CHAPTER I

PROJECT BACKGROUND

This chapter presents the Introduction, General Objectives, and Specific Objectives. It also includes the Scope and Delimitation, the Significance of the Study, and the Project Dictionary.

Introduction

One of the pivotal aspects of managing and securing the safety of an institution is generating and handing identification cards to its members like employees and students for educational institutions. In the present scenario, many institutions rely on the traditional process of generating identification cards for the whole institution which is manual, time-inefficient, and prone to typographical errors. As the world advances to technology-driven solutions, organizations rely on numerous processes and systems to streamline operations like automation of generating identification cards that eliminate manual, time-inefficiency, and prone to typographical errors which is highly beneficial to any institution (Vedanth, et. Al, 2024).

In national setting, identification cards are utilized by numerous organizations in the present to prove a person's identity. Organizations like educational institutions issues identification cards to their students, faculty, and staff to indicate the person's connection to the institution (Casiño & Casiño, 2022). Furthermore, Student Identification Card improves overall security and attendance monitoring in Samar National School (Buenaventura, et al., 2018). Overall, Student Identification Card improves one's

institutions security but the processing and issuing of Identification Card makes it trail behind to the modern technology for generating Identification Card.

On a local setting, Aemilianum College Incorporated acknowledges the need to update its current process of issuing Identification Card to its institution to improve its security, especially the addition of the new students and staff of the Aemilianum College Incorporated that needs identification card in requirements to legally enter the campus premises. By implementing an automated digital identification card generator system that modernizes processing and issuance of Identification Card in Aemilianum College Incorporated most likely lessen the time processing of identification card, reduces labor cost and human error like typos in the identification card information.

The researchers speculate that Aemilianum College Incorporated crucially requires an effective automated digital identification card generator system to help the institutions overcome the security challenges that the institution faces until now. Thus, this study centralizes on designing and developing Automated Digital Identification Card Generator that is highly anticipated to deliver the best, easiest, most-effective and faster processing of identification card within the campus.

General Objective

The study design and develop the "Automated Digital Identification Card Generator System for Aemilianum College Incorporated".

Specific Objectives

Specifically, this study aimed to:

1. To design and develop an Automated Digital Identification Card Generator System with the following features:
    1.1 Generate Digital Identification Cards
    1.2 Update Digital Identification Cards
    1.3 View Digital Identification Cards
    1.4 Delete Digital Identification Cards
    1.5 Back-up
2. To design modules for the following:
    2.1 Update Student Information
    2.2 View Student Information
3. To Print the Digital Identification Cards
4. To evaluate the developed system using ISO 25010 in terms of:
    4.1 Functional Suitability
    4.2 Performance Efficiency
    4.3 Compatibility
    4.4 Usability
    4.5 Reliability
    4.6 Security
    4.7 Maintainability
    4.8 Portability

Scope and Delimitations

The study entitled Automated Digital Identification Card Generator System in Aemilianum College Incorporated aimed to develop a technology-oriented solution

specifically for the institutions. The system spotlights vital utilities for generating identification cards, including the capacity to generate digital identification cards, update digital identification cards, view generated digital identification cards, delete identification card holder's records, and backup. Moreover, the study includes designing of modules for the student enable them to update and view the information that is to be shown to their own identification card. The most vital feature of this study is that its helps to the printing of the physical identification cards. To guarantee the developed system satisfies the conditions of high-quality standards, the study assessed it using ISO 25010 quality framework that includes key aspects such as functional stability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability. The process of assessing involved feedback from three (3) IT professionals and the AITV5 Station Manager, guaranteeing a comprehensive assessment of the system's efficiency and user-friendliness.

In the meantime, the study highlights the vital aspects of automated generation of identification cards, it was also necessary to acknowledge its delimitations. The study focused solely on streamlining an automated generation of digital identification cards, which is not to automated generation of a physical identification card. The system can enhance the speed of generating the identification instead of manual editing of identification cards. Additionally, the scope was limited only to the students, staff, and non-teaching staff of both Aemilianum College Inc. Campus in Pangpang and Piot, Sorsogon City. The scope also limited to features highlighted in the specific objectives, keeping out any additional features that were considered desirable but were not part of the initial design. The assessment relied on a limited set of assessors, particularly three (3) IT professionals

and the AITV5 Station Manager which may not have fully conveyed the various outlook of all potential uses, including students, staff, non-teaching staff, and registrar. Furthermore, the study did not dig through the long-term effects of implementing the system on the generation of identification cards, as it primarily focused on evolution and direct quality assessment of the software.

Significance of the Study

The propose system is deemed significant to the following;

AITV Staff. To speed up the process of ID release and printing, accelerate the processing and issuance of the ID

Aemilianum College Inc. Add a security layer to enhance protection. Improve the organization of information for better clarity and accessibility.

Students. Students will provide a faster and efficient way obtaining their ID cards, can reduced wait times, ensuring that they receive their IDs in a timely manner.

Registrar. Registrar will enhance the efficiency of the registrar's office by automating the ID issuance process and reducing workload associated with manual ID processing, minimizing errors in student information.

Guard. Guard will manage and easily recognize employees, guests, and students.

Future Researchers. Future Researchers will serve as a valuable reference for future researchers who wish to explore advancements in automated identification systems.

Project Dictionary

Each defined term must be defined conceptually and operationally. There should be two definitions for each term, along with references for the conceptual definitions.

Automated. It means made to operate by the machines or computers in order to reduce the work done by human (Britanica, 2024). In this study, it refers to the use of computer-based systems and software to perform generate automated card efficiently with minimal human intervention.

Digital. Electronic of technologies, involving digital data; making use of digital computers (Oxford English Dictionary, 2023). In this study, it refers to the electronic format of identification credentials stored and accessed through the Automated Digital Identification Card General System.

Identification Card. Is an official document or card carries personal data that is used to verify (Merriam-Webster, 2024). In this study, it refers to the digital credential that contains essential personal information, set security features, and is generated or accessed by the automated system.

Generator System. It produces or creates a particular outcome or product, often referring to a machine or mechanism that transforms input to output (Merriam-Webster, 2024). In this study, it refers to the software within the Automated Digital Identification Card Generator System that automatically creates and assigns unique digital credentials. It ensures each generated ID is properly matched to the right person's information, so the system remains both reliable and secure.

