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Implementation of an Automated Daily Time Record Management System for Elementary School Personnel

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ABSTRACT: Given your present workplace attendance a makeover in the digital age, going tech isn't simply a trend; it's a requirement for increasing efficiency. We need human minds to focus on more vital duties like strategy and positioning rather than manual administration and record keeping as work becomes more complex and competition becomes more intense. Managing faculty attendance and timekeeping is one of Nanaguan Elementary School's main concerns. Our employees are our most valuable asset, therefore keeping correct records of their working hours, shifts, and vacation time is critical. In reality, it has the potential to significantly improve the school's operations, as well as its production and efficiency. To solve the concerns, this study created a web-based Daily Time Record Management System. The project discusses the idea of the Agile model, which is more adaptable and less efficient in terms of scope and requirements. Installing a Daily Time Record Management System can verify that your employees' records are accurate and that you are in compliance with labor rules. The system was also assessed using the ISO 25010 quality standard, and it was determined to be very satisfactory and compliant, with a total mean of 4.73, indicating "Strongly Agree." Hence, this approach streamlines and simplifies your job while also reducing errors.

KEYWORDS: Daily Time Record Management System, Agile Model, Alpha, Beta, ISO 25010

INTRODUCTION

As the world is evolving and the growth and modernization are inevitable, we observe that the objects around us are changed. The rapid change and evolution of communication and technology has been enormous, and it is now so widely used that nearly everyone in this generation has gotten their hands on it.

Everyone benefits from the use of technology; it has become a focal point in all areas of human life and has become a staple in many homes around the world. Its presence has permeated into all facets of our lives, including educational settings.

Small and medium-sized businesses used a manual method to record workers' daily work hours, which served as the basis for calculating their wages. On the contrary, this approach requires the accounting clerk to spend too much time and money encoding all of the employee's attendance. Furthermore, it necessitates time-consuming procedures such as remittance data collection, regular time records, and individual manual payroll calculations, all of which can result in unreliable results.

The research focuses into the system's architecture, development, testing, and evaluation entitled Daily Time Record Management System for Public Elementary School, a system that can track time keeping and management process. It can record information based on the employee's work schedule, daily time work and daily time rendered. It provides a file management system where employees' information and system transaction records are logged-in. It also covers the management of employees' time in/out using fingerprint scanner. At the same time, it can also generate printing of attendance information consisting of daily time reports, and number of hours worked. The automation of recording employees' daily time entries is essential to the Human resource office for record and speed up the working process therefore saving valuable time.

It also aids the department in reducing errors due to hand written entries. It can process information faster and handle transactions more accurately. Since the information about the attendance of employees is directed automatically to the human resources, it does not require employees to submit their daily time record. every now and then. It also does not require them to use time cards in order to log their time (Samulde, 2013).

Attendance monitoring has strategic importance for every organization. It has shifted from utilizing paper-based attendance monitoring to biometrics, radio-frequency identification, Bluetooth and smart technologies, Internet of Things (IoT), cloud computing, or face recognition technology (Arif, Z. et al. (2018). Many records are available in electronic format, while some are only available in paper format. In document type, the past existed. However, the need utility, and intent of the Records Management remains the same, with the aim of boosting and improving the system phase of company. Employees are better able to deal with today's technological advancements by introducing an integrated timekeeping method. Manual systems that trigger logistical issues

and are inconvenient for workers will be phased out. Thus, the automated Daily Time Record Time Management System was proposed by the researchers. Through Daily Time Record Management System eliminates the risk of erroneous and keeps a fair and real time record of the time checks within the school at Nanaguan Elementary School. It indicate productivity against each investment and highlight the areas that fail to generate the expected return on investment. Daily Time Record Management System make workflow efficient and hassle free.

Many Daily Time Record Management System have been introduced in recent years. (Jain et al., 2011). Daily time record management system are used to track and monitor when employees start and stop work. It enables an employer to monitor their employees working hours and late arrivals, early departures, time taken on breaks and absenteeism. It also helps to control labor costs by reducing over-payments, which are often caused by paying employees for time that are not working, and eliminates transcription error, interpretation error and intentional error (Tom Hommand, 2017). A daily time record system allows a company to effectively manage its employees by providing adequate data. Due to the fact that an inefficient daily time record system will wreak havoc an Payroll system, add to paperwork, and make reliable productivity calculations difficult. (ononiwu G.C and okorafor G N et al., 2012). There is the need and more accurate in effect this method using a modern technology in this generation. (Shoewn et al., 2018) Similarly, Attendance Record System (ARS) is one of the tools used by organizations to track their staff`s daily attendance and performance analysis. The system helps organizations to determine the number of their active staff, staff punctuality, preparation of monthly payroll and also in making some decisions on staff (Olalere et al., 2018).

