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# A Comprehensive Study on Designing and Implementing the 'Kudat Tour' Mobile App

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**ABSTRACT**

Kudat, a renowned tourist destination in Malaysia's Sabah state, faces challenges, including a scarcity of tour guides emphasizing attractions beyond The Tip of Borneo and Rungus Longhouse, coupled with limited tourism information. To tackle these issues, our study investigates industry trends, and introduces the "Kudat Tour" app for tourists. This innovative app utilizing GPS technology to assist users in navigating and discovering tourist hotspots, local cuisine, accommodations, and historical landmarks. By integrating a geo-search algorithm, the app empowers individuals to effortlessly pinpoint nearby dining options. Kudat Tour eliminates the need for traditional tour guides, making exploration accessible to all. By offering this mobile application, we anticipate significant economic growth for Kudat and enhanced global recognition.

## 1. Introduction

The travel industry has undergone a significant transformation with the pervasive influence of digital technology. In today's interconnected world, tourists increasingly rely on smart technologies to shape their travel experiences, from planning and navigation to sharing their adventures with fellow travelers [1]. This digital shift has brought both opportunities and challenges, particularly in the context of rural tourism. Sabah, a state in Malaysia celebrated for its natural beauty and cultural richness, is actively promoting rural tourism as a means of sustainable economic development. However, rural communities in this region face the dual challenge of adapting to digital advancements and meeting evolving language standards [3].

Kudat, often referred to as the "Tip of Borneo," stands out as a prominent destination within Sabah. Renowned for its pristine beaches and unique cultural heritage, Kudat offers an enticing proposition for tourists. In this evolving landscape, the focus of tourism development is shifting

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towards rural areas, emphasizing the need to empower local communities with digital proficiency and effective communication skills [3].

This research endeavor takes root in recognizing the potential of digital tools in bridging the gap between Kudat's rural charm and modern traveler expectations. The primary objective is to develop the "Kudat Tour" mobile application, a cutting-edge solution that equips tourists with comprehensive information to explore the captivating region of Kudat with ease and convenience [4]. By harnessing user preferences and harnessing the power of internet technologies, this app aims to seamlessly guide visitors to their desired destinations while providing contextually relevant, location-based insights [4].

To achieve this, our study has set forth several key objectives. Firstly, the app will serve as a platform for discovering intriguing places and attractions within Kudat, ensuring that travelers can uncover hidden gems beyond the well-known landmarks. Secondly, it will provide users with real-time location information, enhancing their ability to navigate the region confidently. Moreover, the app will facilitate feedback collection, empowering travelers to share their experiences and contribute valuable insights, thereby assisting future visitors in coping with the unpredictability of travel [6]. Lastly, this study encompasses a rigorous usability evaluation plan, ensuring that the app's design is user-centric and responsive to the needs of diverse travelers [7].

In this way, the "Kudat Tour" app not only addresses immediate travel requirements, but also holds the potential to contribute significantly to the development of tourism in Kudat, bridging the gap between traditional charm and modern expectations. Through this research, we aim to foster a deeper appreciation for the importance of digital proficiency in rural communities and underline the broader implications of promoting sustainable tourism in Sabah.

## 2. Literature Review

### *2.1 Geo – searching*

Geo-searching algorithms play a pivotal role in today's interconnected world, where location-based information is of paramount importance. These algorithms are designed to efficiently retrieve, and process data based on geographic coordinates, enabling a wide range of applications from navigation and mapping to social media check-ins, and local business searches [8]. The fundamental principle underlying geo-searching algorithms is to locate and retrieve information that is relevant to a specific geographical area or within a certain proximity [9].

At its core, a geo-searching algorithm is responsible for translating a human-readable location query, often in the form of an address or place name, into geographic coordinates such as latitude and longitude [10]. This conversion process is known as geocoding and involves matching the query against a vast database of location references. Once the geocoding is complete, the algorithm's main task begins searching for relevant data within a specified radius or bounding box around the given coordinates [11].

