The Seybold Report

ISSN 1533-9211

DOI 10.5281/zenodo.6656095

DEVELOPMENT AND EVALUATION OF AN APP-BASED ALUMNI TRACER SYSTEM WITH STATISTICAL SUPPORT

JENNY ROSE V. WENCESLAO

College of Information and Computing Studies, Northern Iloilo State University, Estancia, Iloilo, Philippines. Email: wenceslao.jennyrose19@gmail.com

Abstract

The App-based Alumni Tracer System with Statistical Support was specifically developed for the purpose of bridging the gap between alumni and the schools with the use of a computer-based solution employing web and mobile technologies. Specifically, it sought determine the level of usability and acceptability among school officials and alumni as users. Moreover, it also evaluated the performance of the developed system in terms of time behaviour and accessibility. This study employed the descriptive research design. The data were gathered through a survey questionnaire that primarily solicited the perception of respondents about the various functionalities of the developed system using the McCall's Software Evaluation Criteria for Software Quality Model and the ISO/IEC 25010 Software Characteristics. There were a total of 87 respondents comprising of five experts in the field of information technology, alumni affairs director, ten department chairpersons and sixty-six alumni respondents from the BSCS program of batches 2015 and 2016. The Waterfall Model was used in the Software Development Life Cycle. Moreover, the mean statistic was used to interpret the results. The finding revealed that in terms of reliability and learn ability, the developed system gained a verbally interpretation of "Very Good". It was easy to learn because of its simple interface design due to its interactive user design. Moreover, the usability and acceptability of the developed system yielded a description of "Very Good" which meant that the system was very usable in terms of monitoring the alumni. The speed of transaction and security of data of Android-based Alumni Tracer with Statistical Support has been described as "Very Good". Monitoring on the status and whereabouts of alumni was efficiently fast. It was able to meet user requirements through its various functional components and provided accurate results with good level of precision.

Keywords: alumni tracer, app-based system, waterfall model, McCall's, ISO/IEC 25010

1. Introduction

Higher educational institutions are the source of manpower in any industry. Many graduates from colleges and universities go directly to the labour market for employment. Therefore, it is imperative for any academic institution to prepare their students towards that goal. Thus, a strong feedback mechanism should be in place so that school administrators can always revisit existing curricula to meet the requirements of the industry.

One of the valuable tools that higher educational institutions used to gauge the significance of their program offerings is the alumni tracer. The alumni are considered as the best evidence of a program's effectiveness in terms of employment and positions held. Moreover, they are a good source of feedback regarding the program's relevance in the current labour market [1]. Thus, a tracer study is an approach that enables higher education institutions to obtain information about possible deficiencies in the educational process and the learning process and can form the basis for planning activities for the improvement in the future [2]. If done

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.6656095

objectively, the results of a tracer study can be used by colleges and universities to ascertain that the educational processes they provided to their students are effective and successful.

The conduct of an alumni tracer study can build strong bonds between the Alma Mater and the ever-increasing graduates. There are two obvious reasons for doing such an initiative. First, the alumni are the rich source of feedback for improvements in the course curriculum, teaching, research, extension, and networking. Secondly, the tracer study helps to measure the extent of professional and academic careers pursued by the graduates after gaining knowledge and skill through academic institutions.

However, conducting a tracer study can be challenging. Higher educational institutions had tried to find the whereabouts of their graduates, but the results are still not satisfactory. They have done several ways to perform tracer study, among other things, to distribute questionnaires by mail, e-mail, mailing lists, graduation, graduate meetings, and others [3]. To some extent, the address and other contact details left by the students prior to their graduation were often different from the ones they are currently using. The use of paper questionnaire or telephone interview is no longer efficient and does not anymore meet the needs of time.

Tracer studies come in various forms and the kind of technology being employed. In [4] [5], they employed the use of web-based technologies in the design and development of their respective alumni tracer systems. HTML, PHP, XAMPP, CSS, Javascripts and Laravel were among the tools used in those systems. Aside from web technologies, [6] added Global Positioning System in order to locate the graduates using coordinates.