Image Processing. Analysis of images using computer algorithms to enhance, transform, or extract useful information from them (Merriam-Webster, 2024). In this study, it refers to the techniques and algorithms used to analyze digital image, such as photographs within the Automated Digital Identification Card Generator System. These processes help

the system recognize and verify a person's identity correctly, ensuring that the digital ID truly belongs to them.

System Interface. The point where different components of a computer system interact, allowing users or other systems to exchange information (Oxford Dictionary of Computing, 2024). In this study, it refers to the visual design and interactive elements of the Automated Digital Identification Card Generator System that allow users to handle, input data, and access their digital ID. It ensures a smooth and user-friendly experience, making it easy for individuals to verify their identity.

Human Error. A mistake made by a person due to error in judgement, oversight, or failure to follow procedures (Oxford English Dictionary, 2024). In this study, it refers to any mistake or misstep by a user or operator when interacting with the Automated Digital Identification Card Generator System. This could include incorrect data entry, misinterpreting on-screen instructions from the user protocol.

*Update Record***.** Actions and process are being carried out in accordance with predefined criteria and guidelines established by the program (IBM, 2020). In this study, it refers to the procedure within the Automated Digital Identification Card Generator System by which user information such as personal details, security credentials, or biometric data. This process ensures that every digital ID remains accurate and reliable over time.

ISO 25010. Describes two quality models: The quality in use model composed of five characteristics (some of which are further sub-divided into sub characteristics) that relate to the outcome of interaction when a product is used in a particular context of use (Perforce, 2021). In this study, operationally refers to the international standard used to evaluate the

quality of the developed system, assessing key attributes such as functionality, performance, usability, reliability, security, maintainability, and portability.

Functional Suitability. A product or system can provide functions that meet the stated and implied needs. Functional Completeness: Refers to the set of functions that covers all the specified tasks and user objectives (ISO/IEC, 2023). In this study, it refers to the Automated Digital Identification Card Generator System performing its intended tasks. This includes ensuring that the system exactly verify the names, processes and updates records, and integrates features.

Performance Efficiency. The degree to which a product performs its functions within specified time and throughput parameters and is efficient in the use of resources (such as CPU, memory, storage, network devices, energy, materials...) under specified conditions (ISO/IEC, 2023). In this study, it refers to the how Automated Digital Identification Card Generator System responds to user requests and processes data. This includes ensuring that the system provides fast response times, handles multiple transactions efficiently, and optimizes resource usage to deliver a responsive and reliable user experience even under heavy load.

Compatibility. The degree to which a software product or system can exchange information with other products or systems, and function properly while sharing the same hardware or software environment, essentially indicating how well it can "coexist" with other systems without issues; it encompasses the ability to share information and resources with other products without detrimental impact (ISO/IEC, 2023). In this study, it refers to how well the Automated Digital Identification Card Generator System integrates with existing hardware, software, and network infrastructures. This means the system can work

efficiently alongside other technologies such as card readers, biometric devices, or external databases.

Usability. The degree to which a product or system can be used by specified users to achieve specified goals effectively, efficiently, and satisfactorily within a given context, essentially describing how well a product can be used by its intended users to complete tasks with ease and satisfaction; it encompasses aspects like learnability, operability, and user error protection (ISO/IEC, 2023). In this study, it refers that the Automated Digital Identification Card Generator System should be simple and intuitive for everyone to use. The system is designed so that even people with little technical experience can easily navigate through it, understand the instructions, and complete their tasks without unnecessary confusion.

Reliability. The degree to which a system, product, or component consistently performs its specified functions under specified conditions for a specified period, essentially meaning how dependable and stable the system is in delivering its intended functionality without failures; it encompasses aspects like faultlessness and availability (ISO/IEC, 2023). In this study, it refers to the Automated Digital Identification Card Generator System that should work correctly every time it's used. It's built to handle unexpected issues efficiently, recover quickly if problems occur, and consistently perform its tasks ensuring that users can depend on it for accurate identity verification.

Security. The degree to which a product or system protects information and data from unauthorized access, modification, or disclosure by malicious actors, ensuring that only authorized users can access data appropriate to their level of permission; it encompasses aspects like confidentiality, integrity, and authenticity, effectively measuring how well a

system defends against security threats (ISO/IEC, 2023). In this study, it refers to the Automated Digital Identification Card Generator System that is built to keep user data safe from unauthorized access and cyber threats. It includes protective measures like encryption, authentication protocols, and secure data storage, ensuring that personal information remains private and always protected.

Maintainability. The requirements deal with the service failure. They determine the maximum allowed failure rate to the software system (Fahmy, 2017). In this study, refers to the ability of the automated library system to consistently perform its functions accurately and without failure over time, ensuring continuous availability and correct operation of services (ISO/IEC, 2023). In this study, it refers to the Automated Digital Identification Card Generator System designed to be easy to update, fix, and improve over time. Whether it's adding new features, fixing bugs, or ensuring compatibility with future technologies, the system should be structured in a way that allows developers to make necessary changes efficiently without causing disruptions.

Portability. Is a measure of how easily an application can be transferred from one computer environment to another (OMGWiki.com, 2024). In this study, refers to the system's ability to be easily transferred and deployed across different platforms or environments without requiring significant modification, ensuring flexibility in its use for managing student records.

Notes

Vedanth, L., Shrujan, T. Gouthami, U., Karthik, G., & Vishnu, T., (2024) Generation of ID Card Using Uipath. *Journal of Emerging Technologies and Innovative Research (JETIR),* 11(5), 1-2.

Casiño. G.E., & K.R., Casiño, (2022). Web-Based Student Identification Card System: An Alternative for School On-site Processing. International Journal of Innovative Science and Research Technology, 8(7). 233-234.

Buenaventura, et al., (2018). The Effectiveness of Using Student ID System in Samar National School. https://www.researchgate.net/publication/380978145¬¬¬¬¬ _The_Effectiveness_of_using_Student_ID_System_in_Samar_National_School

CHAPTER II

REVIEW OF RELATED LITERATURE AND RELATE SYSTEMS

This chapter shows the related literature and system from foreign and local reliable sources which is vital for the current study and gives relevant information. This chapter also show the Synthesis of the state of the Art, Gap Bridge by the study and the conceptual framework

Related Literature

The following related literatures tackle the concept, ideas, principles, theories and quotations from several authors and researchers, foreign and local sources that is relevant and integral to the present study.