One common application of geo-searching algorithms is in mapping and navigation services. When a user inputs a destination, the algorithm calculates the optimal route by considering factors like traffic conditions, road networks, and real-time data [12]. These algorithms not only need to find the destination's coordinates but also efficiently retrieve other relevant information like nearby points of interest, gas stations, restaurants, and traffic updates [13]. The accuracy and speed of these algorithms can significantly impact the user's experience, especially when real-time decisions are critical.

Geo-searching algorithms also revolutionize the way businesses operate and market themselves [14]. Local search engines and location-based social media platforms utilize these algorithms to help

users find nearby services and attractions. For instance, a user searching for "coffee shops near me" triggers a geo-searching algorithm to identify coffee shops within a certain radius of the user's location.

Another remarkable application of geo-searching algorithms is in disaster management and emergency response [15]. In times of emergencies such as natural calamities or unforeseen incidents, it is imperative for first responders to promptly ascertain impacted regions, distribute essential resources, and engage in well-informed decision-making processes. Geo-searching algorithms aid in processing vast amounts of data, such as satellite imagery, sensor readings, and social media posts to identify affected regions and assess the situation's severity [16]. By rapidly collecting and analysing geographically relevant information, responders can devise effective strategies and save valuable time in critical situations [17].

Underpinning these applications are various geo-searching techniques, each with its strengths and trade-offs [18]. One such method is the grid-based approach, where the entire geographic area is divided into a grid of cells [19]. Each cell contains a list of data points associated with it, and when a query is made, the algorithm only considers the cells within the query's radius. This method is efficient for distributing and categorizing large datasets but may struggle with varying data densities across different regions [20].

Another technique is the tree-based approach, which includes structures like quad trees and R-trees. These structures hierarchically partition the space into smaller subsets, making the search process faster by eliminating the need to evaluate all data points. Quad trees, for example, recursively divide the space into four quadrants until a certain threshold is reached, improving the efficiency of both insertion and retrieval operations [21]. However, these structures may become unbalanced, affecting their performance.

Advancements in technology and the growing demand for real-time, accurate location-based information are driving the continuous evolution of geo-searching algorithms. As more industries incorporate location data into their operations, the challenges become more complex. Privacy concerns, data quality, and the need for seamless integration across platforms are some of the issues that algorithm designers must navigate [22]. Additionally, incorporating machine learning techniques can enhance the algorithms' predictive capabilities, enabling them to anticipate user preferences and behaviours based on historical data [23].

In conclusion, geo-searching algorithms have transformed the way we interact with and utilize geographic information [24]. These algorithms enable navigation, enhance business strategies, aid emergency response, and empower users with personalized recommendations. By efficiently processing vast amounts of location-based data, geo-searching algorithms continue to push the boundaries of innovation in an increasingly interconnected world. As technology evolves and our reliance on location data deepens, the development of sophisticated geo-searching algorithms will remain a critical area of research and application.

### *2.1 Kuala Lumpur Travel Guide*

This app enables users to discover the top tourist destinations in Kuala Lumpur, read reviews from residents and fellow travellers, and accurately locate these attractions on the map. The application provides seamless access to dynamic maps such as Google Maps or the option of utilizing offline OpenStreetMap (OSM) data. Furthermore, the app presents an extensive array of customer reviews, comprehensive pricing details, and precise geographical information for various dining establishments. Remarkably, it incorporates an innovative Augmented Reality (AR) feature, enabling users to effortlessly identify landmarks and points of interest. Users can also seamlessly access a

diverse range of sports clubs, recreational spots, current weather forecasts, a real-time currency converter, and an exhaustive selection of hotel accommodations. Additionally, the app empowers users to curate personalized wish lists and stay updated with online flight information including both arrivals and departures.

### *2.1 TripAdvisor*

TripAdvisor is the top source worldwide for travel websites. It gives reliable suggestions and a wide range of travel options. People online can carefully plan their dream vacation using helpful reviews, attractive pictures, and interesting discussions about various accommodations and getaways all around the world. This versatile platform offers a complete set of tools for making reservations and bookings. It includes not only places to stay but also exciting experiences and popular restaurants. Furthermore, it provides lots of ideas through carefully designed travel plans and useful tools for planning, making it a vital helper for achieving the users travel dreams. The users who join in can share their own thoughts and reviews. They can also easily get digital tickets for planned trips and interesting places they have booked using the platform's easy booking system.