On the other hand, [7] [8] [9] [10] made use of the popular social media platforms. These included the use of Face book, Google Forms and email services in order to get the responses from their alumni.

In 2020, around 72.1% of the population in the Philippines used a Smartphone and an estimated 77.1% by 2025 [11]. The majority of Smartphone devices run on Android operating system. In fact, as of June 2021 Android held a share of 87.59% of the mobile operating system market in the Philippines [12]. Therefore, it should be logical that development of information systems that targeted young Filipinos such as alumni from colleges and universities be implemented in Android-based mobile devices as these are the preferred gadget owned by them.

The Office of the Alumni Affairs (OAA) at Northern Iloilo Polytechnic State College in Estancia, Iloilo is currently using a manual-based system for tracing the status of the NIPSC graduates. With this method, alumni information was very hard to update and consolidate. Since one of the recommendations for programs accreditation was to establish an alumni tracer tool, the OAA needs to have a better system than the existing pencil and paper method. Developing a modern, reliable and timely alumni tracer that would run in App-based devices would bridge the gap between the alumni and the institution. Hence, data would be organized properly and dissemination of information would be easier and faster.

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.6656095

Objectives of the Study

The Android-based Alumni Tracer with Statistical Support is a system designed to find NIPSC alumni anywhere in the globe. The system paved the way to communicate with the graduates and to know more about their experiences and careers after school. Hence, the primary purpose of developing this alumni tracer was to find the NIPSC alumni and solicit relevant information from them and secondly, for the school to use their records during evaluation and related activities.

Specifically, it sought to:

1. develop an information system that combined the web and mobile technologies that is reliable and easy to learn for NIPSC personnel and alumni;
2. determine the level of usability of the App-based Alumni Tracer with Statistical Support as perceived by NIPSC personnel and alumni; and
3. evaluate the performance of the App-based Alumni Tracer with Statistical Support in terms of time behaviour and accessibility of the information provided to clienteles.

2. Research Methods and Materials

2.1 Research Design

In the conduct of this study, the descriptive research design was used. Descriptive research involves the description, recording, analysis and interpretation of the present nature, composition or processes of phenomena which focuses on prevailing conditions, or how a person, group or thing behaves or functions in the present [13]. More so, the Waterfall model was used in the development of the system prototype.

2.2 Participants of the Study

The participants of this study were 82 respondents who were requested to use the system prototype and subsequently asked to answer a survey questionnaire. They included five (5) respondents of an expert group, one (1) Director of the Office of the Alumni Affairs, 10 randomly selected Department Chairpersons, and 66 conveniently sampled alumni from the Bachelor of Science in Computer Science batches 2015 and 2016.

The expert group were composed of Information Technology teachers from the Institute of Information and Computer Studies at NIPSC Main Campus. There were considered as experts as they have done system development themselves were familiar with the processes. The Department Chairpersons were also directly involved in tracing the alumni from their respective academic programs. The alumni-respondents were the ones that the researcher was able to reach and were available to participate in this study. Table 1 shows the distribution of respondents.

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.6656095

Table1. Distribution of Respondents of the Study

Evaluators	N	%
Expert Group	5	6.10
Director, OAA	1	1.21
Department Chairpersons	10	12.20
Alumni	66	80.49
Total	82	100.00

2.3 Data Gathering Procedure

The researcher reached the alumni thru the social networking site Facebook™ or thru their mobile numbers. For the expert evaluators, OAA Director and Department Chairpersons, the research personally approached them and requested to participate in the study. A walk-through on the operations of the system prototype was demonstrated to them. The respondents were then requested to download the Android app from the Google Playstore and were asked to use it accordingly. Finally, they were invited to rate the system prototype to determine its usability and acceptability, reliability and learnability, and performance.