The system was designed into top-down approach that involved dividing into subsystem or modules and each subsystem is divided into even smaller subs. This procedure of division is repeatedly uses until it is small enough to be conveniently coded as an independent entity that perform clearly operation (Obansola et al., 2016). Thumb print of employees will be enrolled and verified, absentee can easily identified. The thumb print serves as check because if an employee attempt to thumb print for another, the system will disallow and record invalid entry for that employee after displaying unsuccessful clock-in/clock-out message (Chiwa and Dalah, 2014). In addition, using this system can be solved the problem of fake attendance and proxies. It gives an overview of some known methods used to implement this system and also the benefits and problems of it (Naeema and Shelmy 2017). In recent years, a number of face recognition based attendance management system have introduced in order to improve the performance of students in different organization.Traditional attendance marking techniques i.e, pen and paper or signing attendance sheets are easy to bypass and trick as giving proxies or false signatures is a common practice among students nowadays, students take an unfair advantage of this at most times. But a facial recognition system is unassailable and cannot be fooled as each person has a set of unique and individual features common to that person and cannot be replicated or changed, it all comes down to one simple truth that is, unless you are physically present in the lecture your attendance will not get marked. (Jomon Joseph, K. P. Zacharia, 2013) This is physically hardwired into the human brain. If the part of the brain that does this survival task is damaged, you become “face blind” and literally cannot match a photograph to the person sitting next to you, or even your own image in a mirror. (Joe Celko, in Joe Celko’s Complete Guide to NoSQL, 2014). Computers can transcend the limitations of humans with their almost unlimited memory and processing speed. Therefore facial recognition continues to be an unresolved concern and a developing requirement.(Himadri Biswas, ... Debabrata Sarddar, in Recent Trends in Computational Intelligence Enabled Research, 2021) . LBP helps to convert the image into machine understandable formats i.e. in binary format. Before face detection and recognition, the captured image should be converted into grey scale to simplify the calculation. Face detection technique first capture the image (student dataset) and detect faces from the images, the detected faces are stored for further reference. Face recognition technique capture the images from classroom and try to recognize it by comparing it with a earlier detected faces. (Shireesha Chintalapati, M.V. Raghunadh et. al). The featurebased approach uses key point features of the face, such as edges, eyes, nose, mouth, or other special characteristics. Therefore, the calculation process only covers some parts of the given image that have been extracted previously. On the other hand, the brightness-based approach calculates all parts of the given image. It is also known as holistic-based or image-based approach. (M. Alwakeel and Z. Shaaban, 2010) started with a vision with the coming age of upgraded facial recognition that will require close to null human exertion and totally computer based. As facial recognition is one of the best ways of human identification, a lot of work has been done through years. Facial recognition is being used by various tech companies and for different purposes. In China people swipe their faces to make payments, nowadays it used as a biometric process to unlock your phones. (At Intel Gary Bradski, 2014). Agent-technologies have been used for higher-level decision making in addition to carrying out lower-level automation and control functions in industrial systems. The ISO/IEC 25010 model can easily be adapted to the subject matter of this work, which investigates how to assess the integration of industrial (software) agents with low-level automation systems. To that end, ISO/IEC 25010 defines a Quality in Use model listing additional characteristics. The software product quality model proposed by the ISO/IEC 25010 family of standards is used as starting point and is put in the industrial automation context. Subsequently, the proposed methodology is applied, and a survey of experts in the domain is carried out, in order to reveal some insights on the key characteristics of the subject matter (Stamatis Karnouskos et al., 2018).

In addition, based on the researchers’ evaluation using ISO/IEC 25010 in terms of functionality and suitability, the system is suitable for Android devices that has Android KitKat and higher operating system. Through performance efficiency, the system displays

data in real time efficiently. In compatibility, although the system is not suitable for any other mobile operating system, the system operates well in Android devices that comply with the specification given by the proponent. In terms of usability, the system is user-friendly and it can be understood easily. In reliability, the system is not downloadable and is only intended for authorized devices only. However, it functions according to the needs of the user. In terms of security, the end user cannot edit or modify the system itself but only on authorized devices the application is installed. In terms of maintainability, the system can be tested, modified, and diagnosed easily. And lastly, in terms of portability, Monitor Me can be easily installed (Sulejaena Herrera).

METHODS

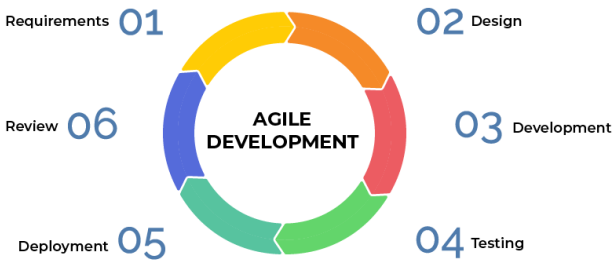


Figure 3-1. AGILE MODEL

AGILE methodology is a practice that promotes continuous iteration of development and testing throughout the software development lifecycle of the project. (Guru99, 2021). Agile method focusses in the need to develop software quickly in an environment of rapidly changing requirements and emphasizes working software. And it is widely recognized that lean manufacturing principles have been highly influential in the evolution of agile software development (Greer and Hamon).
The phases of the Iterative model are:

Requirements
This phase entails the researchers obtaining data in order to identify the study's precise objectives. This phase also determined the identification of problems that had occurred in the school. In addition to reviewing relevant articles, studies, and documents to identify the study's ultimate goal, namely the recording technique and constraints, the researchers also reviewed necessary publications, studies, and documents. Observation and internet research were utilized as methods of gathering this information.

Design
In this step, the researchers planned out to construct the proposed system based on the needs that had been determined, with the goal of addressing and providing better answers to the school current challenges. Nanaguan Elementary School's largest issue is keeping track of employee attendance and timekeeping. Your school is your most valuable asset, and keeping correct records of their working hours, shifts, and leave is critical. In reality, it has the potential to significantly improve the school's operations, as well as its production and efficiency. Employers used to keep track of their employees' attendance using a manual system. The graphic user interface, the system's basic structure, the system database, and the overall system were all designed.