Foreign

Helping to generate the Identification cards using the Identification Card Generator System would create so much ease for the employees, students, and teachers of any educational institution by entering their important details to be shown in the ID card. The system will generate the ID card based on the inputted details by the user (Abhijit, et. Al, 2023).

The literature highlights that the generation of Identification Cards using a system would be beneficial to the educational institution and would make a big impact in terms of lessening difficulties in generating ID cards. The literature also stated that generating ID cards based on the user's inputted details would also be shown the generated ID cards. The

researcher found its relevance to the present study, as it emphasizes the need for an automated and efficient digital identification card system. By developing a technology-based solution, the study aims to streamline the automation of digital identification cards that enables the school for quick and efficiently issuance of ID cards. Therefore, enhances the organization and identification within the school.

Identification Cards can intensify building security in numerous ways, making it manageable for security personnel to easily recognize employees or guests, preventing burglars from entering the institution. Hence, one organization or institution should produce and issue ID cards that carry the summary of anyone's information (Abhijit, et. Al, 2023).

The literature on the intensification of the security of an institution by issuing identification cards in various ways that prevent intruders from outside of the institution from entering the school premises. As the institution faces concerns about the security of the school, identification cards play a vital role in securing the school from breaches and intruders entering the school and recognizing those who are employees, students, and guests and is high relevant to the study. The proposed system aims to implement automation of generating digital identification cards allowing security personnel to handle the school's security concerns. By improving the speed, accuracy, and efficiency of generating digital identification cards, the system enables the institution to provide timely issuance of identification cards and manageable school premises for security personnel.

Agencies and institutions should always issue an identification card that accepts you as a bonafide part of theirs. The identification cards often individualize the body and

include an image of the ID card holder, so you can evidently match his/her face. The identification card may also include the holder's details such as address, birth date, and signature. Driver's licenses, military identification, and passports serve as example of the common structure of an identification card (Abhijit, et. Al, 2023).

The literature discusses the issuance of identification cards is a requirement for every institution or agency that accepts the ID card holder as a legitimate part of it. The literature also discusses that identification cards might also include his/her face image, address, birth date, and signature of the holder. These details are highly relevant to the present study. By developing a feature within the system that lets users input accurate information like name, address, birth date, facial image, contact number, digital signature, etc. that promotes the accuracy and integrity of the holder's information that ensures the authenticity of identification card holder's information and weaken the possibility of identity fraud.

The generation of identification cards became a vital aspect of managing employees and guarantees access to the facilities of one's institution. Normally, traditional processes were used to generate identification cards through manual and time-consuming processes, which can be likely to cause errors (Vedanth, et. Al, 2024).

The literature highlights the common problem encountered with the traditional processing of identification cards, which is gone by manual and time-consuming process that is likely to cause errors whereas it is the also the main problem of the institution. The institution also faces problem in terms of processing identification card that costs more time and human labor for the identification card to be process. It is highly relevant to the

present study and one of the reasons for the researchers to develop a system that aims to eliminate time-consuming, reduce human labor, and make efficient techniques of generating identification cards. By automating the generation of identification cards, it would greatly help to the processing speed of the issuance of identification cards within the institution.

Creating user-friendly software can make the process of generating an identification card exceptionally easy and convenient to the user. By only visiting the online site, choosing the identification card template they want to generate and find all important templates on the designated title (Vedanth, et. Al, 2024)

The literature highlights the convenience brought by developing user-friendly software that is beneficial to the user only needing to visit an online site, choosing an identification card template and title makes the process of generating an identification card go smoothly and convenient for the user is extremely relevant to the present study. The researchers are motivated to propose a system that is very user-friendly to the employees and students of the institution. Streamlining this user-friendly design of the proposed system enables the institution to process and generate an identification card conveniently and much easier for the user to customize their identification card.

Local

The main purpose of an identification card is to provide identification for an individual, and encourages the future researchers to continuously improve the identification card by introducing another new feature that makes the students and

employees find the identification card to be convenient and extremely functional in an educational institution (Escober, et. Al. 2022)

The literature emphasizes the sole purpose of identification cards to be one's identity and needs to be improved consistently by adding a new feature to the identification card that makes it easier, functional, and more convenient for the holder to use is highly relevant to the present study. The proposed system will introduce a new feature and is completely different from the traditional process of generating an identification card. By adding a completely digital signature that is different from manual editing of signature to insert in the digital identification card that serves as an authenticity of the identification card holder. Additionally, the researchers will streamline a marker to the identification cards that identify those students who are Education Service Contracting (ESC) grantees by the Department of Education that help students in need to enroll in a private junior high school (Private Education Assistance Committee, 2014)

Student identification cards may contain the summary of the student information. It is widely used to prove a person's identity in numerous establishments. Establishment like educational institutions provide identification cards to their students, faculty, and employees to indicate their relationship to the institution (Casiño, et. Al, 2022)

The literature on the identification card as commonly used to prove a person's identity within the establishment like educational institutions. Educational institutions required to provide identification cards to their bonafide students, staff, and faculty to show their legitimate connection to the institution is highly relevant to the present study. The proposed system will include access from every department within the school. From

Elementary, Junior high school, Senior high school, College, College of Law, Master of Information Technology, Faculty and Non-teaching staff will have their own designated digital identification card template for better management of personnel within the school premises and easily recognize individual.s.

Students find identification cards beneficial for them. Identification cards can be utilized by the students to avail discounts on their fares. Identification cards can also be utilized for identity verification for financial purposes for instance transactions from money remittances coming from their relatives (Casiño, et. Al, 2022)

The literature highlights the utilization of identification cards by students is beneficial for them. Identification card serves as an important document for students for transactional purposes like remittances, identity verification, availing discounts on fares, etc. It is highly relevant to the present study because the proposed system aims to quicken the processing time of identification cards. The proposed system will increasingly quicken the processing time of identification cards by automating the generation of identification cards that is completely different from manual processing, time and human-labor consuming and prone to typographical errors caused by humans. By automating the generation of identification cards, students will take satisfaction in using their identification cards for their daily basis.