Two leading industry standard questionnaires were used. These are the McCall's Software Evaluation Criteria for Software Quality Model and the ISO/IEC 25010 software characteristics. The McCall's Software Quality Model [14] questionnaire was intended for the expert group while the ISO/IEC 25010 [15] questionnaire was distributed to the other respondents. A 5-point Likert scale comprising of 1 as Poor and 5 as Very Good was used the developed system prototype. Table 2 shows the descriptive interpretation for the computed mean.

Table2. Descriptive Interpretation for the Computed Mean

Mean Score	Verbal Description
4.21 – 5.00	Very Good
3.41 – 4.20	Good
2.61 – 3.40	Average
1.81 – 2.60	Fair
1.00 – 1.80	Poor

2.4 Construction of the System Prototype

In the construction of the system prototype, the server-side component was a web-based system done in PHP5 scripting language. The PHP is an industry standard programming language of choice by many web developers because is it easily implementable, high performance, very scalable and easy to install. Running the system in a server environment also required Apache web application and MySQL for database management. On the client side, the app-based system employed Android technology which was done using Java

ISSN 1533-9211

DOI 10.5281/zenodo.6656095

programming language. Furthermore, subscription to online SMS gateway to facilitate SMS bulk services was also made.

The System Administrator's (SysAdmin) Main Page

After a successful login using a valid username and password, the system would redirect SysAdmin to the Main Page. This page is a web-based interface which would allow the SysAdmin to have an overall control on the operations and monitoring of alumni that were registered into the system. An important component was the statistical data that showed the employment status of registered alumni as well as whether their jobs were in line with their field of specialization. Other prominent components included a listing of registered alumni which could be accessed using the Alumni button, announcements by clicking the Announcement button and upcoming events thru the Events button which were all found in the left pane of the screen. The operations in this page was very straight-forward and could be learned easily. Figure 1 shows the captured screenshot of the SysAdmin's Home Page.

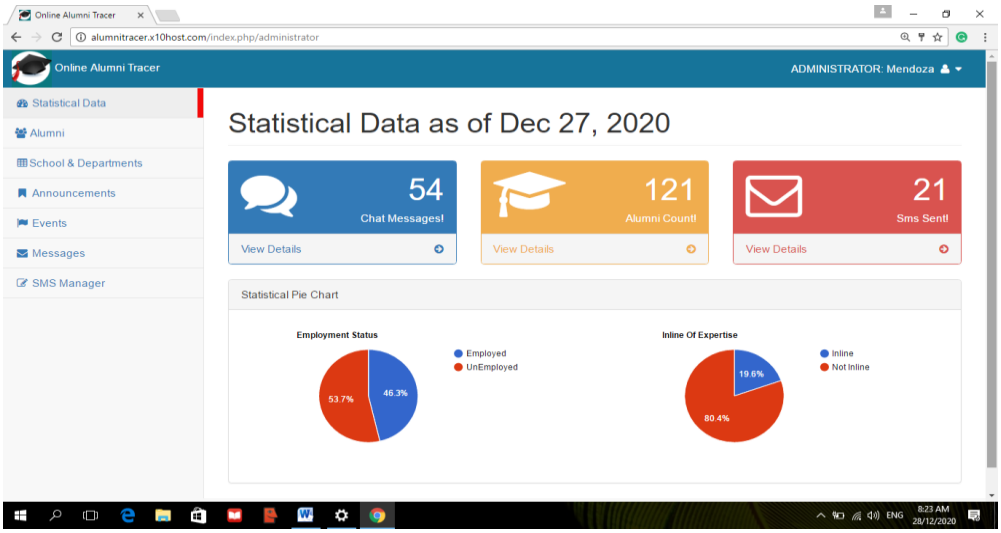

Figure1. The System Administrator's Home Page

The Alumni Page

An Android-based app was developed and could be downloaded from the Google Play store. After the app was downloaded, it could be installed in a Smartphone running on Android operating system. The Alumni Page could be accessed by a duly registered alumna upon signing with his or her username and password. Relative to the various components found in the SysAdmin's Page, the Android app also contained functionalities for announcements, events, alumni profile, SMS notifications and others. The user could even also search for specific name and could arrange the contents by sorting the registered members of the group. Figure 2 shows a screenshot of the alumni page.

