

Fingerprint biometric attendance system essay



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CHAPTER 1 INTRODUCTION

The increasing complexity of administrative operations in Colegio de St. Monique in Binangonan, Rizal, is the effect of the growing population of students, faculty and administration and the physical expansion of the institution. The increase in complexity means additional manpower and workloads and more complicated data processing system. To meet the growing needs of education, the institution, as a result formulated new innovations, techniques, methods and modernized equipment to aid the complexity of operations.

New facilities such as the computer were developed, not only for the instructions, but also for research and academic applications. Technologies such as the Fingerprint Biometrics ID System make identification and attendance an easy task. The burden will be lessen for the IT and Human Resource personnel. What usually is a long process of logging in and out and identification is eliminated. Further, a Computerized Payroll System will help a lot in processing salaries and other financial matters for the employees. It will help reduce if not totally get rid of errors encountered when handling the payroll manually.

Recording and monitoring the movement of faculties as they arrive at work, have breaks and leave for the day were traditionally performed by writing logs. Replacing the manual process with computerized attendance system with the application of biometrics technology prevents any abuses of the system and can be incorporated with time management software to produce management accounting and personnel reports. Generally speaking, any

situation that allows an interaction between human and machine is capable of incorporating biometrics.

Such situations may fall into a range of application areas. Biometrics is currently being used in areas such as computer desktops, networks, and monitoring the time and attendance of staff. Technology is a tool which may be developed and used intelligently, ethically and for the common good or may be used unintelligently, unethically and against the common good.

When we introduce new technology, it affects individuals, we must bear in mind these realities and do our best in a responsible manner. Background of the Study

The study will focus on developing a fully improved attendance system using a Fingerprint Biometrics ID System and also create a Computerized Payroll System for the employees of Colegio de St. Monique. The current state of the school's logging in and out to check the attendance is done manually by writing their names, time of arrival or departure and signature. In terms of handling the payroll of employees, the school at present is managing it manually. We use biometric device because of its known capability, high security measure and convenience of using it.

Our method of identification is uniquely designed for heavy security measurement so no one can access your record except you and the administrator because there will be a tendency that other personnel will interfere with your account. We selected the fingerprint over our biometric attendance system because as we all know each one of us has a unique fingerprint. All these problems can be addressed by implementing the

Fingerprint Biometrics ID System and the Computerized Payroll System.

Conceptual Framework Figure 1. 1 Paradigm of existing attendance system

PROCESS Employee writes name, time of log-in or log-out and signature *

The HR checks the attendance logs for evaluation

OUTPUT * Written (manual) logs of employees' attendance

INPUT * Names * Time of log-in / log-out * signature Figure 1. 2 Paradigm of existing payroll system

PROCESS * The HR evaluates the attendance to compute payroll

INPUT * Attendance logs of employees

OUTPUT * Payroll of employees based on manual logs Figure 1. 3 Paradigm of proposed attendance and payroll system
OUTPUT * The attendance logs are automatically stored on the server * Computerized payroll * Payroll * Employee List * Summary of Payroll per month

PROCESS * The scanner scans the fingerprint and identifies the employee (name, time of arrival/departure) * The data is stored on the server * the HR uses this data to compute for payroll

INPUT * Fingerprint Statement of the Problem The proponents proposed study " Fingerprint Biometrics ID System and Computerized Payroll System for Colegio de St. Monique in Binangonan Rizal" desire to provide fully improved attendance and ID system and a computerized payroll system for the said school. One of the main problems of manual attendance system is the time wasted inputting the employees' work details. For the manual

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payroll system, inaccuracy of the numbers would result to loss either to the employee or the administration. Specifically, the study seeks to answer the following questions:

1. Is the proposed system beneficial to the users?
2. Is the proposed system more organized compared to the existing manual system? Can the proposed system provide its users convenience of using?

Hypothesis The study can prove:

1. That the proposed biometrics system will be able to diminish the time of operations of the existing system wherein there is manual log-in and log-out.
2. That the proposed payroll system be able to eradicate any errors in handling finances.
3. That a more organized handling of important transactions such as payroll is beneficial to all elements involved.

