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Short Paper

Click Boat: Boat Repair and Rental Management System

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Abstract

Purpose – The general objective of the study is to develop a web/mobile application that can be used by yacht owners, yacht charter, tourists, and boat owners. To be able to understand the main objective, the specific objectives were drawn: (1) Define problems encountered in: a. Yacht repair scheduling, b. Yacht repair management, c. tourist itinerary,d. boat scheduling;(2) Define modules of the system developed to address the problem;(3) the level of acceptance of the respondents in the developed system in terms of: a. user-friendliness, and functionality ; (4) Issues encountered during the initial deployment of the system.

Method – To be able to develop the final output, the study followed the processes involved in Agile Development. It includes all the processes that are necessary to finish the study which are: (1) Plan, (2) Design, (3) Develop, (4)Test, (5) Release, and (6) Feedback. The data needed to conduct the study were analyzed and validated based from the system requirements of the project.

Results – The developed system's evaluation resulted in the mean range of 4 above with the equivalent of a high acceptability rating for both user-friendliness and functionality.

The developed modules are for tourists, yacht charter, yacht owners, and boat owners where they can communicate and automate some of the processes that involve notification and report generation.

Conclusion – Mobile and web application is a good way to cater to marina-based services such as boat repair and rental. Different available API and libraries are very useful in the development because it speeds up the process. The ability to test different environments of the system is a must especially since technology is evolving.

Recommendations – Due to the system's high acceptability rating from the users the marina business may try to pursue the usage of management systems that involves automation of the processes they needed such as user notifications and report generations. The developed system can be improved to make it more useful for the marina businesses such as boat repair and rentals.

Research Implications – Marina-related businesses are not typical kinds of businesses most clients and service provider encounter difficulty in terms of using the traditional system. With the use of technology, we can improve the process and especially attract more customers because the service is one click away to be availed.

Keywords – Marina, yacht charter, tourist itinerary, web application, boat scheduling, yacht repair scheduling

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INTRODUCTION

The boating and yacht industry has been one of the major components in terms of marina tourism, Boat rental and repair have been vital yacht charter maybe not a typical type of business even though owning a yacht is pretty expensive clients are still availing and finding services for boat repairs, same as the boat rental industry which may comprise tourism such as boat ride and island hopping, in addition to that Philippines is an archipelago that makes it a good spot for marina services such as marina tourism where the Tourist can book a boat ride on Boat owners for tourists spot islands such as Fortune Island and Twin Island on Nasugbu, Batangas. The Country is also a hub for the number of Yacht charter that offers repairs on either boats or ships. Even though in some countries like the US there is an unemployment rate increase that makes the market on boating decline still the industry revenue manages to come back on the market with some constraints on the line such as smaller market but few competitors around due to unemployment of the crews.

Papaya yacht charter is one of the local yacht charters that offer this kind of service in the municipality of Nasugbu, they often use paper and flat databases like excel on recording transactions, because of this report generating can take time to do and another

is the handling of transactions is hard when it is an open season or occasion of yacht repairs and maintenance transactions record are hard to keep because it is on the form of paper records that is probable of it to lost and will not be able to retrieve it. Another is the Boat owners have difficulty in terms of managing the transactions in terms of different tourists, tourist may also encounter difficulties in looking for boat owners who have the right size of boat to rent. Barangay Papaya has been a tourist spot in the past years since 2015, manual transaction has been the constraint they have been facing that makes it difficult for the boat owners to cater to guests.

The purpose of this research titled "Click Boat: Boat Repair and Rental Management System " is to improve the business process in the industry of Boat repair and rental with the use of technologies and develop a system to serve both sides of yacht owners, managers, boat owner and tourists to help improve the aspects of the business such as report generating, tracking and management of the information needed to become a functional and efficient service provider.

LITERATURE REVIEW

This part depicts past works done about data frameworks connected with Marina organizations. Having Business process robotization on a business implies a great deal since it diminishes time and individuals expected to complete the responsibility. Different investigations have shown that utilizing a Management framework is an extremely crucial part of their success.