Displaying identification card at all times while inside the campus premises is a responsibility of every student of Caraga State University to help their campus keep safe for everyone. The Caraga State University regards student identification cards as a non-transferable and vital part of their campus security system (Caraga State University, 2023)

This literature intensifies the importance of the student identification card in the overall security of the Caraga State University. Complying with this policy is a must for the legitimate students of Caraga State University to help keep their campus safe while inside the premises is highly relevant to the present study. By developing an automated digital identification card generator that quickens the processing of generating identification cards for the students, staff, and non-teaching staff of Aemilianum College Inc., not only it will allow them to comply with the policy immediately but also ensure campus safe at all times, contributing to the overall security of the campus within the school premises.

The effectiveness of digital automation solutions is visible, particularly in diminishing expenses where extensive manual, time-consuming processes are implied. This digital process automation improvements not only strengthen efficiency but also speed up process improvements, providing effective advantages for businesses to survive in technology-driven and digital landscape. The benefit of digital process automation is crucial that's why enterprises in the Philippines shifts to this new trend in technology (SmartOSC, 2023).

This literature emphasizes the streamlining of automation within enterprises in the Philippines. The effectiveness of digital process automation is clearly pivotal to the industries that strengthens efficiency, speeds up the process, and offer effective advantages that is why industries shifting into the solutions offered by digital process automation is highly relevant to the present study, *Automated Digital Identification Card Generator in Aemilianum College Incorporated.* Matches the focus of the industries here in the Philippines which is to shift to digital process automation that reduces the cost of manual

and time-processing in their businesses. The proposed system will use a digital process automation to generate identification cards that is cost-efficient and faster processing compared to the manual, prone to typographical error, and time and human-labor-consuming process of generating identification cards.

Related Systems

The related system analyzes the comparison and contrast of the found foreign and local system which are related to the proposed system. These studies are reviewed to come up with relevant information and identify the gaps of their system and what could be addressed by the study.

Foreign

This project identification card generator brought relevance to an educational institution. The review system was developed to decrease the human labor and time in producing identification cards and increase the Maharaja Ranjit Singh Punjab Technical University’s overall security. The identification card generator converts users' information into digitized identification cards. The system runs online on a website and was developed with the utilization of Hypertext Markup Language (HTML), Cascading Style Sheets (CSS), Python, and databases. Moreover, the system generates automatically an identification card on the simple user interface (UI) designated templates for employees and students of the educational institution without any hassle (Singh, Singh, Singh, and Singh, 2023).

The reviewed system and present system both focused primarily onto diminish the processing time and human effort of producing identification cards for the school, by adopting automation to generate digital identification cards. Both systems addressed the need to adopt technology-driven techniques, increase building security and eliminate the traditional process of generating identification cards. Likewise, the reviewed system and present system utilize both simple and user-friendly interfaces for the students, employees, and guests for the to use the systems. Although, both systems are in parallel to improve the processing time of generating identification cards, but the present system's primary focus lies on generating digital identification cards automatically on-site to ensure that the identification card holder is a bonafide student, teaching and non-teaching staff of the school rather than enabling remote registration for a digital identification card. While the reviewed system promotes remote registration for identification cards using a website.

The reviewed system which is the Online Identification Card Generator is very effective and user-friendly. They also conclude that maintaining the system would be very low cost. Also, the processing and printing of identification cards would cost less than usual. The system is also attached to a barcode-generating system. The system also utilized HTML, CSS, and JavaScript for software development (Bora, Ahuja, Shaikh, Aswani, Kale, 2022).

Both the reviewed system and the present system are cost-effective and user-friendly when it comes to the utilization of generating identification cards automatically, in terms of processing time and human labor required. However, the present system mainly focuses on generating digital identification cards automatically that quicken the processing time of identification cards rather than including the process of printing physical cards. The

reviewed system also developed a web-based system using HTML, CSS and JavaScript to promote remote registration for generating identification cards rather on-site registration inside the school. Additionally, the reviewed system utilizes barcode-generating system in generating the identification cards while the present system operates a digital signature specimen attached to the file to prove its uniqueness and legitimacy of identification card's holder.

The project eliminates the reason for humans to say "To err is human" on rationalizing human mistakes. The identification card generator system keeps pace with the time, to bring greater efficiency and acquire the best result without malfunctions from humans in terms of generating identification. By streamlining the automation of generating identification cards, it reduces a lot of time and money. The system uses Python for application-based development that replaces and modernizes the current and traditional way of generating identification card (Jadhav, 2023)

The reviewed system and present system aim to streamline automation for generating identification cards that are cost-effective and acquire the best result meanwhile limiting malfunctions from human intervention. Moreover, both systems are developed as an application-based system and are both user-friendly. Although, the reviewed system utilized Python as the main programming language to develop their system and lacks customization in terms of generating the digital image for identification cards, the present system used Visual Studio 2019 for better customization and modern graphics within the system's user interface.

The reviewed system from the Government Degree College in Wari, Pakistan aims to speed up and cut ties with traditional way of generating the identification card making for its volume students of the educational institution. By developing a web-based application using Hypertext Markup Language (HTML), Cascading Style Sheets (CSS), and JavaScript, the identification card generation becomes seamless and accessible in a matter of seconds. The reviewed system also optimized for the full customization of identification card templates that students can choose from what to generate (Ullah and Badahar, 2023).

The reviewed system and the present both targets to eliminate the struggles of the traditional process of generating identification cards for their respective institution. Both systems also streamline the customization of the identification card templates that identify them to what department they are in. The reviewed system's main goal was to develop a web-based application that the students of Government Degree College in Wari, Pakistan can access and generate identification cards remotely and seamlessly using the internet while the present system encourages students to be on-site to generate their digital identification cards as they enroll to the school to ensure that legitimacy and security of the enrollees is ensured.