ISSN 1533-9211

DOI 10.5281/zenodo.6656095

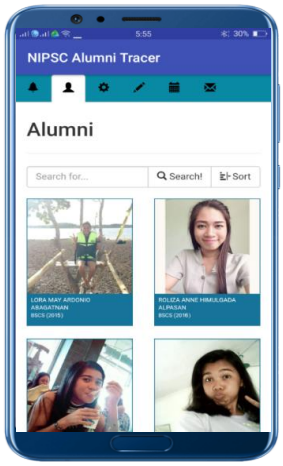

Figure 2. The Alumni Page of the System Prototype

The Update Page

One of the most important components in the system prototype was the Update Page. This page is part of the Android app where an alumna could be able to update his or her information. By having this functionality, the Office of Alumni Affairs could be able to trace the status of the alumni. Included in this page was a form which would require the alumni to enter updated information such as contact number, email address, birth date, current location and current employment status. Upon saving the record, it would then be recorded into the database at the server computer. The server computer was being hosted in the cloud for testing purposes. However, when the system prototype reached the production phase of the project, it would be then turned over to the Management Information System Unit of the College for hosting. Figure 3 shows the screenshot of the update page of the system prototype.

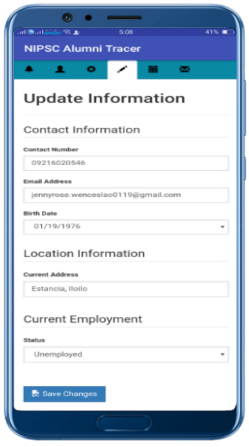

Figure 3. The Alumni Update Page of the System Prototype

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.6656095

3. Results and Discussion

3.1 On the development of an information system using the web and mobile technologies that are reliable and easy to learn for NIPSC personnel and alumni

Table 3 shows the result of the evaluators' feedbacks on the development of the developed App-based Alumni Tracer with Statistical Support in terms of reliability and learnability. The results showed indicated that the App-based Alumni Tracer with Statistical Support, in terms of reliability had a numerical value of 4.73 which was verbally interpreted as "Very Good". In terms of learnability, the system got a mean value of 4.83 which was interpreted as "Very Good".

The findings proved that with the App-based Alumni Tracer with Statistical Support when implemented in terms of the reliability, the respondents agreed that it was always available, operational, accessible and responsive every time they ask for the needed information. The Director of the Alumni Affairs and the department chairpersons were impressed by the efficient processing of information upon receipt by the developed system. Statistical charts were instantly presented as soon as updates on alumni records were made. The alumni themselves were appreciative of this system because they said that not only they can update their records, they can make contact with long lost friends as well as they can also be updated about activities of the Alumni Affairs due to its Announcement module. During the evaluation, most of the respondents agreed that they were impressed by the way for which the system was able to provide them with the information that they need at their most convenient time.

Table 3. Evaluators' Feedbacks on the Development of the Developed App-based Alumni Tracer with Statistical Support in terms of Reliability and Learnability

Objective	Mean	Verbal Interpretation
Develop an information system using web and mobile technologies in terms of:		
a. reliability	4.73	Very Good
b. learnability	4.83	Very Good

3.2 On determining the level of usability of the App-Based Alumni Tracer with Statistical Support as perceived by NIPSC personnel and alumni

The table below presented the level of usability of the App-based Alumni Tracer with Statistical Support as perceived by NIPSC personnels and alumni. The results showed that the level of usability and acceptability of the App-based Alumni Tracer with Statistical Support had a mean value of 4.76 which was interpreted as very good.

This finding confirmed that the App-based Alumni Tracer with Statistical Support possessed a high level of usability because the users were able to use it easily due to its simple but well-performing components. It also has a high level of learnability because the interface designs were simple using the developed system's interfaces being presented using graphical user

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.6656095

interfaces (GUI). Both the Director of the Alumni Affairs, Department Chairpersons and the alumni respondents unanimously agreed that the App-based Alumni Tracer with Statistical Support possessed a high level of usability.

