E-MAYOR: SCHEDULING APPOINTMENT SYSTEM

I. INTRODUCTION

As population grows bigger, the hunger for improvements in life grows bigger too. Since then, innovation of technology is born to support the quality life of people in various aspects and objectives. Manual transactions are by then replaced by vast advanced technologies. Technology lessens the time of works, creates mobility, encourages creativity, easier and faster communication, and provides better opportunities in any field. Current technology, mostly contributes to the advancement of entertainment like games and gadgets; and services in business, school, banks, hotel, restaurants, and hospitals. The term information technology (IT) was used by these services to describe the processes they used to store information. With the use of advanced technology, transactions, processing and operations becomes faster, accurate and effective. A schedule or a timetable, as a basic time-management tool, consists of a list of times at which possible tasks, events, or actions are intended to take place, or of a sequence of events in the chronological order in which such things are intended to take place. Every person has a timetable or schedule of their work or pace in their daily lives. They can be a simple dinner date to appointments with the mayor, people jot down it in their calendars or simply remember themselves mentally to remind themselves that they have somewhere to go to in this date, of this time of a specific month. There are 44 national offices in the Philippines and making appointments for every important figure is a way to address the public of its concerns. The Municipality of Sta. Cruz is consisted of 26 barangays with 117,605 population with a large scope area that qualifies as first-class municipality. The municipal hall of Sta. Cruz, Laguna is located at Poblacion III near the town plaza. With the overall population of 11,605 in Sta. Cruz Laguna the mayor must make time to address the concerns of his citizens, with this huge population the Mayor's office is having a conundrum how to address every citizen with each of their concerns personally in the span of the mayors available time.

In the past few decades, modern technology has been interchanging rapidly and this can actually be considered as a primary tool of many industries such as health industry, business industry, educational industry and many other organizational institutions with multi transaction. Getting an appointment with the mayor through the secretary physically is the traditional way of doing things. In this era of technology where inquiring things through social media, SMS and E-Mails is used the Mayor's Office is the focal point of office that is being inquired if the mayor is available for having an appointment with them. The current process of the mayors' office of making appointments with the mayor is by going there personally and requesting one with the secretary, or by the mayors' consent. Making an appointment with the mayor is a time-consuming pursuit because of the mayors' schedule is ever changing with many people making

appointments or the mayors schedule on that time is canceled, with this reason the secretary changes the mayors schedule every time. The people need to make appointments with the mayor because there are certain inputs, advice, permissions that can only be resolved by the mayor.

In this study the researcher proposes a website and mobile application where the information about the mayors schedule is publicly given except for ones that are confidential where it is accessed by various users ranging from civilians to office staffs and barangay staffs, where the mayors' office staff has a more access to the website and mobile applications where they can add, and delete appointments, the proposed system also comes with an SMS notification function where the appointee is notified if their appointment is accepted or not. With the use of advance technology, transactions, processing and operations becomes faster, accurate and effective. As time goes by, having an automated system with the use of advance technology became very useful for it minimizes the amount of time needed to accomplish of such a specific or multi task. And at this generation, computer machines can now be considered as one of the primary necessities in many institutions. The Progression or the advancement of technology like computer machines, mobile phone and other hardware devices were growing up to make our task easier, better and the mode of being accurate and reliable output promoting to gain more encouragement and acknowledgement.

II. RESEARCH OBJECTIVES

Generally, the study aims to develop, test and evaluate the E-Mayor appointment management system of the Sta.Cruz Laguna Municipality that supports the Mayor's Office in monitoring particularly the needs of the people of Sta.Cruz Laguna.

