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On Demand Home Service Medical Testing

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The study aims to provide medical testing at home. The proposed project provides: the list of services of each medical laboratory here in Pampanga that can be conveniently accessed by the user/client; appointment booking feature where the client/user can book his/her appointment, and what or when and where the testing is to be taken; a direct message where both client/user and lab can interact to each other by the use of the system; tracking feature that the laboratory can manage to view the list of the staff or its members to find out whether they are active or not; invoice feature where the client/user can see the history of his/her payment.

With the help of the On Demand Medical Testing Home Service, the locals in Angeles City can now avail medical testing services at their most convenient time at their most comfortable place, their own homes. Medical laboratories can now offer innovative way of providing medical testing services and will have interactions with their beloved Clients.

Keywords: medical testing, home service, mobile testing, on demand testing

Introduction

Family is important in every individual's life. Family has a lot of definitions for everyone. People can define it in so many ways. Because once the people hear the word, they are reminded of the people whom they could consider to have great part in their life from their childhood up to their adulthood.

According to Loofbourrow (2016), family is the foundation of support, where people find individuals who would inspire and motivate them in everything that they do, comfort them and give adviceeach time they face a lot of hindrances in life. It is where they find refuge and strength, learn new things starting from childhood, laughter and tears that later become a memory that has a great impact into their lives. According to the American Academy of Pediatrics (2015) parents are supposed to be the role models in a family and children are the ones to follow the supervisions given by their parents. Parents are said to be the final authorities who decide for the welfare of the family. Parents are also the ones who supply the financial needs of the family by finding jobs.

What about the Filipino families? Filipino families are family-oriented. Members have strong bond to each other from the core family unit to the extended family where aunties, uncles or even grandparents still live in one house, a compound or a community according to Cabayaran (2015). Being blood related or not, Filipinos love, honor and respect each other especially to the elders. According to Montebon (2015), Filipinos are said to be the ones who look after their aging parents. He added that according to the American Association of Retired Persons study, 42% of Asians give directly care to their elderly.

But there are still several problems that exist.In order for the family to survive its daily living, parents or any family member considered as breadwinner who earns money to support the needs of the family needs to find a job and leave the house for a while.

It just shows that Filipinos would not have a second thought in making sacrifices for the sake of their family. That explains how and why Filipinos have a strong bond with their families. Some would even go abroad and work away from home just to earn money for the future. Others tend to skip meals for being busy and having lots of tasks to be done at work and get sleepless due to stress to work where they consume lots of time in working forgetting to unwind. These might cause several negative consequences to their health according to Neuner (2018).

Also, according to Arceo-Dumlao (2014), 45 % of Filipinos admitted that they have unhealthy eating habits and also lack sleep aside of being exhausted in their work. And over 60% said that they do not exercise regularly. According to Peri (2019), having lack of sleep might cause road accidents because drowsiness for not having enough time to sleep is equal to a reaction of driving as drunk. Not only that, chronic sleep loss can put someone at risk of getting heart disease, heart attack, heart failure, irregular heartbeat, high blood pressure, stroke, diabetes etc.

No wonder why most of the employers require their employees to take the pre-employment and annual medical assessment because they do care about their people. This is also to understand the possible risks that will occur if the employees have illness or injury while working with their company that will surely have an impact to the company's operations. Furthermore, this is to identify who are the capable to do the job and to ensure that no one will not be harmed while on duty (Philips, 2017). About 1.44 million people or 1.57 percent of 92.1 million household populations in the Philippines had disability based on the 2010 Census of Population and Housing (Philippine Statistics Authority, 2013).

That is why the researchers came up with the research named "On Demand Medical Testing Home Service." With the help of the web app, knowledgeable and most trusted medical technologists will be able to help the clients in monitoring their health conditions. Clients will be assisted straight to their houses at their most convenient time by licensed medical technologists provided by the affiliated laboratories which will take their samples and will provide a faster way of getting the laboratory testing results by just sending them through email provided by the clients. Clients need not to go back to laboratories to take medical testing nor wait too long for their for results. The researchers aim to provide a system that will innovate the way of getting medical testing more efficiently and user friendly.