Brötzmann's (2013) research entitled the "Arctic and Subarctic Gateways for Private Naughtical tourism" discussed the different parts of a marina such as a tourist, boating, and yachting. Moreover, his targets are from a different cluster of society he analyzes different aspects of the people around the industry of the marina and defines the factors why this person chooses the marina as a business. In addition to that, he implies the following such as safety and branding strategy on how to compete on the market of Marina in different clusters such as tourism and transportation.

Hurley's (2016) research entitled "Boat dealership and repair in the US" is research that discusses the different factors and the state of the yacht cluster servicing addressed the problem inside the specified business firm. The research introduced the holistic field of the marina business that is referring to yacht services. It discussed issues regarding how different business firms in the marina market compete and make an edge against others.

Yang's (2019) research on Tourism E-Commerce Users Based on Artificial Intelligence Technology found a method used in designing and developing a software system. An agent-based process became an advance in developing software engineering. The Researcher also discussed the function between user satisfaction and e-commerce in tourism and found out that Web data mining is one of the technologies solutions to Web personalizing service

In the study of Stanivuk, Tatjana, Stazić, Ladislav, Vidović, Frane, and Čobanov (2020), they found out that for more than thirty years, computerized PMS (Planned Maintenance Systems) for ships have been commonly used all over the world. PMS is regulated by several rules and regulations, the most important of which is the ISM code. Maintenance is critical in the maritime industry because it impacts the ship's stability and durability, so it must be continuously supervised and changed.

Umaya and Zarlis (2018) discovered that Booking systems have been famous nowadays because it automates the process making the job of the people easy, especially those who are working in the logistics department, transportation, and other establishments that involve the process of booking or reservation.

Henry's (2018) concluded that most customers are seeking several offers on a single website to find the best quality-price ratio with as little wasted time as possible. She found out the positive and also the negative impacts of online booking on the customers and also on the hospitality industry. She added that online booking systems use third-party websites for some processes.

In Malaysia, a new system is needed to substitute the manual booking system to increase more tourists, both local and foreign, to travel Norfadhlina, Zarina, and Puteri (2019) create research about a Web-based online booking system that is used for reservation purposes. The system accepts possible customers/ clients to have reservations and also the payment process for any transactions. This online reservation system helps the staff's work easier and avoids double bookings. The system gives online services like ticket and room reservations on their ferry and provides printed tickets to the customers.

Strulak-Wójcikiewicz, Wagner, and Łapko (2020) indicated that they used e-platforms to support both tourism service providers and visitors. Because of the convenience with which prospective tourists can be reached, e-platforms are opportunities to attract product and service providers. In addition, the e-platform drew new users and improved information technology to deliver high-quality services.

Wakil and Jawawi (2019) scrutinize and find out that Network Technology Integration such as the Internet of Things (IoT) is useful in monitoring and having access to the real-time flow of data. This technology allows the company to maximize the usage of the web to the point that it is one click away from the service that we want, with these they found out that Web applications are important in different domains such as economics, education, and marketing.

Wang, Zheng, and Chen (2018) a group of Chinese researchers found out that the yacht industry is the first to gain the benefit to raise the industry's financial and intellectual resources, there are also problems that the yacht industry faces, such as the fact that

growth is still not advanced enough, and the weaknesses are clear. Human capital deficiency, a shortage of human capital is expressed in both consistency and quantity. As a result, many yacht producers are behind schedule. The yacht industry's lack of human resources and available management systems hindered the formation of industrial innovation and hampered the growth of industrial profit margins.

John, Mostashari, and Mansouri (2011) implied in their study that in " the 24/7 web industry, business owners can feel a constant need to push the latest and greatest software to the live site to remain competitive and ensure growth. " The risks in this phase arise and some factors are not considered because of the rapid development phase. In addition, the need for a System like management system that is deployed on a web-scale up. Procurement of technology to use and Maintenance cost are things that also needed to consider in the process while on the other hand, Severities started to appear as the environment where the product is running changes such as Incompatibility of version and legacy-modern system communication.

The study by Aloini, Dulmin, Mininno, and Ponticelli (2013) entitled "Project-service Solutions in the Yacht Industry: A Value-Chain Analysis" analyzed how a yacht business can gain an advantage over its competitor, in addition to that the research also discusses different strategies that the yacht service cluster do to retain and sustain their position on the market. They want to implore the innovative value of Information system that offers strategic planning and analytics to predict the consumer’s needs.