Specifically, the study focuses on achieving the following objectives:

1. to design and develop a system that supports E-Mayor appointment management
2. to test the functionalities of the developed system based on the behavior of the system during the test case focusing on its major features:
   a) Online Inquiry
   b) Scheduling Portability
   c) SMS response
   d) User Management
3. To assess the developed system with regards to user acceptance and behavioral intention to use the system using technology acceptance model (TAM) criteria in terms of:

   a) Quality factors
   b) Perceive Ease of Use
   c) Experience
   d) Perceived Usefulness
   e) Attitude Towards Using
   f) Behavioral Intention to Use

III. LITERATURE OF THE STUDY

These Local and Foreign literature's and studies mentioned and discussed above are related to the present study since they discussed how e-government is important to

the present community of Sta. Cruz Laguna, Municipality. In the Impact of E-Government in which if the studies there were all summarized it discussed that with the use of ICTs it is to promote a more efficient and cost effective government in the present-day world and with the use of E-Government it may just be the thing to have a more effective government that may serve the constituents of the Sta. Cruz Laguna. While it is stated in the studies containing in the Needs of E-Government to succeed, if summarized is that even if the Sta. Cruz Laguna Municipality implements an E-Government way, with it being a new thing for the constituents of Sta. Cruz Laguna it would be faced with scrutiny, and mistrust because of the abrupt changing of doing things. Whereas in the studies under Difficulties in Implementing E-Government states that in order to have an efficient, cost effective and effective path for the E-Government to be implemented is it needs to solve problems that is present in all newly implemented systems mainly, it needs to have a more thorough research, funds, political standing, public trust and etc. In the studies under the E-Mayor Software Development, it mainly shows what it is needed to have in a website and mobile application in order for it to be amiably be accepted by the constituents of Sta. Cruz Laguna. While in the studies under Appointment Booking states that having a scheduling system that can handle the work of the staff while minimizing human error, minimizing paper trails, and maximizing efficiency and convenience of the staff and client where they can access the website at any internet accessed computer and mobile which supports the idea of the Office of the Mayor requesting an Web-based Appointment and Booking System and Mobile App w/ SMS Notification aka E-Mayor. In the studies under the Management Information System SMS with notification summarizes that role of the government is not limited only in the security of the citizens but it is expanded on the public welfare, development-oriented activities, information dissemination, public awareness and researches while SMS is a great idea for notification which supports the notion of an SMS Notification of the study. Whereas the studies under Record Management System summarizes that having physical copies of information on a paper is mostly a fire hazard, a waste of space, and prone to damage, while computer stored or cloud stored information is mostly safe from being destroyed, saves space for further storage, and helps the environment by lessening the amount of trees being cut that is used to make paper. While in the studies under Research Design mostly says that prototyping model is a cost effective and efficient method by recycling previously developed system to build a prototype then review and improve from there. In the studies under System Development and Evaluation summarizes that the use of TAM and Blackbox testing is imperative in order to further develop and enhance the researcher's system.

IV. METHODOLOGY

Research Design

Modernizing the current process by developing web and mobile application with SMS integration has been the focus of the

project and the study. The researchers used the descriptive and developmental research method as a basis in gathering information for a better understanding to have a better output. The descriptive research was used to describe the characteristic of population or phenomenon that are being studied. This method also has a process of investigations to have more reliable information. The developmental research is a development-oriented, a kind of research that is relevant and that can provide answer to developmental problems.

Descriptive Research was defined by Aquino (2006) as fact-finding with adequate interpretation. The descriptive method is something more and beyond just data-gathering. The real meaning of the data collected should be reported from the point of view of the objectives and the basic assumption of the project underway. This employed methods of research in order to acquire all the necessary information needed to finish this study. There are several classifications of methods of research, but most appropriate to as a fundamental tool in the case of the present study is the descriptive method. The descriptive research is devoted to the gathering of information about prevailing conditions or situations for the purpose of description and interpretation. It can involve collections of qualitative information that can be tabulated along continuum in numerical form, such as scores on a test or the number of times a person chooses to use a certain feature of a multimedia program, or it can describe categories of information such as process or patterns of interaction when using technology in a group situation.