Develop
This entailed the creation of the entire system, which would be based on the needs and design that the researchers had gathered and planned. The system will be developed using PHP Programming Code, the database will be constructed using MySQL database management system.

Test
When the system has completed its development phase, IT experts will run a series of tests with the help of researchers to identify and pinpoint any potential faults or flaws in the system.
1. **Unit Testing.** The researchers make sure that the complete functionality of the codes, as well as each module unit of the system, is working properly and that it fits all of the system's design and criteria. Examining the tiniest elements of the system independently and separately to see if the written codes perform as they should.
2. **System Integration Testing.** This focuses on the entire testing of the entire system, with the goal of evaluating the end-to-end system specifications.

Deploy
In this stage, the researcher would put the system for full operation and ready to use by the employees of the assign Public School.

Review

The researchers review the system using ISO 25010 to measure the software quality in terms of the following:

- Functional Suitability
- Performance Efficiency
- Compatibility
- Usability
- Reliability
- Security
- Maintainability
- Portability

This entailed designing the program from the ground up to meet the needs of the school.

Table 1: Software requirements

Components	Minimum	Recommended
Operating System	Windows 8 64-bit Operating System	Windows 8 or higher
Browser Text Editor Database Server	Google Chrome Sublime Text 3 phpMyAdmin 4.2	Google Chrome latest version Sublime Text 3 or higher phpMyAdmin 4.2
Computer Unit Hard Disk Drive	 40 gb available space	 500 gb or higher
Computer Processor Video card Memory(RAM) Face Recognition Biometric Acces Contol Router UTP cable	2.7GHz Core I3 2gb 4gb Tenda F3 Router Cat 5e	2.7GHz Core I3 or higher 2gb or higher 4gb or higher Tenda F3 Router Cat 5e

RESULTS AND DISCUSSION

Attendance and Generate of Report

Having an attendance monitoring system in the Philippines is a great way to keep track of their work performance and monitor possible delinquencies in attendance. By observing Nanaguan Elementary School in the City of Ilagan, We, the Researchers determined that the process of tracking working times has always been a complicated task. When you rely on time sheets, there is always a risk of human error. Employees may record their hours of work incorrectly in a time sheet or the information may be incorrectly entered into your payroll software. In addition, monitoring and managing attendance can be a time-consuming and laborious task. Consequently, it also ends up being a very expensive one. It takes more time than you think to process your employee's attendance.

ADMIN

This module may include the Registration for Admin and other features that ONLY related to the Admin.

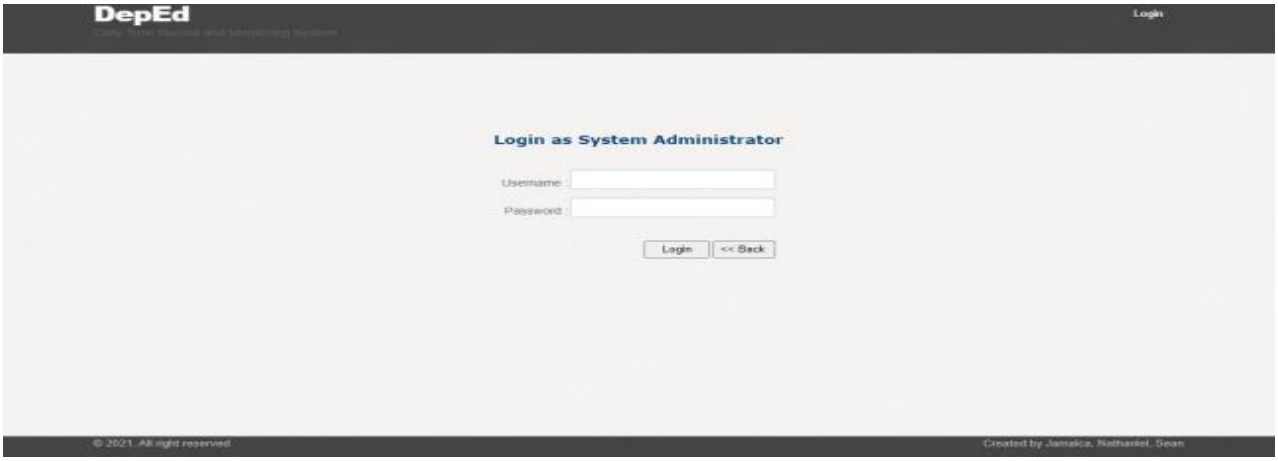


Figure 4-1. Log in of Administrator

In this diagram, the user will enter his login and password to gain access to the system's account configuration, record management (registration, attendances, DTRs, and Applying of Leaves etc.), and report production features. Users whose accounts have not been saved will be unable to use the system. Only the administrator has access to the system and able to manipulate if there is a change about the DTR and Account of the user which is the Employees.