Table 4. Level of usability of the App-Based Alumni Tracer with Statistical Support as Perceived by NIPSC Personnel and Alumni

Objective	Mean	Verbal Interpretation
Determine the level of usability of the App-Based Alumni Tracer with Statistical Support as perceived by NIPSC personnel and alumni	4.76	Very Good

3.3 On the evaluation of the performance of the App-based Alumni Tracer with Statistical Support in terms of time behavior and accessibility of the information provided to alumni

The following table present the performance of the developed App-based Alumni Tracer with Statistical Support in terms of time behaviour and accessibility of the information provided to alumni. The results shown above reflected that as far as performance of the developed system in terms of time behavior, it yielded a mean of 4.77 described as "Very Good" while in terms of accessibility it yielded a mean of 4.79 which was interpreted as "Very Good".

The findings suggested that upon evaluation of the performance of the App-based Alumni Tracer with Statistical Support, the respondents believed that its responses to requests and processing throughputs were reasonably impressive. At the same time, it has able to meet the requirements set forth by the users by virtue of its various functional components. It also provided the accurate results with good level of precision. It was also able to facilitate accomplishment of specific tasks they wanted for the system to perform. On the other hand, in terms of the accessibility of the developed system was concerned, it was always available to download since it is already available in the Google Play store. The respondents stated that the developed system has the widest range of characteristics to achieve a specified goal in a specified context use.

Table 5. Evaluation of the performance of the App-based Alumni Tracer with Statistical Support in terms of time behavior and accessibility of the information provided to alumni

Objective	Mean	Verbal Interpretation
Evaluate the performance of the App-based Alumni Tracer with Statistical Support in terms of:		
a. time behaviour	4.77	Very Good
b. accessibility	4.79	Very Good

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.6656095

3.4 On the evaluation of the expert with regards to the system based on McCall's Software Quality Model

Table 6 present the evaluation of the five experts of the App-based Alumni Tracer with Statistical Support. The findings of the experts of the various areas of the App-based Alumni Tracer with Statistical Support yielded a mean 4.73 which was described as "Very Good".

The five experts agreed that the developed system was able to meet the requirements set forth by the users through the different functionalities. The system designs were simple yet provide the affordances necessary in the operations of the developed system. It was easy to learn and use.

Table 6. Experts Evaluation of the App-based Alumni Tracer with Statistical Support.

Objective	Mean	Verbal Interpretation
Evaluation of the Experts using the McCall's Software Quality Model.	4.73	Very Good

4. Conclusion

The features of the App-based Alumni Tracer with Statistical Support were very useful in terms of gathering the relevant and updated information about of the alumni. The respondents agreed that it was always available, operational, accessible and responsive every time they ask for the needed information. The Director of the Alumni Affairs and the department chairpersons were impressed by the efficient processing of information upon receipt by the developed system. Most of the respondents agreed that they were impressed by the way for which the system was able to provide them with the information that they need at their most convenient time. They are able to operate the developed system with less time of familiarization. Furthermore, it has a high level of reliability and learnability.

The developed system possessed a high level of usability because the users were able to use it easily due to its simple but well-performing components. Both the Director of the Alumni Affairs, Department Chairpersons and the alumni respondents unanimously agreed that the App-based Alumni Tracer with Statistical Support possessed a high level of usability.

The findings suggested that upon evaluation of the performance of the App-based Alumni Tracer with Statistical Support, the respondents believed that its responses to requests and processing throughputs were reasonably impressive. At the same time, it has able to meet the requirements set forth by the users by virtue of its various functional components. It also provided the accurate results with good level of precision. On the other hand, in terms of the accessibility of the developed system was concerned, it was always available for download since it was already uploaded into the Google Play store. The respondents stated that the developed system has the widest range of characteristics to achieve a specified goal in a specified context use.