Descriptive developmental is used to analyse and described the product-developmental, descriptive developmental is also defined as the systematic of designing, developing and evaluating that must meet the criteria of effectiveness of the final product. According to Miller (2017) in descriptive developmental, to start the testing of the developed system participants with testing skill is important and needed to be recruited, testing skills is the ability needed in actual working with research participant, whether face-to-face interaction or in observing and measuring behaviour. The researcher used black box testing which is based on the requirement and functionality through the use of test case which will help to test if the developed system functions and features is perfectly functioning according to its used, and then the researcher formulate tam questionnaire with ISO standard to identify the user level of acceptance and their comments, suggestions and feedbacks regarding on the developed system.

To emphasize the understanding of the study, the researchers used the various methods of research just as interview, library research and internet research. Through these methods, it supports the researchers in terms of gathering accurate and reliable information which helps in the development of the study. Descriptive research involves gathering data that describe by Glass and Hopkins (1984) as an event and then organize, tabulates, depicts and describe the data collective. In addition, Salmorin (2006) also said that descriptive research has an objective to describe systematically a

situation, condition or area of interest factually and accurately.

Population of the Study

The study focuses on achieving several objectives and one of those is to assess the developed system with regards to the level of acceptability and behavioral intention behavioral intention to use the appointment scheduling management system by the end-user. The research was conducted in the Municipality of Sta. Cruz Laguna specifically the Mayor's Office. In this case, it is composed of secretaries and citizens which has been the end-user and main respondents of the study. In addition to the mentioned main respondents, Information Technology experts was found out to be significant as a respondent in this study.

Sampling Design

Sampling is the process of selecting the sample for estimating the population characteristics. The researchers used probability sampling method during the initial gathering and investigation to produce results that are representative of the whole population. The researchers used the purposive sampling method type of probability sampling in selecting respondents. According to Etikan, I. (2016) The purposive sampling technique, also called judgment sampling,is the deliberate choice of a participant due to the qualities the participant possesses. It is a nonrandom technique that does not need underlying theories or a set number of participants. It is also said in a work of Tongco (2019) that purposive sampling technique as a non-probability sampling technique that is more effective in choosing intentional informants which relates to their ability to answer and interpret a specific concept or phenomenon. The sampling method enables the researchers to get the most important information out of all the data collected from all of the participants emphasized by Foley (2018). Also, it is more often used by the researchers for it is extremely time and cost effective unlike the other sampling method.

Locale of the study

In this part it discusses the place or setting of the study. It describes in brief the place where the study is conducted. The client is located at the Municipal Office of Sta. Cruz, Laguna. Each municipality have their own Mayors Offices and is tasked to service the general public with their services which comprises of (1) Approval of Aids to Individual Crisis Situation (AICS) (2) Issuance of Guarantee Letter (3) Scheduling Wedding and Preparation of Marriage (4) Permit for Procession/ Motorcade/ Parade (5) Issuance of Certification (for Meralco) (6) Issuance of Mayors Clearance of Local Employment (7) Scheduling of Set-up Tent, Sound System and Monoblock Chairs (8) Approval of Request's Letter to NGO's, Barangays and Civil Society.

Data Collection Method

To gather the needed information in the process of developing the study, the researchers used some types of method in conducting the study like interview, library research and surfing through the use of internet to support the development of the study.

The proponents gathered data in a series of interview. The information from the Public Information Office made the proponents to come up with the study to design and develop a system for information dissemination.

Library Research

The proponents did some research in the LSPU – SCC library and in CCS research lab to gather some information like reading some thesis related to the proposed system and read some computer books to have further knowledge regarding the proposed system.

Internet Research

The proponents used internet since it has a large collection of information that is accessible anytime. The proponents read some journals, articles and published thesis to collect different information related to the propose study. Some of the website that the researchers visited were sciencedirect, googlescholars, plusgroups etc,. The information gathered was used for the related literatures and studies.

