Indang Konektayo Kiosk: An Interactive Menu System for Tourists

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Abstract: Every traveler wants to experience hassle-free and safe travel while maintaining an enjoyable journey with the help of user-friendly interfaces and an innovative technological menu system. An interactive information menu system that improves the traveler experience, commercial operations, and tourism information at the Municipality of Indang. It is a technological solution that is relevant to today's demand and interest, and that is readily available data sources and information, which benefit. Specifically, it possesses the following characteristics, including: (1) a place finder that provides registered places in Indang with the right information and allows users to discover new established places in Indang; (2) mapping routes that provide directions and generate routes; and (3) sending the Google Maps URL through a short messaging system (SMS) to the mobile phone of the user, which can be opened in digital maps such as Google Maps. The descriptive method of research was used in this study and was created with Cascading Style Sheet (CSS), Hypertext Markup Language (HTML), Hypertext Processor (PHP), JavaScript (JS) in web development, MySQL for its database, as well as an SMS API for sending map URLs based on the queries. The Agile software model was used, which was composed of sprints, each of which was meant to focus on the developmental adjustments as interactive kiosks were prone to updates and ran into serious changes. Using ISO 9126 software product quality standards, the system received an average rating of 4.71 from respondents, indicating excellent quality and that it served its functions properly and met all of the required requirements.

Keywords: Mapping Routes, Interactive Menu System, Information, Short Messaging System, Digital Maps

1. Introduction

Since then until today, self-service technology has made everything more convenient, particularly for customers who have made computers a part of their daily lives. The power of innovation in this self-

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service technology, such as kiosks, enhances the efficiency and flexibility of consumer experiences. It takes flexibility to manage one's own interactions, particularly while seeking assistance and information. While it is uncommon to find a kiosk designed to provide information directly to a tourist or someone unfamiliar with the area, having an informative kiosk may increase the revenue of the establishment and that place due to its positive impact on consumers [1]. Tourists and visitors preferred information kiosks. It's a screen-based interactive map that allows them to plan their itinerary and learn more about everything in a specific place at an unprecedented level. This enhances the visitor experience while also reducing staffing requirements [2]. Because of technological advancements and digital kiosks, it is possible to maximize information capacity and contribute to improved efficiency, speed, and quality of services in the tourism business. As the digital signage trend grows, the tourism and travel industries are starting to use digital information to help travelers better discover the places they visit [3].

The Philippines boasts breathtaking scenery, historical landmarks, delicious Filipino cuisine, and world-class beaches. Each of its thousands of islands is endowed with a wealth of natural and man-made attractions. But, in a municipality with several historical landmarks, natural locations, and business establishments, the internet remains inaccessible in Google Maps [4]. Only social media platforms like Facebook and Instagram are available. However, not everyone can be reached through social media posts or paid advertising. Similarly, not everyone has data connectivity to access the internet and use the information it provides. As a result, many individuals, particularly the elderly, do not rely on technology and are unwilling to purchase a computer device to adapt to the new normal that today's situation has caused [5][6]. On the other hand, the presence of any does not imply that the information is up-to-date or correct. Social media posts are not guaranteed to reach the intended audience. Online advertisements do not last long, causing a location or establishment to close when target visitors are not met in a reasonable amount of time, and these events will hinder tourism growth. Nowadays, people rely on online reviews from prior guests to determine whether a location is recommended or not. Some people believe that good reviews will attract more people [7][8].

The population and tourism industries continue to develop, and new destinations are emerging and being established. However, there is an absence of information and a public place directory that should address the informational demands of existing businesses and places while also offering accurate information about the municipality's historical background, geographic location, and so on. Thus, the development of an informative kiosk can provide a user's information demands by mapping routes that will provide directions and generate routes, locating locations or a place finder that will provide all places in a municipality with the right information and allow users to discover new established places, and sending the Google Maps uniform resource locator (URL) through a short messaging system (SMS) to the mobile phone of the user and can be opened in digital maps such as Google Maps. This may be searched in the Google Maps app and used as a travel map by utilizing location services and data connectivity.

