Chapter 3

**RESULTS AND DISCUSSION**

This chapter summarizes the study's findings and conclusions regarding the problems concerned with the development of the proposed Monitoring System for the municipality of Bolinao. It provides recommendations on its proper implementation and further developments.

**Current Process in Tourism Office System**

The proponents interviewed the Municipal Tourism Officer of Bolinao, Ms. Mary C. De Guzman, and Mr. Darwin Borines. Through the interviews, the proponents determined that the Tourism Office currently uses manual processes and Google Forms to record tourism activities.

Registration of Tourists’ Data. Registration form is being distributed to a list of tourist sites and registered establishments by the Bolinao Tourism Office.

The Bolinao Tourism Office collects tourist data by requesting newly arrived guests to fill out a registration form on designated tourist sites and establishments. The guest must write down their name, nationality, age, date of birth, gender, address, contact information, date of arrival, and travel history. This process is required for every tourist site and establishment guests visit.

Figure 8:

Registration of Tourists’ Data.

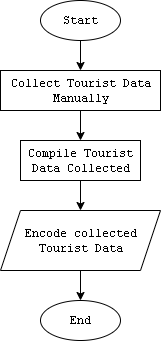


Collecting tourist data manually. The tourism office collects tourist data manually by filling out registration forms. In tourist sites and establishments with poor network signals, manual data collection of registration forms is conducted. Schedules for collecting the registration forms may vary from location to location, but it is required to collect these reports monthly.

The collected data will then be compiled in the tourism office for encoding.

Figure 9:

Collecting Tourist Data Manually.

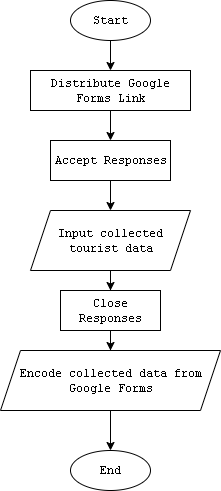


Tourist Data Collection through Google Forms. Tourist data collection through Google Forms is done when the tourist site and establishment have access to the Internet.

The Google forms are created by the IT Staff of the tourism office. Links will be distributed to tourist sites and establishments with Internet access. After accepting responses, the tourism office will encode all the collected data for compilation.

Figure 10:

Tourist Data Collection through Google Forms.



Encoding of data in Excel. Encoding is done manually by the tourism office through constant online work in the office. All data collected manually and through Google Forms are then compiled monthly. The compiled data will be encoded by the statistician of the tourism office using an Excel format provided by the Department of Tourism.

The encoded data by the statistician will then be sent to the Department of Tourism. These data will also be used by the Tourism Office to analyze tourism activities.

Figure 11:

Encoding of Data in Excel.



**Difficulties Encountered in the Current System of Tourism Office**

Based on the data gathered from the interview conducted with Ms. Mary C. De Guzman, the following are the difficulties encountered by the Tourism Office:

Limited network signals in other sites and establishments. Limited network signals to certain tourist sites and establishments result in the manual collection of registration forms and the manual generation of reports. This difficulty makes it challenging for the tourism office to collect tourist data promptly.

Time-consuming collection of data. The tourism office will need to visit the tourist sites and establishments with network signal problems to collect tourist data. Certain areas take time to reach because some tourist sites and registered establishments are located in areas that require sailing, such as the tourist site on Santiago Island. Additionally, most tourist sites and registered establishments are also situated in remote areas of Bolinao.

Inconvenience to guests. Peak seasons and holidays cause inconvenience to the guests, especially at famous tourist sites or establishments where heavy traffic may occur, resulting in guests having to find other sites or establishments for accommodation. The lack of information on the status of these destinations inconveniences guests.

**Features of the Proposed System**

The development of Tourism Monitoring System for Bolinao is designed to provide the following features:

Register Account. The system feature can only be accessed by requiring users to register an account. A One-time Password (OTP) will be required for successful registration.

By registering, users will gain access to the basic core features of the system.

Figure 12:

Register Account.

Graphical user interface

Description automatically generated

User Profile Setting. This feature allows the user to view their Profile. It can be accessed upon successful login of the user by navigating to the right part of the header.

Users will be able to edit their Profile information, and they are also required to add their gender and address to request for booking.

The profile information by the user will serve as the basis for booking entry in destinations registered in the system.

Figure 13:

User Profile Setting.

Graphical user interface, application

Description automatically generated

Dashboard. This feature allows users to view real-time information about current visits to tourist sites or establishments. The number of visits to an establishment will update in real-time whenever staff accounts accept new bookings.

Figure 14:

Dashboard.

Graphical user interface, application

Description automatically generated

Live Map Counter. This feature allows users to see the map of Bolinao via map pins of the tourist sites and establishments. The counter will also update whenever a booking entry is approved.

As for privacy concerns, the live map counter on the homepage will only show the pins of every tourist site and establishment. The user must log in or register an account to see the live number of total visits on the map.