There is significant difference between the existing system and the proposed inventory system in the evaluation of employees and IT experts in terms of:

1. Accuracy
 2. Efficiency
 3. Reliability
 4. Security
 5. Speed
- Significance of the Study

The study is conducted for the improvement of monitoring attendance and payroll system of Colegio de St. Monique. The study will benefit specifically

the Human Resource Department and IT Department that hold the responsibility in preparing the attendance and payroll system. Other employees such as the faculty will benefit by not having to undergo a long process of logging in and out.

The proponents would also be beneficiaries of the study since they would value the importance of enhancing their skills and work performance while grasping knowledge throughout the study. Future researchers would benefit by making this study their reference for their related works. Due to new technologies, they are surprisingly affordable and pay for themselves over time. Switching to biometric time clocks will rid you of the hassles of standard clocks and they are an easy solution to any time and attendance problems. Making the switch to them is the best way to eliminate existing time issues and prevent new issues from occurring.

Scope and Delimitation The study focused on a proposed Fingerprint Biometric ID System and a Computerized Payroll System of Colegio De Saint Monique in Binangonan, Rizal. The proponents used a fingerprint scanner that matches fingerprints using sensor to enrol, modify, delete and then to identify the users. The programs the proponents used are VB. NET and Microsoft SQL Server Express. The proposed system can show attendance logs with the name and other details of the employee. The administrator can add, edit and delete employee, schedule and payroll list.

The system is capable of printing out payslip of a particular employee. It can also print time entry sheet of the employees. Most importantly, the proposed system can print out payroll sheet showing necessary payroll details such as

salaries and deductions. The proponents did not use actual salaries and compensations of the employees for they are strictly confidential. The figures used in this project are for research purposes only. The computation of salaries will cover basic deductions such as SSS, Pag-ibig, PhilHealth, loans, leaves, absences, tardiness and withholding tax. Definition of Terms

1. Application - is computer software designed to help the user to perform specific tasks.
2. Attendance - The act of attending. The persons or number of persons that are present.
3. Biometrics - It is used as a form of identity access management and access control. It is also used to identify individuals in groups that are under surveillance.
4. Biometrics Attendance System - is the modern-day equivalent of the paper time sheet or punch clock. They automate day-to-day tasks such as tracking work hours and calculating accrued benefits, providing valuable information and making your business more efficient.
5. Computer - is a programmable machine designed to sequentially and automatically carry out a sequence of arithmetic or logical operations.
6. Database - It is an integrated collection of logically related records or files consolidated into a common pool that provides data for one or more multiple users.

7. Enrolment - Process of registering an employees' biometrics information or fingerprints to be stored in the database.

8. Fingerprints - The impression of fingertips on any surface also an ink impression of the lines upon the fingertips taken for the purpose of identification.

9. Identification - an act of identifying; the state of being identified.

10. Payroll - is the sum of all financial records of salaries for an employee, wages, bonuses and deductions.

11. Sensor - device that responds to a physical stimulus (as heat, light, sound, pressure, magnetism or a particular motion) and transmits a resulting impulse (as per measurement or operating a control).

12. Software - is a collection of computer programs and related data that provide the instructions for telling a computer what to do and how to do it.

13. System - An organized set of doctrines, ideas or principle usually intended to explain the arrangement or working of a schematic whole; an organized or established procedure.

CHAPTER 2 REVIEW OF RELATED LITERATURE AND STUDIES

Local Literature MANILA, Philippines - As deterrent to absenteeism and tardiness, the Quezon City government has enforced the electronic attendance (E-Attendance) system to city hall employees. Administrator Victor B. Endriga said that implementing the E-Attendance will enable the

city government to provide quality time and service to the public while serving as an accurate tool to weed out the undesirables at city hall.

In a memorandum, Endriga ordered city hall departments and offices, task forces and unit heads to immediately implement the E-Attendance to monitor the time-in and time-out of their personnel. Endriga said that the E-Attendance is part of Mayor Herbert Bautista's program for automated or paperless transaction at the Quezon City Hall. The memorandum also asked the departments and offices, task forces and unit heads to coordinate with the Quezon City Information Technology Development Office (QCITDO) for the installation of one unit of computer and web cam in their respective offices for the daily attendance of city-paid workers.

Endriga said that the use of E-Attendance will ensure the transacting public that city hall employees will be on service to them at exactly 8: 00 a. m. to 5: 00 p. m. daily or on the time schedule assigned to them. Endriga also noted that the process will also save the city's coffers of thousands or millions of pesos in the monitoring of daily time record (DTR) of QC Hall employees.

