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CHED-UNIFAST PROFILING AND BILLING CABINET

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ABSTRACT

Republic Act No. 10931 intends to provide all Filipinos with an equal opportunity to quality tertiary education as to ensure the optimized utilization of government resources in education. This study was designed and develop the system Commission on Higher Education-Unified Financial Assistance System for Tertiary Education Profiling and Billing Cabinet to effectively and efficiently deliver processes in the aspect of student profiling and billing documents that was an integral part after the enrolment period. This system will be utilized as system process that could helped the Registrar and Accountant to generate reportorial accurately. The respondents of the study were three (3) campus registrars, three (3) campus accountants , two (2) staff and two (2) IT Experts who are purposively selected. This study applied the Unified Modeling Language (UML) to describe the structure of the software. Likewise, using the Agile Method by (Dinni Muslihat, 2018) as guide in developing the system. The International Organization for Standardization (ISO) 25010:2011 software engineering standard was used to evaluate the application in terms of product quality in use criteria and all mean equivalents for each characteristic were described as "Very Effective". The study proved that the system is useful and effective.

Keywords: *Profiling, Billing Cabinet*

1. Introduction

One important aspect of school administration is the management of school finances. School financial management includes overseeing the funding for building and grounds, employee salaries, student programs, supplies, and technology (Stearns, January 19, 2022); and is geared towards the promotion of quality education.

The delivery of quality education is foremost among the mandated mission of every educational institution. However, in the pursuit of quality education financial allocation is involved and its receipt and utilization are expected to be managed efficiently. Managing the financial resources of the school is very crucial to educational management (Abag, 2019), particularly on the matter of raising the quality of education and enhancing student programs such as scholarships, and financial assistance. According to Yizengaw (2021), to increase quality education, it is mandatory to make sure that the required finance is obtained on time and that the existing financial resources should be managed properly in schools. The successful implementation of various educational programs and projects largely depends on the proper utilization of funds and effective management of school finances (Abag, 2019). Lack of capacity in financial management will lead to the absence of quality education (Yizengaw, 2021); and to accomplish proper financial management, the researcher believes that the use of information and communication technology (ICT) infrastructure is vital and imperative.

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Muema (2015) reported that ICT has been used intensively in instruction, but gradually permeated to other institutional functions like financial management in educational institutions. Moreover, Kirmani et al (2015) predicted that the traditional manual system used to manage school finances will be possibly replaced by a more efficient and effective method, one that utilizes information and communication technologies (ICT).

This study focused on the status and importance of financial management in higher educational institutions (HEIs) in the Philippines, as in this case, at West Visayas State University (WVSU), Lambunao Campus, in the advent of the implementation of the Commission on Higher Education Unified Financial Assistant System for Tertiary Education (CHED UniFAST) to promote free quality tertiary education, and on how it can be managed with the proposed digitized system.

CHED-UniFAST was created with the enactment of Republic Act No. 10931, otherwise known as the Universal Access to Quality Tertiary Education Act (UAQTE) or aptly called "Free Tuition Law", which mandated all public higher education institutions (HEIs) and government-run technical-vocational institutions (TVIs) in the Philippines to provide free quality tertiary education among eligible Filipino students. The Act is in support of one of the Sustainable Development Goals of the United Nations (Goal No. 4) that by 2020 the number of scholarships available to developing countries for enrollment in higher education should have increased significantly.

R. A. 10931 ("Free Tuition Law") was promulgated to accomplish the following objectives, namely, 1) provide adequate funding and other mechanisms to increase the participation rate among all socioeconomic classes in tertiary education; 2) provide all Filipinos with equal opportunity to quality tertiary education in both the private and public educational institutions; 3) give priority to students who are academically able and who come from poor families; 4) ensure the optimized utilization of government resources in education; 5) provide adequate guidance and incentives in channeling young Filipinos in their career choices and towards the proper development and utilization of human resources, and; 6) recognize the complementary roles of public and private institutions in the tertiary educational system

Aside from the provision of tuition-free higher education in public HEIs and STVIs, the Law also provides for other assistance mechanisms that aim to give additional support to eligible financially-disadvantaged students. The first one is the Tertiary Education Subsidy (TES) which aims to provide additional funding to cover education-related costs of students, who shall be identified through a prioritization scheme. The second mechanism is the Student Loan Program (SLP) which offers short-term and long-term loans for the tertiary education needs of eligible students. Both mechanisms under the Law are administered by the Unified Financial Assistant System for Tertiary Education (UniFAST) Board with annual budget appropriations lodged in CHED and the Technical Education and Skills Development Authority (TESDA).

Students can avail the said financial assistance through submission of their applications after enrollment with the TES/UniFAST Focal Persons or Campus Scholarship Coordinator. The individual application is processed following the provisions of the Law and the requirements of the HEIs on who can avail of the program and how long they would enjoy it. After the processing of the students' applications to the grant-in-aid program, their names are listed, finalized, and submitted to the CHED, the number of which is dependent on the number of slots determined by CHED. After verification and validation by CHED, the list is returned to the HEI concerned with the corresponding amount for all students who were qualified.

While the UniIFAST program seems to offer better financial privileges for all tertiary students, HEIs are bound to efficiently manage its operational implementation relative to students' records, submission of billing documents, and management of fees. However, during its implementation, some problems were observed that ultimately affected the release of the financial assistance to students on time, such as the erroneous information and incompleteness of the required personal data, and the not filling out their Personal Data Sheet (PDS) forms. These unwarranted situations affected the generation of the

Certification of Registration (COR), an important document that is required in submitting the billing information to the CHED UniFAST office, and caused redundancy. Likewise, errors in the assessment of fees and billing of documents caused delays in the release of subsequent UniFAST financial assistance.
With these in mind, the researcher obtained baseline information through a study to ascertain the state of technology the WVSU Lambunao Campus has in handling or managing UniFAST funds and transactions. The results of the study revealed that the process of student profiling, management of fees, and submission of billing documents to CHED-UNIFAST was not systemized. It was also found that no system linked and harmonized students' data from the Office of the Registrar with the Accounting Office's billing statements and receipts of the financial assistance from CHED, as well as, the subsequent releases of the said grants to student grantees. Moreover, the results of the study indicated that having no electronic/ digitized system to process TES/UniFAST transactions, the task of managing it, as it involves financial resources, was tedious and difficult as the processes involved in the said transaction were not simple as they seem

It is apparent, therefore, that WVSU Lambunao Campus needs to have a system or program software that will tackle the whole process efficiently and effectively, in replacement or enhancement of the traditional methods being done at the offices of the Registrars and Accountants of the said Campus. It should be a system that is aided substantially by information and communication technologies (ICTs) to manage the whole process of the program, as well as, its financial aspect.

After all, the ultimate intent of the UniFAST program is the promotion of quality tertiary education in the Philippines. However, to realize the ideal of quality inclusive education, proper financial management is vital (Aina and Bipath, 2020).

Thus, in the light of the above premises, this study proposed to create a software/program aptly called "The Students' Profiling and Billing Cabinet" for the use of the WVSU Lambunao Campus to enhance its capacity and capability in managing the CHED UniFAST program and its financial resource, particularly in the storing and tracking of students' data, and in providing Admin Users (Registrar's Office and Accounting Office) an easy and manageable way of generating billing documents in the template set by the CHED-UniFAST, and their subsequent submission to CHED every end of the enrolment for a current semester.

This study aimed to design and develop a CHED-UNIFAST Profiling and Billing Cabinet for the use of the WVSU Lambunao Campus.

Specifically, this study aimed to:

1.Create a program/software that could manage user accounts.

2.Develop a program/software that would (a) create student profile data, (b) generate and manage the curriculum of the current semester correctly, (c) assess and reflect management of fees of the current semester properly, and (d) generate UNIFAST billing documents accurately and efficiently.

3.Evaluate and test the developed System to determine its level of effectiveness using the International Standard Organization (ISO) 25010:2011 (Product Quality and Quality in Use) software quality model criteria as perceived by the evaluators.

2. Literature Review

Faisal (2008) developed a human resource management application called "Employee Profile Management System (EPMS)". The system was designed to facilitate effective employee data management and integrated directory services to lower the administrative costs associated with employee profile management. In the existing system, a minor modification such as changes in personal information entails a long time pending approval by the administrator to effect such changes. In the EPMS, the administrator or the staff in charge can just add, edit, update, and save student information; provided, that in changing vital information such as data in the PSA birth certificate, a true copy of the latest document

is needed before the change and a copy of the document will be at the custody of the office concerned for keeping to file record of the student.

The above-mentioned system is useful and relevant to the current study since it deals with the same objective of managing personal profiles using a computerized system.

Jah and Shoriko (2018) conducted a study entitled "A Novel CALM Algorithm in Student Profiling". The study deals with computational intelligence which according to them plays a significant role in the improvement of the learning process. Jah and Shoriko (2018) believed that a student profile can provide an overview of personality and establishes a connection between abilities and learning preferences. The study is geared to develop an algorithmic approach to student profiling in the selection of subjects and professions. In their study, a calculative associative logical memorable (CALM) algorithm was proposed which integrates calculative thinking, association, logical perception, and memorizing features. The developed CALM approach was validated by including the environmental and social constraints. The validation outcomes claim that the CALM can design a noble student profiling framework that leads to further improvement in the quality of the learning process.

This information is important to the present study as it is about designing and developing software that can manage student profiles.

In the study of Ansari (2018), the importance of automation in managing employee information in an organization such as schools, colleges, companies, and industries was noted. As management of this type of information was considered a tedious task to do, the study proposed an "Employee Management System" to manage employee's attendance payroll activities based on attendance, gratuity, provident fund and generates Salary slips. The software was capable of easy storage of information related to an employee through a database. Moreover, with the system, the use of a large amount of paperwork was reduced. This software was built using PHP, AJAX, CSS, and MySQL for the database.

The aforementioned information is relevant to the present study since it discusses designing and developing a similar system using different databases to manage employee profiles.

Al-Ani, Noory, and Al-Ani (2012) conducted a project on a billing system aimed to pay invoices electronically based on the Internet environment. The approach is implemented via virtual banks, in which the process of money transfer can be implemented, including other services such as deposit e-money, withdrawal e-money, and determining account balance. Authentication rules, security, and privacy are done through a gateway translator and CRC 32 and MD5 hash functions. The system works 24 hours a day, 7 days a week anytime and anywhere. The Implemented system leads to increase flexibility and efficiency of the payment process by reducing transaction process time and reducing cost. The implemented system introduced many flexible interfaces such as the main system interface, user registration interface, and E-bank services interface. Concepts of security have been applied to the system to protect it from unauthorized access. The security issue is implemented via; encrypted passwords using the hash function (MD5), the hash function (MD5), and CRC32.

This information is useful to the researcher as it outlined the development of a billing system that leads to increased efficiency of the payment transaction and portrays security measures using the services of the Internet, which this present study finds similar in purpose.

In the study conducted by Iwashita and Tanimoto (2013) entitled "Consideration of Billing Management Method for Cloud Computing Services", the use of information-communication (info-communication) infrastructures such as broadband networks and data centers in business management was noted to be more and more important soon. The study indicated that, in particular, billing management is very critical for both providers and customers. Moreover, the study observed that cloud computing services induce a lot of corporate alliances and this complicates customer-service management. Thus, the creation of a billing management method that can quickly adjust to any business environment change is expected.

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This literature is relevant to the present study as it emphasizes the use of information and communication technologies, particularly cloud computing, in the management of billing activities.

