



TOURIST APPLICATION MANAGEMENT AND INVENTORY (TAppMI)

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ABSTRACT

This research addressed the gaps in the current tourist recording system of Bohol Tourism Offices as it uses manual process in counting the tourist visiting each destination via logbooks. Accordingly, some tourists are not counted because some of them failed to register on the logbooks or only the van driver or the tour guide's name is registered and only indicates the number of tourists. Tourism Application for Management and Inventory (TAppMI) tried to solve the gaps. With TAppMI, the tourists are counted fairly because they only have to tap their cards or souvenir items in every tourist destination. Without those, the entry of tourists is not allowed. This system is composed of RFID Cards or Souvenir Items with combine RFID, Microcontrollers, and a webserver. The proper accounting of reports is done in the main tourism office via a Webpage that features a one-stop dashboard that shows the logs from every tourist destination. This system ensures that every guest reaches their tourist destination based on their itinerary and can also be a tool in tracing them in case of distress. It also uses the Agile-Scrum methodology of software engineering that enables the researchers to deal with a task by breaking it into phases, including consistent effort with project stakeholders and constant development and iteration in every phase.

Keywords: Tourism, Tourism management, Tourism inventory Wireless technology, Raspberry pi server, Micro-computer, Radio Frequency Identification, Web Application, Philippines

INTRODUCTION

Tourism industry plays a big role in the Philippines. According to the data of the Department of Tourism there are more than 8.2 million international tourist arrivals in 2019, 20.81 percent of 2018's statistics. This huge number of tourists generated more than PHP 482.15 billion. These tourists are counted via

tourist arrivals in hotels and resorts. Other way of counting for both local and foreign tourists is by manually logging them in the logbooks which sometimes offer less accuracy. Another case is if the guests arrived in a batch, only one name will be logged as head of the batch while others will only be collected an entrance fee and good to go. These scenarios will lead to the inaccuracy of the number of tourists that actually visited the country. If the tourists are



inaccurately counted, this will affect to the income of the tourism sector and to the future decisions and strategies of the tourism industry in order to keep and further improve it pace.

Pursuant to Republic Act No. 9593, an act declaring a national policy for tourism as an engine of investment, employment, growth and national development, and strengthening the department of tourism and its attached agencies to effectively and efficiently implement that policy, and appropriating funds, it is right and just to invest in new technologies such as IOT in tourism industry in order to cope up with other tourism hub countries. Adopting in new technologies is also an investment that leads to the convenience and security of the tourists.

According to Schwab (2016), we are undergoing the fourth industrial revolution, an era characterized by breakthroughs in emerging technologies in such fields as robotics, artificial intelligence (AI), nanotechnology, quantum computing, the internet-of things, fifth-generation wireless technologies, and fully autonomous vehicles, all of which will affect how we create and distribute value, and will change the way we live, work, and interact.

The field of tourism is must not be left behind. Same as other sectors, tourism industry is also facing a great technological future in terms of its operation in order to cope up with the fast pace of automated future.

The term Internet of Things (IOT) is one of the major technological innovations that have been used in almost all of the fields including the in the field of tourism. It is a network setup of interconnect able things and perform comple functions.

According to Luigi Atzori et. al (2017) the Internet of Things (IoT) is a novel paradigm that is rapidly gaining ground in the scenario of modern wireless telecommunications. The basic idea of this concept is the pervasive presence around us of a variety of things or objects – such as Radio-Frequency IDentification (RFID) tags, sensors, actuators, mobile phones, etc. – which, through unique addressing schemes, are able to interact with

each other and cooperate with their neighbors to reach common goals.

Tussyadiah, I. (2020) stated that some of the benefits of intelligent automation in travel and tourism are apparent (e.g., comfort, convenience, savings), but so are the concerns surrounding the transformation it would bring to people and society in general.

TAppMI is an IOT based Tourist Application Management and Inventory is a system developed to accurately count the number of guest visiting every tourist destination in the province, to track if the itinerary is followed (for security purposes) and a possible tool to for contact tracing in case of emergency. TAppMI

OBJECTIVES OF THE STUDY

The main objective of this project is to count correctly the number of guests visiting every tourist destination in the province. Specifically, it sought to:

1. track if the itinerary is followed for security purposes;
2. use as a tool for contact tracing; and
3. to automatically count the number if tourist entering in the tourist destinations.

This system counts the number of tourists who visits tourist destinations by simply tapping a souvenir item into the node/terminal. In order to do it, the researchers designed a system that operates in two platforms, online and offline nodes/terminals to give access to the places where the internet connection is poor. For offline nodes/terminals, the uploading to the logs is done via over the air update (OTA). Meaning the data will be uploaded to the server whenever internet connection is available. TAppMI also features a website that shows a complete report in its dashboard like the real-time number of guests visiting in tourist destinations which can also be sorted according to age, nationalism, gender orientation and many others. RFID Souvenir can be availed in the hotel, travel and tours, tourist destinations, ports and other partner agencies of the tourism



office. If the guest's visit is already done and decided to leave the country, the RFID Souvenir will be deactivated.

Correspondingly, this system used a complex combination of sensors, Raspberry PI, PHP, MySQL and Data Servers.

MATERIALS AND METHODS

This project used Agile: Scrum methodology of software engineering. It is a type of methodology that enables the researchers to deal with a task by breaking it into phases which includes consistent effort with project stakeholders and constant development and iteration in every phase. The phases of this methodology includes stakeholders' meetings, product backlogs, sprint planning, sprint backlogs, the actual project sprint, daily standup meetings, sprint review and the potential shippable product. With this methodology, the researchers did the following activities in each phase:

Stakeholder Meetings. The team sat with the tourism officer and list down the current issues encountered by tourist destinations particularly in keeping the logs correct.