Brun and Frederick (2017) indicated that the industry employs 48,000 workers and is geographically concentrated in the greater Manila area and Cebu. They also find out the market is young to the country and unsaturated cross border clients have been chasing to avail the service such as repair and maintenance the Researcher of dukes also finds out that there are no large shipyards on the country, management system also a vital role on these repair hubs with this the systems provides analytics for the efficient decision making of every move the company does.

Yi-Man, Kun-Shan, and Che-Yi (2020) made a study about getting customers' opinions about their hotel booking experiences whether offline or online. They made and used questionnaires including 300 respondents from a five-star hotel in Taiwan. After getting some information, they got an idea of customers' choices. The results of the study showed that the customers prefer to have a hotel booking online than offline because it has broader choices, lots of discounts, and more privacy.

Habermann, Kasugai, and Ziefle (2016) concluded that the fast progress of smart devices and applications in the mobility sector opens up a huge potential for novel mobility services that allow for the individualization of mobility patterns for travelers. The rapid advancement of smart devices and applications in the mobility industry opens up significant potential for unique mobility services that allow users to customize their travel patterns. Novel mobility concepts, when combined with expanding public transportation

infrastructure and diversified modes of movement in cities, constitute a possible response to societal changes and mobility needs. However, as the functionality and variety of options rise, the complexity of using such services increases as well.

Mobile applications (apps) have moved from the margins to the mainstream in recent years, thanks to technical and societal pressures. Understanding the function of transportation applications in urban mobility is critical for policymakers and planners. (Shaheen,2016). The researcher also found out that respondents utilized multimodal applications in ways that resulted in less energy-intensive travel and greater support for public transportation. In the future, smartphone applications, especially multimodal aggregators, may provide transportation planners and policymakers with the opportunity to improve their understanding of multimodal travel behavior, exchange data, improve cooperation, and find prospects for public-private collaborations.

The following studies proposed a system related to the concept of marina services. Features said from the previous studies has been integrated into the system such as automated report generations and web application. Since People nowadays have devices neither it is a computer nor smartphones, the researcher has come up with the idea of developing a system that can cater the Boat repair and rental, where both the service provider and clients can interact with each other and become aware of their transaction status with the use of automated Email and SMS notification, in addition to that the researcher also tries to integrate geolocation and weather API that may also serve as a guide for them in terms of direction and weather condition.

METHODOLOGY

In developing the said service-oriented platform, the Researcher used the Agile model as the framework for developing and finishing the project. This development method is popularly used in the development of a system because it covers the loopholes the waterfall has such as difficulty in incremental changes.

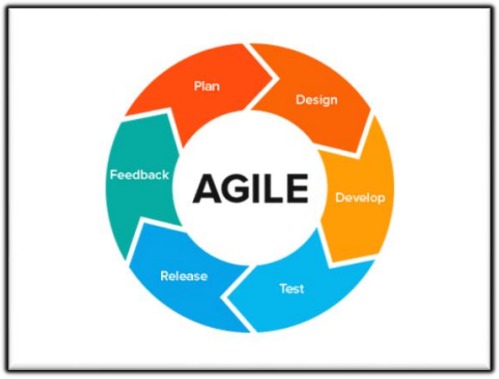

Figure 1. Agile Model

Figure 1 shows the Agile model. Agile Methodology is a people-focused, results-focused approach to software development that respects our rapidly changing world. It is centred on adaptive planning, self-organization, and short delivery times. It is flexible, fast, and aims for continuous improvements in quality. According to Altvater (2017), "Agile Methodology is a people-focused, results-focused approach to software development that respects our rapidly changing world. It's centered around adaptive planning, self-organization, and short delivery times."

Planning- This phase is important because it serves as the foundation of the development of the system. The Researcher benchmarked and conducted a preliminary investigation on the existing business process of the possible users of the system they are dealing with. This phase also defined the scope of the system and system requirements.

Design-The process where the researcher defined the components, modules, interfaces, and data for a system to satisfy specified requirements. After the information has been gathered, the Researcher dealt with the designing phase this phase includes the possible system architecture and the software tool needed to develop the software.