Uchkun (2017) conducted a study entitled, "The Ways of Accounting over Telephone Communication Services in the Existence of Billing Systems" to investigate major billing services in the Republic of Uzbekistan and its relationships with telecommunications. Due to the installation of the modern, high-tech system in telecommunication, the number of subscribers increased to about 20 million people. To improve the services to the population, the government decided to create single technical requirements, standards, and parameters for the clientele base and billing system. In this case, small office phone conversations are taken into account. The developed billing system used IP telephony, the Internet, and a database management system (DBMS).

This information is important to the present study as it focuses on a billing system that can handle a large number of people's payments with the use of the Internet, telecommunication infrastructures, and database.

3. Research Method

The project entitled "CHED-UNIFAST Profiling and Billing Cabinet" is a system process that aimed to support Republic Act 10931 on its billing requirements. This system focused on how the registrar and accountant handle the generation of a report after the enrolment period and on how to have an accurate submission of billing documents to the CHED-UniFAST. This system was created for the use of the WVSU Lambunao Campus in its management of the CHED-UniFAST financial resource.

Specifically, the purpose of the project is to develop a system that manages user-friendly accounts – where there are two Admin users (Office of the Registrar & Office of the Accountant) who will manipulate the operations in the system. No other users are permitted to operate the system unless authorized. Also, to create student profiling in which data of students will be stored and can be updated from time to time, basic data of students are needed in the FHE Billing Details Form 2.

Management of curriculum of the current semester is generated correctly, management of fees for the current semester is assessed and reflected properly are the functions of the accountant to the system. He/She can have a pre-and final assessment of fees.

Billing documents that were submitted to CHED-UNIFAST are prepared by both offices and were usually done five (5) days after the enrolment in the particular semester is closed.

The development, adoption, and use of the system are aided by the Agile Software Development Method as shown in Figure 2, and are geared toward enhancing the management capability of the school concerning the implementation of the "Free Tuition Law" in tertiary education by the CHED-UniFAST. In this system, the user can access the system by signing up first with an individual account and password, if done for the first time, and log in if the user has already registered and recognized. Once the system is opened it will allow the user, in this case, two Admin users – one in the Registrar\'s Office and the other in the Accountant's Office. The system will allow the Registrar's Office user to manage student profiling, subject, and curriculum aspects; while the Accountant's Office user will manage fees, assessment of fees, billing statements, and generation of accounting reports.

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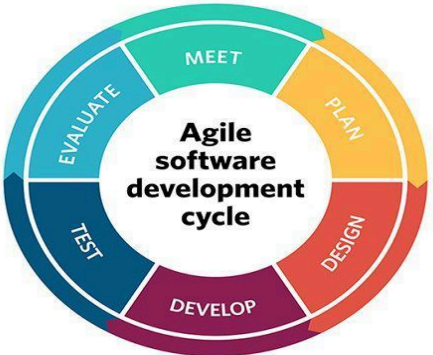

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Figure 2**.** The Agile Software Development Cycle for the
CHED-UniFAST Profiling and Billing Cabinet

MEET

In this phase, the researcher met with his adviser, to discuss the perspective of the proposed system and its underlying functions. He also met the end-user, the Campus Registrar, and the Accountant of WVSU Lambunao Campus. During their discussion, the researcher took down notes especially in gathering information on why the system is needed, what are the problems encountered, and their inputs to make the system efficient and effective. The system requirements that the researchers include for developing an application are: personal laptop, Internet connection, react native for software development, MYSQL Programing Language and Unified Modeling Language to describe the structure of the software, and Firebase as storage for gathered data of researcher.

PLAN

In this phase, the researcher planned and combined gathered data to create an output that shows relevant and useful plants information suitable for the needs of a student and other people in the community. The researcher planned to create a system that will help the registrar and accountant to have efficient and effective delivery of reports during the profiling and processing of billing documents for CHED-UNIFAST. In this phase, the researcher drew out some initial steps by identifying the tasks done by the user through a sequence diagram (Figure 3). Use case diagrams of the main systems for the Registrar (Figures 4 to 9), and Accountant (Figures 10 to 14) were also utilized to help in the holistic understanding of the design of the functionalities of the system on how it delivers its intended purpose.

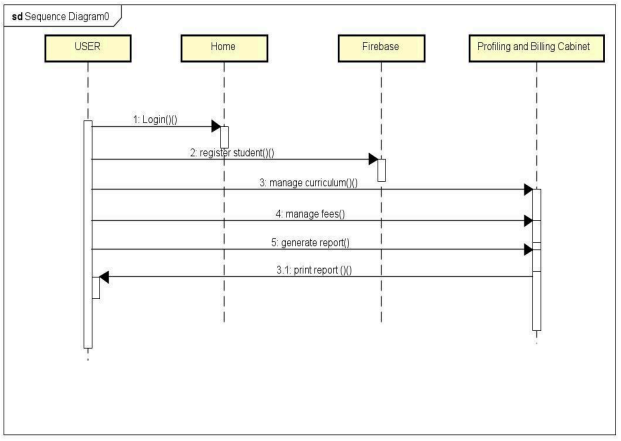

Figure 3. The Sequence Diagram of Admin managing the CHED-UNIFAST Profiling and Billing Cabinet

This diagram shows the interaction of the Admin to the Webpage wherein the admin can view Firebase that serves as database storage of the CHED-UNIFAST Profiling and Billing Cabinet. The admin needs to log in to Firebase to manage the system database. The admin can also create, add, update, generate a report, and view to change the data system database.

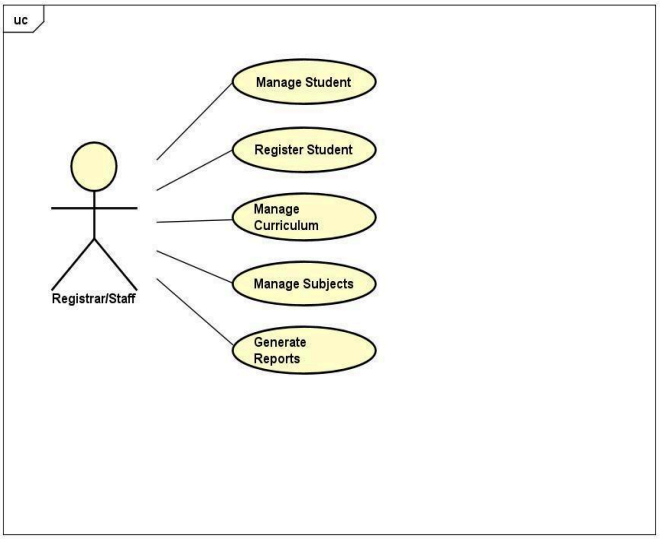

Figure 4. The Use Case Diagram of Registrar in the proposed syste*m*

This diagram shows the functions of the Registrar's personnel in the proposed system. The Registrar/staff can manage students' information, they can register students, manage curriculum and subjects offered for a particular semester only, and generate reports like enrolment reports.

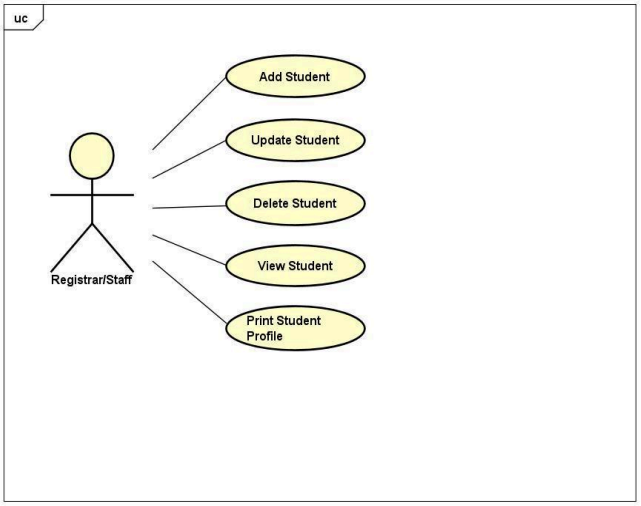

Figure 5. The Use Case Diagram of Registrar in the Management of Students

This diagram shows the functions of the Registrar's personnel in the management of students. For new and existing currently enrolled students, since the system is new, the Registrar/staff can add student data, update student data, delete student data, can view student profiles, and can print profiles of a student. Printing is necessary because printed documents are kept in the file folder of the particular student.

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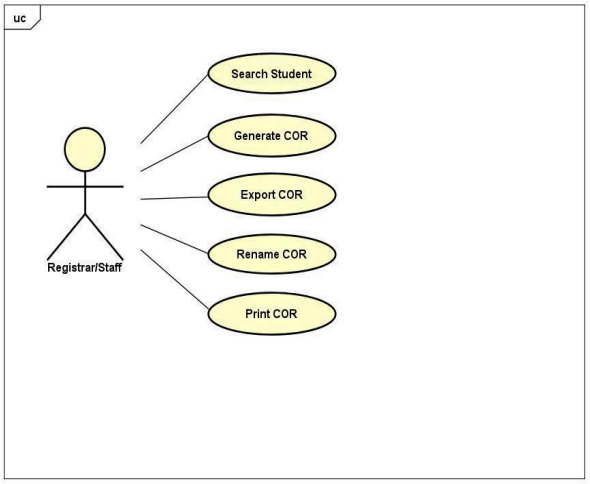

Figure 6. The Use Case Diagram of Registrar in the Registration of Students

This diagram shows the functions of the Registrar in the registration of students. In the area, the Registrar/staff can search a particular name of the student, generate into Certificate of Registration (COR) format, also it can export the COR, renamed it after exporting, and print it. COR is one of the requirements required by the CHED-UNIFAST, it will be exported into a pdf. file. Printed COR is kept in the file folder of the particular student.

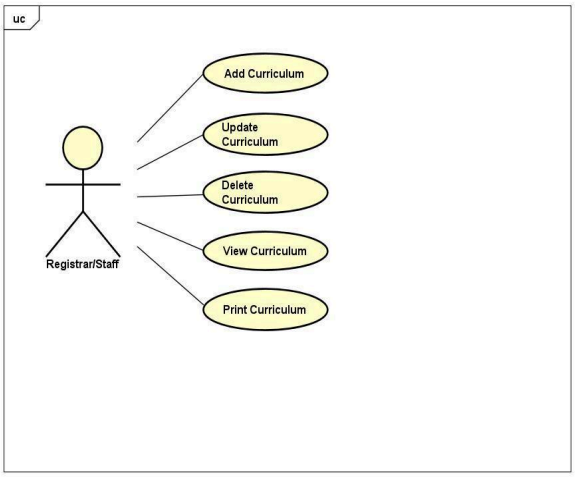

Figure 7. The Use Case Diagram of Registrar in the Management of Curriculum

This diagram shows the functions of the Registrar in the management of the curriculum. To this, the registrar/staff can add curriculum, update curriculum, delete curriculum, can view the curriculum, and print curriculum. In the proposed system, only the curriculum for a particular semester is integrated.

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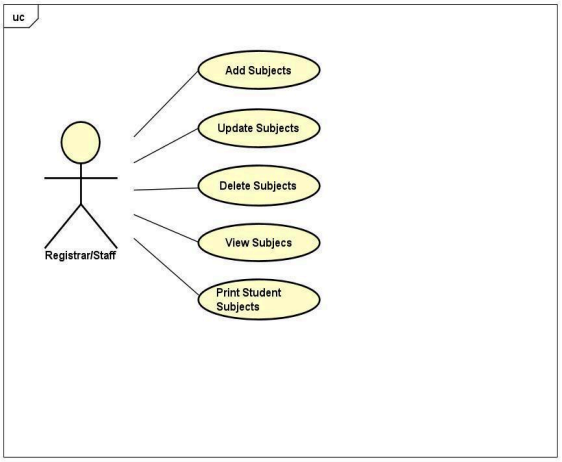

Figure 8. The Use Case Diagram of Registrar in the Management of Subjects

This diagram shows the functions of the Registrar in the management of subjects. Meanwhile, after inclusions of the curriculum of a particular semester, the registrar/staff can add subjects, update subjects, delete subjects, view subjects, and can print student subjects offered in the particular semester. The Office of the Dean of Instruction is handling subject offerings and only furnished copies to the Office of the Registrar for reportorial inclusions and filling.