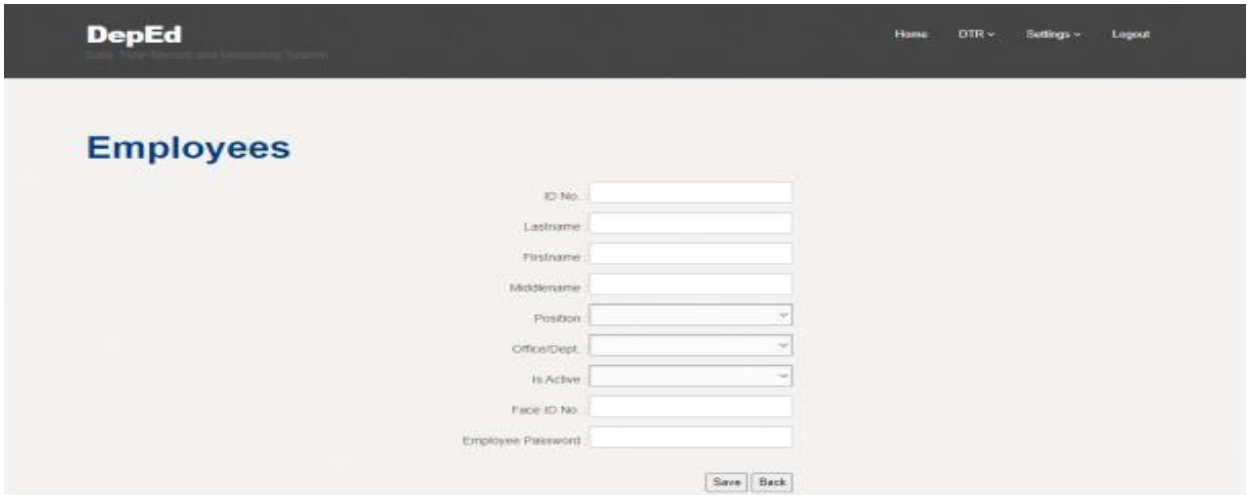


Figure 4-2. Registration

This form allows the user to register a Nanaguan Faculty personal information, after which the user can see, amend, and remove that person's account.

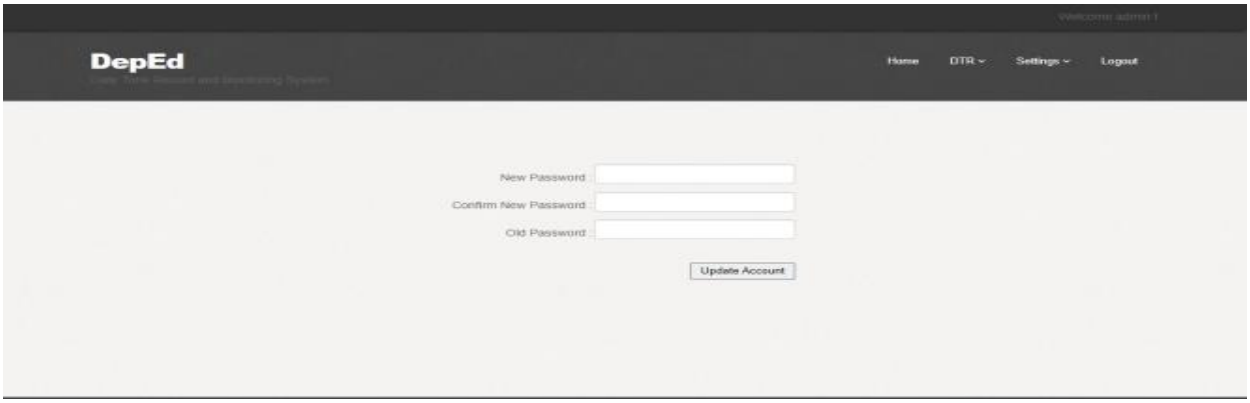


Figure 4-3. Account Update

In this figure the User either the Admin or User can change the password for security purposes.

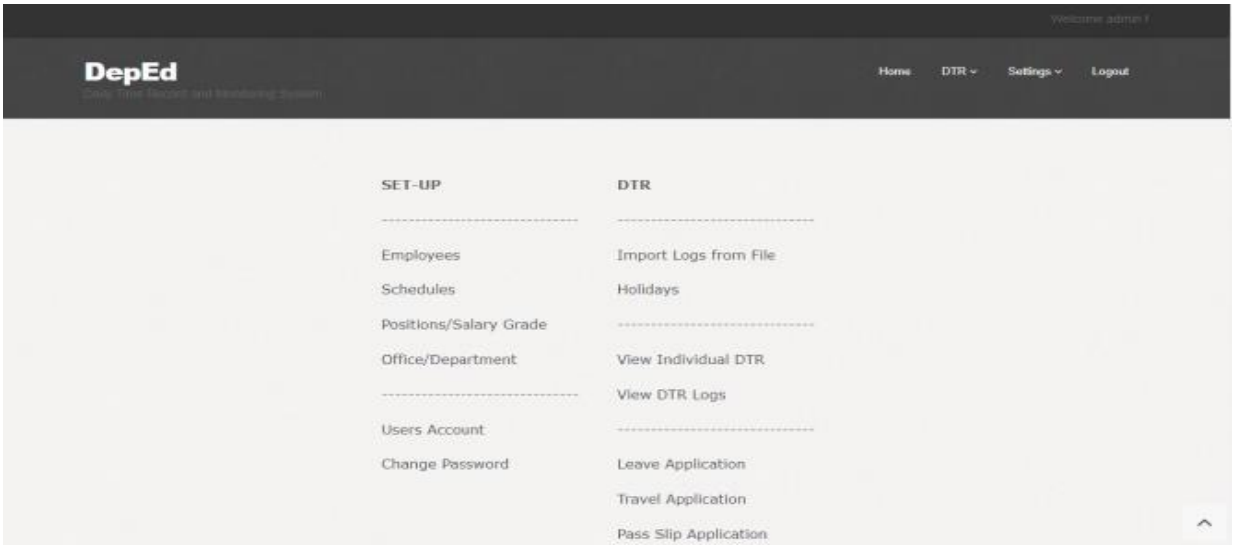


Figure 4-.4 General Home

This form indicates the general home page of the system. The features include employee, schedules,