The eTutor School Enterprise Resource Planning (ERP) software developed an efficient way to design, print and manage identification cards for students and employees. It also contributes to the professionalism, security and organization of their environment. The key features of the reviewed system are streamlined automation of generating identification cards that saves time in terms of processing, ensures accuracy and consistency of each identification cards, full customization for security branding, flexibility

and adaptability, Quick Response (QR) technology and Barcode technology integration for advance tracking and facilitating of students, etc. (eTutor Digital, 2024)

Both the reviewed system and the present system highlight the streamlining of automated generation of identification cards that can be impactful for reducing processing time of generating identification cards, reducing workload for teachers, adding an extra layer of security, makes students and employees look more professional, etc. This complex task of generating identification cards has gone seamlessly by developing an automated process of both reviewed system and present system. The reviewed system was developed as a web-based application and integrated with Quick Response (QR) and Barcode technology to provide seamless and remote generation of identification card while the present system encourages its constituents to visit the registrar for valid registration and application for identification cards.

Local

The ePhilID or electronic Philippine ID is a technique of the Philippine Statistics Authority (PSA) that enables more Filipinos to have the benefits of being PhilSys-registered or National ID-registered. This strategy works by having a virtual identification card while waiting for the physical ePhilID card to be processed, printed, and released. This ePhilID can be used for all transactional purposes, used as a valid ID, and for better access to more financial and social protection services. The ePhilID system presents information on the front of the virtual card including the PhilID Card Number (PCN), the user's facial image, full name including surname, first name and middle name, date of birth, and legal residency. The back of the virtual card presents the issuance date of the ePhilID,

unique Quick Response (QR) code, serial number, the user's sex orientation, blood type, marital status, and place of birth. This ePhilID is accessible through the eGovPH app on both Android and iOS devices (PhilSys, 2022).

The reviewed system drew and the present system both utilizes and generates identification card that enables person to have the advantages of having valid document for transactional purposes and social protection services. Both reviewed system and present system uses unique identification number, PhilID Card Number for previous system and Standard Identification Number for present system as their primary feature that separates one identification card to one another. However, the reviewed system's main focus is to generate and virtualize the National ID card that is valuable as the physical National ID card that can be used as a valid document for identity while holder waits for the physical ID card to be printed and handed out to them. Meanwhile, the present system's main goal is to automatically generate only the digital version of the holder's identification card which quickens the process of issuing the identification cards within the school.

Alternating the process of generating identification cards in Tagoloan Community College through a web-based application that enables students to process their identification cards online and no longer go on-site for manual registration for identification card that saves time and effort for them. It was also developed in the midst of the pandemic that requires social distancing (Casiño and Casiño, 2022).

Both the reviewed system and the present system streamlined the automation of generating identification cards for time and effort-saving, seamless processing and issuance to the students of Tagoloan Community College. The reviewed system's main priority was

to develop an automated generating of identification cards using a web-based application that enables students to generate their identification cards remotely that complies with the laws implemented during the pandemic, especially social distancing and no physical contact transactions. While the present system's main goal is to develop an application-based system within the school to secure and recognize the students and employees are bonafide member of the institution.

Another reviewed system which is the SIGv2: Enhanced Student Identification Card Generator and Management System. The automated generation and management of identification cards were developed by utilizing an electronic identification system that has advanced technology and is used for integration into other information systems in educational institutions. Nonetheless, in its implementation, the reviewed system figured out that the system lacked capabilities and needed enhancement to improve the system's capabilities. The reviewed system used International Organization for Standardization (ISO) 9126 for student identification system enhancement which was the International Standard for the evaluation of software quality. it includes maintainability, efficiency, portability, reliability, functionality, and usability for compliance (Serrano, 2021).

Although, both systems is used for automated generation of identification cards for educational institutions. The reviewed system used ISO 9126 which is an outdated standard for software that uses only six (6) characteristics in developing software and was published in 2001 while the present system uses ISO 25010 which is the latest standard for software development that introduces seven (7) characteristics and was introduced in 2011. The ISO 25010 is composed of seven (7) attributes for software to be possessed which are functionality, performance, usability, reliability, security, maintainability, and portability

rather than ISO 9126's maintainability, usability, efficiency, functionality, reliability, and portability. The reviewed system explored the possibility of integration of identification cards into other information systems inside the educational institution while the present system solely focuses on generating digital identification cards that are ready for printing and speed up the process.

Shifting to a digital and automated generation of identification cards from manual and traditional process was the main goal of the reviewed system. The web-based application was developed integrated with Radio Frequency Identification (RFID) technology to secure data preservation of the students, eliminate manual generation of identification cards, to improve library capacity monitoring and computer library access control in Camarines Sur Polytechnic Colleges (Dacara, Dioquino, and Oñate, 2023).

Both the reviewed system and the present system streamlined digitalization and automation of generating identification shifting from traditional and manual process of generating of identification card through a web-based application. The reviewed system added a feature of integrating Radio Frequency Identification (RFID) Technology to their system that enhances their educational institution's secure data preservation, replacing the traditional process of generating identification cards, upgrading library capacity monitoring, and seamless access control in the computer library. Meanwhile, the present system only aims to quicken the generation of identification cards by automating the process to enhance the institution's overall security, diminishing delay of identification card issuance, and help students to have the benefit of having a valid document for their daily purpose.

Quick Response (QR) code technology were integrated to the reviewed system of the University of Makati. The reviewed system enables the students of the institution to generate their virtual identification cards that can be scanned through a QR code scanner while they haven't received their physical identification cards because the distribution of physical identification cards was scheduled every before the start of second semester. It also enables security personnel to check the student's status and identity much faster (University of Makati, 2024)

The reviewed system's main focus is to have an alternative solution for the delayed schedule of distribution of physical identification cards by developing a system that generates virtual identification cards that can be scanned by a Quick Response (QR) scanner. Although, both reviewed system and the present system offers automation of generating identification cards, the present system aims to quicken the processing of generating identification cards that helps with the issuance of physical identification cards within the school in an efficient way.

Synthesis of the state-of-the-Art

The insights from Abhijit emphasizes the importance of identification cards within an educational institution in terms of seamless facilitating and intensifying security within the campus. The identification card should also show and contain a summary of the holder's important information like name, address, birthdate, facial image, contact number, digital signature, etc. that promotes the integrity of an individual as they are known as a legitimate part of the institution. Abhijit and Vedanth also weigh in on the importance of having a user-friendly, technology-driven, convenient, and automated way of processing

identification cards that eliminates the traditional and manual way of processing identification cards that are time-consuming processes, reduces human labor, and typographical errors that would be a great help to the processing speed of identification cards within the institution.