### *2.1 Cuti-Cuti Langkawi*

Cuti-Cuti Langkawi emerges as a cutting-edge and digitally powered travel-oriented platform, originating from Langkawi in the year 2020. This modern digital business cleverly provides a wide range of helpful travel information and services through its well-designed website and mobile app. Bringing together technology and travel, this platform works closely with respected boat operators in Langkawi. It becomes an important way to share up-to-date, carefully chosen information about many different attractions. This includes, but is not limited to, detailed information about places to stay, ways to get around, interesting places to visit, and a wide variety of extra services. Smart travellers can easily find great deals in various categories. These include not only ferry tickets but also exciting offers like local products, relaxing spa treatments, interesting workshops, the latest ferry schedules, and a list of Malaysia's public holidays that help in planning a good travel schedule.

**Table 1**
Comparison of the existing system

| System features | Kuala Lumpur Travel Guide | TripAdvisor | Cuti-Cuti Langkawi | Proposed System |
|---|---|---|---|---|
| Rating and reviews | Yes | Yes | No | Yes |
| Offline access | No | Yes | Yes | No |
| Navigation and maps | No | Yes | No | Yes |
| User support | Yes | Yes | Yes | Yes |
| Emergency services | Yes | No | Yes | Yes |
| Users' planner | Yes | Yes | Yes | Yes |
| Find nearby location | No | Yes | No | Yes |

## 3. Requirements

During this phase, a survey was carried out to gather feedback regarding their experience with the Kudat Tour app. The survey included various questions aimed at understanding their user experience and solicited suggestions for enhancing the features of the proposed system. Table II presents a comprehensive list of functional requirements that will be utilized in the development of the application. Functional requirements describe what a system, component, or service should do and the results it needs to achieve. They explain the specific tasks the system must perform and the outcomes it should produce [25].

### *3.1 Functional Requirements*

Functional testing has proven to be an exceedingly reliable technique for effectively identifying errors within software systems [26]. This important process involves checking if the software's planned features match how they are built, which helps find any differences that might come up. [27]. The primary objective of functional testing is to validate the effective realization of planned functions, guaranteeing their performance aligns with the intended design. Each individual function subjected to testing is meticulously evaluated to ensure its alignment with the anticipated outcomes. If the outcomes of these tests do not meet the expected benchmarks, it becomes the obligation of the developer to undertake a methodical process of debugging and ongoing testing until the desired output is consistently obtained. In the realm of functional testing, customized test cases are meticulously designed for each individual module. In the context of the proposed application, namely the "Kudat Tour," a comprehensive range of separate modules has been distinctly outlined, each fulfilling a distinctive role in the software's operation and effectiveness. By conducting thorough functional testing across these identified modules, the application's integrity and adherence to its intended operations can be comprehensively evaluated.

**Table 2**
Functions to be tested

| Functions ID | Functions |
|---|---|
| F001 | User Login |
| F002 | User Registration |
| F003 | Edit Profile |
| F004 | View List of Categories |
| F005 | View Tourist Spot |
| F006 | View Food |
| F007 | View Accommodation |
| F008 | View Historical Place |
| F009 | View Location Map |
| F010 | View Near Me Map |
| F011 | View User Current Location |
| F012 | Get Direction |
| F013 | Add Review |
| F014 | View Historical Story |
| F015 | Add Place as Favourite |
| F016 | View List of Favourite |
| F017 | Create Notes |
| F018 | View Emergency Call Numbers |
| F019 | View Privacy Policy |
| F020 | Add Feedback |
| F021 | Logout |

### *3.2 Non-Functional Requirements*

There are two categories of non-functional specifications namely,

**Table 3**
A list of non-functional requirements

| Categories | Non-functional Requirement |
|---|---|
| Usability | Evaluating the user-friendliness and user experience to ensure it meets users' needs and expectations. |
| Reliability | Assessing the stability and consistency under various conditions to ensure dependable and error-free performance over time. |

## 3. Results

The development of the Kudat Tour mobile application involves the utilization of two essential tools: Android Studio and the Flutter Framework. These tools, in combination with the Dart programming language, serve as the building blocks for creating the app's functionality. Android Studio and the Flutter Framework work together smoothly to easily make the app's features and look. The Dart programming language is the glue that holds everything together, allowing developers to write the code that powers the app's behaviour.

