Development of User Guide on Interactive Way-Finder and E-Notices System

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ABSTRACT

Time is everything and with people demanding everything to be faster with the little patient, working with old school conventional technology is losing out. The primary goals of this research are to understand the benefits of fast and easy access through the interactive touch screen way-finder. The Interactive Way-Finder and E-Notices on Display for University campus is a collaborative map locator using a touch screen monitor with kiosk, plotting schedule for the faculty and announcement display. The system is running smoothly, It is ready to be implemented and can be used by the beneficiary. A modified questionnaire was used to seek the needed data in evaluating the functionalities of the system. The criteria of evaluation of software quality were adapted in ISO/IEC 25010:2011.

Keywords: Announcement, interactive way finder, map locator, software engineering, schedule, wayfinding

1. INTRODUCTION

Gone are the days for talking to a stranger and ask for information in a university or school when people can access it right at their fingertips. The newness for the student and guest coming to school asking questions and inquiries, It's overwhelming, unproductive and might lead for asking a wrong person giving implausible instruction or some unexpected inquiries to any
offices that might disturb them from their works. The volume of old students, new enrollees and guests came to school for the need for inquiries, updates, prospectus, and requirements every trimester. The researchers created an interactive way-finder where all the concerns of the visitors and students can access information through the use of a touch screen monitor placed at the lobby of the school building.

The researchers used a touch screen monitor for the way-finder and other school concerns mentioned above. This will allow an old and new student, guests, employees, and administration to navigate, inquire and look for specific details concerning enrolment requirements, room schedule, professor schedule, and interactive map locator or a way-finder. Due to location and tracking concerns, the researchers develop interactive way-finder and e-notices on display to help students and employees catch what they are looking without the hassle of going to numerous offices inside the school premises.

The researchers fabricate system design electronic directories and bulletin board with a touch screen monitor. An interactive way-finder and e-notices on display placed conveniently at the lobby of the university. It will eliminate sudden requests and inquiries. Instead of going directly to the faculty, all the queries will be done at the lobby where the system is located. The student has easy access for their inquiries, schedules and school updates. New students and guests will help them locate rooms and offices right at their fingertips. All the concerns regarding inquiries for enrolment are within reach.

It will make a daily task at ease. It will help offices and faculty save time and effort. The system will be of great help to the students, new enrollees and guests. It will also reduce unexpected inquiries in the admission office, faculty, and registrar. It will be easy access for every individual inside the school premises. Admission icons will help users to have instant response for their concerns regarding enrolment and schedules. The system will be updated from time to time more specifically for the course offering every trimester like real-time announcements for school activities, enrolment schedule, exams and important pronouncement from the administration, faculty or the dean's office.

In the implementation of the touch screen monitor, the touch screen enables the user to interact directly with what is displayed, rather than using a mouse, touch pad, or other devices. Touch screen technology is the direct manipulation type of gesture-based technology. Direct manipulation is the ability to manipulate digital world inside a screen. A Touch screen is an electronic visual display capable of detecting and locating a touch over its display area.

According to [1, 42], the implementation of touch screen kiosks in airports started using the Automated Passport Control computer program. From doing the old school way of filling up immigration card and lining up at the customs when travelling, they switch for having them simply scan their passports and answer a few questions on a touch screen kiosk. O'Hare International Airport is the first U.S airport to start this trend.

Moreover, the new Mac Book Pro has the brightest, most colorful Mac notebook display ever and it features the Touch Bar — a Multi-Touch enabled strip of glass built into the keyboard for instant access to the tools you want, right when you want them [12, 14]. Mac Book Pro is built on groundbreaking ideas. The Touch Bar replaces the function keys that have long occupied the top of your keyboard with something much more versatile and capable [15, 17]. It changes automatically based on what you're doing to show you relevant tools you already know how to use — system controls like volume and brightness, interactive ways to adjust or browse through content, intelligent typing features like emoji and predictive text, and more and now touch ID is available on a Mac, enabling instant access to logins and fast, secure online
purchases with Apple Pay. The EARIST touch screen map locator theme showed that as people go beyond the modernization of the world, automation is in demand. More computers and gadgets are invented to make people lives easier and convenient. One of the useful materials that had been invented was a locator map [16]. But now a day's, locator map was upgraded and became a gadget like a touch screen map locator. Touch screen map locator is the combination of a locator map with the use of a touch screen monitor. The touch screen enables people to interact with what is displayed directly on the screen, where it is displayed rather than indirectly w/ a mouse or touchpad. The touch screen locator map will be more helpful to the people that need to know the location of one place to another [18, 19]. The EARIST touch screen map locator is a device where people can find the map of EARIST by using the touch screen monitor; people can select items on the screen by pointing to the location on a map by using their finger. The Way-finder System is how people find their way and it is an application of the common-sense approach, combines sign elements that help them reach their destination and will help who find themselves in unfamiliar places.