Develop-This phase is more on the technical side of the process in the system, so the Researcher dealt with programming and defined how to automate the business process in terms of translating it into a system requirement. In this phase, a prototype of the system and different versions upon revision or reworking were included.

Test-After the development has been finished; the output underwent the testing process. Different series of testing were done to provide a back job on the side of the developers. The Researcher also dealt with concluding what must be and what must not appear on the holistic features of the system.

Release- The researcher deployed the system into the actual working web server and test it again before undergoing the evaluation phase. The following issues encountered have been documented and defined using the 4-point software severity models. The researcher also implied the solution to the following deployment issues.

Feedback-In feedback, the researcher tallied the results of the system acceptance test from four types of respondents boat drivers, tourists, yacht owners, and the yacht charter. After that, they computed the mean for each parameter on the system evaluation form and then they carefully analyzed it to conclude the findings

Software And Hardware Needed for Development

The table below contains the tools that the researchers used to develop the solution in the boat repair and rental. The Table 1 contains the software needed to develop the system and the Table 2 contain the hardware needed to run the system.

Table 1. Software requirements

Software	Specification
Operating System	32 bit or higher
Database	MySQL
Web Editor	XAMMP
Text Editor	Sublime 3
FTP client	Filezilla

Table 2. Hardware requirements

Android	GPS-enabled	high accuracy GPS
Android	RAM	512 Mb ram or higher

Preparation and evaluation

Table 3 shows the guideline for the rating of the system's user-friendliness and functionality. The researcher may include universality and cognitive understanding in terms of dealing with this aspect of the system, the descriptive equivalent will define if the user or respondents is satisfied with the way the components of the system are arranged.

Table 3. Guideline Interval for Determining The Level Of User-Friendliness And Functionality Of The Developed System

Scale	Mean Range	Descriptive Equivalent
5	4.21- 5.00	Highly Acceptable
4	3.41- 4.20	Moderately Acceptable
3	2.61- 3.40	Acceptable
2	1.80 – 2.60	Slightly Acceptable
1	1.00 – 1.80	Not Acceptable

The Researcher used benchmarking and held an initial interview to know what is wrong with the process used by the organization in their daily operations. After brainstorming, the Researcher formulated the system requirements. They also did tests and debugging on the developed system. With the system finished they consulted their research adviser and validated the questionnaire. A proposal for a letter of research approval was also presented to the dean to have the authority to conduct research outside the university.

After the System has been developed the Researcher gather information from all members of the population; thus, a purposive sampling procedure was used in this study. A total of 71 respondents with different types, the first group consist of 1 Yacht Charter, while the second group is yacht owners which can be counted as 10, 20 boat owners, and 40 tourists or client with a total of 71 respondents on the whole population.

RESULTS AND DISCUSSION

In the planning phase of the study, the researcher conducted a study about the different problems they encountered from the current type of system or process they are using in their business. The information gathered has been utilized to decide the significant highlights and functionalities required on the created application to address the difficulties/issues recognized.