Android platform provides a solid foundation for crafting mobile map applications [28]. It makes use of the Java Development Kit (JDK), which is like the main framework's building blocks. This framework is especially versatile, offering developers a wide array of tools for crafting multimedia-rich applications [29]. This means that the app can incorporate various types of media, such as images, audio, and video, to enhance the user experience. When it comes to storing and managing data, the Kudat Tour app relies on Firebase as its trusty database.

Firebase's Realtime Database functionality ensures that data remains synchronized across all users in real time [30]. This coordination ensures that users constantly receive the most current information, boosting the app's dependability.

Integrating the Google Maps API achieves the app's ability to identify the user's current location through GPS and provide useful information. This API, or Application Programming Interface, acts as a bridge between the app and Google's mapping services. It is a popular choice among developers working with maps and location-based features due to its effectiveness and robustness [31].

In conclusion, the Kudat Tour mobile application is crafted through the collaborative efforts of Android Studio, the Flutter Framework, and the Dart programming language. This combination of tools and technologies empowers the app to provide users with an engaging and informative tour experience.

### *3.1 User Access and Workflow*

The Kudat Tour App welcomes users with a sign-up page, where they can create their own accounts using a password that is at least six characters long. This password keeps their accounts secure. The app uses Firebase to make sure that each person's email is unique when they register. This helps prevent confusion and mix-ups. Once users have confirmed their information, they're

granted access to a bunch of great features. These include info about cool places to visit, tasty food joints, cozy places to stay, and spots with historical significance. All of this is shown on the main page when they open the app. At the bottom of the screen, there are four important buttons. The "Explore" button is for finding new and exciting things to do. "Near Me" uses a special tool (Google Maps) to show restaurants that are close by. If the user wants to learn about the history of Kudat, they can tap on the "History" button. And if the user wants to see their own account details, make changes to their plans, call for help in an emergency, read about privacy rules, contact the app's administrator, or just log out, they can head to the "Profile" button. To sum it up, the Kudat Tour App is like a handy guide. It assists individuals in uncovering interesting places and delightful dining experiences.

### *3.2 Implementation of Geo-searching*

The provided code includes the implementation of a geo-searching algorithm designed to enhance the 'Kudat Tour App's' functionality. This algorithm employs the capabilities of the Google Maps Places API, offering access to a wide range of location-based information. By utilizing this algorithm, users can effortlessly discover nearby dining options [32], significantly improving their ability to explore their surroundings. This streamlined process is depicted in Figure 1. Through the integration of the Google Maps Places API, the algorithm seamlessly provides relevant location-based data, optimizing the user experience in locating and accessing nearby dining establishments.