According to [4, 26, 29] that the first and true interactive digital way-finder in the Philippines can be found in Eastwood City. It is an 18-hectares township masterpiece and the most successful integrated township project that offers complete facilities, amenities, and establishments for living, working, playing, and shopping in the Philippines. Also known as Philippines' first cyber park, in line with its township masterpiece, Eastwood City has added Interactive Wayfinding Directory powered by whistone that's not only change how mall directory should be but also innovate how mall goers should interact with it. Combine with its dynamic design and intuitive user interface, Eastwood City's Interactive Digital Wayfinding Directory top the rest of its kind in the Philippines. Eastwood City's Interactive Wayfinding Directory content are very sharp and relevant. With its real-time and seamless content, it allows users to dive into areas important to them in a fun and easy way. Way-Finders or self-service kiosks contain interactive touch screens to enable guests and employees to browse through the ever-updated activities schedule on board and find their way around the ship [20, 21]. Royal Caribbean's Oasis and Allure of the Seas were the first ships to be fitted with LCD Way finders, while the technology has gradually been rolled out to the rest of their fleet The LCD Way-finder system was developed by Four Winds Interactive and won a number awards in 2011 for technological excellence including the ones from the Digital Screen Media Association and Hospitality Technology magazine [22, 23].

A touch screen digital Way-finders have been included on every new build since then and retrofitted on most of the fleet. Oasis cried out for digital Way-finders if only because of its size and scope. Big enough to house the residents of Aspen, Colo. – as well as everything needed to feed, refresh, entertain, protect, inform, pamper, clothe and adorn them – Oasis, its sister ships Allure of the Seas and Harmony of the Seas, and the similarly robust ships of the Quantum-class can challenge guests' sense of direction[24,25]. When Royal Caribbean hired Denver-based Four Winds Interactive to come up with Way-finders to help guests, well, find their way, it was to offer more options than getting directions to their staterooms on boarding day [26]. It's also broken out into a bunch of different venues. So, if the guests hit entertainment. It's going to show the guests, the list of all the entertainment venues. If the guests hit shops, it's going to give the guests a list of all the shops. Same goes for the guest services, medical facilities, the casino, dining rooms and more [27, 28]. When a selection is made from any of the categories, written directions come up and light shows the location of the destination on a map of the deck where it's found. Also included is a digital version of Royal Caribbean's
shipboard activities guide, Cruise Compass, an ink-on-paper handout that's updated daily [30, 31]. The digital version is updated whenever and as often as necessary, filling the screen with the day's up-to-the-minute schedule of events and activities at the touch of a finger.

Efficiency means a level of execution that portrays a procedure that uses the most minimal measure of contributions to make the best measure of yields [32, 33]. Productivity identifies with the utilization of all contributions for creating any given yield, including individual time and vitality. Productivity is a quantifiable idea that can be controlled by deciding the proportion of valuable yield to aggregate info. It minimizes the misuse of assets, for example, physical materials, vitality and time, while effectively accomplishing the craved yield [34, 35].

According to [7, 13, 36], a product procedure is "efficient" if, with respect to an option, it delivers an identical or better outcome at a lower cost in measuring software process efficiency, it should go throughout different testing according to the objective or target function of a specific software product that is developed.

Reliability refers to the repeatability of findings [38]. If the study were to be done a second time, would it yield the same results? If so, the data are reliable. If more than one person is observing behavior or some event, all observers should agree on what is being recorded in order to claim that the data are reliable. Reliability also applies to individual measures. When people take a vocabulary test two times, their scores on the two occasions should be very similar. If so, the test can then be described as reliable. To be reliable, an inventory measuring self-esteem should give the same result if given twice to the same person within a short period of time. IQ tests should not give different results over time (as intelligence is assumed to be a stable characteristic).

According to [8, 11, 39] Reliability is the key factor for credibility evaluation, which is defined as believability, trust, trustworthiness, accuracy, fairness, and objectivity, among others [2-4]. The reliability concept seems to be understood by many authors [5, 9] as one of the criteria that are composed of quality and credibility. If information reliability depends on user evaluation [6, 10, 40], there is no way to guarantee that such information will be reliable outside its current context, especially when it is not utilized. However, there are indicators of information sources and publication contents that may help the researcher in the search and discovery processes. The indicators of scientific information reliability may include two elements: the information sources that contain scientific publications; and the content of each publication recovered.