Foreign Literature For many years now, the promise of biometrics has not been fully realized in large part because performance in the lab is not representative of performance in the field. That's the reason major locksmiths began shying away from biometrics.

Failure rates were running from 3 to 20 percent. In a 50-person firm, they could work around this. However, if hundreds of people are involved, the customer has a big mess which falls back on the locksmith. The core problem is that conventional biometric technologies rely on unobstructed and

complete contact between the fingerprint and the sensor, a condition that is elusive in the real world, a world that is wet, dry, or dirty. Users are not all young office workers with great skin who are experienced at using biometrics. Bottom line - good images give good results; bad images give bad results.

Wet conditions are notoriously difficult for both semiconductor and conventional optical fingerprint sensors to handle. And, yet, moisture is a fairly common real world condition. Some environments are naturally damp, due to climate (Oregon) or setting (a spa). Some people have moist hands. It is also typical for people going through security to be nervous — and to have sweaty hands. Conventional optical technologies are often unable to produce images in wet conditions because excess moisture obscures fingerprint ridges, resulting in images of puddles, not fingerprints.

Has any other real world condition caused so much trouble in the biometrics industry? Dry fingertips are common, caused by anything from climate conditions and natural skin characteristics to frequent hand-washing and air travel. For instance, a high desert climate causes dry fingers in an entire population. Most optical sensors are configured to look for the presence or absence of total internal reflectance (TIR), which is the phenomenon whereby the interface between glass and air acts like a mirror at certain angles.

The contact between the skin and the platen defeats the TIR, allowing those points of contact between the finger and the sensor to be imaged. Thus, those points of contact must be complete and unobscured to enable the

conventional sensor to collect a fingerprint image. With dry fingers, this is simply not the case. Establishing firm and complete contact with the sensor is very difficult with dry fingers. There is not enough moisture in the skin nor is the skin pliable enough to facilitate the contact necessary for TIR imaging. The real world is a rough place and most of us are showing some wear and tear on our hands.

Additionally, people don't have time to wash and lotion their hands before they use a fingerprint sensor. A construction site is an interesting case. Construction workers work with their hands and have the cuts and calluses to prove it. Additionally, the construction site is dirty so workers may have grime on their hands when they approach a fingerprint sensor. Altogether, this real world scenario is a nightmare for system administrators whose conventional fingerprint sensors depend on quality contact between the finger and the platen. Many people, both young and adult, have small or fine fingerprint features that can be difficult to image.

If the sensor cannot differentiate between these fine characteristics, system performance will suffer. Age is another physiological characteristic that can affect the ability of a sensor. One effect of aging is the loss of collagen in the skin; elderly fingers have soft fingerprint ridges that collapse into each other when the finger touches a surface. Because many sensor technologies depend on the quality of contact between the finger and the sensor to collect a good image, soft fingerprint ridges can be difficult. Behavioral differences across user populations can affect performance.

Some people may tend to press hard and others, being more tentative, may barely touch the sensor at all. For technologies that depend on the quality of that touch, this can be a big problem. Multispectral imaging is a sophisticated technology developed to overcome the fingerprint capture problems conventional imaging systems have in less-than-ideal conditions. This more effective solution is based on using multiple spectrums of light and advanced polarization techniques to extract unique fingerprint characteristics from both the surface and subsurface of the skin.

The nature of human skin physiology is such that this subsurface information is both relevant to fingerprint capture and unaffected by surface wear and other environmental factors. The fingerprint ridges that we see on the surface of the finger have their foundation beneath the surface of the skin, in the capillary beds and other sub-dermal structures. The fingerprint ridges we see on our fingertips are merely an echo of the foundational “ inner fingerprint”. Unlike the surface fingerprint characteristics that can be obscured by moisture, dirt or wear, the “ inner fingerprint” lies undisturbed and unaltered beneath the surface.

When surface fingerprint information is combined with subsurface fingerprint information and reassembled in an intelligent and integrated manner, the results are more consistent, more inclusive and more tamper-resistant. Multispectral fingerprint sensors capture high-quality images because the direct imaging process does not depend on a clean finger/sensor interface. At last, biometrics can provide the same type of reliability as a card but removes all the negatives of the card, including cost of the cards themselves and the more expensive cost of managing cards.