2.   Materials and Methods

The study begins by acquiring data, which includes conducting interviews, surveys, and reviewing related studies and literature. All of these data sources underwent problem identification, which focuses on analyzing the current system and determining requirements. This is the foundation of software design, including database design and prototyping. During the system development phase, there were several system optimizations and system testing. The system review occurred after the system was deemed

ready for public usage. Finally, the documentation process began with the system proposal and continued through its completion.

2.1 Research and System Design

To create an efficient system, the study used an agile methodology. This strategy assists the researcher in improving and enhancing the system by implying that development is iterative, with tasks divided into separate modes. Also, it is a stringent phase-based linear application development methodology. When one phase ends, another begins. It is based on continuous iteration, which means developing and testing a product simultaneously in a project [9][10].

Different languages are used, such as HTML to create a webpage, CSS for design, JQuery for project optimization, JavaScript for events and scripting, PHP for database connection, Bootstrap for front-end framework, and MySQL for system database management. For software requirements or development tools, a text editor used for program and script coding, a browser as the medium for the test bench, XAMPP for MySQL and Apache, and KioskSimple software designed to transform Windows OS into a secure kiosk machine, as well as an SMS API, which allows written code to send a short message via SMS gateway. The operating system required for Windows 10 is at least 1507 RTM (LTSB), which is a business edition. Hardware requirements include an Intel Core i3-5005U processor for smooth and slightly high clock rates, 8GB DDR3 Random Access Memory (RAM) for heavy browser load, a 256GB M.2 SSD for faster read and write, a 21.5" Touch Screen Monitor for User Experience (UX) testing and implementation, and a shielded twisted pair for outdoor wired internet connectivity.

2.2 Synthesis

The development and implementation of the informative kiosk in Indang, Cavite, which is also the scope of this research, includes visitors and residents of the municipality. A comparison between various studies on the development of informative system kiosks is depicted in Table 1.

Table 1. Comparison Table

Studies	M1	M2	M3	M4	M5	M6	Methodology
Developing KIOSKs - Touch Based Interactive Information System [11]					√	√	*not specified in the study*
Development of an Interactive Kiosk with Screen Amplifier for the Elderly and Those with Low Vision [15]				√		√	*not specified in the study*
Self-service technology kiosk design for restaurants: An QFD application [13]					√		Relational Matrix Framework or HoQ

	M1	M2	M3	M4	M5	M6	
Remote Device Interrogation Kiosks (ReDInK) [16]						√	*not specified in the study*
"KAALAMAN": Development of farmer's rice doctor kiosk for increase production	√					√	Chi-Square RGB histogram
KIOSQO: A Self-Service Student Records Management Kiosk [14]						√	Spiral Model
Information kiosk for ABE Manila [12]	√					√	Descriptive-evaluation research design
Indang KonekTayo Kiosk	√	√	√	√	√	√	Agile SDLC

Legend:

√ - included on the study

M1 – Map Route Module

M2 – Place Finder Module

M3 – SMS Module

M4 – Announcements Module

M5 – Wiki Module

M6 – Kiosk Management Module

Developing KIOSKs - Touch Based Interactive Information System [11] focuses on the informational feature of their kiosk about their college that cater to and assist the students and build a student's feedback system similar to the Information kiosk for ABE Manila [12]. Information kiosk for ABE Manila that allows the users/students to access information faster, effective, and efficiently. Their study is quite similar to the objectives but unrelated scope in the study of Park *et al.* [13] which focuses on the Kiosks in restaurants. In the study, A Self-Service Student Records Management Kiosk [14], the system focuses on the information retrieval of the students and alumni for transcript of records (TOR) requests and avoided a long waiting line as it was paperless and straightforward. In the agriculture side, Kiosk machines serve as an information hub, providing the farmers with fundamental information for the crops and produce and can handle inquiries and receive answers via SMS.

The study of Bidarra and Oyamada [15] focused on the elderly and those with low vision that use screen amplifiers, the same scenario as in the study of Wong *et al.* [16] that mainly developed and tested the system for healthcare checkups during the COVID-19 situation.