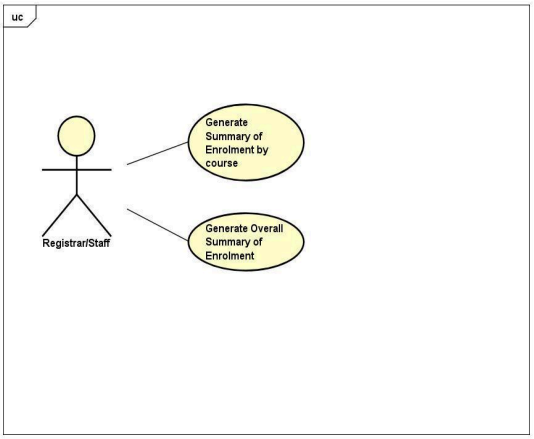

Figure 9. The Use Case Diagram of Registrar in the Generation of Reports

This diagram shows the functions of the Registrar in the generation of reports. As part of the major requirements in billing, a summary of enrolment by course, gender, and the major and an overall summary of enrolment are essential. It reflects the actual enrolment in all programs.

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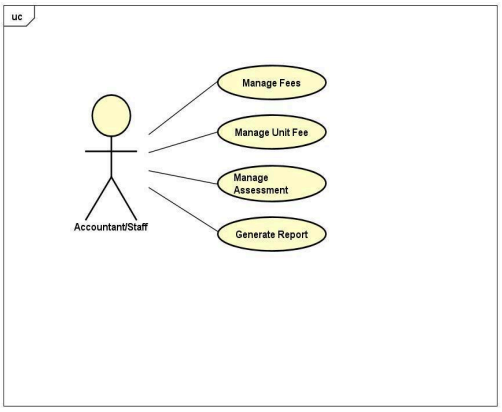

Figure 10. The Use Case Diagram of Accountant/Staff in the proposed system

This diagram shows the functions of the Accountant/Staff in the proposed system. The Accountant/Staff can manage fees, manage fees per unit, also can manage assessment, and can generate accounting reports.

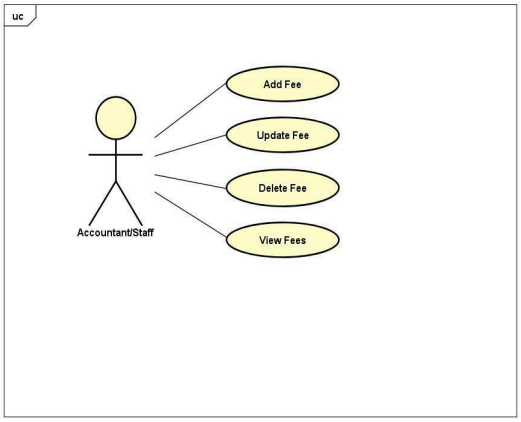

Figure 11. The Use Case Diagram of Accountant in the Management of Fees

This diagram shows the functions of the Accountant in the management of fees. The Accountant/staff can add fees, update fees, delete fees, and view fees for a particular semester. Changes in fees can be done to this section.

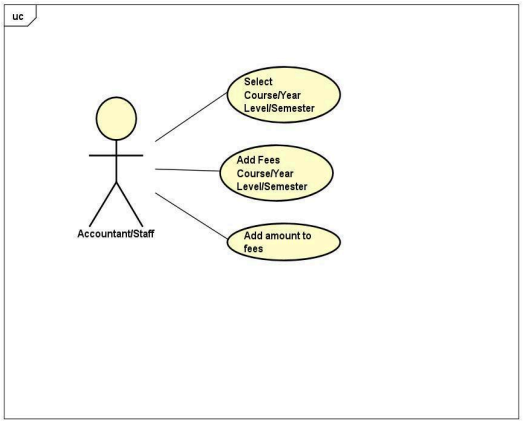

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Figure 12. The Use Case Diagram of Accountant in the Management of Unit Fees

This diagram shows the functions of the Accountant in the management of unit fees. The Accountant/staff can select a course, year level, and semester, also can add fees, and add the amount to fees on a certain particular.

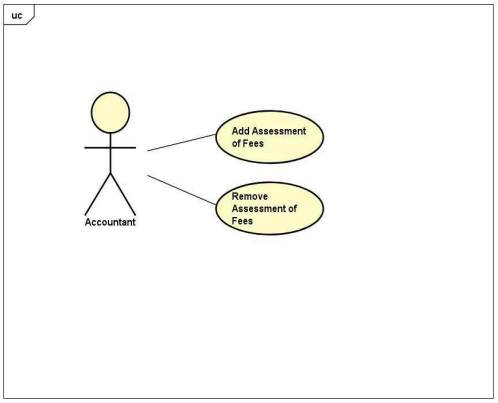

Figure 13. The Use Case Diagram of Accountant in the Management of Assessment

This diagram shows the functions of the Accountant in the management of assessment. In this area, the Accountant can add and remove assessments, since there is a pre-assessment in the proposed system; this part is the final assessment that only the accountant can do the changes.

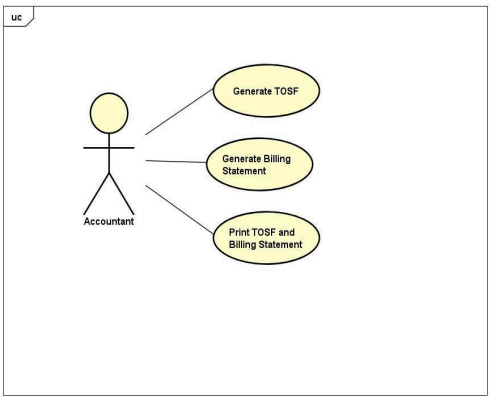

Figure 14. The Use Case Diagram of Accountant in the Generation of Reports

This diagram shows the functions of the Accountant in the generation of an accounting report. The Accountant can generate Tuition and Other School Fees (TOSF), FHE billing statements, and can print both documents. Those are the reports on the part of the Accountant that is submitted as to the finality of the amount to be billed to CHED-UNIFAST.

DESIGN

In this phase, the researchers start to analyze and design the possible output of the proposed system. In this phase, the programmer starts to design and develop a mobile application using React Native as software development and Firebase for storing data of the project.

Figure 6 shows the Entity-Relationship Diagram of the system.

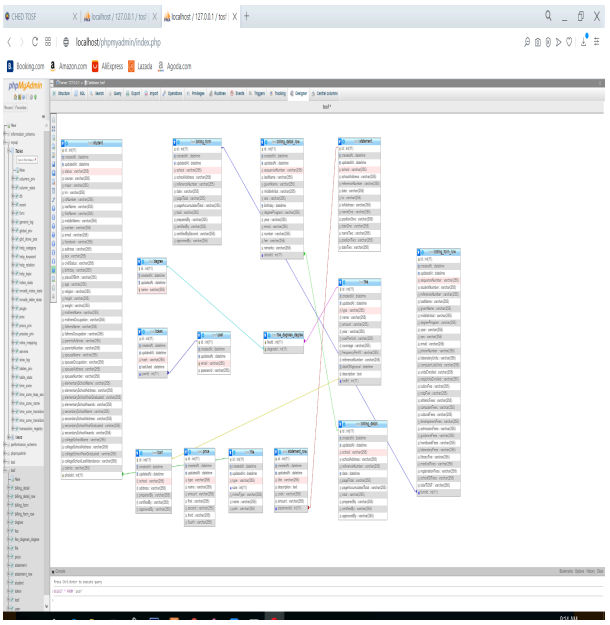

Figure 15. The Entity Relationship Diagram

DEVELOP

In this phase, the programmer continues to advance the task via the use of Android Studio as software development. And in this phase, the programmer encountered different issues which include code blunders and fixing.

Figures 7 and 8 show the activity diagrams of Registrar and Accountant Admin users, respectively.

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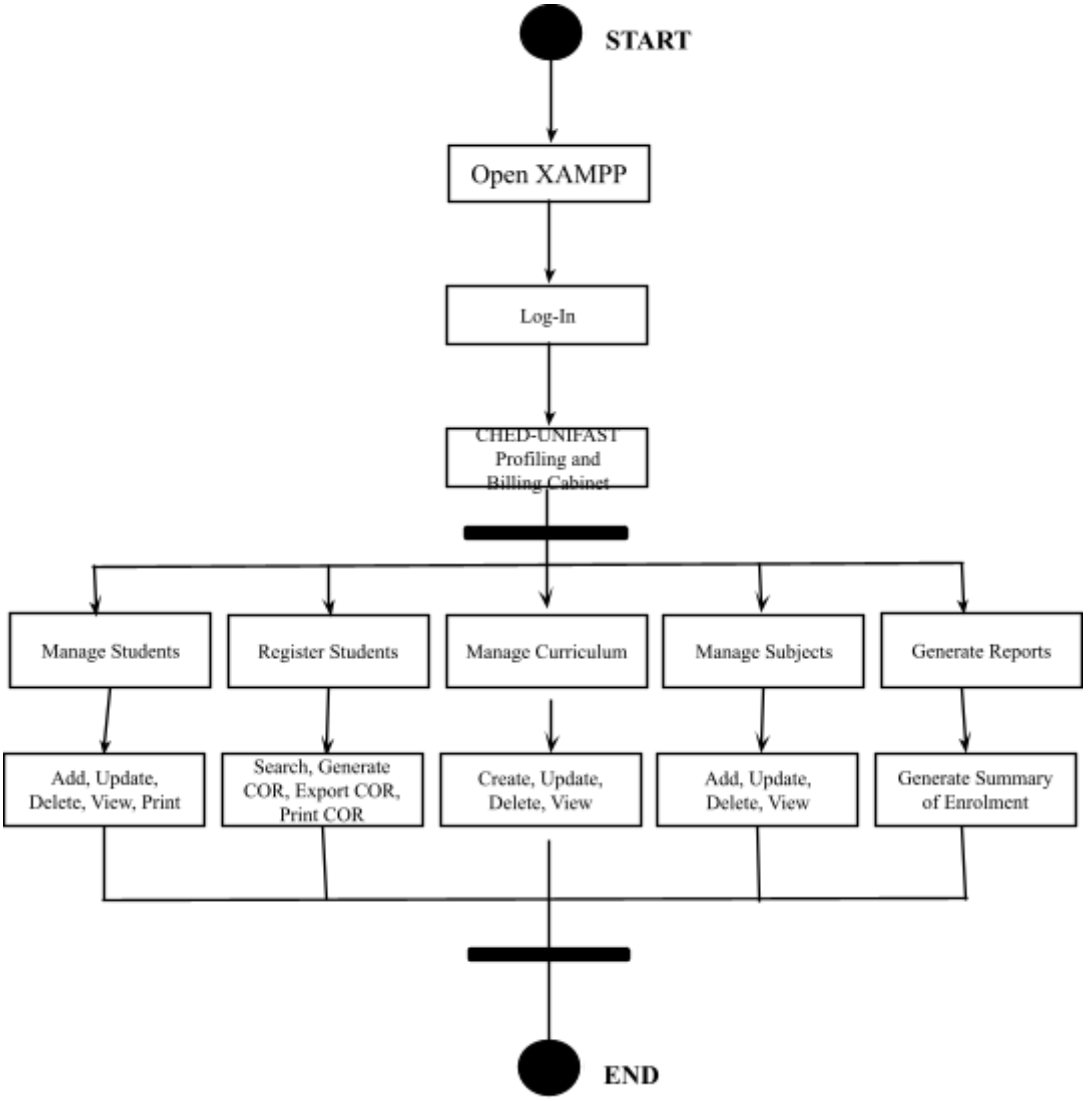

Figure 16. The Activity Diagram of Admin Registrar in managing CHED-UNIFAST Profiling and Billing Cabinet

This figure shows how the admin registrar manages the system. The admin must open XAMPP to log in to its account on Firebase. The Firebase serves as storage that is used to store all collected data of the researcher for the profiling and billing process. The admin can manage data storage and collection on the Firebase database.