Figure 4-.5 Office/ Department Module

Public primary school had their own offices such as Faculty, Principal and Head Teachers offices. In this figure Admin can set the Employees to what department they belong. This may benefit the admin to easily track the position of the employee. In this module the admin can edit, delete or add a department.

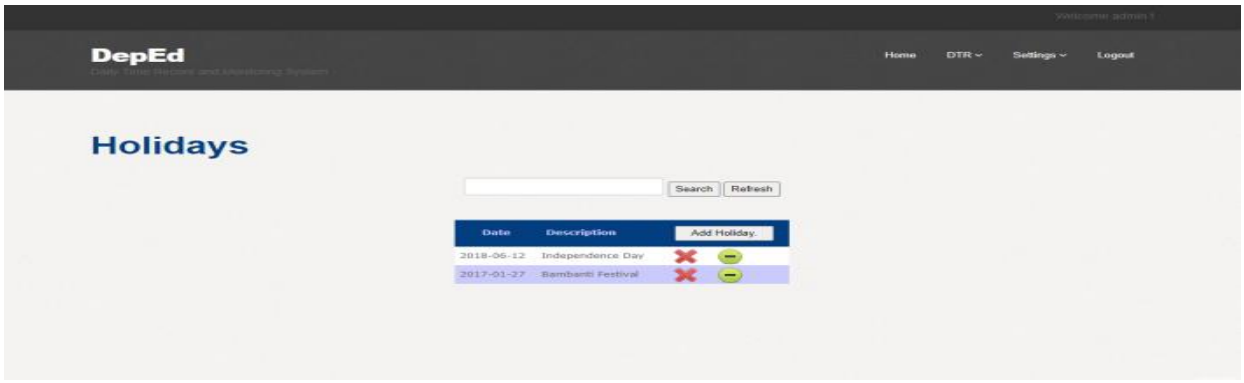


Figure 4-.6 Holidays and Events

In this form the Admin can set a holiday or events particularly about national holidays and school calendar related activities. It is also set as basis of possible remark in DTR form.

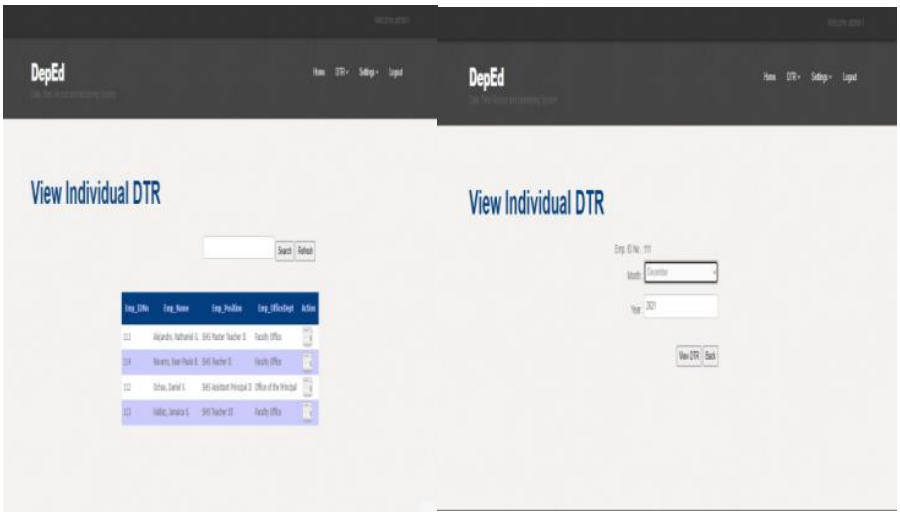


Figure 4-.7 Employees DTR

Employees DTR form allows the user and the admin to view a certain date of the attendance and provide a hard copy. The admin views the attendance general or individual by searching the employees I.D. or month that they want to view.