After all, nobody leaves their finger at home nor does it wear out. Operation is simple. The user comes up to the reader, lays his/her finger on the reader, and an image is captured. The unique points are translated into information that is compared to that on file. If they match, the user sees a green light, the lock output is energized and the user walks through the door.

Importantly, now biometrics, which determines that you are you - not what you carry - can be sold by locksmiths with confidence in more places and more applications.

For example, more than 40 million people are already enrolled on multispectral imaging-based systems at locales ranging from the classic door access control situation to the gates of the world's favorite theme parks. Such readers are keeping borders secure around the world. Indeed, more than 400,000 people pass through multispectral imaging sensors every day at the Hong Kong border crossing. Local Study Biometrics is an automated method of recognizing a person based on physiological or behavioural characteristics such as fingerprints, speech (voice), face, retina, iris, handwritten signature, hand geometry, and wrist veins.

Biometrics address the need for authentication, the process of identifying an individual, replacing or augmenting verification based on a username and password. Biometrics can be used in identification mode wherein it identifies a person from the entire enrolled population by searching a database for a match. It can also be used in verification mode wherein it authenticates a person's claimed identity from his/her previously enrolled pattern. Biometrics offers some unique advantages because identification is based on a person's intrinsic part.

Tokens, such as smart cards, magnetic stripe cards, physical keys may be lost, stolen, duplicated, or left at home. Passwords may be forgotten, shared, or observed. In the Philippines, biometrics would most likely find first application in providing verification and authentication for financial transactions (bank loans and social security claims) and limiting access to high-security areas like military establishments and sensitive government buildings. The United States - the US government in particular - currently uses or has proposed to use biometrics in the following ways at the Federal, State, local, and foreign office levels.

Electronic and Physical Access Control. One use is to provide robust authentication for access to computer systems that hold sensitive information used by the military services, intelligence agencies, and other security-critical Federal organizations. Physical access control to restricted areas is another key application. There are many law enforcement applications, mostly for fingerprint recognition, at the Federal, State, and local levels. Other law enforcement applications include home incarceration and physical access control in jails and prisons. One of the most extensive applications of biometrics in the U.

S. is for entitlements. Fraud in entitlement programs is estimated by the General Accounting Office at over \$10 billion per year. Pilot programs in several States have demonstrated dramatic savings by requiring biometric authentication for applicants for entitlement benefits. There are also significant commercial applications of biometrics, principally in financial transactions like use of Automated Teller Machines (ATMs), credit or debit

cards, banking by phone and through the Internet, and buying and selling securities by phone or through the Internet.

Biometrics is also being considered to reduce or prevent fraud in the use of cellular telephones, which is estimated to have reached over \$1 billion a year, and phone credit cards. There are also commercial applications for computer access control, access to web site servers, access through firewalls, and physical access control to protect sensitive information. The system is expensive. It is not only the initial cost of the sensor or the matching software that is involved. Often, the life-cycle support cost of providing system administration support and an enrollment operator add a lot to the initial cost of the hardware.

Biometrics technology has not attained enough maturity to merit definite inclusion in the GISP. According to the Biometrics Consortium, the only available information on biometric devices is often just a sales brochure. The performance claims in the sales brochure may not hold true for a given device in a given application. For example, a device that measured 0.3% equal-error rate in a lab was found in the field to have a false-rejection rate of approximately 25% (at an unknown false-acceptance rate).

While a change in this device's threshold between the lab and field tests might explain the difference, it is more likely that the 0.3% equal-error rate was measured under unrealistic conditions. Establishment of an independent evaluation center to test the maturity, reliability and repeatability of a biometric device was expected by the end of 1996. While the reliability of biometrics as a means of authentication is increasing as the technology

matures, its price remains prohibitive. Substantial investments are required to set up, operate, and maintain the necessary technological infrastructure.

Most, if not all, components would have to be sourced abroad. Expectedly, the major cost after initial investment would be in maintenance and technical support from other countries, particularly the US. However, given the rapid development in information technology, it is not inconceivable that within the 5 year timeframe of the GISP, sufficient progress in biometric technology could occur to make it a viable option for implementing say a national crime information system, or even an election system. Foreign Study

In June 2004, the Committee on Citizens' Freedoms and Rights, Justice and Home Affairs of the European Parliament (the LIBE Committee) asked the JRC to carry out a study on the future impact of biometric technologies. The report *Biometrics at the Frontiers: Assessing the Impact on Society* (EUR: 21585)¹ is the result of this request. The work was carried out by staff from the IPTS ICT Unit, in collaboration with a number of external experts. Four experts were asked to contribute to the study, expressing their views on the technical, legal, social and economic implications of biometrics.