Indang KonekTayo Kiosk will provide information that a visitor or the resident needs, mapping routes of the business establishments, parks, historical landmarks, schools, tourist spots, restaurants, cafes, and transportation terminals—a very different approach in both systems presented by Adhoni *et al.* [11] and Park *et al.* [13] and different methodologies used in the studies of Bidarra and Oyamada [15] and Wong *et al.* [16], which is a healthcare checkup kiosk.

Upon searching for specific finds, suggestions will appear on the screen. The kiosk will also ask the users if they would like to send the Google Maps coordinates to their phone; if the user agrees, the system asks to input their phone numbers, and the coordinates will be sent, and their phones must have an enabled GPS and Google Maps software installed. The geological location of Indang interconnects different towns, including Tagaytay City, Mendez, Trece Martires, Naic, and more. Different transportation terminals located in different places can be easily identified since the Indang KonekTayo Kiosk has a travel and transportation category in the Place Finder module. Thus, the researcher stands for its uniqueness and does not copy the work of others. It also has a video conferencing tool that most e-learning sites don't have.

2.3 Population and Sampling

This study's stratified random sampling of 50 respondents comprises both visitors and residents of the Municipality of Indang. The population was divided into homogeneous subpopulations known as strata or plural of stratum based on defined features in a stratified sample, such as race, gender, and geography. Every person in the population should fit into one of the strata. Following that, a different probability strategy was used, such as cluster or random sampling, to estimate statistical measures for each stratum [17][18]. Survey and interview questionnaires were employed regarding the usage of mobile devices and internet connectivity; then obtained the satisfaction level of the users on how mobile devices work and deliver services and measured the user's experience while using the mobile devices.

Table 2. 5-point Scale, Mean Range, and Interpretation

Score	Range of Weighted Mean	Interpretation
5	4.51-5.00	Strongly agree
4	3.51-4.50	Agree
3	2.51-3.50	Undecided
2	1.51-2.50	Disagree
1	1.50 and below	Strongly disagree

Table 2 shows the Likert scale that can be used to generate the overall interpretation of the mean score of each item for system evaluation [19].

On the other hand, the statistical approaches outlined below will be used to assess the data gathered from system evaluation questionnaires. The outcomes of the quantifiable strategy will determine the

respondent's overall perspective on the system. The sample mean represents a sample's average score on a given variable.

Percentage, as depicted in equation 1, determines the frequency counts and percentage distribution of respondents' personal-related variables.

$$\% = \frac{f}{n} \text{ X } 100 \tag{1}$$

Where:

% = mean

f = frequency

n = total number of respondents

The mean, as depicted in equation 2, is the average score of a sample on a given variable.

$$\bar{x} = \frac{\sum_{i=1}^{n} Xi}{n} \tag{2}$$

Where:

$\bar{x}$ = mean

X_i = representation of each observation from respondents

n = total number of respondents

The standard deviation, as depicted in equation 3, measures the spread or variability of the sample's scores on a given variable [20].

$$s = \sqrt{\frac{\sum_{i=1}^{n}(Xi - \bar{x})^2}{n-1}} \tag{3}$$

Where:

$\bar{x}$ = mean

X_i = representation of each observation from respondents

n = number of respondents

s = sample standard deviation

3. Results and Discussion

The visitors, residents, and employees of Indang Municipality had been able to access the kiosk through devices provided by the researcher, such as accessing the places inside Indang, Cavite, mapping routes from the kiosk's current location, and providing information from announcements and a Wiki.

The findings were compared to the related research and literature provided, and it was discovered that the Interactive Menu System for a Travel Assistance Solution was extremely beneficial in incentivizing tourists to visit and explore the town. The municipality's Interactive Menu System

efficiently arranges locations, offers information, and operates without the use of paper. Similarly, the designed system efficiently offered current information in the form of announcements and Wiki by capturing the users' attention. This received a very positive rating from its users, showing that the development as a whole was successful.