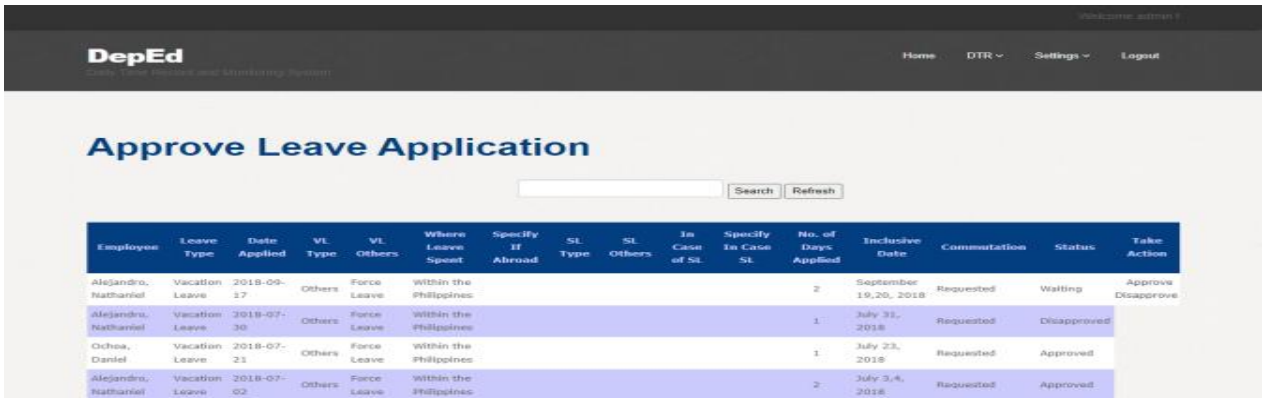


Figure 4-.8 Leave Application

In this form the admin either approve or disapprove the pre- application of Leave. Once the leave been approved the admin is responsible in processing of the leave application.

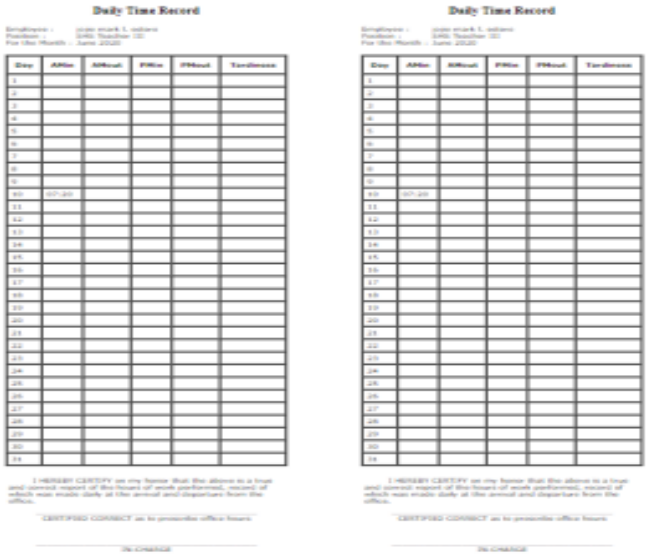


Figure 4-.9 DTR sample

In this figure after the admin has collected all the data from the facial recognition device and imported it in the system. The format of device goes like this. The date of his presented indicate in the device may automatically input in this form including the day of his absences, late, holidays and unexpected activity. Only can the admin can provide a original copy of the DTR and the employees only access a duplicate copy of DTR without value and authorize signature from the head of the school.

EMPLOYEE

This module features the employee talks about his/her limitation of accessing the system.



Figure 4-10. Log in of Employees

In this figure, the employee will put his username and password for him to access the limited features inside the system such as his account, own DTR, attendance, application for leave, progress of leave application and be able to change his input data. This system had the power to back from the beginning once the user reaches 3 minutes of not using the system “Expired using this Session” pop up.

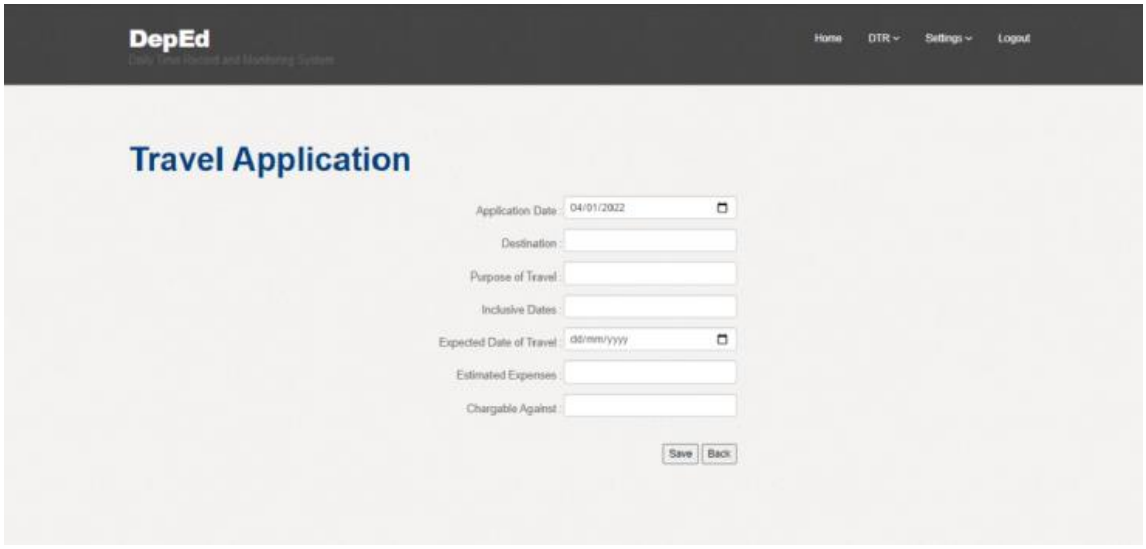


Figure 4-11. Travel Application

This figure allows the Employee to apply for early travel application. This form consists of the Date, Destination, Purpose of Travel (school related) including their expenses.

