$). This strong correlation highlights the importance of providing detailed information about traditional food options. When users have access to comprehensive information about what they are eating, where it comes from, and how it aligns with sustainable practices, it fosters a deeper understanding and appreciation of traditional food culture. This knowledge not only educates the user but also empowers them to make more sustainable food choices.

Furthermore, the study uncovers a positive correlation between the ease of resetting the map view and the user's perception of the app's interface ($r = .381^{**}$; $P < .01$). This indicates that the ability to easily navigate and reset one's location on the app is a significant factor in enhancing user experience and engagement with traditional food culture. By allowing users to effortlessly explore different geographical areas and food categories, the app serves as a virtual bridge connecting them with a diverse range of sustainable traditional food choices.
The application's impact on users' attitudes towards sustainability is also significant. For instance, there is a noteworthy correlation between using the app and increased awareness of sustainability in traditional food locations ($r = .288^{**}$; $P < .01$). This implies that the app

effectively raises consciousness about sustainability issues related to traditional food, thereby promoting more responsible consumption patterns among its users.
Similarly, the feature allowing users to identify sustainable traditional food options is positively correlated with their positive feelings towards using the app for supporting traditional food locations and sustainability ($r = .376^{**}$; $P < .01$). This showcases the app's role not just as a tool for locating food but as a medium for fostering a sustainable mindset. Through this functionality, the app not only provides a service but also educates and influences user behavior in favor of sustainable practices.

Moreover, the correlation between the perception of the app being beneficial for eco-friendly food choices and positive feelings towards using the app for sustainability ($r = .307^{**}$; $P < .01$) cannot be overlooked. This indicates that users who recognize the app's utility in promoting environmentally friendly choices are more likely to have positive attitudes towards its usage for sustainability. This relationship underscores the importance of aligning the app's functionalities with sustainability goals, thereby reinforcing the sustainability of traditional food culture.

The significant correlations identified in this study underscore the substantial role that app can play in advancing the sustainability of traditional food culture. By offering features that enhance user experience and increase awareness about sustainable practices, these applications can effectively bridge the gap between traditional food enthusiasts and sustainable food choices. This not only supports the preservation of traditional food culture but also contributes to broader sustainability efforts. The findings from this study provide valuable insights for developers and stakeholders in the traditional food industry, highlighting the potential of technology in promoting sustainable practices and preserving cultural heritage.

5 Conclusion

This study effectively addresses three key research questions, providing insights into the Traditional Food Mapping App's impact on promoting Yogyakarta's traditional food culture. The app's user-friendly features, such as detailed food information, category-specific maps, and simple map resetting, significantly enhance satisfaction and engagement, encouraging users to explore diverse traditional foods, as reflected in positive feedback and high satisfaction scores. While users generally perceive the app as usable, System Usability Scale (SUS) evaluations highlight areas for improvement, including interface complexity and layout inconsistencies, which, if addressed, could better support the app's goal of sustaining traditional food culture. Functionalities like integration with food delivery platforms and real-time updates foster a sustainability mindset, raising awareness of traditional food locations and positively correlate with users' intentions to continue using the app and recommending it to others, thereby reinforcing its cultural preservation mission. Overall, the app successfully combines technology with cultural preservation through its user-centric design and impactful features, offering a model for future cultural sustainability initiatives. However, the study's focus on Yogyakarta limits the generalizability of findings to other regions, and while the sample of 148 participants provides meaningful insights, a larger, more diverse pool could enhance the study.

Exploring the impact of similar web-based applications in different geographical settings would offer comparative insights into the influence of cultural and regional variations. Longitudinal studies would be beneficial in understanding how user perceptions and behaviors change over time with the app's continued use. Including a more diverse range of participants in terms of age, technology proficiency, and cultural backgrounds would enrich the understanding of the app's usability and acceptance across different user groups. Investigating advanced technological features like AI for personalized recommendations or

augmented reality could unveil new dimensions of user engagement and satisfaction. It would also be insightful to assess the app's impact from the viewpoint of traditional food vendors, providing a fuller picture of how such technologies affect local businesses and sustainability efforts. Finally, situating the app within a broader ecosystem of sustainability initiatives could offer a more holistic perspective on its role and effectiveness in promoting sustainable practices in traditional food culture. These areas of future research would significantly contribute to a more nuanced and comprehensive understanding of the integration of technology with cultural preservation and sustainability.

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