Interview

The proponents conducted an interview in Mayor's Office of Sta. Cruz on February 21, 2020 to identify their current process and problems encountered. The proponents asked some questions regarding their current process in creating appointments for the mayor and arranging the prioritized and non-prioritized schedule of the mayor. Cruz. The researchers found out that with their current way of arranging schedule and creating appointments with the mayor they still encounter human error cases, and more workload so they wish to improve it by using a way better technology which is a scheduling system with SMS Notification.

Statistical Treatment

The researchers used the Frequency and Percentage Distribution to treat the data gathered in the testing phase in order to determine how functional the two developed platforms are.

The standard deviation measures the spreading of the dataset relative to its mean and is calculated as the square root of the variance. According to Delmase and Liu (2005) on his article entitle "Exploring Students' Conceptions of the Standard Deviation", if the data points are further from the mean, there is a higher deviation within the data set; thus, the more spread out the data, the higher the standard deviation.

PA (Perfectly Acceptable or 7), A (Acceptable or 6), SA (Slightly Acceptable or 5), N (Neutral or 4), SU (Slightly Unacceptable or 3), U (Unacceptable or 2), TU (Totally Unacceptable or 1).

Project Design

To make this project completely functional, the researcher has applied the System Development Life Cycle (SDLC) Prototyping Model, generally the seven steps are (1) Requirement Identification (2)

Design Stage (3) Build Prototype (4) Review of the Prototype (5) Iteration and Enhancement of Prototype.

Requirement Identification: Here identification of product requirements is cleared in details. It is done through interview some product's future users and other members of the departments where the researcher has interviewed with the Secretaries of the Mayor for what is the difficulties of the process of how to get an appointment with the Mayor.

Design Stage: A first-round design is created in this stage for the new system. In this phase the researcher has made a rough draft of what to put in the system and at how it looks while minding the color palettes of the System because the Secretaries of Mayor Egay has mentioned that a specific color is banned from using in the City Hall.

Build the Initial Prototype: An initial prototype the target software is built from the original design. Working off all the product components may not be perfect or accurate. The first sample model of the system is built by the researcher tailored to the needs of the Mayor, Secretaries and Clients of the City Hall.

Review of the Prototype: After the product completes all the iterations of the update, it is presented to the staff or secretary of the Mayors' office. The response is accumulated in an organized way so that they can be used for further system enhancements.

Iteration and Enhancement of Prototype: Once the review of the product is done, it is set for further enhancement based on factors like - time, suggestions and time. Also, the technical feasibility of actual implementation is checked.

Testing and Evaluation Procedure

This section discusses the test and evaluation procedures used by the researchers to further evaluate the study. The researcher believes the method used will be a big help for the developed study.

Black box testing also known as behavioral testing is a software testing tool that is used to measure the internal structure or design of the item that is being tested. The advantage of using black box testing is that user can easily point out what is missing or lacking on the object that is being tested without requiring them to have a knowledge of which programming language was used or how the system was created as a whole. Black box testing is a type of testing which ignores internal specifications of a system or a software, it is used when the code itself is not seen by the users rather focuses on the outputs relatively to the actions given (Bhasin, Khanna and Sudha 2014)

Validation of Questionnaire

Researchers constructed two self-made questionnaires for each user group to obtain user feedback and acceptance towards the developed mobile platform. The questionnaires are constructed based on the Technology Acceptance Model factors in terms of Quality, Perceive Ease of Use, Perceived Usefulness, Experience, Attitude towards Using and the Behavioral Intention to Use, combined with the ISO/IEC 9126 software quality metrics. According to Bhatti and Kepler (2005), application of

software metrics is proven to be an effective technique for assessing, estimating software quality and productivity. The researchers incorporate the ISO/IEC 9126 software quality metrics to the Technology Acceptance Model in order give more accurate and relevant assessment. The questionnaires are validated by Dr. Villarica, Mia, the research study adviser for further rectification before the dissemination

V. RESULTS AND DISCUSSION

RESEARCH OBJECTIVE 1: To design and develop a system that supports E-Mayor appointment management