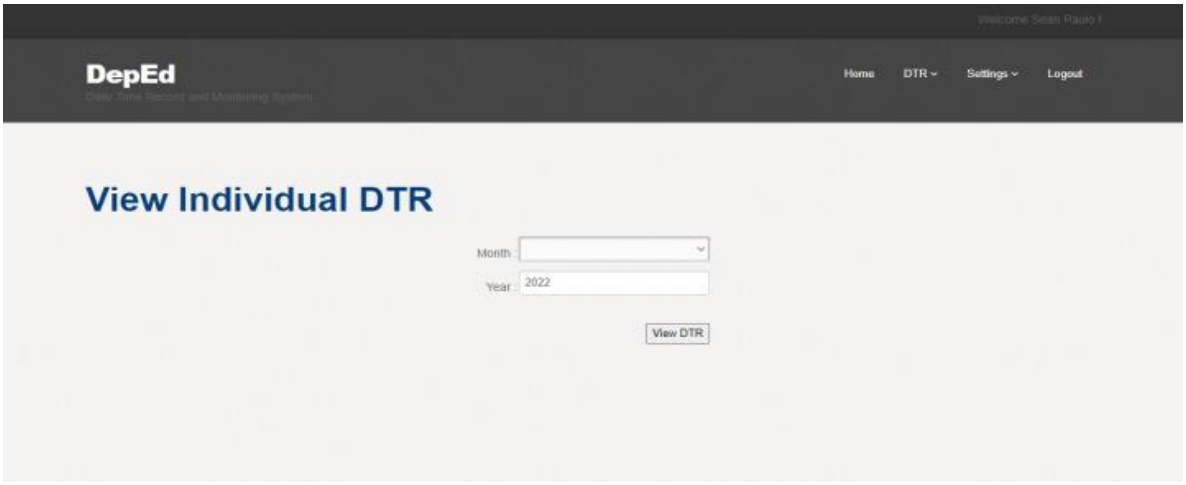
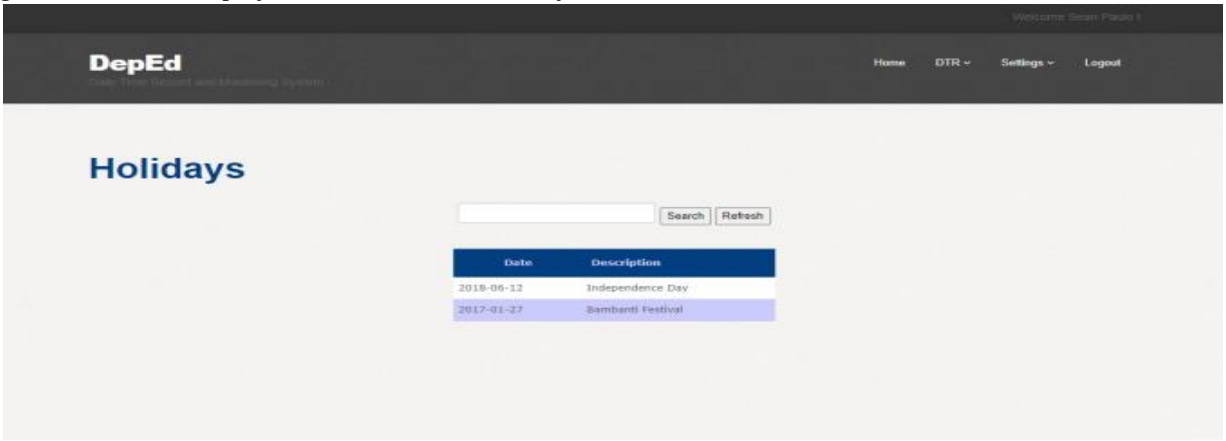


Figure 4-12. Employees Individual DTR view.

In this figure it allows the employee to view his DTR which year bar and view DTR button



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Figure 4-13. Holidays Form.

This figure serve as basis of the employees about Holidays and School Calendar Activities within school year.



Figure 4-14. Schedule of the employee.

This figure shows the weekly schedule of employee. It serves as their weekly basis.



Figure 4-15. Leave Application

This figure shows how the employees can apply for leave. It contains the following bar: leave type, application date, vacation leave type, where leave will be spent, specify it abroad, sick leave, no. Of working days applied, inclusive dates and commutation.



Figure 4-16. Personal Data

This figure shows the employee's personal data.