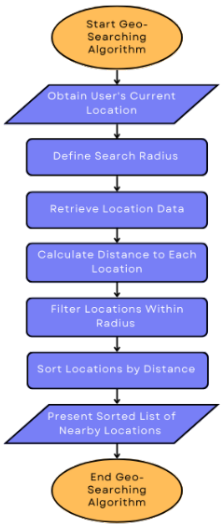



**Fig. 1.** The geo-searching algorithm flowchart

The process kicks off with the core function called "_fetchNearbyPlaces." This function plays a crucial role in how the geo-searching works. When this function is triggered, it starts gathering important details about the user current location. Specifically, it collects two important pieces of information: the user's latitude and longitude. It does this by using something called the Geolocator package. This package is like a tool that talks to the device's GPS system. This whole process is shown visually in Figure 2. When the "_fetchNearbyPlaces" function is used, it sets everything in motion for the geo-searching. It gets the needed geographical info, which is like a key that unlocks the next steps of the algorithm. This stage holds significance as it establishes the groundwork for the subsequent seamless operation of the algorithm.

```
113         Position position = await Geolocator.getCurrentPosition();
114
115         GoogleMapController controller = await _controller.future;
116         controller.animateCamera(CameraUpdate.newCameraPosition(
117             // on below line we have given positions of Location 5
118             CameraPosition(
119           target: LatLng(position.latitude, position.longitude),
120           zoom: 14,
121         )));  // CameraPosition
122         setState(() {
123           currentPosition = LatLng(position.latitude, position.longitude);
124         });
125         fetchNearbyPlaces(LatLng(position.latitude, position.longitude));
126       } catch (e) {
127         Info.error(e.toString(), context: context);
128       }
129     }
```

**Fig. 2.** Coding segment to find nearby places from the user current location using inbuilt function Geolocator

Referring to Figure 3, the current location information is utilized as a starting point. With this geographical data available, the application proceeds to set up a vital variable known as "_places." This variable assumes a pivotal role in the subsequent stages of the process. The app connects with the Google Maps Places API using a special key for security. By setting up this connection, the application obtains access to a vast pool of information related to places. This encompasses an extensive array of data about various locations. This connection enables the application to proficiently execute searches that are guided by the geographical location. In simpler words, the app can effectively search for places near where the user's current location. It is important to highlight that this connection to the Google Maps Places API unlocks numerous opportunities. This helps the app do searches based on location, making the results more relevant and accurate for the user. This phase marks a crucial juncture in the algorithm, as it provides the application with the means to initiate focused and efficient searches that are closely tied to the user's location.

```
43    GoogleMapsPlaces _places =
44        GoogleMapsPlaces(apiKey: "AIzaSyACuixL6nM4aQk9BGdz4v3LEjaXp8883kw");
```

**Fig. 3.** Coding segment to perform efficient location-based searches

Following that, the "_fetchNearbyPlaces" function initiates a request directed towards the Google Maps Places API. This request is carefully configured with specific search criteria. In this instance, the application indicates its intent to uncover restaurants that are situated nearby. The search radius is defined at approximately 5 kilometres, centred around the user's current location. This process is visually depicted in Figure 4. By conducting this procedure, the application signals its requirements to the Google Maps Places API. It's akin to telling the API to provide relevant information related to restaurants located within a certain distance from where the user is positioned. This task involves specifying the necessary parameters, which in this case includes the desired radius of the search. This step is quite pivotal as it serves as a way for the application to communicate its search criteria effectively to the API. This interaction plays a significant role in facilitating the retrieval of pertinent data that aligns with the user's preferences and the context of their current location.

```
void fetchNearbyPlaces(LatLng center) async {
  this.setState(() {
    floatingPlaces = [];
  });
  try {
    Map<MarkerId, Marker> tempMarkers = <MarkerId, Marker>{};
    // Set up the request parameters
    final location = Location(lat: center.latitude, lng: center.longitude);
    // 5km radius
    final response = await _places.searchNearbyWithRadius(location, 5000,
        keyword: "restaurant");
```

**Fig. 4.** Coding segment to seeks nearby restaurants within 5-kilometer

Figure 5 illustrates the following stage. Once the API provides a response, the information it contains is handled and put into a variable called "response." This response is like a treasure chest of valuable details about the restaurants that are nearby. These details include their names, as well as their exact locations represented by their latitude and longitude. The response also includes ratings given by other users. Subsequently, a "Marker" is created for each of the restaurants mentioned in the API response. Imagine a Marker as akin to a signpost, serving as a visual indicator on a Google Map to display the precise location of each restaurant. These markers serve as visual indicators, helping users see where the restaurants are on the map. When a user interacts with these markers, they can learn even more about each restaurant. This extra information includes the restaurant's name, the ratings it has received from other people, and even a picture to give a visual glimpse of what the place looks like. This step adds a layer of interactivity, letting users dig deeper into the restaurant details that catch their interest.

```
    // Process the response
    for (PlacesSearchResult result in response.results) {
      // Extract information about each place
      final name = result.name;
      final latitude = result.geometry?.location.lat;
      final longitude = result.geometry?.location.lng;
      // creating a new MARKER
      final Marker marker = Marker(
        markerId: MarkerId(name),
        position: LatLng(
          latitude!,
          longitude!,
        ),  // LatLng
        infoWindow: InfoWindow(title: name),
        onTap: () {
          navigateDetail(name, result);
        },
        icon: BitmapDescriptor.defaultMarkerWithHue(
          BitmapDescriptor.hueViolet,
        ),
      );  // Marker
      tempMarkers[MarkerId(name)] = marker;
      floatingPlaces.add(FloatingPlace(
          name: name,
          lat: latitude,
          lng: longitude,
          rating: result.rating ?? 0.0,
          image: result.photos.isNotEmpty
              ? "https://maps.googleapis.com/maps/api/place/photo?maxwidth=400&photo_reference"
              "=${result.photos[0].photoReference}&key=AIzaSyACuixL6nM4aQk9BGdz4v3LEjaXp8883kw"
              : ""));
```