In the local sight, the findings from various institutions underscored the importance of developing a technology-driven system and integrating a new feature into the identification cards that is completely different from the traditional process of generating identification cards to keep the process easy, functional and convenient as noted by Escober and SmartOSC. Casiño also highlighted the importance of having identification cards within the institution to prove an individual's identity in the establishment. Casiño also highlighted the benefits for students having an identification card that can be used as a valid document to avail discounts on their fare, financial transactions from money remittances, etc. Moreover, the insights Caraga State University illustrated the responsibility of every student to wear their identification cards within the school premises to their campus to keep safe for everyone

Gap Bridge by the Study

The reviewed systems harmoniously highlight a notable evolution in generating identification cards, particularly in response to the challenges brought by manual and traditional ways of generating identification and the gradual increase of students within the institution that demand for technology integration. By way of illustration, the reviewed studies focused on integrating web-based applications and platforms tailored for students that they can utilize in generating identification card automatically and remotely without

having difficulties and going on-site from identification card generation. These approaches highlight the continuous steps to enhance the cost-effectiveness of generating identification cards. Nonetheless, the common gap across these studies is the insufficient emphasis on the internal process of generating identification cards within the school premises. While the reviewed systems effectively deal with the generating of identification cards remotely, they failed to notice the challenges of having a remote application for generating identification cards, specifically in terms of tracking and validating legitimate students enrolled in the institution and enhancing data handling. This gap denotes the need for a specialized approach that not only benefits the whole process of generating identification cards but also enhances security and data handling within the institution.

On the other hand, the present study uniquely addresses this gap by focusing mainly on the automated generation of identification cards within Aemilianum College Inc. campus. By developing a system that renovates the traditional way of processing identification cards, enhances data management within the campus, and speeds up and saves time on the issuance of identification cards, this study provides a pivotal contribution to the overall management and security of the campus. Meanwhile the reviewed system may have established different technological improvements for the automated generation of identification cards within the institution, the present project fills a critical function by guaranteeing that all the holders of the generated identification cards are from bonafide members of the institution. This focus on internal processes enables the institution, especially security and teaching personnel to better manage and secure the institution and their respective classes. By bridging the gap in overall security and management of the

institution, this study not only harmonizes existing literature but also sets a guide for future innovations in generating identification cards for institutions.

Conceptual Framework

The conceptual paradigm of the study portrays a structured approach to developing a technology-integrated solution for the institution. The input phase identified specific objectives aimed at enhancing the process of generating identification cards. The study aimed to create a comprehensive system with features such as generating digital identification cards, updating digital identification cards, viewing generated digital identification cards, deleting identification card holders' records, and backup records. Moreover, it included integrating digital identification card application modules for the students, teaching, and non-teaching staff, enabling them to add, view, and update their summary of information. Additionally, the study enables the AITV5 Station to print the identification cards fast and cost-efficiently. And lastly, the evaluation of the developed system was based on the ISO 25010 quality standards, which possess aspects including functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability.

In the process phase, the study adopted a Waterfall methodology, which is well-defined and needs expected features to integrate with the system, and software requires attentive planning and execution. The steps involved such as requirements gathering and documentation, where the project scope and features were gathered and documented upfront by the client and stakeholders; system design, where the system was developed by detailed planning and step-by-step approach for the best user experience and interface; implementation, coded and worked through structured manner, following the detailed

system design; testing, which ensured the system met specified requirements and quality standards through systematic and comprehensive testing; deployment, which system deployed after successfully passed previous phases, and maintenance for post-deployment, as the system requires maintenance and updates. This methodology allowed consistent improvement and updates of the system to meet the requirements of the institution effectively.

The output phase of this study concluded in the development of an “Automated Digital Identification Card Generator System for Aemilianum College Inc.”. This system aimed to modernize how the institution processes the generation of identification cards, enhancing the speed and providing cost-effective solutions of generating of identification cards within the institution. By streamlining the automated approach, the system not only enhances data management but also enables teachers and security personnel to manage students that adds to the overall security of the establishment.

Feedback from the stakeholders insisted that the developed system remarkably improved the generation of identification cards within the institution. Users declared improved speed and efficiency process of generating identification cards, ease of use by integrating a user-friendly interface, and better handling of the security personnel within the institution. The Waterfall methodology enabled consistent adjustments based on feedback, ensuring the final product met the expectations of the users. The study successfully bridged the gap between traditional and manual processes and modern technological approaches, establishing the foundation for future innovations in generating identification cards for institutions.