An initial stage of bibliographic searching is the identification of those information sources that are found to be adequate publications for the research. Once the searching process is finalized, analysis and filtering of retrieved publications begin. In both of these stages, the reliability analysis is a criterion for the achievement of effective results, and the use of reliable sources during the search anticipates the quality of the publications retrieved. Three processes are necessary to obtain reliable information: comprehending and utilizing criteria to determine information quality – the bibliometric indicators; carefully selecting and evaluating information sources to be searched, and analyzing the publication contents before including them in the research [40, 41].

This study covers the navigation of the school map from underground up to the last floor of the building. Viewing and navigating of the school premises, course offerings for the current school year or one calendar year, schedules by subjects, professors and room assignments. Furthermore, the system will have an updated announcement from the faculty and a real-time course offering system. The professors can track and plot their schedules by accessing the
administration account and they can have it printed as well. The system only requires a touch screen monitor with a kiosk at the lobby and a synchronized monitor at the faculty for the real-time updates and announcements.

Furthermore, this study will help the faculty and staffs lessened direct inquiries from students and guests. At the same time, the faculty can plot and print their schedule as well. It will help the students to have a smooth transaction in terms of course offering, enrolment concerns, exams, schedules, and announced activities. In this technology, the administration department has the power to access to read and modify the system.

2. PROJECT DEVELOPMENT

The researchers made use of waterfall model to develop the wayfinding system application software because it gave the researchers an easy overview of the software based on the required specifications, and to present the general flow on the development of the software application.

![Figure 1. The Modified Waterfall Model](image)

Waterfall approach was first SDLC Model to be used widely in Software Engineering to ensure success of the project. In "The Waterfall" approach, the whole process of software development is divided into separate phases. In this Waterfall model shown in Figure 1, the outcome of one phase acts as the input for the next phase sequentially.

2.1. Design

All possible requirements of the system to be developed are captured in this phase and documented in a requirement specification document. The researchers studied on how the application should work, and how to develop and implement the engine, which is the vital part
of the application. The researchers gathered all the information needed to provide data which would be needed in the development of an Interactive Way-Finder and E-Notices on Display. To come up with this stage, the researchers choose important information and materials in preparing for the design, in which it visualizes the output of a system application. The requirement specifications from the first phase are studied in this phase and the system design is prepared. This system design helps in specifying hardware and system requirements and helps in defining the overall system architecture. The researchers decided to develop an Interactive Way-Finder and E-Notices on Display by creating a minimalistic and simple design of the interface that is easy to comprehend and use while considering the efficiency and performance of the engine. This also includes the other concept and themes to be implemented. The data flow diagram is shown in Figure 2 while Figure 3 shows the process map of interactive way-finder and e-notices on display.

![Data Flow Diagram](image)

**Figure 2.** Data Flow Diagram

### 2.2. Coding

It is the actual implementation of the software’s framework in the program code. It is the part where the researcher put all ideas and resources gathered to make the software into completion.

The researchers implement high-quality images for the interface and coding a unique set of algorithms to maintain the efficiency and fast performance of the application. Figure 4 shows the codes for the administration, professors and admissions of interactive way-finder and e-notices on display for AMA Makati.

-368-
Figure 3. Process Map
2.3. Verification and Testing

The third phase is the testing and evaluation. To check the consistency and performance of the application, the researchers constantly conducted a test. Several testers were employed to test the application to see if there are errors in the application that the researcher had overlooked. All units developed in the implementation phase were integrated into a system after testing of each unit. Post-integration the entire system was tested for any faults and failures. As shown in Figure 5, the images displayed are the sample output and interface of interactive way-finder and e-notices on display for AMA Makati.

2.4. Deployment of System

The fourth phase is the deployment once the functional and non-functional testing is done; the product is deployed in the customer environment or released into the market.

3. METHODOLOGY

The study used the developmental and descriptive research method to obtain information concerning the development of Interactive Way-Finder and E-notices on Display for AMA Makati. The intent of the descriptive research is to produce statistics about the aspects of the development of using this method, the specific problems raised in the study and their determinants were verified.

Developmental research, as opposed to simple instructional development, has been defined as the systematic study of designing, developing, and evaluating instructional programs, processes, and products that must meet criteria of internal consistency and effectiveness.
The researchers used the Modified Waterfall Model in developing the system. The modified waterfall model is a sequential design process used in software development processes in which it is flowing steadily following downwards like a waterfall through the following phases: Requirements, Design and Architecture, Development and Coding, Quality Assurance and Software Testing, Implementation, and Maintenance.

