Guidance and Counseling Information Support System

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Abstract - The rapid growth in Information and Communication Technology paved the way to the development of various systems that will help Guidance Counselors with their information storage and retrieval needs. Since the birth of the World Wide Web, most transactions in the organization were implemented online for easy access and retrieval by various authorized users. The Iloilo Science and Technology University located at Burgos St. Lapaz Iloilo City is composed of five (5) branches. These include the Lapaz Campus, Leon Campus, Miag-ao Campus, Barotac Campus and Dumangas Campus. Each campus has a designated Guidance Counselors who facilitated the efficient management of guidance records. The Online Database Management of Guidance Records for Effective and Immediate Access of Data to Follow-up Students was an online system designed to be implemented to all ISAT U campuses. Since the system is online, all Guidance Counselors from all campuses can secure an account to access the system as well as all the students in each campus. The Data Management System encapsulates processing of the Student's Information Profiles, Routine Interviews, Exit Interviews, and Graduate Tracking records.The system is tested using ISO 9126 software quality standards so as to determine the system's conformance to the software quality measures which include the system's Functionality, Efficiency, Usability, Maintainability, Reliability and Portability. Moreover, the system's performance was tested using Google's PageSpeed Tool.

Keywords: *Guidance and Counselling, Information System, Graduate Tracking, Students Information Profile*

INTRODUCTION

Historically, counseling and guidance have suffered from lack of innovation and purposely-built tools. If we compare this field to medicine or sports, we can easily see a marked difference in the rate of development of new tools and methods. The advent of ICT has opened the possibility to create and implement numerous new instruments specifically designed for counseling and guidance [1].

Iacob[1] has stated that even in the relatively short time that ICT has been available to counselors, it has proven to be of considerable help to everyday activities and will probably continue to grow and become even more intertwined with counseling services.

In the study conducted by Vinluan [2], it was stated that Guidance Counselors in Metro Manila, Philippines were frequently conducting student's appraisal and counseling which is commonly done using paper-based and face to face method. It is also stated that the primary source of guidance-related information came from printed materials. However, the respondents were stated to have positive attitude to the use of ICT in guidance work and were confident in the use of ICT given additional trainings.

Moreover, according to the research conducted by Oraegbunam [3], delivering guidance and counseling such as in the form of forum, electronic discussion and retrieval of important student information can be achieved through the internet either in urban or rural setting.

In this project, the researchers formally integrate Information and Communication Technologies (ICT) in facilitating an effective delivery of the guidance and counseling services.

An ICT program is created wherein career and school guidance practitioners conduct an initial intake and screening process through the use of a database. Results of the intake, routine interview, and exit interview are consolidated in the database for fast and effective tracking of the students' progress. Moreover, the system can also accept alumni information that

will be accessed by the Guidance Counselor to track the progress of those who graduated from the University.

The efficient and effective management of guidance records through ICT will enable the policy makers and guidance counselors to organize, plan, manage and evaluate the guidance services and make informed policies responsive to the needs of their clients.

The system will ensure an effective tracking of student's progress and easier follow-up and communication between clients and guidance Counselors. Moreover, the output of the program is a means to have a quick and cost effective way of guidance data management. It would facilitate the effective sharing and accessing of confidential records among Guidance Counselors for effective case management. Moreover, a good management of counseling records will also be used to support an evidence-based guidance and counselling practice.

OBJECTIVES OF THE STUDY

The aim of this research is to find a meaningful integration of ICT in delivering guidance services and counselling for the benefit of potential clients.

Specifically, this project will attempt the following objectives: Automate the record and retrieval of student's routine interview, exit-interview and personal record, and automate the record and retrieval of alumni record.

The study was evaluated using International Organization for Standardization (ISO) 9126 software quality standards as to determine the conformance of the developed system to the quality standards set in ISO 9126.

METHOD

The study includes the development of the online Guidance and Counseling Information Support System. The systems component is shown in Figure 1.0 using the UML Component Diagram. According to Dennis, Wixom, Tegarden [4], UML Component Diagram describes the relationships among the system's necessary components among the system's different modules. The UML Component Diagram shows the interaction and the relationship of all the modules included in the system.

The purpose of the component diagram is to show the dependencies of each software component to other component such as libraries, objects and packages [5].

The system uses CodeIgniter as the application framework. It adapts the software engineering pattern referred to as Model-View-Controller (MVC). The Model Component is responsible for the storage and retrieval of the system's data to its backend database. The View Component is the system's user interface. Controller is the overall system coordinator by receiving requests from the View Component, passing it to the Model Component and sending the response of the Controller back to the View Component.

In the component diagram, the View component consists of the interface Request and Response which are basically responsible for handling the user request and the application's response. The View component consists of PHP files which are ultimately processed into HTML files prior to being sent to the client's browser.