They were respectively Professor Bernadette Dorizzi of the Institut National des Telecommunications (INT), FR; Professor Paul de Hert, of the faculty of Law, University of Leiden; Julian Ashbourn, chairman of the International Biometric Foundation and creator of the AVANTI non-profit on-line biometric resource and Jonathan Cave, Senior Lecturer at the Department of Economics, University of Warwick, UK, and Project Leader at RAND Europe.

Synthesis Technology is a tool which may be developed and used intelligently or unintelligently, ethically or unethically, for the common good or against the common good.

When we introduce new technologies which will affect the lives of many millions of individuals, we must bear such realities in mind and strive to do so in a responsible manner. Biometrics and related enabling technologies are a case in point. It is not enough to make assumptions about biometrics and their role in society. We must dig deeper and understand – really understand, the implications of introducing such technologies on a wide scale within the public sector. Not just the immediate implications, but the longer term societal implications.

Make no mistake, we are introducing a fundamental change in the trust model between citizen and state which will affect ourselves, our children and future generations. Concepts such as anonymity and personal privacy are being challenged while the traditional concept of being considered innocent until proven guilty, one of the cornerstones of free society, is being dismissed in relation to everyday transactions such as border crossing. Such an undertaking carries a heavy burden of responsibility.

If we do it poorly, we shall not only fail to achieve any significant benefits from a security perspective, but we shall negatively impact the quality of life for millions of people and erode public confidence accordingly. This is not a matter of scare-mongering or trying to attach a negative connotation to current political aspirations in this area, but simply drawing attention to a

very real possibility. A possibility accentuated by the speed with which such aspirations are being pursued.

If, on the other hand, we do things well, then there are certainly benefits to be realised from the intelligent and responsible use of biometrics and related technologies. To date, much of the discussion in this context has been of a technical nature. We have concerned ourselves with the technicalities of biometric template formats, portable storage such as embedded chips and the practical considerations of tokens such as chip cards and smart passports. We have also expended much energy on discussions around theoretical performance and have spent years discussing suitable standards.

Qualified discussion around the longer term societal implications has however been conspicuous mostly by its absence. This paper will go some way to restoring the balance, although it is stressed that more research in this area would be desirable, as would true national, European and international coordination. In order to properly understand and discuss such matters, we must first place this technology in context. The following section therefore offers a brief introduction to biometrics from a societal and historical perspective, together with an overview of the currently popular techniques.

This will equip the reader with a point of reference in relation to concepts and ideas discussed subsequently.

CHAPTER 3 METHODOLOGY

In this chapter, the proponents concentrate on the methods that will be used in this study. This chapter also contains different techniques to be utilized in the study. Included as well are the comprehensive description of the research design, the instrument that will be used in the study to gather information, procedures to be applied, the analytical tools that will be applied in creating the proposed system, and the diagrams.

Specifically, focus will be on the research design, population and sample size, respondents, questionnaires/instruments, reliability testing and statistical treatment. Biometrics device is widely used because it has wide applications particularly in the field of Information Technology. There are many existing attendance system over the world. Moreover, gathering information needed in our system is a hard thing to do because not all of the information we need are available in the internet. We use many kinds of methods of information gathering just to find the exact information we need to create this kind of system.

Method of Research Descriptive Research Method. The proponents used this method to gather data concerned with the characteristics of the proposed system. Initial planning for the system design involved identifying the problems encountered by users in the manual system. The proponents analyzed these problems and determined the necessary details for the development of the system. It includes many particular methodologies and procedures such as observations, questionnaires and evaluation tests.

Gradually, we use all the methods we thought that would help us in constructing this thesis documentation and system for the contentment of

the students and others in reading and understanding on how the system works. Software Development Model Procedures must be employed in order to solve problems in an organized manner. The procedures will become a comprehensive guideline that must be followed in order to complete every activity in the SDLC. Figure 3. 1 is a concise description of the methods the proponents followed to develop the system.