**Fig. 5.** Coding segment to process the information and set to a Marker

### *3.2 User Acceptance Testing*

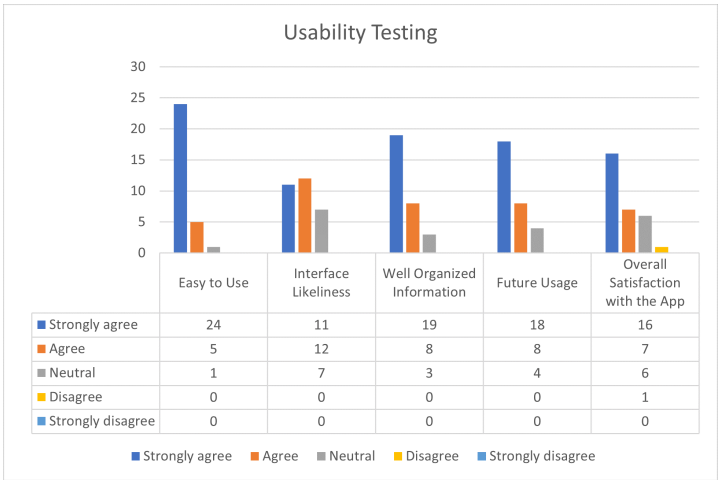
The According to the data displayed in Figure 6, we can observe the outcomes of the survey. A considerable number of participants, precisely 24, expressed their satisfaction with the user-friendliness of the Kudat Tour app. Furthermore, there were 11 individuals who strongly affirmed

their positive stance, while an additional 12 individuals also expressed agreement regarding their appreciation of the app's interface.

However, the survey data indicates that there is room for improvement in certain aspects of the app's interface. This sentiment is evident from the fact that 7 respondents maintained a neutral stance in this regard. This suggests that while many users found the app easy to navigate, there are some areas that could be refined to enhance the user experience. Looking at how the app's content is arranged, a big group of 19 people really liked how the information was put together in a clear and organized way. This indicates that the app effectively conveyed its content in an orderly and understandable manner.

Considering the likelihood of future app usage, a noteworthy finding emerged as 18 respondents indicated their intent to utilize the app once again. This underlines a positive inclination towards incorporating the app into their future activities. On a broader perspective, the overall satisfaction levels were also evident from the survey data. Specifically, 16 participants expressed strong agreement with their contentment regarding the app, while an additional 7 participants also indicated agreement.

This collective sentiment highlights a substantial level of satisfaction among the survey participants. Summing up the findings, a significant portion of the respondents reported a positive experience with the app, emphasizing its user-friendliness and expressing their satisfaction. These findings provide valuable insights into the app's reception and user perceptions, indicating its strengths and areas that warrant further attention for improvement.




| | Easy to Use | Interface Likeliness | Well Organized Information | Future Usage | Overall Satisfaction with the App |
|---|---|---|---|---|---|
| Strongly agree | 24 | 11 | 19 | 18 | 16 |
| Agree | 5 | 12 | 8 | 8 | 7 |
| Neutral | 1 | 7 | 3 | 4 | 6 |
| Disagree | 0 | 0 | 0 | 0 | 1 |
| Strongly disagree | 0 | 0 | 0 | 0 | 0 |