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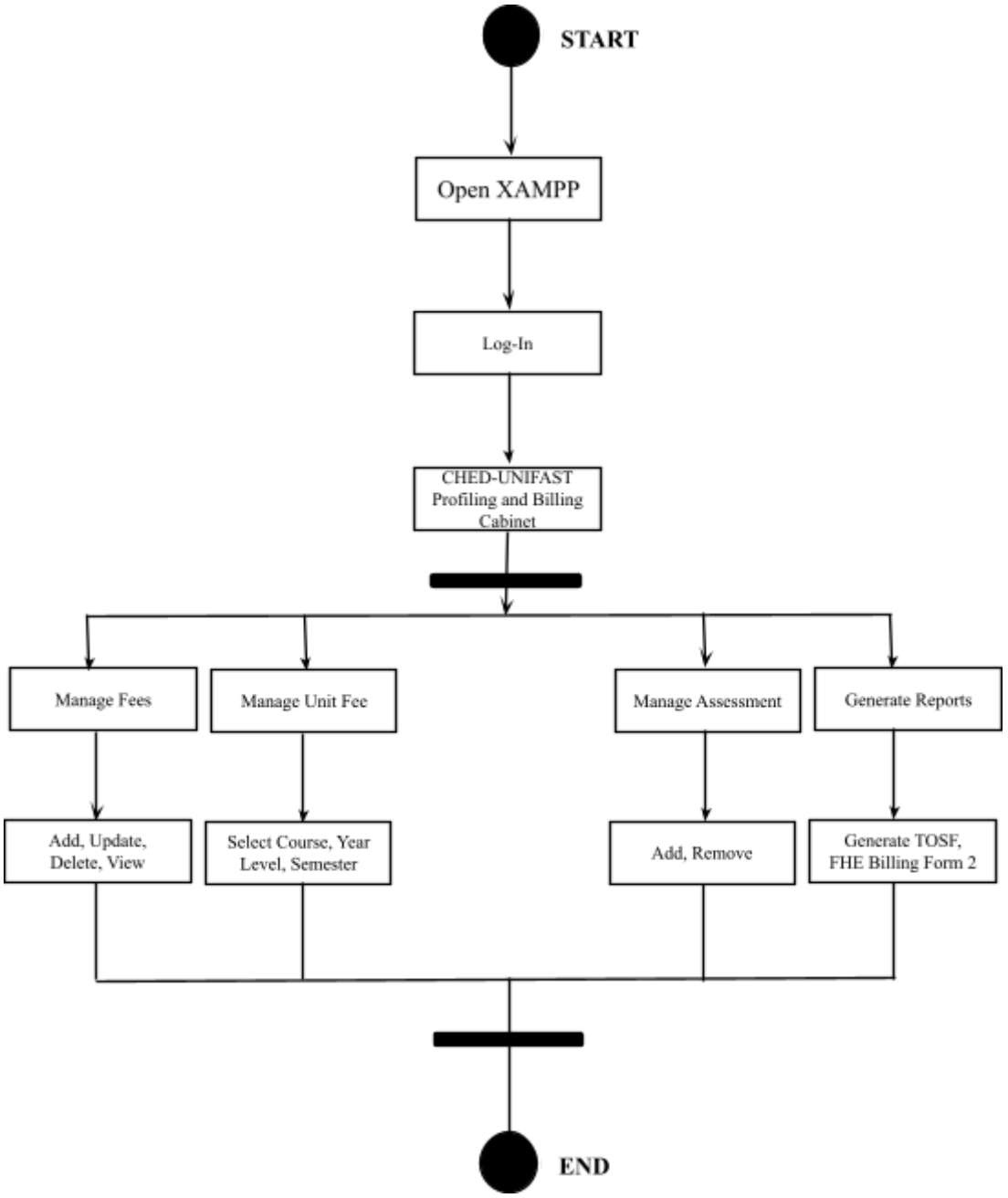

Figure 17 The Activity Diagram of Admin Accountant in using the CHED-UNIFAST Profiling and Billing Cabinet

This figure shows how the admin accountants access the system. The admin must open XAMPP to log in to its account on firebase. After, his/her functions in the system will appear and began doing his/her process.

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TEST

In this phase, the researcher/programmer initially tested the system if it is capable of delivering the desired results following the specified design and given data through the installation of the XAMPP Operating System and using the White Box Testing method. The White Box Testing method is a software testing method in which the internal structure/design/implementation of the item being tested is known/to the tester (*softwaretestingfundamentals.com*). The tests were done a considerable number of times to ensure that the system will run smoothly and free of errors. However, to achieve optimum functional accuracy, the system was subjected to further testing by an independent Panel of Experts/Technical Evaluators, formed through invitations made by the researcher, and was comprised of the following members, namely, one (1) ICT Expert, one (1) External Examiner, two (2) ICT Faculty, and (1) Dean. The panel tested the program developed by the researcher/programmer using the Black Box Testing method which is a software testing method in which the internal structure/design/implementation of the item being tested is not known to the tester (*softwaretestingfundamentals.com*). The testing is carried out in conjunction with its conformance to the International Standard Organization (ISO) 25010:2011.

The following are descriptions of the above ISO 25010 quality criteria.

The ISO 25010 Quality Criteria Descriptions

Product Quality

Functional Suitability – is the degree to which a product or system provides functions that meet stated and implied needs when used under specified conditions. It is composed of the following sub-characteristics: a) Functional completeness - The degree to which the set of functions covers all the specified tasks and user objectives; b) Functional correctness - the degree to which a product or system provides the correct results with the needed degree of precision; and c) Functional appropriateness – the degree to which the functions facilitate the accomplishment of specified tasks and objectives.

Performance Efficiency – This represents the performance relative to the number of resources used under stated conditions. The following are its sub- characteristics: a) Time behavior - the degree to which the response and processing times and throughput rates of a product or system, when performing its functions, meet requirements; b) Resource utilization - the degree to which the amounts and types of resources used by a product or system, when performing its functions, meet requirements; and, c) Capacity - the degree to which the maximum limits of a product or system parameter meet requirements

Compatibility – which a product, system, or component can exchange information with other products. It is composed of the following characteristics: a.) Co-existence – the degree to which a product can perform its required functions efficiently while sharing a common environment and resources with other products, without detrimental impact on any other product; and, b) Interoperability – The degree to which two or more systems, products, or components can exchange information and use the information that has been exchanged.

Usability – The degree to which the System can be used by targeted users to achieve specified goals easily and accurately. It is composed of the following sub-characteristics: a) Appropriateness recognizability - the degree to which users can recognize whether a product or system is appropriate for their needs; b) Learnability - the degree to which a product or system can be used by specified users to achieve specified goals of learning to use the product or system with effectiveness, efficiency, freedom from risk and satisfaction in a specified context of use; c) Operability - the degree to which a product or system has attributes that make it easy to operate and control; d) User error protection - the degree to which a system protects users against making errors; e) User interface aesthetics - the degree to which a user interface enables pleasing and satisfying interaction for the user; and, f) Accessibility - the degree to which a product or system can be used by people with the widest range of characteristics and capabilities to achieve a specified goal in a specified context of use.

Reliability – The degree to which the System is reliably operational under a normal condition with provision for data recovery in case of hardware or software failure. Its sub-characteristics are the following: a) Maturity – the degree to which a system, product, or component meets needs for reliability under normal operation; b) Availability - the degree to which a system, product, or component is operational and accessible when required for use; c) Fault tolerance - the degree to which a system, product or component operates as intended despite the presence of hardware or software faults; and, d) Recoverability - the degree to which, in the event of an interruption or a failure, a product or system can

recover the data directly affected and re-establish the desired state of the system.

Security – the degree by which a system is secured and can prevent unwarranted access to it and that it is provided with authentic and non-repudiable activity log. Its sub-characteristics are a) Confidentiality - the degree to which a product or system ensures that data are accessible only to those authorized to have access; b) Integrity - the degree to which a system, product, or component prevents unauthorized access to, or modification of, computer programs or data; c) Non-repudiation - the degree to which actions or events can be proven to have taken place so that the events or actions cannot be repudiated later; d) Authenticity - the degree to which actions or events can be proven to have taken place so that the events or actions cannot be repudiated later; and, e) Accountability - the degree to which the actions of an entity can be traced uniquely to the entity.

Maintainability – the degree of effectiveness and efficiency with which an application can be modified to improve it, correct it, or adapt it to changes in the environment, and requirements. It is composed of the following sub-characteristics: a.) Modularity - to which application is composed of the discrete components such that a change to one component has minimal impact on other components; b) Reusability - to which an asset can be used in more than one system, or in building other assets; c) Analyzability- the ability to diagnose the deficiencies or causes of failures; d) Modifiability - to which application can be effectively and efficiently modified without introducing defects or degrading existing product quality; and, e) Testability- test can be performing to determine whether those criteria have been met.

Portability – Application can be transferred from one hardware, software, or other operational or usage environment to another. Its sub-characteristics are the following: a) Adaptability - Application can effectively and efficiently be adapted for different or evolving hardware, software, or other operational or usage environments; b) Instability- in which application can be successfully installed and/or uninstalled in a specified environment; c) Replaceability- which an application can replace another specified software product for the same purpose in the same environment.

Quality in Use

Effectiveness – accuracy, and completeness with which users achieve specified goals.

Efficiency – resources expanded concerning the accuracy and completeness with which users achieve goals.

Satisfaction – the degree to which user needs are satisfied when a product or a system is used in a specified context of use. It is composed of the following sub-characteristics: a) Usefulness - which a user is satisfied with their perceived achievement of pragmatic goals including the results of use and the consequences of use; b) Trust - which a user or other stakeholder has confidence that a product or system will behave as intended; c) Pleasure - which a user obtains pleasure from fulfilling their personal needs; and, d) Comfort - which the user is satisfied with physical comfort.

Freedom from Risk – a product or a system mitigates the potential risk to economic status, human life, health, or the environment. It is composed of the following sub-characteristics: a) Economic Risk Mitigation - product or system mitigates the potential risk to people in the intended contexts of use; b) Health and safety risk mitigation – the degree to which a product or system mitigates the potential risk to people in the intended contexts of use; and, c) Environmental Risk Mitigation- mitigates the potential risk to property or the environment in the intended contexts of use.

Context coverage – the degree to which a product or system can be with effectiveness, efficiency, freedom from risk, and satisfaction in both specified context of use and context beyond those initially explicitly identified. It is composed of the following sub-characteristics: a) Context Completeness - the degree to which the system can be used with effectiveness, efficiency, freedom from risk, and satisfaction in all the specified contexts of use; b) Flexibility - the system can be used with effectiveness, efficiency, freedom from risk and satisfaction in contexts beyond those initially specified in the requirements.

EVALUATE

In this phase, the System was deemed ready and was further subjected to a performance assessment, this time by ten (10) identified users as evaluators, comprised of the three (3) campus registrars, 3 campus accountants, two (2) staff, and 2 IT experts utilizing a questionnaire based on the criteria of ISO 25010:2011.