Problems

Following the instances of many Filipino family members who have no one to assist them to take laboratory testing for the reason that they have disabilities and/or they are living alone and of busy employees who have minimal time and do not want to wait too long to get the medical results in the laboratory, the researchers found the following problems:

1. Employees who have busy schedule and have minimal time going to laboratories
2. People who have disabilities or are sick and cannot go to hospital laboratories to take medical testing
3. People do not want to wait too long at the hospital to get the medical results of their laboratory testing

4. Inaccuracy in monitoring the status of the schedule of conduct of medical test and release of results.

Objectives

The main objective of this study is to develop “On Demand Home Service Medical Testing”. This web app would facilitate the reservation of medical testing with the help of the medical technologists and affiliated laboratories to guide the clients find knowledgeable specialists in getting their medical testing done in an easier and reliable way at their most convenient time.

The objectives are as follows:

1. To design a web app for the reservation of appointments of clients
2. To provide clients with medical testing services at the comfort and convenience of their own houses with the help of the medical technologists and reliable affiliated laboratories. The system would be used to innovate the way of conducting medical testing by delivering it as fast and convenient to the clients.
3. To innovate the way of getting the medical results through email. The medical results would be sent to the email used by the users in verifying their accounts.
4. To accurately monitor the status of conduct of the medical testing and the release dates of the medical results sent to the clients’ email.

Method

System Development Methodology

This section consists of the steps conducted by the researchers with the purpose of developing the system. The researchers used Rapid Application Development (RAD). “Rapid Application Development is a development model which prioritizes rapid prototyping and quick feedback over long drawn out development and cycles” (KISSFLOW, 2018) . Using rapid application development, the developers can create several changes and updates to the software anytime. Rapid Application Development is separated into four stages and these are the following:

Phases of Agile Methodology

Requirements Planning

This stage consists of the data gathered from the meeting with the client’s segments. The researchers used interviews, and surveys. The researchers discussed user specifications which included the needs, scope and requirements of the system. During this phase the researchers interviewed the representatives from the laboratories in Angeles City and also the patients who experienced and were taking medical testing for annual and pre-employment physical exam.

The researchers used evaluation tool in the interviews that pointed out the problems in the existing condition of the chosen clients’ segments.

User design

This stage consists of the data regarding the interaction of the user to the system. The researchers also looked for an existing similar system interfaces that served as a guide in developing the system. The researchers complied with the clients' segments and developed a prototype / representation of the system processes and their desired input and output. The researchers were able to refine the system and made some changes based on the clients' design output.

Construction

This stage consists of the data regarding the system development and programming. The researchers took their attention in creating and developing the system based on the functionalities of the other system that the system needed and the interfaces satisfied the user/clients. The users continued to cooperate with the client's segments' suggestions for them to make changes to improve the system.

Cut over

In this stage, the researchers already tested and debugged the system. The desired output is being used in the present.

Results

Evaluation Results

This section consists of the results of the evaluation conducted by the researchers in order to know the verdicts and comments about the system of the IT experts, users and medical laboratories.

Table 1. Assessment Result of IT Experts

Criteria	Mean	Descriptive Rating	Rank
Functionality	4.67	Excellent	1
Performance Efficiency	4.33	Excellent	4
Compatibility	4.33	Excellent	4
Usability	4.44	Excellent	3
Reliability	4.58	Excellent	2
Security	4.33	Excellent	4
Maintainability	4.33	Excellent	4
Portability	4.22	Excellent	5
Overall Mean	4.41	Excellent	

Table 1 summarizes the result of the evaluation of the IT experts, which acquired an overall mean of 4.41. Functionality, which is how the system works or functions as a whole, got a mean of 4.67 which is equal to a rating of excellent. Performance efficiency, which represents the performance relative to the number of resources used under stated conditions, got a mean of 4.33 which is equal to a rating of excellent. Compatibility, which is a degree to which a product, system or component can exchange information with other products, systems or

components, and/or perform its required functions, while sharing the same hardware or software environment, got a mean of 4.33 which is equal to a rating of excellent. Usability got a mean of 4.44 which is equal to a rating of excellent. Reliability, which is the degree to which a system, product or component performs specified functions under specified conditions for a specified period of time, got a mean of 4.58 which is equal to a rating of excellent. Security got a mean of 4.33 which is equal to a rating of excellent. Maintainability, which represents the degree of effectiveness and efficiency with which a product or system can be modified to improve it, correct it or adapt it to changes in environment, and in requirements, got a mean 4.33 which is equal to a rating of excellent. Portability got a mean of 4.22 which is equal to a rating of excellent. And the overall mean got a mean is 4.41 which is equal to a rating of excellent.