The only difference between this in pure waterfall model is, it allows the researchers to overlaps in the phases. The proponents can also go back in their recent phases. This model is...
very effective in once a system that is for only small projects but need to have more changes in the system. In this model, you can change what you have done in some phases that need to edit as layout and coding. It helps reduce erroneous process.

The researchers used a simple random sampling technique for students and employees because each member of the subset carries an equal opportunity of being chosen as a part of the sampling process. Thirty (30) employees and Two Hundred Ninety-One (291) students of AMA Makati were randomly selected to participate in the study.

An adopted instrument was utilized to get the assessment of the respondents pertaining to the development of an Interactive Way-Finder and E-Notices on Display for AMA Makati. The instrument contains the name (optional), age, sex, and nationality. Moreover, it includes questions to measure respondents’ assessment on the development of an Interactive Way-Finder and E-Notices on Display for AMA Makati in terms of functionality, efficiency, compatibility, usability, reliability, portability, and security.

To investigate the respondent’s perceptions about the development of an Interactive Way-Finder and E-Notices on Display for AMA Makati, the questionnaire was administered to students and employees. The questionnaire was focused on the respondents’ assessment on the development of an Interactive Way-Finder and E-Notices on Display for AMA Makati. In the questionnaire, the Likert scale was used to determine the level of acceptability. The researchers assured confidentially of their survey sheets since the identities are not important. The researchers also understood that people’s consciousness may also affect their honesty and effectiveness in answering the survey. Thus, the researcher gave people the option of being anonymous.

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4. RESULTS AND DISCUSSIONS

The researchers evaluated the game based on the Software Quality ISO Standard and with the sub-characteristics. The evaluation is divided into 5 categories: Strongly Agree (SA), Agree (A), Moderately Agree (MA), Disagree (D), and Strongly Disagree (SD).

4.1. Mean Responses on Level of Agreeableness by Functionality

Table 1 shows that the employees’ average mean is 4.35 and the students’ average mean is 4.44 which are both verbally interpreted as “Agree.” This implies that Interactive Way-Finder and E-Notices on Display for AMA Makati System in terms of functionality was complete, correct and appropriate. The data interpreted that the user obtains efficiency at the specified tasks provided by the application.

Table 1. Level of Agreeableness by Functionality

<table>
<thead>
<tr>
<th>Interactive Way-Finder and E-Notices on Display for AMA Makati</th>
<th>Students</th>
<th>Verbal Interpretation</th>
<th>Employees</th>
<th>Verbal Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional Completeness</td>
<td>4.33</td>
<td>Agree</td>
<td>4.43</td>
<td>Agree</td>
</tr>
<tr>
<td>Functional Correctness</td>
<td>4.40</td>
<td>Agree</td>
<td>4.33</td>
<td>Agree</td>
</tr>
<tr>
<td>Functional Appropriateness</td>
<td>4.33</td>
<td>Agree</td>
<td>4.57</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Overall</td>
<td>4.35</td>
<td>Agree</td>
<td>4.44</td>
<td>Agree</td>
</tr>
</tbody>
</table>

4.2. Mean Responses on Level of Agreeableness by Efficiency

Table 2 shows the assessment of the students and employees in the development of an interactive way-finder and e-notices on display for AMA Makati in terms of efficiency.

The results of the assessment showed that the employees’ average mean is 4.60 and the students’ average mean is 4.58 which are both verbally interpreted as “Strongly Agree.” This indicates that Interactive Way-Finder and E-Notices on Display for AMA Makati System in terms of efficiency meets its functions and requirements when performing. The data interpreted that the user obtains the degree of time behavior and capacity and performance proficiency at the specified tasks provided by the application.
Table 2. Level of Agreeableness by Efficiency

<table>
<thead>
<tr>
<th>Interactive Way-Finder and E-Notices on Display for AMA Makati</th>
<th>Students Weighted Mean</th>
<th>Verbal Interpretation</th>
<th>Employees Weighted Mean</th>
<th>Verbal Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Efficiency</td>
<td>4.67</td>
<td>Strongly Agree</td>
<td>4.63</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Time Behavior</td>
<td>4.53</td>
<td>Strongly Agree</td>
<td>4.60</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Capacity</td>
<td>4.60</td>
<td>Strongly Agree</td>
<td>4.52</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Overall</td>
<td>4.60</td>
<td>Strongly Agree</td>
<td>4.58</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

4.3. Mean Responses on Level of Agreeableness by Compatibility

Table 3 shows the assessment of the students and employees in the development of an interactive way-finder and e-notices on display for AMA Makati in terms of compatibility.