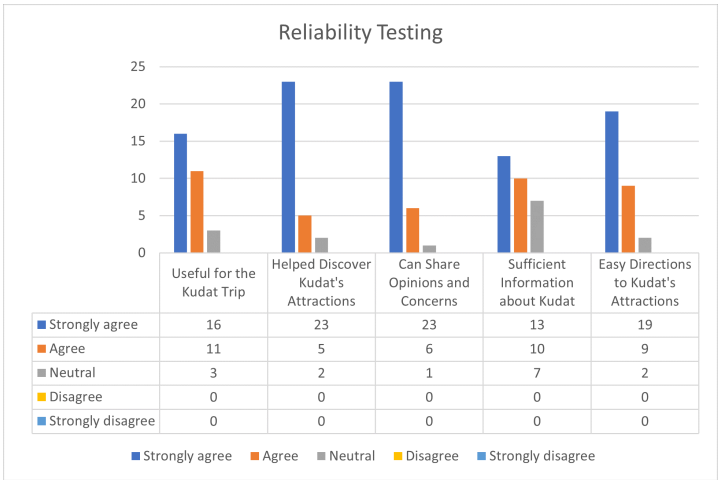
**Fig. 6.** Usability testing

Based on the insights presented in Figure 7, the majority of those who took part in the survey displayed a strong alignment with positive sentiments across various aspects of the Kudat Tour app. Notably, a significant number, specifically 27 individuals, expressed a strong agreement that the app was indeed valuable during their trip. This suggests that the app served as a useful companion, enhancing their travel experience in a meaningful way.

Additionally, a noteworthy 28 participants conveyed strong agreement regarding the app's capability to introduce them to intriguing and captivating destinations. This implies that the app effectively facilitated the discovery of places that captured their interest and curiosity. The ability of the app to serve as a platform for expressing opinions resonated with a substantial number of respondents, with 29 indicating a strong agreement in this regard.

Furthermore, the feedback reflected that the app effectively met the need for comprehensive and relevant information. Out of the participants, 23 expressed strong agreement that the app provided them with ample details to support their trip planning and exploration endeavours. Lastly, a significant 28 people confirmed that the app was good at making it easier to find directions. This feature of the app played a big role in helping them move around smoothly.

In conclusion, the collective feedback derived from the survey painted a positive picture of the Kudat Tour app's impact on the participants' experiences. The app demonstrated its efficacy in various dimensions, such as aiding trip planning, facilitating exploration, enabling information sharing, and streamlining navigation. This positive reception emphasizes the app's effectiveness in enhancing the travel experience within the context of Kudat.




| | Useful for the Kudat Trip | Helped Discover Kudat's Attractions | Can Share Opinions and Concerns | Sufficient Information about Kudat | Easy Directions to Kudat's Attractions |
|---|---|---|---|---|---|
| Strongly agree | 16 | 23 | 23 | 13 | 19 |
| Agree | 11 | 5 | 6 | 10 | 9 |
| Neutral | 3 | 2 | 1 | 7 | 2 |
| Disagree | 0 | 0 | 0 | 0 | 0 |
| Strongly disagree | 0 | 0 | 0 | 0 | 0 |

**Fig. 7.** Reliability testing

## 4. Conclusions

The journey of creating the project comes to an end once the testing phase is completed. During this stage, users offered positive comments, praising the app's easy-to-use design and the orderly arrangement of information about different attractions. The user found that the app effectively met their needs. The app has proven successful in making it easier for tourists to explore Kudat. Moreover, it provides a way for users to give feedback and express any concerns they might have about the area. However, there are certain limits to what the app can do. These include problems with staying connected to the internet, some areas having limited access, difficulties caused by different languages, not all devices being compatible, and not having the most up-to-date information available all the time. Despite these challenges, the app has managed to enhance the overall experience of tourists. It has also played a role in boosting tourism in Kudat. To make the app even better in the future, it is important to work on overcoming these limitations. Through this approach, the app can continually enhance itself, guaranteeing that tourists consistently enjoy a wonderful time as they discover Kudat.

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