The Guidance component is the system's Controller component in the MVC framework. The component is considered the overall administrator, responsible for receiving requests coming from the View Component and passing the request to the appropriate Model components for response. All the components attach to the Guidance component have data access to the dbguidance component for storage and retrieval of the system's data.

The provided interface Interview is responsible for providing response to the request of the View component either to conduct an interview or view a previous interview. Although not shown in high level view of the diagram, part of the request coming from the View component is the type of interview and the relevant information of the student which includes the student's personal information, branch, department and course information. The components StudentUsers, Interviews, Branches, Departments and Courses are responsible for providing the information to the Guidance component for this relevant information. Based on the interview type, any of the components PersonalProfiles, RoutineInterviews, ExitInterviews or GraduateTracks provides the Guidance component with the appropriate response either in the form of interview questions or the interview answers of the particular student.

The provided interface AdminInterface handles user sign up and log in for users belonging to the Admin group. The user could either be branch administrator or guidance counselor.
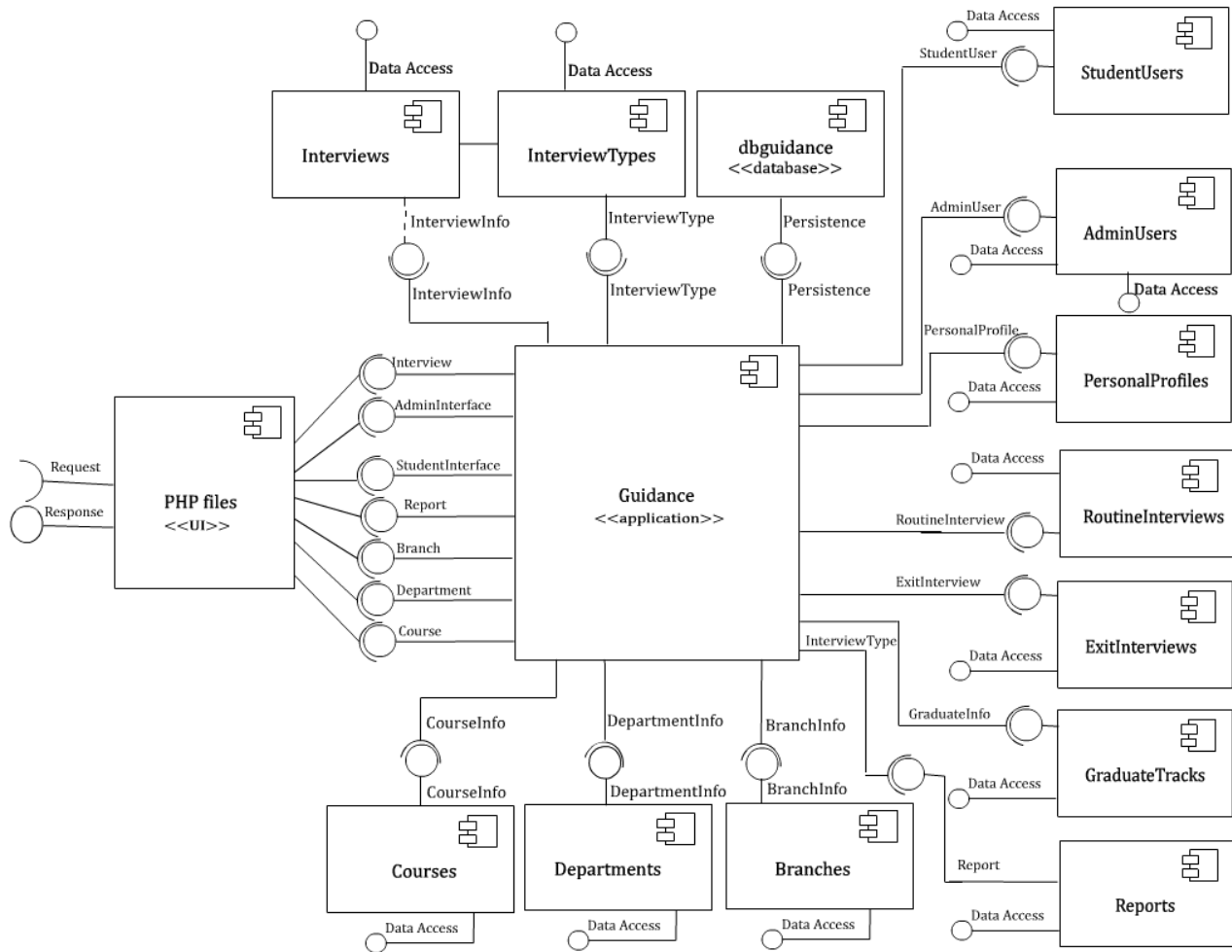
Figure 1.0 UML Component Diagram of Guidance and Counseling Information Support System

The request is delegated by the Guidance component to the AdminUsers component for the storage and retrieval of users in the Admin group. Theprovided interface Interview is responsible AdminInterface serves as the system's access control for Admin users.