This section gives a concise description of the methods used in developing the proposed system through waterfall model. Waterfall model is sometimes often referred to as the linear sequential order or the software life cycle due to the cascading effect from one phase to the other. In this model, each phase explains how the succeeding ones will be achieved and illustrates the data flow and progresses through system, analysis, design, code, testing and maintenance. (SD/Waterfall Model) Figure 3. 1 System Development Planning System Analysis Design Code Testing Implementation Maintenance Planning.

The proponents begin by establishing the requirements immediately associated with the proposed system. This stage produces a broad definition of the system requirements in terms of the functions the system will support. System Analysis. The analysis stage consists of a detailed analysis of the attendance system and payroll transactions related to the proposed system. The proponents gather information and define the system requirements for the system that the proponents are developing. The objective is to clearly understand the proposed system. Design. In the design phase, the information gathered during Analysis stage are utilized.

The major activities that must be done are ; integrating the application architecture, designing the user and system interfaces and designing and integrating the database. Code. The design is translated into an artificial language that the computer can understand and then perform. Testing. The proponents run a test of the program produced to detect its defects and bugs and perform error checking and debugging. Implementation. This phase involves implementing the new system and managing the transition from the old to the new system. This may include converting data and training users. User acceptance is the endpoint of the implementation stage. Maintenance. This phase involves checking the software regularly to ensure its functionality. Maintaining the system means safeguarding it to provide continuity of use. This is the longest stage of a software development. Analytical Tools These are the system tools and statistical tools that are used to review the effectiveness of the proposed system in a way of using graphical representation to present the development and progress of the research. This representation renders an overview of the system processes and program logics included in the proposed system.

System Tools Context Diagram. It presents a conceptual process model of the system and its framework. It attempts to clearly define the boundary between the system under examination and its environment including other system. Data Flow Diagram. It shows the relationships among the business processes within an organization to the external systems and organization. It is used to describe how the system transforms information. It also defines how information is processed and stored and identifies how the information

flows through the processes. Program Flowchart. It shows the sequence of steps performed in a computer program.

Program flowchart deals with the information flow through the computer. It portrays the various arithmetic and logical operations that must be accomplished to solve a data processing problem. Research Instruments To attain the objective of this study, the researchers produce an evaluation sheet essential to gather suitable information in relation with the proposed system. This enables the proponents to obtain necessary information to produce efficient, significant and valuable software. Observation. In this situation, analysis is done in the manual system of recording the attendance and computing the payroll.

Through this problem, the researchers were able to identify the solutions and limitations that affect the operation of the system. Evaluation Form. The proponents will use evaluation form to rate the manual and the proposed system based on the following criteria: accuracy, efficiency, reliability, effectiveness and user-friendliness. Through evaluation form, the proponents will be able to compute the data to get the general mean, general standard deviation and the result of t-test. Statistical Tools The Statistical Method used in the study is the T-test.

This test will be used in this study because the number of population is 30 ($n \leq 30$). This will also be used to check if the effectiveness of the proposed system is significant. The Standard Deviation is used to determine the measurement of the variability or dispersion of a population. It is useful in comparing sets of data, which may have the same mean but a different

range. The variance is the square of the standard deviation. It is a measure of the degree of spread among a set of values; a measure of the tendency of individual values to vary from the mean value. Formula for Standard Deviation

Where: S = sample standard deviation N = sample size X_i = any of the numerical ratings 5, 4, 3, 2, 1 representing the evaluator's rating options for such given criterion. \bar{X} = Arithmetic Mean i = interval Σ = Symbol represents the summation function Statistical Mean. The mean is the average of the scores in the population. Numerically, it equals the sum of the scores divided by the number of scores. It is of interest that the mean is the one value which, if substituted for every score in a population, would yield the same sum as the original scores, and hence it would yield the same mean.

Formula of Weighted Mean $W_m = \frac{\sum w x}{\sum w}$ Where: \bar{X} = it stands for Arithmetic Mean w = any of the numerical ratings 5, 4, 3, 2, 1 representing the evaluator's rating options for such given criterion. N = the sample size represented by the total number of respondents T-Test. The T-test assesses whether the means of two (2) groups are statistically different from each other. This analysis is appropriate whenever you want to compare the means of two groups. The formula for T-Test is: Where: t = t-test X_1 = mean of the first sample X_2 = mean of the second sample S_{21} = sample standard deviation of the first sample