Table 2. Assessment Result of representative of the Medical Laboratories

Criteria	Mean	Descriptive Rating	Rank
Functionality	4.65	Excellent	3
Reliability	4.43	Excellent	5
Usability	4.78	Excellent	1
Performance Efficiency	4.71	Excellent	2
Maintainability	4.57	Excellent	4
Portability	4.43	Excellent	5
Overall Mean	4.59	Excellent	

Table 2 summarizes the result of the evaluation of the medical laboratories' representatives, which acquired an overall mean of 4.59. Functionality, which is how the system works or functions as a whole, got a mean of 4.65 which is equal to a rating of excellent. Reliability, which is the degree to which a system, product or component performs specified functions under specified conditions for a specified period of time, got a mean of 4.43 which is equal to a rating of excellent. Usability got a mean of 4.78 which is equal to a rating of excellent. Performance efficiency, which represents the performance relative to the number of resources used under stated conditions, got a mean of 4.71 which is equal to a rating of excellent. Maintainability, which represents the degree of effectiveness and efficiency with which a product or system can be modified to improve it, correct it or adapt it to changes in environment, and in requirements, got a mean 4.57 which is equal to a rating of excellent. Portability got a mean of 4.43 which is equal to a rating excellent. And the overall mean is 4.59 which is equal to a rating of excellent.

Table 3. Assessment Result of BPO employees and service crews

Criteria	Mean	Descriptive Rating	Rank
Functionality	4.39	Excellent	3
Reliability	4.16	Very Good	5
Usability	4.51	Excellent	2
Performance Efficiency	4.30	Excellent	4
Maintainability	3.24	Very Good	6
Portability	4.58	Excellent	1
Overall Mean	4.20	Very Good	

Table 3 summarizes the result of the evaluation of BPO employees and service crews, which acquired an overall mean of 4.20. Functionality, which is how the system works or functions as a whole, got a mean of 4.39 which is equal to a rating of excellent. Reliability, which is the degree to which a system, product or component performs specified functions under specified conditions for a specified period of time, got a mean of 4.16 which is equal to a rating of very good. Usability got a mean of 4.51 which is equal to a rating of excellent. Performance efficiency, which represents the performance relative to the number of resources used under stated conditions, got a mean of 4.30 which is equal to a rating of excellent. Maintainability, which represents the degree of effectiveness and efficiency with which a product or system can be modified to improve it, correct it or adapt it to changes in environment, and in requirements, got a mean 3.24 which is equal to a rating of very good. Portability got a mean of 4.58 which is equal to a rating excellent. And the overall mean is 4.20 which is equal to a rating of very good.

Discussion

This chapter shows the summary of findings and conclusions that were drawn after analyzing the proposed study. Recommendations to improve the development of the proposed system were also shown in this chapter. Researchers were able to find out that the proposed system's main objectives were successfully achieved. Given an "excellent" rating from the users, laboratory representatives and IT experts, the system met the requirements of the proposed study.

Conclusion

Medical laboratories can now offer innovative way of providing medical testing services andhave interactions with their beloved clients. The objectives in the study helped to achieve the following:

1. The web app named as On Demand Medical Testing Home Service was developed for reservation of appointments.
2. "On demand medical testing home service" successfully helped the conduct medical testing in an innovative way because medical testing can now be conducted by reliable medical technologists and trusted affiliated laboratories at the clients' own home for their comfort and convenience.
3. With the help of the system, users and laboratories can now build and maintain harmonious relationship using the direct message feature. The laboratories can know the contact details of the users and be able to send medical results through the email used to verify their accounts in the system.
4. The clients can now monitor the status of the conduct of their medica testing view the status of the releasing dates of the medical results sent to their emails.

Based from the assessment made by the researchers, here are the features and modules for future work:

1. The researchers suggest to make the coverage of the web-based application wider and more accessible in every town and/or nationwide.
2. The researchers suggest to make a module that will not limit the services of any labs.
3. The researchers suggest to create a module for hiring process in choosing medical technologists.

4. The researchers suggest to create a mobile application for the development of the system.

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