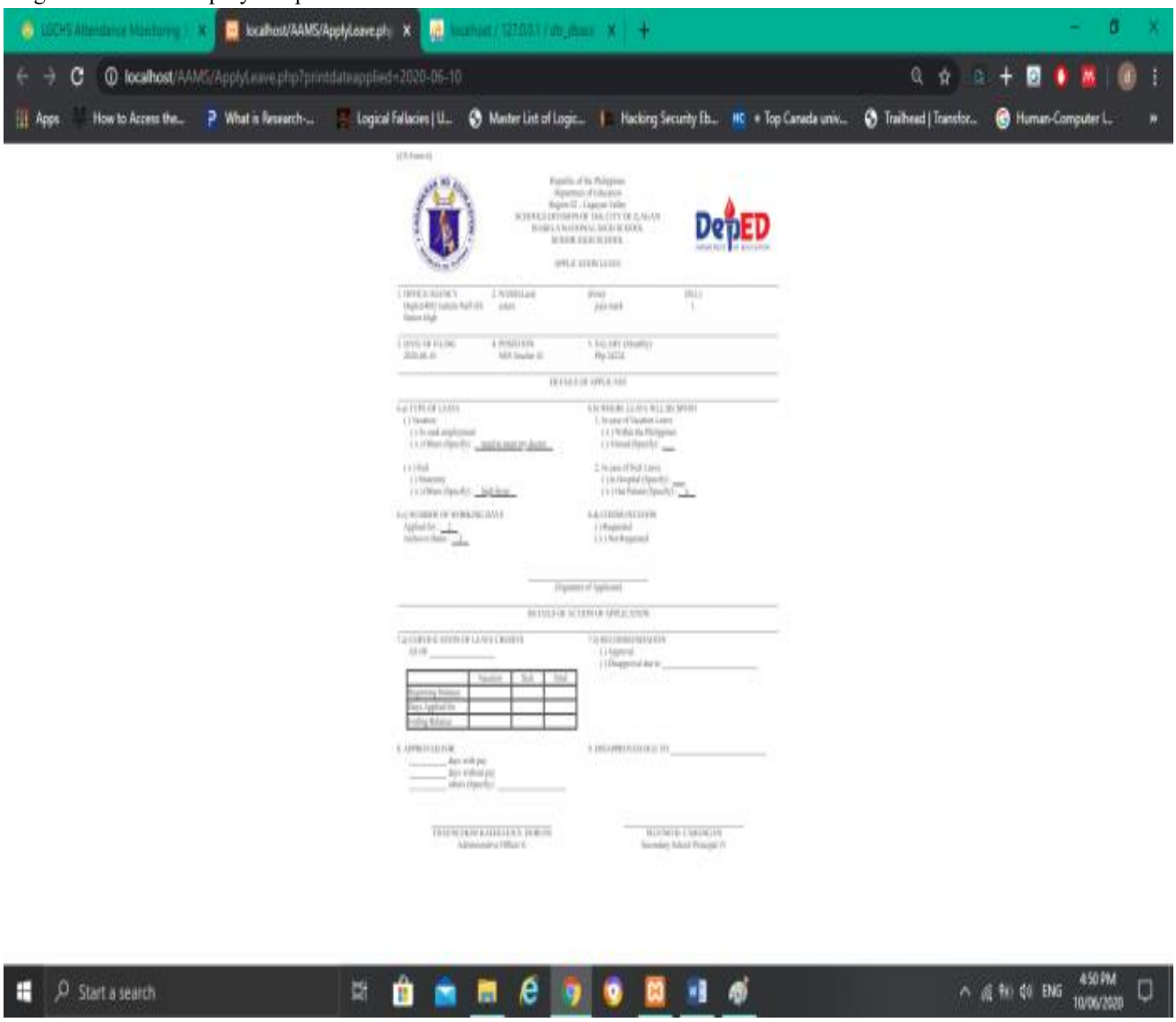


Figure 4-17. For Leave Documents

This figure shows the employees approved Application for Leave. The admin automatically processes the form.

Table 2. Summary of Mean using ISO 25010

Criteria	Mean	Interpretation
Functional Suitability	4.81	Strongly Agree
Performance Efficiency	4.7	Strongly Agree
Compatibility	4.69	Strongly Agree
Usability	4.77	Strongly Agree
Reliability	4.72	Strongly Agree
Security	4.72	Strongly Agree
Maintainability	4.76	Strongly Agree
Portability	4.70	Strongly Agree
Weighted Grand Mean	**4.73**	Strongly Agree

Generally, as shown in the table the respondents found the developed system to be very acceptable and are submissive in ISO 25010 in terms of software quality totaling a weighted grand mean of 4.73. Specifically, the functional suitability, usability and maintainability got the highest mean of 4.73 which is interpreted as strongly agree. Furthermore, this may mean that the developed system can perform appropriately the required modules such as registration, attendance monitoring and report generation. In addition, the system provides all the necessary features as well as users requirements such as, approval of leave, pass slip and travel orders of the employee.

CONCLUSION

The following conclusion were reached based on the study's findings:

1.The school's paper-based system has run into various issues, including limited storage space, lengthy processing times, and erroneous data transmission. However, based on the research findings, the developed system should be adopted by the organization because it is functional and compliant with all transactions. The developed system can really help the users, particularly the administrators, by reducing time spent working and making transactions much simpler.

2.The developed system addresses the problems through the following modules:

2.1Registration;

2.2Calculation of attendance; and

2.3Approval of leave, Pass slip and Travel order of employees; and

3.The produced system was put to the test in terms of usability and compliance to the needs of the end-user.

4.The developed system was evaluated using ISO 25010 and the respondents found it as:

4.1Functional Suitability with a very acceptable mean of 4.81,

4.2Performance efficiency with a very acceptable mean of 4.7,

4.3Compatibility with a very acceptable mean of 4.69,

4.4Usability with a very acceptable mean of 4.77,

4.5Reliability with a very acceptable mean of 4.72,

4.6Security with a very acceptable mean of 4.72,

4.7Maintainability with a very acceptable mean of 4.76; and

4.8Portability with a very acceptable mean of 4.70.

Therefore, the development of Daily Time Record Management Nanaguan Elementary School addressed the way of recording data of employees, monitoring of attendance and approval of leaves. Therefore, the objective of the study has been met.

RECOMMENDATION

The researchers prepare the following recommendations based on the findings and conclusions reached:

1.All public schools in the city of Ilagan are strongly encouraged to use the created system.

2.We recommend the future studies should incorporate an additional SMS notice for verification while logging in on the device.

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