The findings from the system evaluation were sorted by evaluator type and evaluation mark for the proposed project. The evaluation is classified into two (2) categories: non-technical and technical, both based on ISO 9126 international standards [21]. The evaluation included various statement classifications such as the system's functionality, reliability, efficiency, maintainability, portability, and user-friendliness. Non-technical evaluation was conducted face-to-face at the Municipality of Indang, whereas technical evaluation was conducted solely through Google Forms.

Table 3. Likert Scale – Evaluation

Score	Range of Weighted Mean	Interpretation	Remarks
5	4.51-5.00	Excellent	The system fully meets and exceed the most expectations.
4	3.51-4.50	Very Good	The system fully meets and exceed the several expectations.
3	2.51-3.50	Good	The system fully meets all expectations.
2	1.51-2.50	Fair	The system does not fully meet all expectations.
1	1.50 and below	Poor	The system fails to meet to a significant degree in several areas.

Table 3 shows how the weighted mean in each question will be interpreted using the Likert scale.

Table 4. Types of Evaluators

Evaluator	Quantity	Percentage
Residents	21	30%
Visitor in the municipality	24	34%
Municipality employee	20	29%
IT Experts	5	7%
Total	**70**	**100%**

Table 4 displays the four (4) types of evaluators who took part in the system evaluation. There were seventy (70) responses, with twenty-one (21) residents of Indang, twenty-four (24) visitors, twenty (20) government employees, and five (5) IT experts from the College of Engineering and Information Technology, IT consultants of the Municipality of Indang, and other works in a company.

Table 5. Overall System Evaluation Results

Evaluation	Mean	Standard Deviation	Interpretation
Non-technical	4.70	0.47	Excellent
Technical	4.23	0.87	Very Good
Average	**4.47**	**0.67**	**Very Good**

Table 5 displays the system's overall evaluation results from both technical and non-technical evaluators. The system received a very good rating because it has a mean of 4.47 and an average standard deviation of 0.67, indicating that the developed system met and exceeded the stakeholders' expectations while also passing the ISO 9126 software evaluation standards.

4. Conclusion and Recommendations

In this study, an informative kiosk was developed that caters to the problems through specified modules: (1) Map Route, which allows users to have a generated route from its current location to the desired destination; (2) Place Finder, which allows the user to browse registered places and the places that were not present in the Google Maps in Indang and send the route link through the send to my mobile device module via SMS; (3) Indang Wiki module to aid basic information about Indang to the users; (4) announcements module fetched from the official Facebook page of the Municipality of Indang via RSS feed; and (5) Account and Information Module for maintaining the system's data and information. The kiosk also displays the local hotlines of the authority in case of emergency, such as Philippine National Police (PNP), Bureau of Fire Protection (BFP)-Indang, Indang Local Disaster Risk Reduction Management Office (LDRRMO), Indang Rural Health Unit (RHU), Indang Municipal Social Welfare and Development Office (MSWDO), and Security Operations Center hotlines.

All modules are functional and have yielded considerable results for the project's stakeholders, as well as a significant effect on tourism. It also had an innovative influence, as consumers were able to experience being serviced by the kiosk while traveling inside the municipality. Users were able to see places that were not included in the Google Maps data source. It will pin the specified place's current location using longitude and latitude. This allowed it to give an assistive gadget to residents and visitors while also creating consistent job opportunities for the municipality's tourism officers and IT professionals. It obtains positive feedback based on the researchers' evaluation, indicating that it can provide appropriate services and modern solutions to the highlighted difficulties, benefiting both visitors and residents, as well as the local government for tourism in the municipality. Therefore, the researcher concluded that the developed system was a success since it met its key objectives and performed effectively on its intended purpose of resolving concerns highlighted during the project's beginning stages.

Furthermore, for the improvement of the study, the following are recommended: (1) improve the current web-based system for online users and mobile devices; (2) include a feature for file uploads for authorized staff to easily update registered places each year; (3) include a directory of the Municipal Building that shows how to reach each department inside; and (4) integrate a fare matrix guide for public utility vehicles.

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