The researcher sought the approval of the Office of the College President, ISCOF, and Office of

the Campus Administrator, WVSU Lambunao Campus, Lambunao, Iloilo to identify processes in terms of student profiling and billing documents for CHED-UNIFAST and other related information to have reliable data to input on the proposed system. The study used React Native, Internet, MYSQL, UML, and Mobile Phone in developing the software. The researcher further wrote a permission letter to the Campus Administrator of WVSU Lambunao Campus, Lambunao, Iloilo to interview the Campus Registrar and Accountant to get the information needed in the study.

The system was designed and developed to be user-friendly, and as such, it was expected to be consistent in simulating users' interests and to be simple in operation without many instructions to do.

All ratings on each criterion by technical evaluators and users followed the five (5)-point Likert scale described below:

Rating	Description
5	Very effective
4	Effective
3	Fairly effective
2	Less effective
1	Poorly effective

Very effective (5) means that the System exhibits superior product quality and quality in use.
Effective (4) means that the System exhibits high product quality and quality in use.
Fairly effective (3) means that the System exhibits fair product quality and quality in use.
Less effective (2) means that the System exhibits low product quality and quality in use.
Poorly effective (1) means that the System exhibits inferior product quality and quality in use.

Statistical Treatment of Data

To interpret the data gathered as perceived by the respoindents, the scale below was used:

Scale	Interpretation
4.21 – 5.00	Very effective
3.41 – 4.20	Effective
2.61 – 3.40	Fairly effective
1.81 – 2.60	Less effective
1.00 – 1.80	Poorly effective

All statistical computations were processed with the use of Microsoft Excel Software Application

DEPLOYMENT PHASE

Deployment phase follows once the system is approved by the evaluators for implementation.

4. Results and Discussion

Objective No. 1. Create a program/software that could manage user accounts.

Utilizing the Agile model, a program/software, aptly called "CHED-UNIFAST Profiling and Billing Cabinet", was finally created that could manage user accounts. The Main Page (Dashboard) of the system shown in Figure 18 is where the administrator can view modules for the full operations of the system. On this page, the user can view the totality of processes made in a particular function.

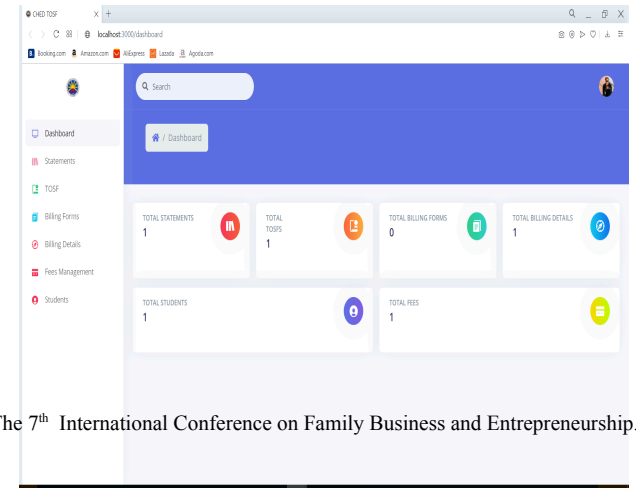

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Figure 18. The Main Page of the System (Dashboard)

The user management of the system shown in Figure 10 shows options for two (2) users to access and operate the software. To create a user account, the user should register first through the specified button. Once the user is registered, he/she can log in to the system with a specific username and password.

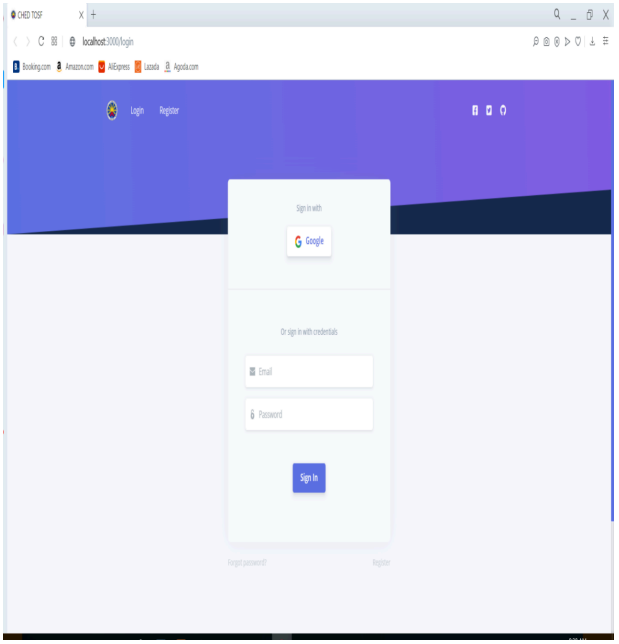

Figure 19 shows the user account management screen.

Figure 19. The user account management page.

Objective 2. Develop a program/software that would (a) create student profile data, (b) generate and manage the curriculum of the current semester correctly, (c) assess and reflect management of fees of the current semester properly, and (d) generate UNIFAST billing documents accurately and efficiently.

Objective 2a. Create student profile data.

The completed program for CHED –UniFAST processing was designed to store and retrieve student personal data for profiling purposes. The page from the system for student profiling displays fields that require the basic and essential information of a particular student. Adding and updating information is done by the registrar.

Figure 20 shows the Student Profiling Page.

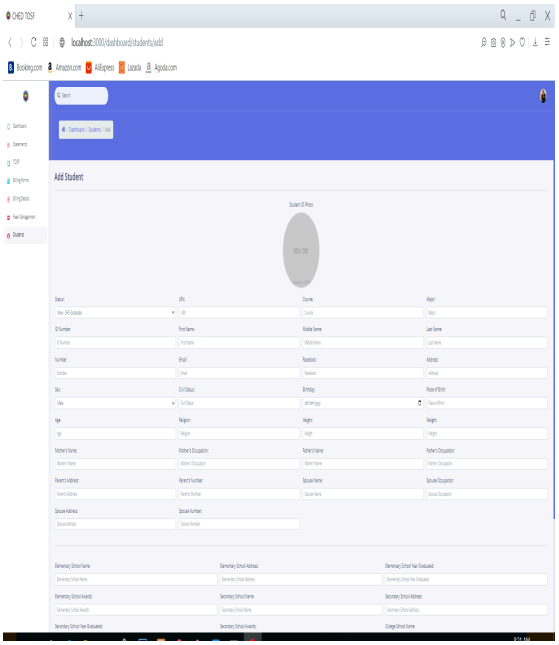

Figure 20. The Student Profiling Page

Objective 2b. Generate and manage the curriculum of the current semester correctly.

The program will allows management of curriculum and was designed to store and update curriculum offered for a particular semester. There was a regular curriculum offered in a particular semester and also part of the overall curriculum but subject for special arrangement or tutorial classes for irregular students.

Figure 21 shows the Management of Curriculum.

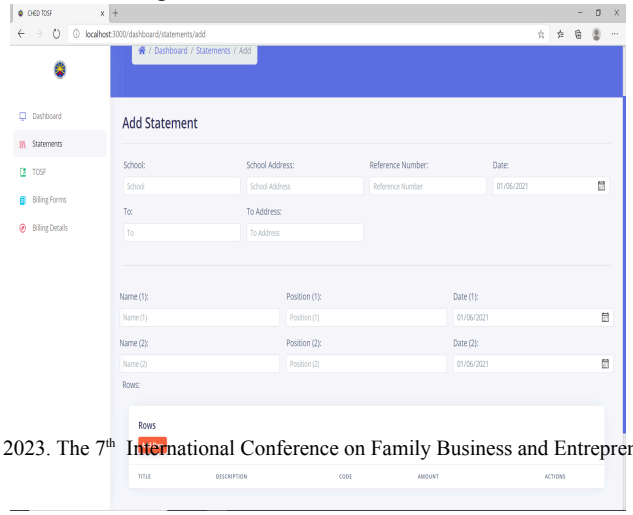

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Figure 21. The Management of Curriculum Page

Objective 2c. Assess and reflect the management of fees for the current semester properly.

The system can assess and reflect management of fees, as well as process the billing details for CHED-UniFAST. In this section, fees for a particular semester are reflected. Figure 22 shows the billing detail page of the program.

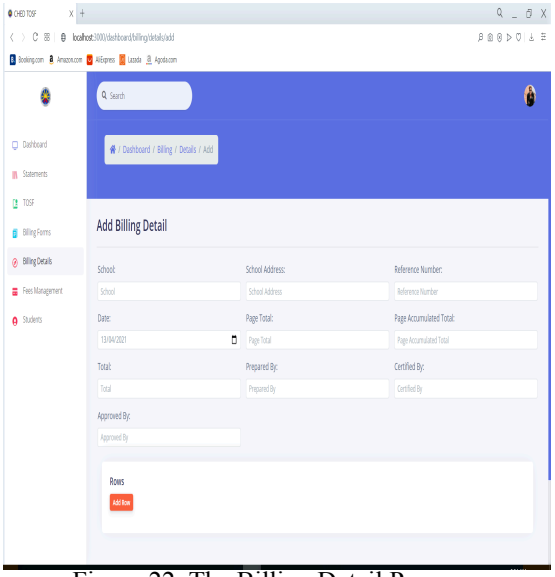
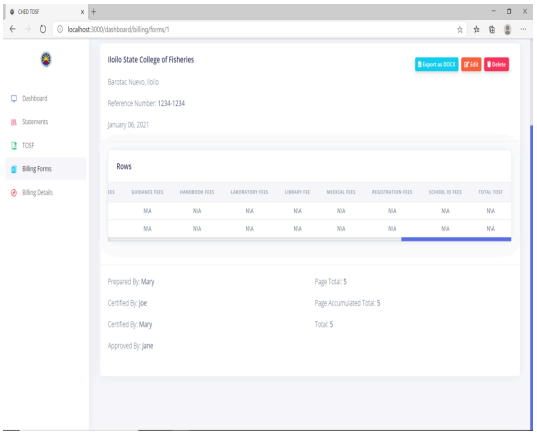


Figure 22. The Billing Detail Page

Objective 2d. Generate UniFAST billing documents accurately and efficiently.

The system was able to generate required billing documents. In this section, the names of student are reflected with corresponding year level, course, tuition and other school fees as part of the billing process.



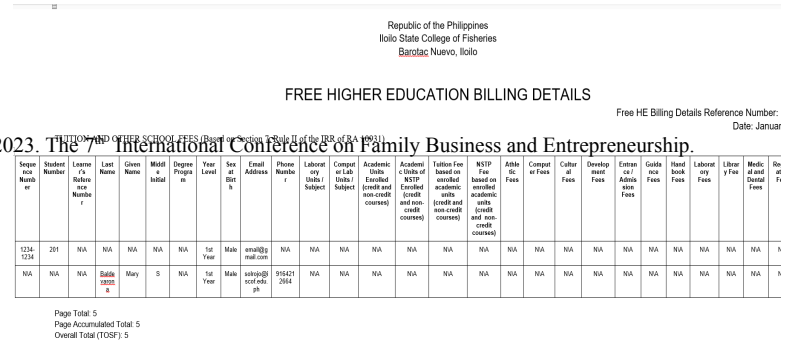


Figure 23. The Billing Detail Page

Objective 3. Evaluate and test the developed System to determine its level of effectiveness using the International Standard Organization (ISO) 25010:2011 (Product Quality and Quality in Use) software quality model criteria as perceived by the evaluators.

Product Quality – ISO 25010:2011

Level of Effectiveness of CHED-UniFAST Profiling and Billing Cabinet in terms of Functional Suitability as Perceived by the Respondents

As perceived by the respondents, the level of Functional Suitability of CHED-UniFAST Profiling and Billing Cabinet was generally Very Effective (Mean = 4.83).