The results of the assessment showed that the employees’ average mean is 4.38 and the students’ average mean is 4.44 which are both verbally interpreted as “Agree.” This indicates that Interactive Way-Finder and E-Notices on Display for AMA Makati System in terms of compatibility can exchange information and performs required functions while sharing a common environment. The data interpreted that the user obtains the degree of Exchangeability, co-existence, and interoperability at the specified tasks provided by the application.

Table 3. Level of Agreeableness by Compatibility

<table>
<thead>
<tr>
<th>Interactive Way-Finder and E-Notices on Display for AMA Makati</th>
<th>Students Weighted Mean</th>
<th>Verbal Interpretation</th>
<th>Employees Weighted Mean</th>
<th>Verbal Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchangeability</td>
<td>4.20</td>
<td>Agree</td>
<td>4.33</td>
<td>Agree</td>
</tr>
<tr>
<td>Co-existence</td>
<td>4.40</td>
<td>Agree</td>
<td>4.43</td>
<td>Agree</td>
</tr>
<tr>
<td>Inter-Operability</td>
<td>4.53</td>
<td>Strongly Agree</td>
<td>4.55</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Overall</td>
<td>4.38</td>
<td>Agree</td>
<td>4.44</td>
<td>Agree</td>
</tr>
</tbody>
</table>
4. 4. Mean Responses on Level of Agreeableness by Usability

Table 4 shows that the assessment of the students and employees in the development of an interactive way-finder and e-notices on display for AMA Makati in terms of usability.

The results of the assessment showed that the employees’ average mean is 4.73 and the students’ average mean is 4.62 which are both verbally interpreted as “Strongly Agree.” This indicates that Interactive Way-Finder and E-Notices on Display for AMA Makati System in terms of usability are workable and has a pleasing interaction to the user. The data interpreted that the user obtains the degree of operability, user interface aesthetics, and accessible at the specified tasks provided by the application.

**Table 4. Level of Agreeableness by Usability**

<table>
<thead>
<tr>
<th>Interactive Way-Finder and E-Notices on Display for AMA Makati</th>
<th>Students</th>
<th>Verbal Interpretation</th>
<th>Employees</th>
<th>Verbal Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weighted Mean</td>
<td></td>
<td>Weighted Mean</td>
<td></td>
</tr>
<tr>
<td>Operability</td>
<td>4.87</td>
<td>Strongly Agree</td>
<td>4.60</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>User interface aesthetics</td>
<td>4.67</td>
<td>Strongly Agree</td>
<td>4.63</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Accessibility</td>
<td>4.67</td>
<td>Strongly Agree</td>
<td>4.64</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Overall</td>
<td>4.73</td>
<td>Strongly Agree</td>
<td>4.62</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

4. 5. Mean Responses on Level of Agreeableness by Reliability

Table 5 shows that the assessment of the students and employees in the development of an interactive way-finder and e-notices on display for AMA Makati in terms of reliability.

The results of the assessment showed that the employees’ average mean is 4.44 which is verbally interpreted as “Agree” and the students’ average mean is 4.54 which is verbally interpreted as “Strongly Agree.”

This indicates that Interactive Way-Finder and E-Notices on Display for AMA Makati System in terms of reliability are manageable, can retrieve data, and error leniency. The data interpreted that the user obtains the degree of availability, recoverability and fault tolerance, at the specified tasks provided by the application.

4. 6. Mean Responses on Level of Agreeableness by Portability

Table 6 shows that the assessment of the employees’ average mean is 4.51 and the students’ average mean is 4.53 which are both verbally interpreted as “Strongly Agree.” This indicates that Interactive Way-Finder and E-Notices on Display for AMA Makati System in
terms of portability are compliant, interchangeable, effective and efficient in installing/uninstalling in a specified environment. The data interpreted that the user obtains the degree of adaptability, installability, and replaceability at the specified tasks provided by the application.