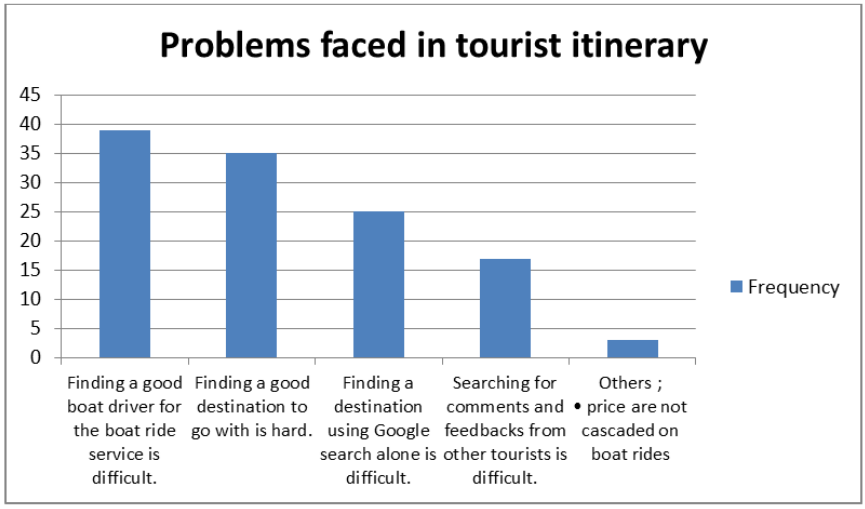

Figure 2. Problems Encountered in the Tourist itinerary

As shown in Figure 2, the major problem faced by the respondents in terms of tourist itinerary is "Finding a good boat driver for the boat ride service" which is answered by 39 (97.5%) of the respondents. It can be assumed that it is an untidy job or there is no actual platform that deals with this type of business process same goes for the difficulty in "Finding a good destination" which is answered by 35 (87.5) of the respondents while the problem on "Searching for comments and feedbacks from other tourists" is answered by the 17 (42.5) respondents and using only google maps as a platform gets 25 (62.5) answers from the respondents which can be assumed that the lack of platforms for tourist itinerary is a problem for tourists.

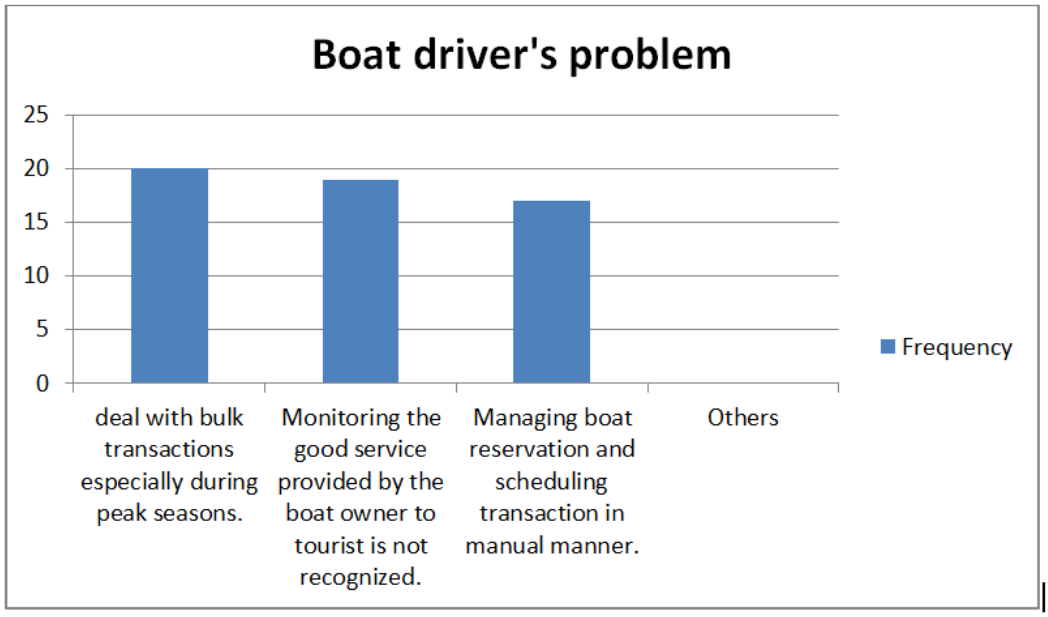

Figure 3. Problems Encountered in Boat Scheduling

Figure 3 shows what does respondent's responses on “what are the problems they have encountered in the scheduling of the boat ride service for the tourist”, the results show on the figure that 20 (100%) of the respondents have experienced "difficulty in dealing with bulk transactions, especially during peak season"; while 19 (95%) of the respondents have found it difficult on "Monitoring the good service provided by the boat owner to tourist" and 17 (85%) of them have found it difficult in terms of "Managing boat reservation and scheduling transaction in a manual manner".