Product Backlogs. The issues encountered by the tourism destination were listed as project backlogs. Each of the backlogs are given priority according to the weight and the urgency of the needs.

Sprint Planning. In this phase, all of the backlogs in the previous phase are given a schedule and the right staffing in order to realize the project as illustrated in Figure 1.

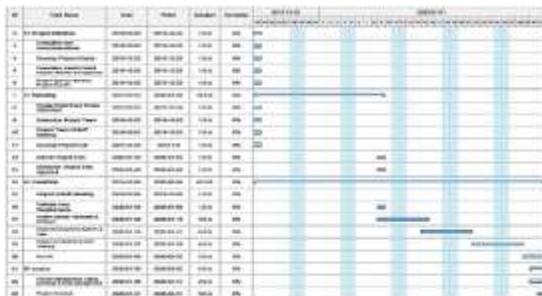


Figure 1. Schedule

Sprint Backlogs. This is the actual task of the project sprint. Normally a sprint is a week-long schedule. In this phase the researchers already received the actual task for the sprint.

Actual Project Sprint. In this phase, the researchers carried out the actual project sprint. The workload basis for this are the activities found in the sprint backlogs

Daily Standup Meetings. A daily standup meeting is done by the scrum master and attended by the rest of the team in order to check the current progress of the project and to earlier address the issues found during the early stages of project development.

Sprint Review. Every end of a sprint the researchers presented the sprint output to the evaluation panel in order to verdict the output if it is acceptable or not.

Potential Shippable Product. The potential Shippable Product is the actual product that the researchers presented to the client. In this phase, the TAppMI was examined by the committee if the project meets their needs.

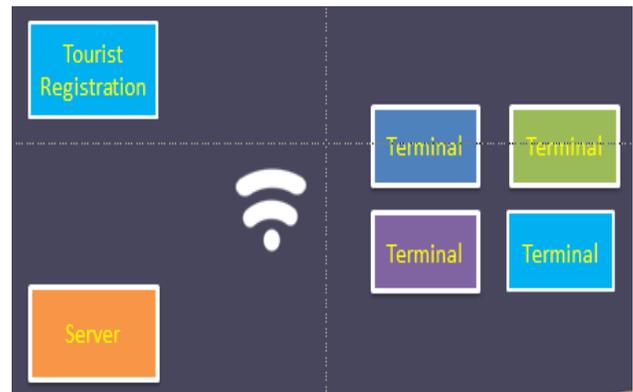


Figure 2. System Prototype

The tourist registers in the tourism office partners. The tourist data is saved in the server. The server is connected to the terminals/nodes which are located in tourist destinations. Whenever the tourist visits a tourist destination, he/she must tap his/her card to the

terminal/nodes. The data from the nodes will be sent into the server where all tourist and tourist spots data are consolidated as shown in Figure 2-3.

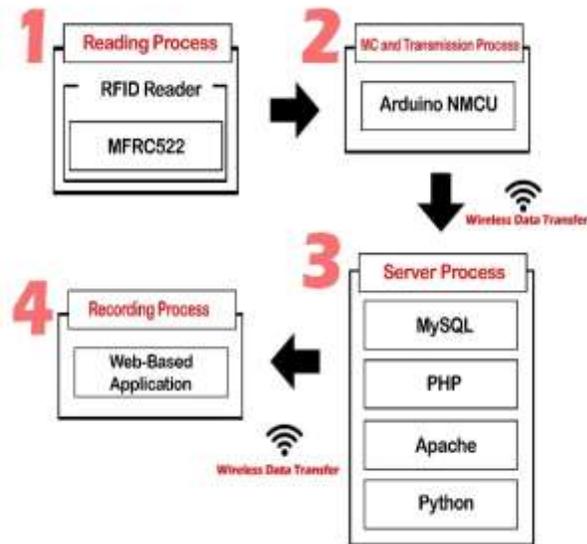


Figure 3. Process Workflow

RESULTS AND DISCUSSION

After testing the study (TAppMI), the problems encountered were successfully addressed. Following are the system screenshots that shows the actual system and the data collected.



Figure 4. Dashboard

Figure 4 shows the dashboard that displays the real-time count of tourists, the travel and tours, tourist destinations. This also

enables that administrator to view reports daily or monthly



Figure 5. Tourist Logs

Figure 5 displays the tourist logs from different terminals. The log also includes the basic information, site visited and the travel agency if available. This log also shows the total guests visited in a particular tourist destination.

The terminals assigned in tourist destinations returned the tourist information in real-time, the itinerary of the tourist can be checked directly if followed or not and the system was able to return the previous tourist destination that the tourist visited.

CONCLUSIONS

The proper counting of both local and international tourists is very vital in tourism industry because they are the entities that keep it alive. The lapses in the traditional way of counting the tourists may contribute to the deficit and the strategies of the tourism business to further grow in the industry. Based on the runs conducted TAppMI counted the tourists accurately from its arrivals down to every tourist destination they visited. This system also has proven to identify if the tourist and the tour guides followed the itinerary and could contribute vital information for contact tracing. With the real-time report that the system provided, the tourism data statistics can be easily produced for further boost the industry.

RECOMMENDATIONS

Tourism industry should shift from the traditional and adopt the use of technology to further boost the industry. In order to maximize the use of the system, it is recommended that the system must be installed in every port of entry, hotel, travel agency, tourist destinations resorts and other places where tourist visits.

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