ISSN 1533-9211

DOI 10.5281/zenodo.6656095

5. Recommendations

Since computers are mostly used, especially in schools, it is highly recommended that the schools should adapt and used the App-based Alumni Tracer with Statistical Support. It is highly suggested that it should be implemented by Northern Iloilo Polytechnic State College to help them have the records for school evaluation.

Once implemented, the Director of the Alumni Affairs must conduct an orientation to all graduating students on how to access and use the developed system.

NIPSC should subscribe to online SMS gateway to facilitate SMS bulk services. SMS notification is an important element of this system. Hence, it is important that alumni working within the Philippines and abroad should be notified of the availability of their accounts.

References

[1] Orejana, Anne, Resurreccion, Pamela. Tracer Study on the Graduates of the BSBA Program: An Input to Curricular Development. The Mindanao Forum. 2010; 23(1). Retrieved from http://ejournals.ph/form/cite.php?id=7051

[2] Schomburg, Harald.Handbook for Graduate Tracer Studies: Centre for Research on Higher Education and Work, Kassel. University of Kassel. 2003.

[3] Indriasari, Sofiyanti. Sistem Informasi Berbasis Web untuk Membantu Kegiatan Tracer Study Program Diploma Institut Pertanian Bogor. Jurnal Sains Terapan. 2012; 2(1). DOI: doi.org/10.29244/jstsv.2.1.48-58

[4] Suryani, Karmila, Khairudin, Khairudin, Syahmaidi, Eril. Online Tracer Study of Bung Hatta University, International Journal of GEOMATE. 2017; 13(37), 20-27.

[5] Balagon, Princess, Sobejana, Noel. Online SPAMAST Graduate Tracer Study in Multiple Platform. International Journal of Communication and Information Technology. 2020; 1(1), 29-39.

[6] Thomas, Gastan Gaoudio, Wagiu, Elmor. Graduate Tracer Study Design System Using Web-Based GPS (Case Study Universitas Advent Indonesia). Proceedings of the International Scholars Conference. 2019. DOI: doi.org/10.35974/isc.v7i1.2006

[7] Plata, Irma T. Connecting With The Graduates: An Online Employability Graduate Tracer Study (O-EGTS) Of Isabela State University. International Journal Of Scientific & Technology Research. 2020; 9(03), 4339-4344

[8] Albina, Albert C., Sumagaysay, Lilian P. Employability tracer study of Information Technology Education graduates from a state university in the Philippines. Social Sciences & Humanities Open. 2020; 2 (1). DOI: doi.org/10.1016/j.ssaho.2020.100055

[9] Palmiano, Dariel A. Graduates Higher Education and Career Interlink of the College of Arts and Sciences of Central Bicol State University of Agriculture-Calabanga Campus. Information and Knowledge Management. 2019; 9(40). DOI: 10.7176/IKM

[10] Woya, Ashenafi Abate. Employability among Statistics Graduates: Graduates' Attributes, Competence, and Quality of Education. Education Research International. 2019. DOI: doi.org/10.1155/2019/7285491

[11] Smartphone penetration as share of population Philippines 2017-2025. https://www.statista.com/statistics/625427/smartphone-user-penetration-in-philippines/. Date accessed: 07/24/2021

The Seybold Report
ISSN 1533-9211
DOI 10.5281/zenodo.6656095

[12] Monthly market share of mobile operating systems Philippines 2020-2021 https://www.statista.com/statistics/931129/philippines-mobile-os-share/. Date accessed: 07/24/2021

[13] Calderon, J. Methods of Research and Thesis Writing (Reprint). 2012.

[14] Minard, Brian. McCall's Software Quality Model. https://bminard.github.io/2020/02/mccalls-software-quality-model. Date accessed: 07/27/2021.

[15] Estdale, J., Georgiadou E. Applying the ISO/IEC 25010 Quality Models to Software Product. EuroSPI 2018: Systems, Software and Services Process Improvement. 2018. DOI: doi.org/10.1007/978-3-319-97925-0_42