For its sub-characteristics, the levels of Functional Completeness (Mean = 4.79), Functional Correctness (Mean = 4.80), and Functional Appropriateness (Mean = 4.90) were all found to be Very Effective. Among the respondents, the IT experts got the higher means (Mean = 4.93) in Functional Suitability. These results show that the CHED-UniFAST Profiling and Billing Cabinet generally works accurately, responds to a correct result, and complies with all specified objectives as perceived by the evaluators.

Table 1 shows the results.

Table 1. Result of the Mean Average of the Level of Functional Suitability of CHED-UniFAST Profiling and Billing Cabinet as perceived by the Respondents

Product Quality (Functional Suitability)	Campus Registrar (3)		Accountant (3)		Staff (2)		IT Expert (2)		Entire Group (10)	
	M	Desc.	M	Desc.	M	Desc.	M	Desc.	M	Desc.
Functional Completeness	5.00	VE	4.75	VE	4.60	VE	4.80	VE	4.79	VE
Functional Correctness	4.80	VE	4.80	VE	4.60	VE	5.00	VE	4.80	VE
Functional Appropriateness	4.80	VE	5.00	VE	4.80	VE	5.00	VE	4.90	VE
Mean Average	4.87	VE	4.85	VE	4.67	VE	4.93	VE	4.83	VE

Scale: 4.21-5.00 (Very effective, VE), 3.41-4.20 (Effective, E), 2.61-3.40 Fairly effective, FE),1.81-2.60 (Less effective, LE), 1.00-1.80 (Poorly effective, PE)

Level of Effectiveness of CHED-UniFAST Profiling and Billing Cabinet in terms of Performance Efficiency as Perceived by the Respondents

Generally, the level of Performance Efficiency of CHED-UniFAST Profiling and Billing Cabinet was Very Effective (Mean = 4.64) as perceived by the respondents

Whether the evaluators were taken individually or as an entire group all categories under the Performance Efficiency (Time Behavior, Mean = 4.75; Resource Utilization, Mean = 4.60; and Capacity, Mean= 4.56) were found to be Very Effective. Mean average values range from 4.29 to 5.00 which are within the scale for very effective. As to the type of user, the IT experts got the highest mean (Mean = 4.79).

As a whole, these results imply that the CHED-UniFAST Profiling and Billing Cabinet provides immediately the result on time and there is no error, provides information and data about the system and its purpose, and it works to its maximum usage.

Table 2 shows the results.

Table 2. Result of the Mean Average of the Level of Performance Efficiency of CHED-UniFAST Profiling and Billing Cabinet as perceived by the Respondents

Product Quality (Performance Efficiency)	Campus Registrar (3)		Accountant (3)		Staff (2)		IT Expert (2)		Entire Group (10)	
	M	Desc.	M	Desc.	M	Desc.	M	Desc.	M	Desc.
Time Behavior	5.00	VE	4.92	VE	4.29	VE	4.80	VE	4.75	VE
Resource Utilization	4.29	VE	4.69	VE	4.40	VE	5.00	VE	4.60	VE
Capacity	4.29	VE	4.77	VE	4.40	VE	4.80	VE	4.56	VE
Mean Average	4.53	VE	4.79	VE	4.36	VE	4.87	VE	4.64	VE

Scale: 4.21-5.00 (Very effective, VE), 3.41-4.20 (Effective, E), 2.61-3.40 Fairly effective, FE),1.81-2.60 (Less effective, LE), 1.00-1.80 (Poorly effective, PE)

Level of Effectiveness of CHED-UniFAST Profiling and Billing Cabinet in terms of Compatibility as Perceived by the Respondents

As perceived by the respondents, the level of Compatibility of CHED-UniFAST Profiling and Billing Cabinet was generally Very Effective (Mean = 4.70).

For its sub-characteristics, the levels of Co-existence (Mean = 4.65), and Interoperability (Mean = 4.75) were all found to be Very Effective. Among the respondents, the Campus Registrar and Accountant got the same higher means (Means = 4.80).

As a whole, these results show that the CHED-UniFAST Profiling and Billing Cabinet can still function while the other system user is in use, and it can also access other systems that are running.

Table 3 shows the results.

Table 3. Result of the Mean Average of the Level of Compatibility of CHED-UniFAST Profiling and Billing Cabinet as perceived by the Respondents

Product Quality (Compatibility)	Campus Registrar (3)		Accountant (3)		Staff (2)		IT Expert (2)		Entire Group (10)	
	M	Desc.	M	Desc.	M	Desc.	M	Desc.	M	Desc.
Coexistence	4.80	VE	4.80	VE	4.40	VE	4.60	VE	4.65	VE
Interoperability	4.80	VE	4.80	VE	4.60	VE	4.80	VE	4.75	VE
Mean Average	4.80	VE	4.80	VE	4.50	VE	4.70	VE	4.70	VE

Scale: 4.21-5.00 (Very effective, VE), 3.41-4.20 (Effective, E), 2.61-3.40 Fairly effective, FE),1.81-2.60 (Less effective, LE), 1.00-1.80 (Poorly effective, PE)

Level of Effectiveness of CHED-UniFAST Profiling and Billing Cabinet in terms of Usability as Perceived by the Respondents

Generally, the level of effectiveness of CHED-UniFAST Profiling and Billing Cabinet in terms of Usability was Very Effective (Mean = 4.77) as perceived by the respondents.

Whether the respondents were taken individually or as an entire group, all categories under Usability (Appropriate recognizability, Mean = 4.80; Learnability, Mean = 4.80; Operability, Mean = 4.85; User error protection, Mean = 4.58; User interface aesthetics, Mean = 4.80; and Accessibility, Mean = 4.80) were found to be Very Effective. Mean average values range from 4.40 to 5.00 which are within the scale for very effective. Among the respondents, the Campus Registrar and IT experts have the same higher means (Means = 4.87).

As a whole, these results mean that the developed Profiling and Billing Cabinet is the right system to be used for CHED-UniFAST transactions, as it is easy to learn and convenient to use, easy to operate, and control, provides for user error protection, and can be accessed easily.

Table 4 shows the results.

Table 4. Result of the Mean Average of the Level of Usability of CHED-UniFAST Profiling and Billing Cabinet as perceived by the Respondents

Product Quality (Usability)	Campus Registrar (3)		Accountant (3)		Staff (2)		IT Expert (2)		Entire Group (10)	
	M	Desc.	M	Desc.	M	Desc.	M	Desc.	M	Desc.
Appropriate Recognizability	4.90	VE	4.60	VE	4.80	VE	4.80	VE	4.80	VE
Learnability	4.80	VE	4.60	VE	5.00	VE	4.80	VE	4.80	VE
Operability	4.80	VE	5.00	VE	4.80	VE	4.80	VE	4.85	VE
User Error Protection	4.70	VE	4.40	VE	4.40	VE	4.80	VE	4.58	VE
User Interface Aesthetics	5.00	VE	4.40	VE	4.80	VE	5.00	VE	4.80	VE
Accessibility	5.00	VE	4.40	VE	4.80	VE	5.00	VE	4.80	VE
Mean Average	4.87	VE	4.57	VE	4.77	VE	4.87	VE	4.77	VE

Scale: 4.21-5.00 (Very effective, VE), 3.41-4.20 (Effective, E), 2.61-3.40 Fairly effective, FE), 1.81-2.60 (Less effective, LE), 1.00-1.80 (Poorly effective, PE)

Level of Effectiveness of CHED-UniFAST Profiling and Billing Cabinet in terms of Reliability as Perceived by the Respondents

As perceived by the respondents, the level of effectiveness of CHED-UniFAST Profiling and Billing Cabinet in terms of Reliability was generally Very Effective (Mean = 4.70).

For its sub-characteristics, the levels of the system's Maturity (Mean = 4.75), Availability (Mean = 4.55), Fault tolerance (Mean = 4.70), and Recoverability (Mean = 4.72) were all found to be Very Effective. Among the respondents, the IT experts rated higher mean (Mean = 4.90) than the others.

Overall, these results show that the CHED-UniFAST Profiling and Billing Cabinet functions at all times without crashes and operates perfectly, works even with a small error or bugs, and recovers data if suddenly disrupted.

Table 5 shows the results.

Table 5. Result of the Mean Average of the Level of Reliability of CHED-UniFAST Profiling and Billing Cabinet as perceived by the Respondents

Product Quality (Reliability)	Campus Registrar (3)		Accountant (3)		Staff (2)		IT Expert (2)		Entire Group (10)	
	M	Desc.	M	Desc.	M	Desc.	M	Desc.	M	Desc.
Maturity	4.80	VE	4.40	VE	4.80	VE	5.00	VE	4.75	VE
Availability	4.60	VE	4.40	VE	4.60	VE	4.60	VE	4.55	VE
Fault Tolerance	4.60	VE	4.60	VE	4.60	VE	5.00	VE	4.70	VE
Recoverability	4.70	VE	4.60	VE	4.60	VE	5.00	VE	4.72	VE
Mean Average	4.67	VE	4.50	VE	4.70	VE	4.90	VE	4.68	VE

Scale: 4.21-5.00 (Very effective, VE), 3.41-4.20 (Effective, E), 2.61-3.40 Fairly effective, FE),1.81-2.60 (Less effective, LE), 1.00-1.80 (Poorly effective, PE

Level of Effectiveness of CHED-UniFAST Profiling and Billing Cabinet in terms of

Security as Perceived by the Respondents

As perceived by the respondents, the level of effectiveness of the CHED-UniFAST Profiling and Billing in terms of Security was generally Very Effective (Mean = 4.47).

For its sub-characteristics, the levels of the system's Confidentiality (Mean = 4.70), Integrity (Mean=4.72), Non-repudiation (Mean=4.70), Accountability (Mean = 4.72), and Authenticity (Mean = 4.52), were all found to be Very Effective, however, Accountability got the higher mean than the others. This implies that the sub characteristic Accountability was more indicative of the effectiveness of the Security of the System. Among the respondents, the Campus Registrar rated a higher mean (Mean = 4.80) than the others. Overall, these results show that the CHED-UniFAST Profiling and Billing Cabinet can secure the data if suddenly disrupted, prevents unauthorized access, shows that the event has taken place and cannot be repudiated later, is responsible and able to give a satisfactory reason, and accurate and reliable to the user.

Table 6 shows the results.

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Table 6. Result of the Mean Average of the Level of Security of CHED-UniFAST Profiling and Billing Cabinet as perceived by the Respondents

Product Quality (Security)	Campus Registrar (3)		Accountant (3)		Staff (2)		IT Expert (2)		Entire Group (10)	
	M	Desc.	M	Desc.	M	Desc.	M	Desc.	M	Desc.
Confidentiality	4.60	VE	4.60	VE	4.80	VE	4.80	VE	4.70	VE
Integrity	4.70	VE	4.60	VE	4.80	VE	4.80	VE	4.72	VE
Non-repudiation	4.80	VE	4.40	VE	4.80	VE	4.80	VE	4.70	VE
Accountability	5.00	VE	4.60	VE	5.00	VE	4.60	VE	4.80	VE
Authenticity	4.90	VE	4.40	VE	4.40	VE	4.60	VE	4.52	VE
Mean Average	4.80	VE	4.52	VE	4.76	VE	4.72	VE	4.69	VE

Scale: 4.21-5.00 (Very effective, VE), 3.41-4.20 (Effective, E), 2.61-3.40 Fairly effective, FE),1.81-2.60 (Less effective, LE), 1.00-1.80 (Poorly effective, PE)

Level of Effectiveness of CHED-UniFAST Profiling and Billing Cabinet in terms of Maintainability as Perceived by the Respondents

As perceived by the evaluators, the level of effectiveness of CHED-UniFAST Profiling and Billing Cabinet in terms of Maintainability was generally Very Effective (Mean = 4.77).