In the provided interface StudentInterface, the Guidance component handles the View component's request and response for student information It is the entry point in handling the student's sign up and log in. The information provided by the View component is used by the Guidance component to query the StudentUsers component for the relevant information. The interface is responsible for access control of student users.

For the View component's request for reports, the provided interface Report handles such request. Based on the interview type, the Guidance component delegates the task to the Report component for the proper response. The interview type of the request from the Guidance component determines the type of the Report interface of the relevant component.

The Branch interface is for handling update of branch information including the branch name, address and branch code. The Guidance component delegates the task to the Branches component for response. The Department interface is the entry point for handling department information and is handled by the Departments component. The interface requires the branch information where the department is under. Meanwhile, the Course interface handles requests for adding and updates of course information and is handed over by the Guidance component to the Courses component for processing.

The guidance head of the main campus acts as the overall system administrator. The person designates the initial user accounts of the guidance heads of the other branches as well as the department names and courses offered at the main campus. He/she also is responsible for providing the initial user accounts of the guidance counselors within the main campus.

Since the system is online, all the guidance counselors from the five (5) campuses can log in into the system after securing their user accounts from the overall administrator. The guidance heads in each of the branches in turn will provide the individual department names, courses offered and the initial user accounts of their guidance counselors.

The overall administrator controls the online availability of the guidance services. When any of the services - personal profiles, exit and routine interview and graduate tracking is disabled by the administrator, no student in any of the branches could avail of the service.

The respective counselors in each branch could only view the records of student within their department. They could also edit any of the interview records, view or save any of the reports provided by the system. The guidance counselors have the option to select only the appropriate fields that should be included in the report.

The students can sign in to the system once their respective guidance heads have already filled out the list of courses within their respective branches. They are not provided their initial user accounts and on sign up must provide the valid username – one that is not yet registered in the system. On successful sign up, the student could log in to avail of the guidance services. The personal information profile is for all students regardless of year level. The routine interview is for second and third year students. These two interviews may be taken once each year. The exit interview is taken once and is for graduating students only. Meanwhile, the graduate tracking is for graduates only and is available once the student has taken an exit interview.

The necessary input of the system includes the students profile, answers to routine and exit interview as well as the graduate's profile. These data are entered by the students through their own user accounts. Moreover, the system can record and retrieve personal information of students, their routine interview answers, exit interview answers as well as the graduate tracking form for the graduates. The

system can also generate report about this information.

To ensure the validity of the study, the system will be tested by selected Information and Communication Technology professionals based on ISO 9126 software quality standards.

RESULT AND DISCUSSION

The study was developed following the Incremental model. Incremental model is a method used to design and implement a software product by adding several additional features to a system until the finished product satisfy the user's requirements [6].

The study was conducted by gathering the functional requirements of the system from the intended users. These requirements includes all the necessary inputs, processes and outputs to automate the record and retrieval of student's routine interview, exit-interview and personal records, as well as the record and retrieval of alumni records.

During the Design and Analysis phase the developer designed and developed each module one after the other until all the user requirements were incorporated in the system.

During the testing phase, each module was tested to validate that the system is error free and is working efficiently. After testing a module, a new feature was added to the system to complete all the system's requirements.

The study is a descriptive research since the evaluation of the system was conducted using survey method to describe the system performance. A Descriptive research according to Kothari [7] includes surveys and other fact-finding techniques to describe a state as it occur in the present.

To determine the respondents for the study, a purposive sampling or judgment sampling technique was used by the researchers. According to Annum [8], it is a type of sampling technique where a researcher use his judgment to select a population whose expertise and background relates to the objectives of the study. The researchers invited five (5) Information and Communication Technology (ICT) professionals who are Programmers, System Analyst and Database Designer to evaluate the system according to ISO 9126 standards. ISO 9126 IS consists of six (6) software quality standards namely: Functionality, Reliability, Usability, Efficiency, Maintainability, and Portability. According to Kanellopoulo et.al [9], the ISO 9126 software quality standard was used to identify and address software quality issues. The ISO

9126 standard specifies the characteristics and sub-characteristics of the software as basis for evaluation.

The instrument used for evaluating the system was adopted from Abran, Al-Qutais, Desharnais, Habra (n.d) [10] with modification related to the study.

Data Processing and Statistical Treatment

Microsoft Excel 2007 was used to tabulate the data collected from the respondents. The weighted Mean and Standard Deviation (SD) was used to analyzed the conformance of the system to ISO 9126 based on the stated objectives of the study.