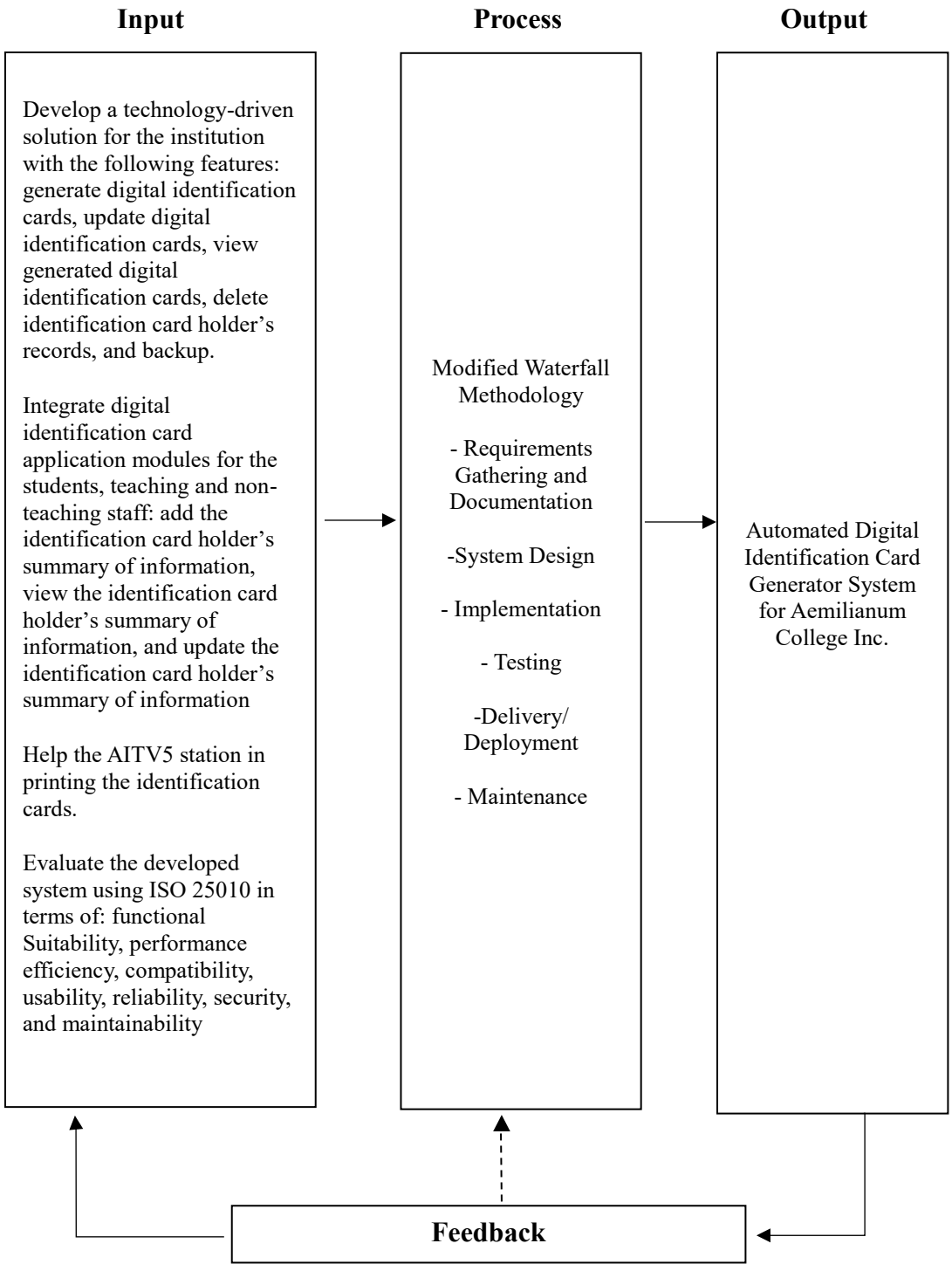

Figure 2.1 Conceptual Paradigm

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CHAPTER III

TECHNICAL BACKGROUND

This chapter shows the technical background of the study. The resources required in the project, the stakeholders, the constraints, and the methodology that will be followed in the project development.

Resources

This section tackles about the hardware and the software that utilize to develop this system. In the hardware requirements, it incorporates the collection of physical parts of a computer system such as processor, memory, and other accessories parts. In software requirements, it incorporates programming language, database management system, and other software, which are shown in the 3.1 and 3.2.

Table 3.1

Software Requirements

Items	Requirements
Programming Language	VB.Net
Database Management System	phpMyAdmin MySQL
Application Software	XAMPP Control Panel Microsoft Visual Studio 2019 Adobe Photoshop CC 2021
Operating System	Windows 8 or Higher

Table 3.1 represents the software requirements that are required to develop the proposed system. The edge of using VB.Net programming language is it is commonly used for application-based development like Unity3D and can be easily connected with the database using MySQL. In addition, MySQL is capable of handling large amount of data using XAMPP Control Panel. The Photoshop CC 2021 for identification card templates that possesses several tools for editing identification card layout.

Table 3.2

Hardware Requirements

Hardware	Requirements
Memory	10.00 GB or Higher
Processor	Intel® Core™ i5-3337U CPU @ 1.80 GHz 1.80 GHz
Display	2 LCD/LED Monitors
Hard Disk	256 GB Solid State Drive
Devices	Drawing Tablet/Signature Pad 1080p Webcam

Table 3.2 represents the hardware requirements of the proposed system to run efficiently. The processor that is necessary in this system must be Intel Core i5 or higher to avoid system issues. At the same time, the RAM/memory required must be 10 GB or higher and 256 GB SSD for system compatibility, enough storage for handling data and backups, and smooth operation. For the display, 2 LCD or LED monitors are recommended that enable the registrar and the applicant to have their preview of the identification card

generated. Lastly, the peripheral device requirements are a Drawing Tablet/ Signature Pad and a 1080p Webcam to generate high-quality facial images and signature images to be displayed on the generated identification cards. These specifications are aimed at ensuring the system functions effectively and efficiently.

Stakeholders

This section probes into the stakeholders involved in the development of this system and their respective tasks. The stakeholders include administrators and students, each with distinct roles and responsibilities within the system.

Table 3.3

Stakeholders

Stakeholders	Task
AITV5 Station	Generates, processes, and prints generated identification cards
Registrar	Fill out the necessary information about the legitimate students, teaching, and non-teaching staff of the school to display on the identification cards. Takes a facial image and signature image of the identification card holder. Validates identification cards.
Students	Fills out the facial image and signature image.
Teaching and Non-teaching Staff	Fills out the facial image and signature image.

Table 3.3 This represents the task of each stakeholder in this proposed system. The first stakeholder, AITV5 station, is responsible for task such as generating, processing, and

printing identification cards. The AITV5 ensures that each member of the institution which are students, teaching, and non-teaching staff has an identification card being worn within the school premises.

The second stakeholder, the Registrar, plays a pivotal role in interacting with the system. Their main task includes filling out the necessary information and taking facial and signature images from the students, teaching and non-teaching staff to be displayed in the generated identification card. They also responsible for validation of the identification card every semester and year. The registrar is also responsible for setting up the AITV5 station for generating and processing of identification cards for the bonafide members of the institution which are the students, teaching and non-teaching staff.

The third and forth stakeholders, the Students and Staff, shared the same task as they provide and fill out the facial image and signature image to be displayed on the respective generated identification cards. The system allows them to engage directly with the educational institution's identification card application in a streamlined, technology-driven manner and provides great experience and ease using the user-friendly interface of the system.

Constraints

Except for the financial cost that can influence in execution of the proposed system, there are also factors that can affect the proposed system’s implementation. One of the constraints that can also delay the system’s implementation is time, which is very integral to every project to be done and executed.