Figure 15:

Live Map Counter.

Map

Description automatically generated

Booking. This feature allows the user to book their chosen tourist site or establishment. The following figure shows the steps in booking:

This is a two-step process; the first step involves the user entering their information. This ensures that all information is correct before proceeding to the next page. Users can modify their information by navigating to the Profile Setting page.

Figure 16:

Booking – User Info.

Graphical user interface, application, Teams

Description automatically generated

The second step will proceed by asking for additional information for the user. Users can choose the list of registered tourist sites or establishments in the system in a drop box.

Figure 17:

Booking – Additional Information.

Graphical user interface, text, application, chat or text message

Description automatically generated

After choosing the location, the user will receive a ticket code that will be sent to the staff assigned to that tourist site or establishment. The staff will need to approve the request upon confirming the user's ticket code.

Figure 18:

Booking – Generate Ticket Number.

Graphical user interface, text, application, chat or text message

Description automatically generated

Manage Request. This feature allows the user to see the list of active bookings requested. Users can also cancel the booking request.

Figure 19:

Request Logs.

Table

Description automatically generated

Add Site Location. This feature will allow the tourism office to add specific locations of tourist sites and registered establishments according to their name, latitude, and longitude.

Figure 20:

Adding Site Location in Live Map.

Graphical user interface, text, application

Description automatically generated

Staff Account Creation. This feature allows the tourism office to create designated staff accounts for specific tourist sites and registered establishments.

Staff accounts have different functionalities that assist in managing and monitoring their designated site or establishment. Staff accounts can only be created if the designated site or establishment has no existing staff account.

Figure 21:

Staff Account Creation.

Graphical user interface, application

Description automatically generated

Notification. Staff accounts will be able to create notifications for users to see updates related to the site or establishments. The notifications can be seen by the users when created including which staff account created the notification. The figures below show the following functionalities of the feature:

This page shows the currently active notifications that is created by the users. Notifications can also be deleted without affecting the notification lists of other users.

Figure 22:

Create Notification.

Table

Description automatically generated

When users click the 'Create Notification' button, they can choose the type of notification it will become. Additionally, a message box is provided for users to fill in the context of the notification.

Figure 23:

Create Notification Modal.

Graphical user interface, text, application, chat or text message

Description automatically generated

Figure 24 shows an example of how normal users view notifications whenever they receive one from the admin account.

Figure 24:

Notification Page – User.

Table

Description automatically generated

**Acceptability Test of the Proposed System**

In completing the proposed Tourism Monitoring System for Bolinao, the Tourism Office and the IT faculty of PSU – ACC will assess the system.

Functionality. Table 5 summarizes evaluators' perspectives on the system's functionality. The system's functionality is rated by respondents with an overall mean of 3.8, which is considered Acceptable. Regarding suitability, the system's functions are deemed appropriate, with a total average weighted mean of 3.9, also classified as Acceptable.

The measured data can be used by the tourism office to ensure data appropriateness. In terms of accuracy, the Tourism Monitoring System achieved a total average weighted mean of 3.78, which translates to an Acceptable rating. The system adheres to existing standards and policies, with a weighted average mean of 3.74, also considered Acceptable. Moreover, the system effectively prevents unauthorized access, as indicated by an average weighted mean of 3.76 for security, which is classified as Acceptable.

The developed system provides security to its users, similar to how the routes can be accessed.

Table 5:

System Evaluation According to Functionality.

|  |  |  |
| --- | --- | --- |
| Functionality | Mean | Description |
| 1. Suitability – The functions of the system are appropriate. | 3.9 | Acceptable |
| 2. Accuracy – The system’s results are accurate. | 3.78 | Acceptable |
| 3. Compliance – It adheres to existing standards and policies. | 3.74 | Acceptable |
| 4. Security – It prevents unauthorized access. | 3.76 | Acceptable |
| Weighted Mean | 3.8 | Acceptable |

Reliability. Table 6 presents users' perceptions of the web application's dependability as evaluated by the users. The web application received a mean rating of 3.56, which is considered Acceptable in terms of maturity, indicating minimal frequency of software faults and failures. This suggests that application errors are less likely to occur.

Regarding fault tolerance, the web application received a mean rating of 3.72, indicating that the application can handle system errors effectively. Additionally, the application received a mean rating of 3.76 for recoverability, signifying its ability to quickly recover its performance in the event of an error.

The Tourism Monitoring System's overall weighted mean is 3.68, which is marked as Acceptable. This demonstrates that users perceive the system to be reliable and efficient.

Table 6:

System Evaluation According to Reliability.

|  |  |  |
| --- | --- | --- |
| Reliability | Mean | Description |
| 1. Maturity – There is a minimum frequency of software faults/failures. | 3.56 | Acceptable |
| 2. Fault Tolerance – The system can handle system errors. | 3.72 | Acceptable |
| 3. Recoverability – System’s performance is re-establishing from failure. | 3.76 | Acceptable |
| Weighted Mean | 3.68 | Acceptable |

Usability. Table 7 presents users' perceptions as evaluators of the application's usability. According to understandability, which assesses how easily users can recognize the concepts incorporated in the application, the application garnered a mean rating of 3.87. This indicates that the words, icons, and buttons added to the web application are easy to understand.