Table 5. Level of Agreeableness by Reliability

<table>
<thead>
<tr>
<th>Interactive Way-Finder and E-Notices on Display for AMA Makati</th>
<th>Students</th>
<th>Verbal Interpretation</th>
<th>Employees</th>
<th>Verbal Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability</td>
<td>4.53</td>
<td>Strongly Agree</td>
<td>4.53</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Fault tolerance</td>
<td>4.47</td>
<td>Agree</td>
<td>4.51</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Recoverability</td>
<td>4.33</td>
<td>Agree</td>
<td>4.58</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Overall</td>
<td>4.44</td>
<td>Agree</td>
<td>4.54</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

Table 6. Level of Agreeableness by Portability

<table>
<thead>
<tr>
<th>Interactive Way-Finder and E-Notices on Display for AMA Makati</th>
<th>Students</th>
<th>Verbal Interpretation</th>
<th>Employees</th>
<th>Verbal Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adaptability</td>
<td>4.53</td>
<td>Strongly Agree</td>
<td>4.57</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Installability</td>
<td>4.53</td>
<td>Strongly Agree</td>
<td>4.46</td>
<td>Agree</td>
</tr>
<tr>
<td>Replaceability</td>
<td>4.47</td>
<td>Agree</td>
<td>4.46</td>
<td>Agree</td>
</tr>
<tr>
<td>Overall</td>
<td>4.51</td>
<td>Strongly Agree</td>
<td>4.53</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>
4. 7. Mean Responses on Level of Agreeableness by Security

Table 7 shows that the assessment of the students and employees in the development of an interactive way-finder and e-notices on display for AMA Makati in terms of security.

The results of the assessment showed that the employees’ average mean is 4.49 which is verbally interpreted as “Agree” and the students’ average mean is 4.60 which is verbally interpreted as “Strongly Agree.” This indicates that Interactive Way-Finder and E-Notices on Display for AMA Makati System in terms of security are secrecy obedient, veracity and reliability. The data interpreted that the user obtains the degree of confidentiality, integrity and the authenticity of the system at the specified tasks provided by the application.

Table 7. Level of Agreeableness by Security

<table>
<thead>
<tr>
<th>Interactive Way-Finder and E-Notices on Display for AMA Makati</th>
<th>Students</th>
<th>Verbal Interpretation</th>
<th>Employees</th>
<th>Verbal Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidentiality</td>
<td>4.47</td>
<td>Agree</td>
<td>4.43</td>
<td>Agree</td>
</tr>
<tr>
<td>Integrity</td>
<td>4.47</td>
<td>Agree</td>
<td>4.43</td>
<td>Agree</td>
</tr>
<tr>
<td>Authenticity</td>
<td>4.53</td>
<td>Strongly Agree</td>
<td>4.95</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Overall</td>
<td>4.49</td>
<td>Agree</td>
<td>4.60</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

4. 8. Mean Responses on Overall Level of Agreeableness

Table 8. Overall Level of Agreeableness

<table>
<thead>
<tr>
<th>Interactive Way-Finder and E-Notices on Display for AMA Makati</th>
<th>Students</th>
<th>Verbal Interpretation</th>
<th>Employees (Acad/Non-Acad)</th>
<th>Verbal Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functionality</td>
<td>4.35</td>
<td>Agree</td>
<td>4.44</td>
<td>Agree</td>
</tr>
<tr>
<td>Efficiency</td>
<td>4.60</td>
<td>Strongly Agree</td>
<td>4.58</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Compatibility</td>
<td>4.38</td>
<td>Agree</td>
<td>4.44</td>
<td>Agree</td>
</tr>
</tbody>
</table>
Table 8 shows that the overall weighted mean of 4.50 and 4.53 verbally interpreted as “Strongly Agree” in between the assessments of the students and employees that the interactive way-finder and e-notices on display for AMA Makati is Functional, Efficient, Compatible, Usable, Reliable, Portable and Secured.

This means that the aforementioned application meets the user goals in which the application can perform the specified task under specified conditions. Also, this means that that application works normally and not to its full extent of use.

4.9. Significant Differences in the Assessment of the Interactive Way-Finder and E-Notices on Display

Table 9 shows the test for differences in the Assessment of the Interactive Way-Finder and E-Notices on Display for AMA Makati between two groups of respondents. It is found out that in functionality, the mean of the students which is 4.35 is greater than the mean of employee which is 4.44 with their $z$-test value of -1.238.

Next is the Efficiency with the mean of 4.60 for the students who are greater compared to the mean of 4.58 for the employees with their $z$-test value of 0.386.

For the compatibility, the mean of students which is 4.38 is lower compared to the mean of employees which is 4.44 with their $z$-test value of -0.515.