The researchers used descriptive research method to further understand the problems within the process of handling of Appointments with the Mayors' Office. The Researcher has used research instruments such as Interview Questioner, Technology Acceptance Model with ISO standard, Test-case scenario. Due to the short time to develop to make a system the researcher has used Prototyping Model to make a system because the logic behind it is the prototyping methodology allows you to design a working "prototype" or early sample of what's to come. The prototyping model According to a study by Mohamad, Jiga, Rahmat, Azlan, Rahman, Saptari, 2019 entitled "Online Booking Systems for Managing Queues at The Road Transport Department "The prototyping model is considered as one of the systems development method (SDM) that allows a prototype to be built, verified, and then revised as necessary until it achieves an acceptable prototype that can be used to develop the complete product or system.

The Prototyping Model, generally the 5 steps are (1) Requirement Identification, here identification of product requirements is cleared in details. It is done through interview some product's future users and other members of the departments where the researcher has interviewed with the Secretaries of the Mayor for what is the difficulties of the process of how to get an appointment with the Mayor. (2) Design Stage, A first-round design is created in this stage for the new system. In this phase the researcher has made a rough draft of what to put in the system and at how it looks while minding the color palettes of the System because the Secretaries of Mayor Egay has mentioned that a specific color is banned from using in the City Hall. (3) Build Prototype, An initial prototype the target software is built from the original design. Working off all the product components may not be perfect or accurate. The first sample model of the system is built by the researcher tailored to the needs of the Mayor, Secretaries and Clients of the City Hall. (4) Review of the Prototype, after the product completes all the iterations of the update, it is presented to the staff or secretary of the Mayors office. The response is accumulated in an organized way so that they can be used for further system enhancements (5) Iteration and Enhancement of Prototype. once the review of the product is done, it is set for further enhancement based on factors like - time, suggestions and time. Also, the technical feasibility of actual implementation is checked.

During the interview with a secretary of the Mayors Offiice the researcher were

able to identify the problems in the process of handling in the appointment management system that supports the Mayors' Office where in 1.) The Appointments is made in paper. 2.) The traffic flow of people going in for an appointment 3.) Mayor constantly changing schedule 4.) Storage Problem 5.) Appointments getting misplaced and 6.) Archived Appointments getting misplaced. These made the researcher to provide a solution that will enhance the current process of Traffic Management Office that would complement the transferring, recording, retrieving of data and viewing of reports that would work well with the developed system.

To enhance the process of the Mayors' Office of Sta. Cruz Laguna the Researcher have identified certain features that the system would provide to further improve the process of appointment management between the Secretary, Mayor and his Constituents. The researcher have identified that having a website for the Mayors' Office would remove the need for the Mayors Constituents in doing a traditional way of making an appointment with Mayor where they need to physically go to the Mayor Secretary just to make a 30 minute or 1 hour meeting with the Mayor, in which the constituent will waste his not just his money and time if his appointment is rejected. The website will give the constituent the power to request an appointment with the Mayor at the comforts of home. The website will also give the secretary the power to handle the appointment requests of the Mayor efficiently without being hassled with the need of physically doing the Mayors

Schedule on a piece of paper that can be easily be misplaced, a fire hazard, and a hassle to store, with the website the secretary can see Pending Requests she can accept or deny on behalf of the mayor and based on those decisions the constituent will receive an SMS Notification regarding the requested schedule. The researcher has provided with a mobile app that the Mayor or his Secretary to use that has the same functionalities with the website mainly seeing the pending Appointments and, either accept or reject the request

RESEARCH OBJECTIVE 2: 2. to test the functionalities of the developed system based on the behavior of the system during the test case focusing on its major features: a. Online Inquiry b. Scheduling Portability c. SMS response d. User Management

The researchers used the descriptive developmental to analyze and describe, the product-developmental, descriptive developmental is also defined as the systematic of designing, developing and evaluating that must meet the criteria of effectiveness of the final product. According to Miller (2017) in descriptive developmental, to start the testing of the developed system participants with testing skill is important and needed to be recruited, testing skills is the ability needed in actual working with research participant, whether face-to-face interaction or in observing and measuring behavior.