In terms of learnability, which measures how easy it is for users to grasp the processes occurring in the application, the application garnered a mean rating of 3.72. This suggests that the processes are straightforward and easy to comprehend.

For operability, which assesses the ease of navigating the controls and different interfaces, the application garnered a mean rating of 3.83. This states that users find it easy to navigate the application.

The overall weighted mean of the application is 3.82, marked as Acceptable. This demonstrates that users perceive the application to be usable and user-friendly.

Table 7:

System Evaluation According to Usability.

|  |  |  |
| --- | --- | --- |
| Usability | Mean | Description |
| 1.Understandability – Concepts are easily recognized. | 3.87 | Acceptable |
| 2. Learnability – The system’s functions are easy to learn | 3.76 | Acceptable |
| 3. Operability – The system is easy to use or operate. | 3.83 | Acceptable |
| Weighted Mean | 3.82 | Acceptable |

Efficiency. Table 8 depicts users' perceptions as evaluators of the web application's efficiency. According to its time behavior, which assesses the response time from server to end-user, the application garnered a mean rating of 3.85. This indicates that the response time in sending and receiving data from the server to end-users of the web application is Acceptable.

In terms of resource behavior, which assesses how easy it is to provide data inputs for the web application, the application garnered a mean rating of 3.81. This suggests that users find it easy to provide data inputs for the application.

The overall weighted mean of the application is 3.83, marked as Acceptable. This demonstrates that users perceive the web application to be efficient in terms of response time and data input.

Table 8:

System Evaluation According to Efficiency.

|  |  |  |
| --- | --- | --- |
| Efficiency | Mean | Description |
| 1. Time Behavior – There is a fast response time in the system. | 3.85 | Acceptable |
| 2. Resource Behavior – Resources used for system performance are accessible. | 3.81 | Acceptable |
| Weighted Mean | 3.83 | Acceptable |

Maintainability. Table 9 depicts users' perceptions of the web application's maintainability as evaluators. According to its analyzability, which assesses how easily failures can be identified, the application garnered a mean rating of 3.78. This indicates that the application effectively informs the user about errors in its processes.

In terms of changeability, which assesses the effort required to modify the system, the application garnered a mean rating of 3.74. This suggests that modifying the web application requires less effort.

For stability, which assesses how simple it is to modify the web application's resources, the application received a mean rating of 3.67. This indicates that the web application's resources are easily modifiable.

The application's overall weighted mean is 3.73, marked as Acceptable. This demonstrates that users perceive the web application to be maintainable and easily modifiable.

Table 9:

System Evaluation According to Maintainability.

|  |  |  |
| --- | --- | --- |
| Maintainability | Mean | Description |
| 1. Analyzability – There is less effort in identifying system failure causes. | 3.78 | Acceptable |
| 1. Changeability – Effort in modifying the system | 3.74 | Acceptable |
| 1. Stability – Sensitivity to modification | 3.67 | Acceptable |
| Weighted Mean | 3.73 | Acceptable |

Portability. Table 10 depicts users' perceptions of the web application's portability. The respondents rate the system's portability as Acceptable, as evidenced by an overall mean of 3.82. With an average weighted mean of 3.74, which translates as Acceptable, specification changes in the system are simple. In terms of Installability, there is an easy process deploying the web application, with an average weighted mean of 3.87, which translates as Acceptable. The web application conforms to portability standards with an average weighted mean of 3.85, which translates as Acceptable.

Table 10:

System Evaluation According to Portability.

|  |  |  |
| --- | --- | --- |
| Portability | Mean | Description |
| 1. Adaptability – Specification changes are done easily. | 3.74 | Acceptable |
| 1. Installability – There is effortless process of installing the system. | 3.87 | Acceptable |
| 1. Conformance – System is compliant to portability standards. | 3.85 | Acceptable |
| Weighted Mean | 3.82 | Acceptable |

Table 11 shows the overall weighted mean of all respondents. The web application is ready for deployment with a computed overall weighted mean for all respondents' acceptability test of 3.78, interpreted as Acceptable.

Table 11:

Overall Weighted Mean for All Respondents.

|  |  |  |
| --- | --- | --- |
| Area | Average Weighted Mean | Description |
| 1. Functionality | 3.8 | Acceptable |
| 1. Reliability | 3.68 | Acceptable |
| 1. Usability | 3.82 | Acceptable |
| 1. Efficiency | 3.86 | Acceptable |
| 1. Maintainability | 3.73 | Acceptable |
| 1. Portability | 3.82 | Acceptable |
| Overall Weighted Mean | 3.78 | Acceptable |