**Table 9. Significant Differences in the Assessment of the Interactive Way-Finder and E-Notices on Display**

<table>
<thead>
<tr>
<th>Interactive Way-Finder and E-Notices on Display for AMA Makati</th>
<th>Students</th>
<th>Employees (Acad/Non-Acad)</th>
<th>$z$-test Value</th>
<th>Verbal Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functionality</td>
<td>4.35</td>
<td>4.44</td>
<td>-1.238</td>
<td>Not Significant ($p = 0.2196$)</td>
</tr>
<tr>
<td>Efficiency</td>
<td>4.60</td>
<td>4.58</td>
<td>0.386</td>
<td>Not Significant ($p = 0.6994$)</td>
</tr>
</tbody>
</table>
In usability, the mean of the students is 4.73 while the mean of employees is 4.62 with z-test value of -1.625. In reliability, the means and z-test value of students and employees are 4.44, 4.54 and -1.597 respectively. In portability, the mean of 4.51 for the students is lesser compared to the mean of 4.53 for employees with a z-test value -0.485. Variable such as security, the means and z-test value of students and employees are 4.49, 4.60 and -0.6287 respectively. The z-test conducted for the responses of these groups revealed that the computed z-values are less than the critical z values of 1.966, and the p-values obtained for the five characteristics are more than 0.05. The result reveals that there is no significant difference in the assessment of the students and employees of the interactive way-finder and e-notices on display for AMA Makati in terms of Functionality, Efficiency, Compatibility, Reliability, Portability, and Security.

4.10. Threats Encountered by the Respondents Using the Developed Way-Finder and E-Notices on Display

Based on the interview of the researcher with the students and employees the problems encountered in utilizing the way-finder system are the following:

Most of the respondents who utilized the way-finder system find it uncomplicated. There is only (1) time that the respondents started to use the way-finder system finds it plain and basic. Majority of the respondents who utilized the way-finder system completed the navigation of the map and inquiries regarding course offered. There is only one (1) time that the user started to use course offered section and finds the display too wide because all the elements are present. Generally, the respondents who utilized the way-finder system stated that the subjects under course offering and course offered are reliable and accurate. There is only one (1) time that the user stated that the details are not updated. Based on the interview and survey that had been answered by the end-user the way-finder and e-notices on display is effective at all times, most of the end-user encountered problems are due to old files encoded during the coding of the system. Based on the data obtained that the functional correctness reveals “Agree” this data refers to the input-output behavior of the algorithm for each input it produces the expected output.
5. CONCLUSIONS AND RECOMMENDATIONS

In light of the findings of the study, the following conclusions were drawn:

1) The stages in the development of an interactive way-finder and e-notices on display for AMA Makati are data gathering, design strategy, coding, verification and testing, and deployment of the system.

2) The students and employees assessment on the development of an interactive way-finder and e-notices on display for AMA Makati was “Strongly Agree”. This means that the respondents accepted the overall performance of the aforementioned way-finder system.

3) There is no significant difference between the assessments of the students and employees in terms of the aforementioned variables based on the results of their z values and p values.

4) One of the problems encountered by the foreign students and language faculty deals with the interface and course offering details because the researcher used old files from the admission.

5) A user’s manual is a very important part of any system or software product because it will serve as a guideline or instruction for every end user of a specified software, specifically, an interactive way-finder and e-notices on display for AMA Makati.

With the results, discussions and the conclusion of the study as the basis, the following are recommended:

1) The application can be developed under different stages and integrated development environment to enhance performance, available function and can run in other mobile operating systems (platform) such as; iOS (apple), and Windows.

2) Interactive way-finder and e-notices on display for AMA Makati can be modified to have more enhanced features and design, as well as improving the directories, professor’s schedule and the school map. Faculty and/or admin can edit, delete and modify their latest schedules and room assignments upon logging-in to the admin icon. We recommend it to our beneficiary and future developer.

6. USER’S MANUAL DEVELOPED ON THE INTERACTIVE WAY-FINDER AND E-NOTICES ON DISPLAY

6. 1. Technical Background

Based on the interview of the researcher with the students and employees the problems encountered in utilizing the way-finder system are the following. The proposed project entitled, An Interactive Way-Finder and E-Notices System, is a local web-based application. This software provides the facility for inquiries, rooms and professors schedule, course offering, a course offered for the current trimester and a map locator. The system will be beneficial to both student and employees. Inquiries and school concerns can access fast right at their fingertips. The software is made to work is functional, efficient, compatible, usable, reliable, portable and secured. This means that the aforementioned application meets the user goals in which the application can perform the specified task under specified conditions. Also, this means that that application works normally and not to its full extent of use
6. 2. Simulation

The researchers used the Modified Waterfall Model for the development of the software. Waterfall approach was first SDLC Model to be used widely in Software Engineering to ensure the success of the project. In "The Waterfall" approach, the whole process of software development is divided into separate phases. In this Waterfall model, typically, the outcome of one phase acts as the input for the next phase sequentially. These are the stages undertaken in developing An Interactive Way-Finder and E-Notices.