Table 3.4

System Development Time Span (Gantt Chart)

ACTIVITIES	Months					
	1	**2**	**3**	**4**	**5**	**6**
Requirement Gathering and Documentation						
System Design						
Implementation						
Testing						
Delivery/Deployment						
Maintenance						

Table 3.4, The Gantt Chart, sums up the time frame for system development, divided into 6 (six) particular phases: Requirements Gathering and Documentation, System Design, Implementation, Testing, Delivery/Deployment and Maintenance. Each phase is allocated a duration of six months, spanning from Month 1 to Month 6. Requirements Gathering and Documentation, the initial phase, likely involves project documentation, requirement gathering, and stakeholders and client's approval. System Design, the second phase, likely involves detailed planning, system architecture and step-by-step approach

based on the requirements gathered. The third phase is Implementation, this phase includes development work such as coding, minimizing error and refinements. Following the third phase is the Testing, the fourth phase, once development was achieved, the system performed a systematic and comprehensive testing on the entire system. Delivery/Deployment, the fifth one, this phase ensures that the system fully functional during rollout with minimal risks to be occurred. And after all that, the last one which is the Maintenance, this post-deployment phase ensures consistent maintenance and updates when the system goes live. This Gantt Chart enabled the study to be executed effectively and thoroughly in each phase with sufficient time.

Financial Constraints

The researchers get the group's financial assistance to further develop the study. A handful of limitations seem to be problems in the development of the system since the researchers rely on their guardians for their financial necessities.

Project Development Methodology

The proposed system was designed and accomplished using the Modified Waterfall Methodology. The Waterfall Model in Software Engineering is a well-known and widely used software development process that has been around for several decades. The main advantage of the modified waterfall model is its flexibility. This allows software development teams to respond to changes in the market or changes in the user requirements without significantly impacting the project timeline. The modified approach also reduces the likelihood of errors and increases the quality of the final product (Prashant, 2024).

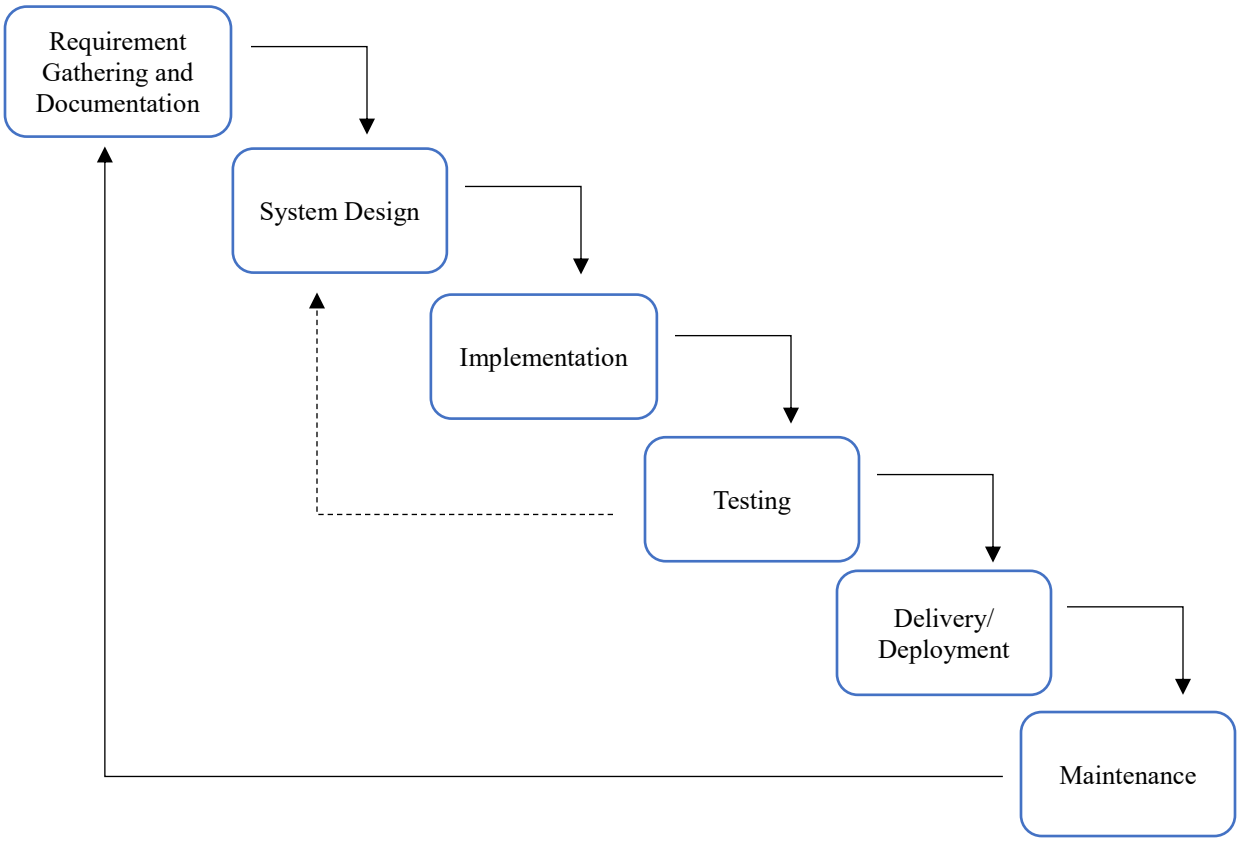

Figure 3.1 Modified Waterfall Methodology

Requirements Gathering and Documentation. In this phase, the project requirements are gathered from stakeholders and a requirements document is created. This document serves as the basis for the rest of the project. We collect all the software requirements from the customer through discussion and interviews and write in a document called SRS document (Software Requirement Specification document). This SRS document is the base of the software project because this document helps to develop the whole software project.

System Design. In this phase, the system design is created based on the requirements document. This includes creating detailed specifications for the system and

its components. It is the process where we define system architecture, components, modules, interface, and data of a system using the requirement specification documents.

Implementation. In this phase, system design is used to develop the system, the system is first developed in small programs called units. This is a coding phase, where programmers start to develop the system by writing code using the programming language. They already decided which language they use for developing the system.

Testing. In this phase, the testing team runs our software and check whether the software gives us the desired result or not.

Deployment/Delivery. Once the testing is done, the product is deployed in the customer environment or released into the market.

Maintenance. Maintenance is the backbone of software success. When software is developed, then the software needs to be modified from time to time to keep it up to date with environmental changes and changing user requirements.

Notes

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