S_{22} = sample standard deviation of the second sample N_1 = number of first sample N_2 = number of second sample Likert Scale. In the proposed system, the proponents will use Likert Scale to weigh the respondents' agreement on

the Likert items which each criteria is rated ranging from 1 - 5, with 5 as the highest or most excellent and 1 as the lowest or poorest. Table 3. 0 Likert Scale Interpretation| Scale| Excellent| 5| Good| 4| Very Good| 3| Satisfactory| 2| Poor| 1| Software and Hardware Requirement Analysis Hardware

Specification: * Computer that has a 1. 6GHz or faster processor * 1 GB (32 Bit) or 2 GB (64 Bit) RAM 3GB of available hard disk space * 5400 RPM hard disk drive * DirectX 9 capable video card running at 1024 x 768 or higher-resolution display * DVD-ROM Drive * Digital Persona Biometric Device

Software Specification: * VB. NET * Structured Query Language (SQL) *

Digital Persona SDK * OS - Windows XP, Windows Vista, Windows 7

CHAPTER 4 PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This chapter deliberates the results of the gathered data. Results are arranged in forms of tables together with the descriptions and numerical interpretations to establish the basis of the conclusion.

This chapter also presents the findings and interpretations of data analysis.

Data was gathered from thirty (30) respondents through evaluation sheets.

The results are presented according to the indicated problems from Chapter

1. Profile of the Respondents This section presents the profile of the

respondents in terms of their types. The proponents used a total of thirty

(30) respondents: five (5) are I. T. Experts or Professionals and twenty (25)

are faculty members who are familiar with computer usage. Table 4. 1 The

Distribution of the Respondents Participation| Frequency| Percentage|

Faculty Members| 25| 83. %| IT experts| 5| 16. 7%| Total| 30| 100%| Based

on the distributed evaluations, Table 2. 0 shows that out of 30 respondents,

25 or 83.3% are faculty Members and 5 or 16.7% are IT Experts. It is seen from the table that the faculty members' percentage got the highest score on the Fingerprint Biometrics Attendance System and Computerized Payroll of Colegio De Saint Monique in Binangonan Rizal. Assessment of the Respondents The proponents evaluated the existing and the proposed system in terms of the following criteria: Accuracy, Efficiency, Reliability, Effectiveness and User - friendliness.

Table 4. 2 Evaluation in Terms of Accuracy Item| Proposed System| Existing System| | WeightedMean| Standard Variance| WeightedMean| Standard Variance| Accuracy| 4. 47| 0. 63| 2. 13| 1. 25|

Table 4. 2 illustrates the evaluation of the respondents in terms of accuracy of the existing manual system and the proposed system. It is based on how accurate the proposed system response to user's action. The existing system has a mean of 2. 13 that is less than the mean of the proposed system which is 4. 47.

Table 4. 3 Evaluation in Terms of Efficiency Item| Proposed System| Existing System| WeightedMean| Standard Variance| WeightedMean| Standard Variance| Efficiency| 4. 60| 0. 62| 2. 10| 1. 21| Table 4. 3 illustrates the evaluation of the respondents in terms of efficiency of the existing manual system and the proposed system. It is based on how competent the proposed system response to user's action. The existing system has a mean of 2. 10 that is less than the mean of the proposed system which is 4. 60.

Table 4. 4 Evaluation in Terms of Reliability Item| Proposed System| Existing System| | WeightedMean| Standard Variance| WeightedMean| Standard Variance| Reliability| 4. 30| 0. 79| 1. 17| 0. 0|

Table 4. 4 illustrates the evaluation of the respondents in terms of reliability of the existing manual

system and the proposed system. The existing system has a mean of 1.17 that is less than the mean of the proposed system which is 4.30. Table 4.5 Evaluation in Terms of Effectiveness

Item	Proposed System	Existing System	Weighted Mean	Standard Variance	Weighted Mean	Standard Variance	Effectiveness
	4.20	0.85	2.20	1.47			

Table 4.5 illustrates the evaluation of the respondents in terms of effectiveness of the existing manual system and the proposed system. The existing system has a mean of 2.0 that is less than the mean of the proposed system which is 4.20.

Table 4.6 Evaluation in Terms of User-friendliness

Item	Proposed System	Existing System	Weighted Mean	Standard Variance	Weighted Mean	Standard Variance	User-friendliness
	4.37	0.81	1.97	1.24			

Table 4.6 illustrates the evaluation of the respondents in terms of user-friendliness of the existing manual system and the proposed system. It is based on the evaluation of the respondents' ease of use. The existing system has a mean of 1.97 that is less than the mean of the proposed system which is 4.37.