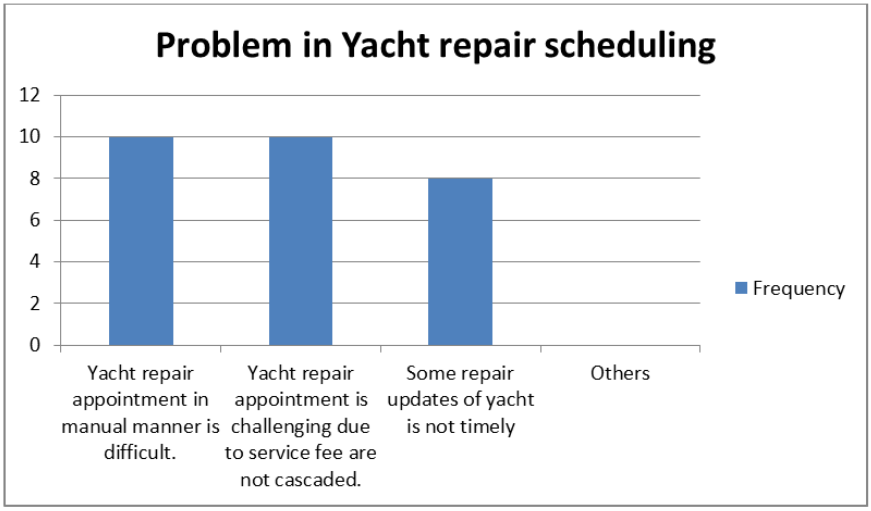

Figure 4. Problems Encountered in Yacht Repair Scheduling

Figure 4 indicates the problems with yacht repair scheduling, 10 (100%) of the respondents answered "difficulty in the manual process"; 8 (80%) of the respondents answered "repair status update is not timely" and also 10 (100%) have said that the "repair scheduling is challenging due to the reason of service fee are not cascaded".

Table 4. Problems Encountered in Boat Repair Management

Problem	Rank
Using Log books and Record books to create a report is difficult.	1
Difficulty to create sales invoices manually.	2
It takes so much time in preparing reports like annual reports, sales reports, and invoice lists of the finished transaction.	3
Difficulty in syncing information from different sources	4

The Table 4 shows the problems that the yacht charter experienced using the manual system. Renato F. Lisud, the manager of the Papaya Yacht Charter and Services Inc., stated that although there is a system they are using in the company, they find it hard to use it because it needed expertise in terms of accounting and proficiency in using flat database management systems such as Microsoft excel. He also added that the business lacks automation different clients are wanting to have the possible and easiest way to access the yacht repair services. As the Researcher demonstrated the technological solution to the Charter manager, he saw how the system's notification capabilities functioned on both Email and SMS, and he expressed his desire to have that type of automation around their business, stating that he wanted to install it on the company.

Table 5. System Acceptability Rating In Terms Of Functionality

Parameters	Mean	Descriptive Equivalent
The system provides accurate ratings, insights, and data visualization	4.76	Highly Acceptable
The system improves the way the business process works.	4.63	Highly Acceptable
The system is capable of handling errors in some cases like invalid inputs such as dates and text strings.	4.63	Highly Acceptable
The system can aid the user to finish a specified task.	4.60	Highly Acceptable
The system can facilitate the	4.62	Highly Acceptable

accomplishment of specified tasks and functions.	

The Table 5 shows the level of acceptance of the respondents in terms of the system's Functionality it shows a Standard deviation that is not below or greater than 4 which means that the data is not well dispersed or spread out. The mode is either 5 or 4 which tells moderate and high acceptability of the system's Functionality.

Table 6. System Acceptability Rating In Terms Of User Friendliness

Parameters	**Mean**	**Descriptive Equivalent**
The system can adapt to different screen sizes.	4.68	Highly Acceptable
The UI design is learnable and easy to use/operate	4.58	Highly Acceptable
The system is easy to navigate and operate.	4.70	Highly Acceptable
The system provides different interactive views of information.	4.66	Highly Acceptable
The system provides a convenient way for the password retrieval process.	4.58	Highly Acceptable
The system interface is aesthetically designed	4.66	Highly Acceptable

The Table 6 shows the level of acceptance of the respondents in terms of the system's user-friendliness it shows a Standard deviation that is not below or greater than 4 which means that the data is not well dispersed or spread out. The mode is either 5 or 4 which tells moderate and high acceptability of the system's User friendliness.

During the release phase or the initial deployment of the system, the Researchers encountered the following issues and they address them while providing the solution to these deployment issues using the 4-point software severity level.