For its individual sub-characteristics, the levels of Modularity (Mean = 4.62), Reusability (Mean = 4.72), Analyzability (Mean = 4.75), Modifiability (Mean = 4.90), and Testability (Mean = 4.85)`were all found to be Very Effective. Among the sub-characteristics, Modifiability exhibits a higher mean. IT experts rated higher mean (Mean = 4.92) than the rest of the respondents.

Overall, these results show that the CHED-UniFAST Profiling and Billing Cabinet generally functions properly, can be used in other assets, identifies errors in its functions, can be modified without degrading the system, and can be tested before releasing to the market/users.

Table 7 shows the result.

Table 7. Result of the Mean Average of the Level of Maintainability of CHED-UniFAST Profiling and Billing Cabinet as perceived by the Respondents

Product Quality (Maintainability)	Campus Registrar (3)		Accountant (3)		Staff (2)		IT Expert (2)		Entire Group (10)	
	M	Desc.	M	Desc.	M	Desc.	M	Desc.	M	Desc.
Modularity	4.70	VE	4.60	VE	4.40	VE	4.80	VE	4.62	VE
Reusability	4.70	VE	4.80	VE	4.40	VE	5.00	VE	4.72	VE
Analyzabilty	4.80	VE	4.80	VE	4.40	VE	5.00	VE	4.75	VE
Modifiability	4.80	VE	4.80	VE	5.00	VE	5.00	VE	4.90	VE
Testability	5.00	VE	4.80	VE	4.80	VE	4.80	VE	4.85	VE
Mean Average	4.80	VE	4.76	VE	4.60	VE	4.92	VE	4.77	VE

Scale: 4.21-5.00 (Very effective, VE), 3.41-4.20 (Effective, E), 2.61-3.40 Fairly effective, FE),1.81-2.60 (Less effective, LE), 1.00-1.80 (Poorly effective, PE)

Level of Effectiveness of CHED-UniFAST Profiling and Billing Cabinet in terms of Portability as Perceived by the Respondents

Generally, the level of effectiveness of CHED-UniFAST Profiling and Billing Cabinet in terms of Portability was Very Effective (Mean = 4.71) as perceived by the respondents.

Whether the respondents were taken individually or as an entire group, all categories under Portability (Adaptability, Mean = 4.68; Installability, Mean = 4.75; and Replaceability, Mean = 4.70) were found to be Very Effective. Mean average values range from 4.60 to 5.00 which are within the scale for very effective. Among the respondents, the Accountant has the higher mean (Meas = 4.80).

As a whole, these results mean that the developed CHED-UniFAST Profiling and Billing Cabinet functions in several technology environments, is easily installed/uninstalled, and works better than the other systems of the same functions.

Table 8 shows the results.

Table 8. Result of the Mean Average of the Level of Portability of CHED-UniFAST Profiling and Billing Cabinet as perceived by the Respondents

Product Quality (Portability)	Campus Registrar (3)		Accountant (3)		Staff (2)		IT Expert (2)		Entire Group (10)	
	M	Desc.	M	Desc.	M	Desc.	M	Desc.	M	Desc.
Adaptability	4.70	VE	4.80	VE	4.60	VE	4.60	VE	4.68	VE
Installability	4.80	VE	4.80	VE	4.60	VE	4.80	VE	4.75	VE
Replaceability	4.60	VE	4.80	VE	4.80	VE	4.60	VE	4.70	VE
Mean Average	4.70	VE	4.80	VE	4.67	VE	4.67	VE	4.71	VE

Scale: 4.21-5.00 (Very effective, VE), 3.41-4.20 (Effective, E), 2.61-3.40 Fairly effective, FE),1.81-2.60 (Less effective, LE), 1.00-1.80 (Poorly effective, PE)

Quality in Use – ISO 25010:2011

Level of Effectiveness of CHED-UniFAST Profiling and Billing Cabinet as Perceived by the Respondents

As perceived by the respondents, the level of effectiveness of the CHED-UniFAST Profiling and Billing Cabinet was generally Very Effective (Mean = 4.70).

This result shows that the CHED-UniFAST Profiling and Billing Cabinet provides complete and exact data according to the ways of MYSQL Programming Language and XAMPP Operating System.

Table 9 shows the result.

Table 9. Result of the Mean Average of the Level of Effectiveness of CHED-UniFAST Profiling and Billing Cabinet as perceived by the Respondents

Quality in Use (Effectiveness)	Campus Registrar (3)		Accountant (3)		Staff (2)		IT Expert (2)		Entire Group (10)	
	M	Desc.	M	Desc.	M	Desc.	M	Desc.	M	Desc.
Effectiveness	4.60	VE	4.80	VE	4.40	VE	5.00	VE	4.70	VE

Mean Average	4.60 VE	4.80 VE	4.40 VE	5.00 VE	4.70 VE

Scale: 4.21-5.00 (Very effective, VE), 3.41-4.20 (Effective, E), 2.61-3.40 Fairly effective, FE),1.81-2.60 (Less effective, LE), 1.00-1.80 (Poorly effective, PE)

Level of Efficiency of CHED-UniFAST Profiling and Billing Cabinet as Perceived by the Respondents

Generally, the level of efficiency of the CHED-UniFAST Profiling and Billing Cabinet was Very Effective (Mean = 4.75) as perceived by the respondents.

This result implies that the CHED-UniFAST Profiling and Billing Cabinet provides complete and accurate results to users.

Table 10 shows the results.

Table 10. Result of the Mean Average of the Level of Efficiency of CHED-UniFAST Profiling and Billing Cabinet as perceived by the Respondents

Quality in Use (Efficiency)	Campus Registrar (3)		Accountant (3)		Staff (2)		IT Expert (2)		Entire Group (10)	
	M	Desc.	M	Desc.	M	Desc.	M	Desc.	M	Desc.
Efficiency	4.60	VE	5.00	VE	4.60	VE	4.80	VE	4.75	VE
Mean Average	4.60	VE	5.00	VE	4.60	VE	4.80	VE	4.75	VE

Scale: 4.21-5.00 (Very effective, VE), 3.41-4.20 (Effective, E), 2.61-3.40 Fairly effective, FE), 1.81-2.60 (Less effective, LE), 1.00-1.80 (Poorly effective, PE)

Level of Effectiveness of CHED-UniFAST Profiling and Billing Cabinet in terms of Satisfaction as Perceived by the Respondents

As perceived by the respondents, the level of Users' Satisfaction with CHED-UniFAST Profiling and Billing Cabinet was generally Very Effective (Mean = 4.74). For its sub-characteristics, the levels of users' satisfaction with the system as to its Usefulness (Mean = 4.68), Trust (Mean = 4.75), Pleasure of use (Mean = 4.78), Comfort (Mean = 4.78), and Economic Risk Mitigation (Mean = 4.70) were all found to be Very Effective. These results show that the CHED-UniFAST Profiling and Billing Cabinet is generally useful in providing information and description about MYSQL Programming Language, and the users feel satisfied after using the system.

Table 11 shows the result.

Table 11. Result of the Mean Average of the Level of Satisfaction of CHED-UniFAST Profiling and Billing Cabinet as perceived by the Respondents

Quality in Use (Satisfaction)	Campus Registrar (3)		Accountant (3)		Staff (2)		IT Expert (2)		Entire Group (10)	
	M	Desc.	M	Desc.	M	Desc.	M	Desc.	M	Desc.
Usefulness	4.70	VE	4.60	VE	4.60	VE	4.80	VE	4.68	VE
Trust	4.80	VE	5.00	VE	4.40	VE	4.80	VE	4.75	VE
Pleasure	4.90	VE	4.80	VE	4.60	VE	4.80	VE	4.78	VE
Comfort	4.70	VE	5.00	VE	4.60	VE	4.80	VE	4.78	VE
Mean Average	4.78	VE	4.85	VE	4.55	VE	4.80	VE	4.75	VE

Scale: 4.21-5.00 (Very effective, VE), 3.41-4.20 (Effective, E), 2.61-3.40 Fairly effective, FE),1.81-2.60 (Less effective, LE), 1.00-1.80 (Poorly effective, PE)

Level of Effectiveness of CHED-UniFAST Profiling and Billing Cabinet in terms of Freedom from Risk as Perceived by the Respondents

Generally, the level of Freedom from Risk of CHED-UniFAST Profiling and Billing Cabinet was Very Effective (Mean = 4.73) as perceived by the evaluators.

All sub-characteristics under Freedom from Risks such as Economic Risk Mitigation (Mean = 4.70), Health and Safety Risk Mitigation (Mean = 4.73), and Environmental Risk Mitigation (Mean = 4.75) were very effective. This result implies that the developed System mitigates the potential risk to financial status, efficient operation, commercial property, reputation, or other resources in the intended contexts of use. Moreover, this result indicates that the developed System provides healthy tips in operating its specified purpose, and mitigates the potential risk to property or the environment.

Table 12 shows the results.

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Table 12. Result of the Mean Average of the Level of Freedom from Risk of CHED-UniFAST Profiling and Billing Cabinet as perceived by the Respondents

Scale: 4.21-5.00 (Very effective, VE), 3.41-4.20 (Effective, E), 2.61-3.40 Fairly effective, FE),1.81-2.60 (Less effective, LE), 1.00-1.80 (Poorly effective, PE)	Quality in Use (Freedom from Risk)	Campus Registrar (3)		Accountant (3)		Staff (2)		IT Expert (2)		Entir Grou (10	
		M	Desc.	M	Desc.	M	Desc.	M	Desc.	M	De
Level of Effectivenss of CHED-UniFAST Profiling and Billing Cabinet in terms of Context Coverage as Perceived by the Respondents	*Economic risk mitigation*	4.80	VE	5.00	VE	4.40	VE	4.60	VE	4.70	V
	Health and safety risk mitigation	4.90	VE	4.60	VE	4.60	VE	4.80	VE	4.73	V
	Environmental risk mitigation	5.00	VE	4.60	VE	4.60	VE	4.80	VE	4.75	V
	Mean Average	4.90	VE	4.73	VE	4.53	VE	4.73	VE	4.73	V

As perceived by the respondents, the level of Context Coverage CHED-UniFAST Profiling and Billing Cabinet in terms of Context Completeness (Mean = 4.70) and Flexibility (Mean = 4.60) was Very Effective. The Campus Registrar has the highest mean (Mean = 5.00) while the Accountant, Staff/s, and IT experts have means of 4.40, 4.70, and 4.50 respectively. The result shows that the developed system complies with all the requirements, and gives satisfying interaction to the user and its environment.

Table 13 shows the result.

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Table 13. Result of the Mean Average of the Level of Context Coverage of CHED-UniFAST Profiling and Billing Cabinet as perceived by the Respondents

Quality in Use (Context Coverage)	Campus Registrar (3)		Accountant (3)		Staff (2)		IT Expert (2)		Entire Group (10)	
	M	Desc.	M	Desc.	M	Desc.	M	Desc.	M	Desc.
Context completeness	5.00	VE	4.40	VE	4.80	VE	4.60	VE	4.70	VE
Flexibility	5.00	VE	4.40	VE	4.60	VE	4.40	VE	4.60	VE
Mean Average	5.00	VE	4.40	VE	4.70	VE	4.50	VE	4.65	VE

Scale: 4.21-5.00 (Very effective, VE), 3.41-4.20 (Effective, E), 2.61-3.40 Fairly effective, FE),1.81-2.60 (Less effective, LE), 1.00-1.80 (Poorly effective, PE)

Product Quality and Quality in Use (ISO 25010:2011) of the CHED-UniFAST

Profiling and Billing Cabinet as Perceived by the Respondents

As shown in Table 14, the overall level of Product Quality (Mean = 4.72) and Quality in Use (Mean = 4.72) of the CHED-UniFAST Profiling and Billing Cabinet are generally Very Effective, as perceived by the respondents, whether they were taken individually or as a group. The mean averages were in the range of 4.36 to 5.00 of which they fall within the Very Effective scale rating.