Table 4.7 Summary Evaluation from the Respondents

Software Criteria	Proposed System	Existing System	Weighted Mean	Standard Variance	Weighted Mean	Standard Variance	Accuracy
	4.47	0.63	2.13	1.25			
Efficiency	4.60	0.62	2.10	1.21			
Reliability	4.30	0.79	1.77	0.80			
Effectiveness	4.20	0.85	2.20	1.47			
User-friendliness	4.37	0.81	1.97	1.24			
Average	4.39	0.74	2.03	1.19			

Table 4.7 shows the Summary Evaluation from the respondents based on the conducted survey. The results say that the respondents strongly agreed that the proposed system is accepted. It is duly indicated that the general average mean of the

existing system is 2.3 which is less than the general average mean of the proposed system which has a value of 4.39.

It is also delineated in the table that the general standard deviation for the proposed system is lower than the existing system wherein the proposed system has an evaluated value of 0.74 and the existing has a value of 1.19.

Table 4.8 Significant Difference between the Existing and the Proposed System

System	Proposed System	Existing System	T-Computed	Weighted Mean	Standard Variance
Proposed System	4.39	2.03	1.19	6.04	0.74
Existing System	2.03	1.19	6.04	0.74	2.03

Table 4. shows the assessment of the respondents to the existing and the proposed system.

The data gathered by the proponents show that the proposed system attained and met the standards and expectation of the users on the given criteria which includes Accuracy, Efficiency, Reliability, Effectiveness and User-friendliness since the t-computed value of 6.04 shows a significant disparity between the existing system and the proposed system. Based on this t-computed value, the proponents concluded that the relationship between the respondents' concurrence and performance of the proposed system is significant compared to one with the existing system.

It shows that the proposed system is very much accepted by the respondents and is operationally feasible.

CHAPTER 5 Summary, Conclusion and Recommendation

This chapter presents the summary of findings, conclusions, and recommendations derived from the study. Summary The researchers

proposed a system to provide Colegio De Saint Monique a Fingerprint Biometrics Attendance System and Computerized Payroll wherein the employees can keep track of their attendance and payroll status.

The system is designed to list attendance using fingerprint scanner and the system will automate payroll for a more reliable computation of payroll.

Related literature and studies on Fingerprint Biometrics greatly helped the researchers to design and developed the functions and features of the system application. Descriptive research method was used to collect, analyze, and interpret the data of “ Fingerprint Biometrics Attendance System and Computerized Payroll of Colegio De Saint Monique in Binangonan, Rizal” statistically.

This attendance system particulates in fingerprint identification because it is integrated with the biometric sensor and matching algorithms to lead the deployment of biometric authentication. After the authentication has been made that’s the only time the user can navigate throughout the system. The application gives confidence to employees regarding the computation of their salaries and also for the part of the administration which gives them assurance that they are getting the right services to what they pay for.

Conclusion In the light of the findings derived from this study, the following conclusions were deduced.

The proposed fingerprint biometrics attendance system and computerized payroll proves to be reliable and effective when it comes to the consideration of the long run efficiency of the system. The proposed fingerprint biometrics attendance system and computerized payroll proves to be significant in

terms of accuracy, reliability, efficiency, effectiveness and user-friendliness based on the evaluation of the respondents. It has a more convenient way of logging-in and logging-out for each faculty members because they don't need to write their name on the logbook which needs more effort.

This computerize system automatically calculates every faculty's total work hours. Unlike with the manual timekeeping that is a time consuming task for both the faculty and the administrative staff. The proposed fingerprint biometrics attendance system and computerized payroll proves to be technically, operationally, and economically feasible. Recommendations Based on the findings of the study the researcher would like to make the following recommendations: The proposed fingerprint biometrics attendance system and computerized payroll can be sold and used by its intended users.

It can give another way for future software to improve the attendance monitoring system and computerized payroll. It can also serve as a guide to software developers to improve and create more and better application for the same purpose. It is highly recommended by the researchers to human resource personnel to install the proposed software so as to ease their work. Future researchers are encouraged to venture in this kind of study how ever with different criteria and design to publish.