Table 7. Deployment Issues

Issue	**Cause**	**Severity**
DNS error	Web server Downtime	Major
MySQL error	Web server Downtime or TCP/IP socket not listening	Moderate
Web Mail Not working	the email account	Minor

	has exceeded its quota IMAP/POP is not enabled.	
Website suspension due to usage limits	Exceeded web server resources.	Minor
FTP service not working	Webserver Downtime	High
GPS not working	GPS service is not working on a non-encrypted connection like HTTP (port 80)	Cosmetic
App not installed	The Android version is not compatible with the app package.	Moderate
Cron Jobs Not working properly	Execution time exceeded. Incorrect permission.	Moderate
The website is not a safe alert	SSL certificate problem, DNS propagation in progress	Moderate
DNS error	Web server Downtime	Major

The following data on the Table 7 shows different issues that the Researcher has encountered during the deployment of the System that is according to the ISTQB (International Software Testing Qualifications Board), to sum it up, it can be seen can see that web-based systems may encounter unexpected problems such as downtime due to multiple services and requests it is receiving across the network. It is important to always have a backup and select the best Web service package service as soon as possible because cheap services may bring drawbacks as the system scales up such as increasing volume of users and data that it process, In addition to that cross-platform system such as a combination of Native and mobile apps are a bit complicated due to the way they access the data and present it to the users.

SAMPLE SCREENSHOTS

The following figures are the main screenshot of the developed web application.

Figure 5. Tour History

Figure 6. Boat ride requests

Figure 5 shows the tourist history of the tourist user the tour history where the user has previously availed of a boat ride. On Figure 6 the boat ride request is where the boat driver checks the status of the transactions the boat ride request also contains information such as weather and distance to the destination.

Figure 7. Calendar of Boat repairs

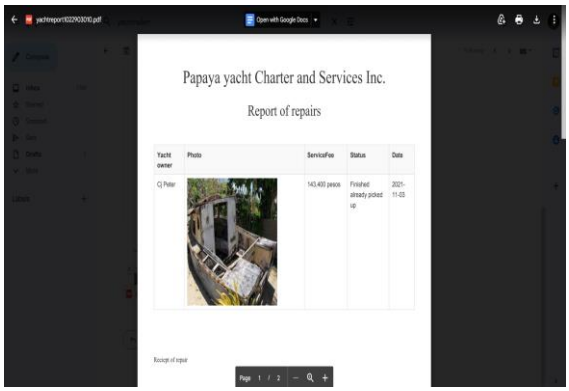

Figure 8. Automated Invoice generated

Figure 7 shows the current yacht repair appointment and the color depicts if the repair has been finished or the appointment date. Figure 8 shows the automated invoice generated in PDF format the invoice is sent to the email of the user attached as a PDF.

CONCLUSIONS AND RECOMMENDATIONS

The study revealed that tourist encounters a problem in the current process of the tourist itinerary which involve manual reservations and finding a boat owner that can

cater the service they needed, while on the other hand boat owners that serves the tourist face difficulty in managing boat schedules, especially during the peak season where the transaction needed to manage is in the form of bulk. Yacht repair scheduling and management is also a difficult task to deal with especially the needed things to do such as manual repair appointments, notification, and report generation.

The system's module that has been developed is the modules for yacht owners, boat drivers, tourists, and Yacht charter owners where the user can interact to avail and manage the transaction on the service they have chosen.

The developed system has a high acceptability rating in terms of features and user-friendliness, also the developed web application has room for improvement and can be used in the boat repair and rental businesses.

The web is a dynamic platform, some deployment issues may arise in the operating environment such as deprecated libraries or frameworks. The developer needs to address these issues as soon as possible before it creates buffers in the development phase.

According to the results of the study, Respondents are satisfied with the features and User friendliness of the system, Businesses that involves in the process of Boat repair and rental should consider using the developed web application as a tool to make their business more efficient.

IMPLICATIONS

Having a Web application platform on a marina-related business is a great way to market the service being offered, having also a web application on your business can bring more clients. With the integration of different technologies, the system can automate the business process and reduce the use of paper.

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