The Likert scale to evaluate the system based on ISO 9126 is as follows: 3.26- 4.00: Very Effective (VE); 2.51-3.25: Effective (E); 1.76- 2.50: Fairly Effective (FE); and 1.00 – 1.75: Ineffective (IE).

The scoring method used by the evaluators to assess the functionality and ease of use of the system were as follows: 4.21-5.0: Strongly Agree (SA); 3.41-4.20: Agree (A); 2.61-3.10: Either Agree or Disagree (EAD); 1.81-2.60: Disagree (D)and 1.0-1.80: Strongly Disagree (SD).

Based on the data gathered from the respondents shown in Table 1.0, the system was perceived as Very Effective with the overall mean of 3.83 and standard deviation of 0.32.

According to Losavio et al. [11], functionality is the capability of the software to provide functions which meet the stated and implied needs of users. The system evaluation with regards to the system Functionality was rated with the mean of 3.80 and standard deviation of 0.45 which is perceived by the respondents as Very Effective. This means that the system functions accurately based on its stated purpose and set of functionalities such as record and retrieved student's information, record and retrieved routine and exit interview and record and retrieval of graduates information. Moreover, the results show that the system's components interoperate cohesively and smoothly such as the exchange of information from students to the different guidance counselors and there is a proper security mechanism to monitor authorized system users. Moreover, the system features, functions and content is suitable to its intended users.

Reliability of the software is the capability of the software product to maintain its level of performance under certain conditions.[12] The Reliability of the system was rated with the mean of 3.60 with standard deviation of 0.60 which is denoted as Very Effective. This result implies that the system consistently and accurately store and retrieved application relevant data. Also the result shows that the system can handle incoming request from client while maintaining its performance. There is also an absence of system failure and if the system manifests certain degradation in performance, the system is able to recover. Likewise, there is an absence of errors in the system output and the system can run smoothly with other applications like Adobe reader for storing and retrieving report in pdf format.

Table 1. ISO 9126 Evaluation of the system

ISO Quality Standards	Mean	Std Deviation	Remarks
Functionality	3.80	0.45	VE
Reliability	3.60	0.60	VE
Usability	3.92	0.18	VE
Efficiency	3.96	0.09	VE
Maintainability	3.76	0.47	VE
Portability	3.92	0.11	VE
Overall	3.83	0.32	VE

The Usability of the system is rated at 3.92 with standard deviation of 0.18 which is denoted as Very Effective. As stated by Losavio et.al [11], usability is the capability of the software product to be understood, learned, used and provides visual appeal, under specified conditions. The results conforms to the standard stated by Bhatia since the system have the appropriate user interfaces, it provides the necessary navigational interfaces to allow users to move across system components and it provides system help or instructions to easily understand system features and the system is simple enough that the user needs less effort in learning how to use it.

The Efficiency of the system is rated with the mean of 3.96 with the standard deviation of 0.09 which is described as Very Effective. Efficiency of a software is defined as the capability of the software product to utilized less amount of computer resources to derived with the desired performance, under stated conditions.[13] The result of the system evaluation conforms to what Bhatia (2011) has stated since the system's response time is acceptable in terms of processing the reports needed by the user; proper tools are displayed and is available, search box is provided to easily search record and the system provides paging to move from one record to another to improve navigation.

Losavio [11], define maintainability as the capability of the software product to be modified

which may include corrections, improvements or adaptations of the software to changes in the environment. The Maintainability of the system is rated at mean 3.76 with standard deviation of 0.47 described as Very Effective. The result of the evaluation implies that the system has applied the process of normalization to the application's database to promote consistency and reliability of the data, the system provides a mechanism to determine the cause of an application error through the use of informational messages and there is a well-designed hierarchy of classes which is easier to follow and understand.

Losavio [11] define portability as the capability of the software product to be 'transferred from one environment to another. The Portability of the system was perceived by the respondents as Very Effective with mean value of 3.92 and standard deviation of 0.32. This result implies that the system is easy to install, adaptable to different web browsers and the system have adequate deployment instructions making it easy to deploy.

CONCLUSION AND RECOMMENDATION

Based on the perception of the respondents, the system is able to effectively automate the record and retrieval of the students' routine interviews, exit interviews and personal information profiles and the alumni records. The system was found to be compliant to the six (6) software quality standards set by ISO 9126 with the overall rating of Very Effective. The study was found to be beneficial to both ISAT U Guidance and Counseling Office and students hence the recording and retrieval of student's information became efficient. Moreover, the study helps the Guidance and Counseling Office to generate valuable report that will help them identify student needs and developed program that will address these needs.

Education institutions that do not currently have this type of system should obtain and used this system to efficiently record and retrieved guidance and counseling records of the students. The components of the system can be enhanced and extended to include other guidance and counseling services. The system can also include SMS notification to inform students when the interview forms are available online. The system can also include graph and chart reports for easy interpretation of data aside from statistical computations.

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