6. 2. 1. Design

This system design helps in specifying hardware and system requirements and helps in defining the overall system architecture. The researcher decided to develop an Interactive Way-Finder and E-Notices on Display for AMA Makati, by creating a minimalistic and simple design of the interface that is easy to comprehend and use while considering the efficiency and performance of the engine. This also includes the other concept and themes to be implemented.

6. 2. 2. Brainstorming and Planning

All possible requirements of the system to be developed are captured in this phase and documented in a requirement specification document. The researchers researched on how the application should work, and how to develop and implement the engine, which is the vital part of the application. The researcher gathered all the information needed to provide a data which would be needed in the development of an Interactive Way-Finder and E-Notices on Display. Every researcher is encouraged to think aloud and suggest as many ideas as possible and the planning on how to gather data and requirements that are needed to achieve their desired goals. To come up with this stage, the researcher chooses important information and materials in preparing for the design, in which it visualizes the output of a system application. The requirement specifications from the first phase are studied in this phase and the system design is prepared.

6. 2. 3. Requirements Analysis

This phase entails the gathering of requirements from the previous and current users of the system in the process of researching, reading journals and articles, and as well as the help of the related literature and studies that the researchers gathered online.

6. 2. 4. System Analysis and Designs

It is the actual implementation of the software’s framework in the program code. It is the part where the researcher put all ideas and resources gathered to make the software into completion. The researchers implement high-quality images for the interface and coding a unique set of algorithms to maintain the efficiency and fast performance of the application. The requirement specifications are studied in this phase and the system design is conducted. The researchers studied and analyzed some of the previous and existing systems for the best results of their proposed project. All the scope and limitations of the proposed system are analyzed and improved upon. Different design tools are being used for this project, including Visual Studio 2010, VB.Net, PHP, and MySQL. The proponents were designed the data structure based on the system requirements.
Main Menu.

this icon is for the directories.

Upon selecting directories button, you can view the list of the rooms and offices. Or type the desired location in the textbox.

click this to return to the menu

Select this icon for the professor’s schedule.

Select and click from the list by highlighting the button of professors you are looking for.

Once the professor’s name is selected, the summary of their room schedule will
6. 2. 5. Implementation and Testing

In this step, testing and evaluation are performed. The proponents used Visual Studio 2010 for the graphical user interface. VB.Net and MySQL are used in designing a robust database and PHP for the application logic which enables communication between the front-end and the backend of the system. To check the consistency and performance of the application, the researcher constantly does a test to make sure that the application is free from errors. All units developed in the implementation phase are integrated into a system after testing of each unit. Post-integration the entire system is tested for any faults and failures.

6. 2. 6. Deployment

Once the functional and non-functional testing is done, the system is ready to deploy to the beneficiary. This stage involves training of the assigned officials that will be given the privilege of operating the system, populating the database with existing records, and converting such data.

6. 2. 7. Maintenance

Make sure that the system will continue to accomplish the task acquired. This includes checking for bugs and errors and ensuring that the entire system is working properly.
The Professors can edit their schedule by clicking the Admin. Just key in the correct password to update or modify their schedule.

Once successfully log-in, the professors can now add, edit or modify their schedule. They can either remove schedule to delete or save button to save it to the database.

Select the desired button.

Click this and the admission menu will appear.
Course Offered: the list of the courses offered for 1st, 2nd & 3rd trimester for the current School Year.
Course Offering: the list of subjects open for enrollment for 1st, 2nd & 3rd trimester for the current School Year.

Under the New Student button, the requirements for the new enrollees and transferees will display.

Repeat this procedure to other button to see the details and information of inquiries needed.

Click this icon to show the mission, vision and about the school.
Used Researchers rs, Guest and Employees - these users can view the interactive map for the rooms, professors schedule, a course offered, course offering and requirements for enrolment. Admin - the admin will be the one that can view and modify all the details on the system. The admin is the one who can post updated details and announcements regarding school concerns.

Based on the interview of the researcher with the students and employees the problems encountered in utilizing the way-finder system are the following. The proposed project entitled, An Interactive Way-Finder and E-Notices System, is a local web-based application. This software provides the facility for inquiries, rooms and professors schedule, course offering, a course offered for the current trimester and a map locator. The system will be beneficial to both student and employees. Inquiries and school concerns can access fast right at their
References