In terms of functional suitability, the developed System was rated by the Campus Registrar (M=4.87), Accountant (M=4.85, Staff/s (M=4.67), and IT experts (4.93) as Very effective. This means that the System works accurately, responds to the correct result, and complies with the specified objectives.

In terms of Performance Efficiency, the System was rated by the Campus Registrar (M=4.53), Accountant (M=4.79), Staff/s (M=4.36), and IT experts (4.87) as Very effective. This means that the System can provide the immediate result on time and there is no error, provide information and data about the CHED-UniFAST program and its purpose efficiently, and work to its maximum usage.

In terms of Compatibility, the System was rated by the Campus Registrar (M=4.80), Accountant (M=4.80), Staff/s (M=4.50), and IT experts (4.70) as Very effective. This means that the System can still function while the other system user is in use, and can access other systems that are also running.

In terms of Usability, the System was rated by the Campus Registrar (M=4.87), Accountant (M=4.57), Staff/s (M=4.77), and IT experts (4.87) as Very effective. This means that the system is a system that one can use in maintaining library transactions. Moreover, this means that the system is user-friendly, as it is convenient to use and easy to learn, operate, and control; as well as it protects the user from error.

In terms of Reliability, the System was rated by the Campus Registrar (M=4.67), Accountant (M=4.50), Staff/s (M=4.70), and IT experts (4.90) as Very effective. This means that the system can function at all times without crashes, can operate perfectly well, and work even with a small error or bugs,

In terms of Security, the System was rated by the Campus Registrar (M=4.80), Accountant (M=4.52), Staff/s (M=4.76), and IT experts (4.72) as Very effective. This means that the System is capable of securing and recovering the data if suddenly disrupted, is responsible and able to give a satisfactory reason, is accurate and reliable to the user, and can be tested before releasing to the targeted clientele.

In terms of Maintainability, the System was rated by the Campus Registrar (M=4.80), Accountant (M=4.76), Staff/s (M=4.60), and IT experts (4.92) as Very effective. This means that the system functions properly and is capable of identifying errors in its functions.

In terms of Portability, the System was rated by the Campus Registrar (M=4.70), Accountant (M=4.80), Staff/s (M=4.67), and IT experts (4.67) as Very effective. This means that the System is capable of functioning in several technology environments, can be easily installed and uninstalled, and can work better than other systems of the same functions.

For the Quality in Use Criteria in terms of Effectiveness, the System was rated by the Campus Registrar (M=4.60), Accountant (M=4.80), Staff/s (M=4.40), and IT experts (5.00) as Very effective. This means that the System can effectively provide complete and exact data according to the ways of MYSQL Programming Language..

In terms of Efficiency, the System was rated by the Campus Registrar (M=4.60), Accountant (M=5.00), Staff/s (M=4.60), and IT experts (4.80) as Very effective. This means that the System can efficiently provide complete and accurate results to users.

In terms of Satisfaction, the System was rated by the Campus Registrar (M=4.78), Accountant (M=4.85), Staff/s (M=4.55), and IT experts (4.80) as Very effective. This means that the System is useful in providing information and description about Visual Basic, and the users are satisfied after using the system.

In terms of Freedom from Risk, the System was rated by the Campus Registrar (M=4.90), Accountant (M=4.73), Staff/s (M=4.53), and IT experts (4.73) as Very effective. This means that the System provides healthy tips for operating its specified objectives.

In terms of Context Coverage, the System was rated by the Campus Registrar (M=5.00), Accountant (M=4.40), Staff/s (M=4.70), and IT experts (4.50) as Very effective. This means that the System complies with all the requirements needed and it gives satisfying interaction to the user and its environment.

The overall means of the respondents indicated that the CHED-UniFAST Profiling and Billing Cabinet shows very effective results both in Product Quality and Quality in Use Criteria, such that the Campus Registrar has a Mean of 4.77; Accountant, 4.72; Staff/s, 4.59; and IT experts, 4.80.

In the Product Quality criteria, Functional Suitability has the highest mean (Mean = 4.83) of the others. While in the Quality in Use criteria, Efficiency and Satisfaction show the same higher means (Means = 4.75) than the rest of the sub-characteristics.

Table 14 shows the results.

Table 14. Consolidated Results of the CHED-UniFAST Profiling and Billing Cabinet as perceived by the Respondents

Product Quality **Criteria**	Campus Registrar (3)		Accountant (3)		Staff (2)		IT Expert (2)		Entire Group (10)	
	M	Desc.	M	Desc.	M	Desc.	M	Desc.	M	Desc.
Functional suitability	4.87	VE	4.85	VE	4.67	VE	4.93	VE	4.83	VE
Performance Efficiency	4.53	VE	4.79	VE	4.36	VE	4.87	VE	4.64	VE
Compatibility	4.80	VE	4.80	VE	4.50	VE	4.70	VE	4.70	VE
Usability	4.87	VE	4.57	VE	4.77	VE	4.87	VE	4.77	VE
Reliability	4.67	VE	4.50	VE	4.70	VE	4.90	VE	4.68	VE
Security	4.80	VE	4.52	VE	4.76	VE	4.72	VE	4.69	VE
Maintainability	4.80	VE	4.76	VE	4.60	VE	4.92	VE	4.77	VE
Portability	4.70	VE	4.80	VE	4.67	VE	4.67	VE	4.71	VE
Mean (Product Quality)	4.76	VE	4.70	VE	4.63	VE	4.82	VE	4.72	VE
Quality in Use **Criteria**	Campus Registrar (3)		Accountant (3)		Staff (2)		IT Expert (2)		Entire Group (10)	
Effectiveness	4.60	VE	4.80	VE	4.40	VE	5.00	VE	4.70	VE
Efficiency	4.60	VE	5.00	VE	4.60	VE	4.80	VE	4.75	VE
Satisfaction	4.78	VE	4.85	VE	4.55	VE	4.80	VE	4.75	VE
Freedom from Risk	4.90	VE	4.73	VE	4.53	VE	4.73	VE	4.73	VE
Context Coverage	5.00	VE	4.40	VE	4.70	VE	4.50	VE	4.65	VE
Mean (Quality in Use)	4.78	VE	4.76	VE	4.56	VE	4.77	VE	4.72	VE
Overall Mean	4.77	VE	4.72	VE	4.59	VE	4.80	VE	4.72	VE

Scale: 4.21-5.00 (Very effective, VE), 3.41-4.20 (Effective, E), 2.61-3.40 Fairly effective, FE), 1.81-2.60 (Less effective, LE), 1.00-1.80 (Poorly effective, PE)

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5. Conclusion and Implications

The following conclusions were drawn.

1.The completed program/software (CHED-UniFAST Profiling and Billing Cabinet) could manage user accounts.

2.The completed CHED-UniFAST Profiling and Billing Cabinet could (a) develop a program/software that could (b) create student profile data, (c) generate and manage the curriculum of the current semester correctly, and (d) assess and reflect management of fees of the current semester properly, and (d) generate UNIFAST billing documents accurately and efficiently.

3.With AGILE methodology and ISO 25010:2011 Software Quality Model as a basis for developing and evaluating the quality of CHED-UniFAST Profiling and Billing Cabinet, the developed system was able to accomplish its objectives based on the results of testing and evaluation by users and IT experts.

4.The developed CHED-UniFAST Profiling and Billing Cabinet is safe and user-friendly and can be used for the services and management of all CHED-UniFAST transactions at WVSU Lambunao Campus efficiently and effectively, with or without Internet connectivity.

The developed system will be of big help to the Office of the Campus Registrar and the Office of the Accountants when it comes to managing student profile information and effective delivery of billing documents that are submitted to the CHED-UniFAST Office as mandated by Republic Act 10931, otherwise known as "Free Tuition Law".

References

Abag, C. (2019). Financial management role of public secondary school managers in the three cities of Batangas Province. *Ascendens Asia Journal of Multidisciplinary Research*. Retrieved on May 2, 2021, from https://ojs.aaresearchindex.com/index.php/AAJMRA/article/view/80212019:3(2M)

Aina, A. Y. & Bipath, K. (2020). School finance management: Insights for decision making in public primary schools. *South African Journal of Education*. November 2020:40(4), 1-9. Retrieved on April 17, 2021, from https://www.ajol.info/index.php/saje/article/view/204995

Apilades, J.E., Cachuela, R.C., & Catoto, Z.L., (2005). *Personnel Information System of Badlan National High School, Calinog, Iloilo*. Unpublished Undergraduate Thesis, West Visayas State University-Calinog Campus, Calinog, Iloilo.

Cleartax (2021). Billing. In *Cleartax,in*. Retrieved on April 4, 2021, from https://cleartax.in/s/billing-in-accounting.

Faisal, T.S. (2008). The employee profile management system. Retrieved from: IT/Employee_Profile_Management_System.php

ISO. (2011). ISO/IEC 25010:2011 – System and software quality models. In *ISO.org*. Retrieved on May 26, 2021, from https://www.iso.org/standard/35733.html

Kirmani, M. M., Wani, F. A., & Saif, S. M. (2015). Impact of ICT on effective financial management. *International Journal of Information Science and System.* 2015: 4(1), 1-14. Retrieved on May 20, 2021, from https://www.researchgate.net/publication/294873765_Impact_of_ICT_on_Effective_Financial_Management

Merriam Webster Dictionary (2021). Profiling. In *Merriam Webster.com*. Retrieved on March 24, 2021, from https://www/merriamwebster.com

Muema, F (2015). Integrating ICT in School Financial Management: A Case of a Secondary School in Tanzania. *International Journal of Economics and Finance* 4(7), 1-22. Retrieved on April 2, 2021, from https://www.academia.edu/17239351/Integration_ICT_in_School_Financial_Management_A_case_of_a_Secondary_School_in_Tanzania

Official Gazette. (February 2, 2020). Implementing Rules and Regulations of Republic Act No. 10931. In *Official Gazette.gov.* Retrieved on May 2, 2021, from https://www.officialgazette.gov.ph.

Panizales L.P., Moleño S.L., & Lamo F.S. (2015). *Automated Carabao Profiling and Personnel Information System of the Philippine Carabao Center*. Unpublished Undergraduate Thesis, West Visayas State University-Calinog Campus, Calinog, Iloilo.

Shelly, G.B., Rosenblatt, H.J., & Cashman, T.J. (2004). *System Analysis and Design* (5th Edition). Cambridge, Mass Course Technology, Boston.

Softwaretestingfundamentals. (n.d.). Black box testing vs white box testing. Retrieved on May 30, 2021,

from https://softwaretestingfundamentals.com

Stearns, C. (January 19, 2022). Financial management in education systems. In *Study.com*. Retrieved on April 23, 2021, from https://study.com/academy/lesson/financial-management-in-education-systems.html.

The Free Dictionary (2021). Cabinet. In *Free Dictionary.com*. Retrieved on May 15, 2021, from http;/www.freediciionary.com

Yizengaw, J. Y., & Agegnehu, M. A. (2021). Practices and challenges of school financial resource management implementation in Bahir Dar City administration of Ethiopia: A comparative study between government and private secondary schools. *Congent Education*. 2021:8(1). Retrieved on April 6, 2021`from https://www.tandfonline.com/doi/full/10.1080/2331186X.2021.1884340

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