The researcher used black box testing which is based on the requirement and functionality through the use of test case which will help to test if the developed system functions and features is perfectly

functioning according to its used to support the researcher choice in using black box testing in the literature review Bhasin, Khanna and Sudha 2014). Black box testing is a type of testing which ignores internal specifications of a system or a software, it is used when the code itself is not seen by the users rather focuses on the outputs relatively to the actions given. The questionnaire consist of the functionality of the developed system in which the tester are not allowed to see the code of the developed system. The researcher followed the method discussed in Srinivas discussion in which to prepare a set of question that reflects the function and features of the developed system. The Researchers presented their system in front of the IT professionals using Zoom testing to test the functionality and features of the developed system if the functions needed by the E-Mayor Scheduling System is functioning.

RESEARCH OBJECTIVE 3: To assess the developed system with regards to user acceptance and behavioral intention to use the system using technology acceptance model (TAM) criteria in terms of: Quality Factors 3. Perceive Ease of Use 4. Experience 5. Perceived Usefulness 6. Attitude Towards Using 7. Behavioral Intention to Use

The researchers conducted a test to the E-Mayor of Sta. Cruz Laguna using the Technology Acceptance Model, which includes Quality Factor, Perceived Ease of Use, Perceived Usefulness, Attitude towards Using, Behavioural Intention to Use and Experience.

The researchers presented their developed system for the respondents to test and get their respondents comment and suggestion toward the use of the developed system to determine the effectiveness and efficiency. The developed system is sufficient in term of user friendly interface with operations that provide ease in their current process. These are the visual representation of the data gathered by the researchers in their test in. The weighted mean result is from the gathered questionnaire given to the respondents under the quality characteristic of the Technology Acceptance Model with ISO standard.

VI. CONCLUSION

The feedback shared by the respondents after the demonstration and the result acquired by the researchers with the used of survey questionnaires, it shows that the developed system is more likely to use by the office of the Mayor when it will be implemented. The system has made the process of creating a mediator between the Constituents of Sta. Cruz Laguna and the Mayor. Based on the results of the Technology Acceptance Model questionnaire and Test case from the respondents and IT professional that evaluated the developed system. As a result to the main goal of the study, the following specific objectives were met:

In order to determine the current process of the handling of Appointments with the Mayors, the researcher used the fact finding techniques specifically; observation, internet and library research as well as in depth interview. It helped the researchers deeply understand the organization and the

current process of ticketing with the help of fact findings techniques and data collection method the researchers were able to gain valuable information uncovering the needs to improve in the traffic management office process of ticketing, this also help the research to analyze and specify the needed software requirement and its function and features of the system, using this method, the researcher has identified the best solution that will enhance the process of the handling the Schedule of the Mayor. To develop the E-Mayor Scheduling System, the researcher used bootstrap and HTML 5 and the website Hostinger for its hosting and domain. For the development, the researchers used PHP and java script as the programming language. PHP or (recursive acronym for PHP: Hypertext Preprocessor) is a widely – used open-source general-purpose scripting language that is especially suited for web development and can be embedded into HTML. On the other hand, JavaScript is a dynamic computer programming language that is lightweight and most commonly used as a part of web pages, whose implementations allow client-side script to interact with the user and make dynamic pages. For the database, the researcher used MyphpAdmin.

VII. RECOMMENDATIONS

The following recommendations were identified for the future improvement of the developed study:

1. Further test the functionalities of the system by using a large number of respondents

2. Integrate a responsive table in the Mobile Application

3. Develop a deployment plan for the possible implementation of the developed system.

4. For more improvement future researcher may add and adjust all the features and functions of the developed system