ɪTRACK APPLICATION FOR FINANCIAL DOCUMENT TRACKING SYSTEM

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Abstract. The iTract Application for financial document is reliable, efficient and usable having a weighted mean of 4.44, 4.65 and 4.66 respectively. It can track the Accounting files, file movements, finding files and securing files that consists of: software that is integrated with RFID technologies for   tracking Liquidation Reports and Cash Advance Requests; updated with the financial report's for the Monitoring of Schools Division Superintendent, Accountant III and Senior Bookkeeper for database query; and can send SMS notification for all School Heads of Department of Education, Schools Division of Catanduanes for easy tracking of approved Liquidation Reports and downloaded Cash Advance Requests.

The iTrack Application for Financial document is reliable in the security alert system if the financial documents are pulled out in an expected location. Certainly it will create a sound alarm for the user and administrator of this system.

The iTrack Application for Financial document is functional and can be used for where it is intended having rated with an overall mean of 4.65**,** meaning it is "Far more than what is expected" from it. It was evaluated different respondents. It passed the evaluation using ISO 9126. Therefore, the clientele may install and use it to where it is intended.

Key Words. Accounting System, Financial Document Tracking System, RFID registry tags, SMS Notifications, Software Application, Tracking Systems

INTRODUCTION

Locating critical files and documents such as financial documents is one of the greatest challenges in workplace today. Temporarily misplaced of files or documents can lead to waste of time and productivity, a serious problem can be even caused due to stolen, transferred or lost sensitive files or documents.

RFID is used in all areas of automatic data capture allowing contactless identification of objects using RF. With applications ranging from secure access control, RFID technology solutions are receiving much attention in the research and development departments of large corporations. IT developers designing RFID products and end-users of RFID technology, computer and electronics engineers in security system development and microchip designers, automation, industrial and transport engineers and materials handling specialists.

RFID enables the most effective way to eliminate the time consuming of file searching. The revolutionary technology transforms typical paper-based and manual searching system to a digitized system that fully automated the process of file tracking and positioning with the provision of instant inventory and document location. The rule-based access control design of the Document Tracking Solution gives enterprises the flexibility to define their own businesses regulations to monitor the document by activating RFID registry codes providing all associated management reports.

Hardcopy document such as Liquidation Reports and Cash Advances on financial records and all files, paper and many others are also very important to our Department. In iTrack, RFID based tracking covers the important data of the submitted reports stored in a database file.

In order to declutter and confine the critical financial documents in the Accounting Unit Office, the submitted Liquidation Reports and Request for Cash Advance Request of School Maintenance and Other Operating Expenses (MOOE) Fund of 42 Secondary Public Schools and 236 Elementary Public Schools in the Division of Catanduanes, the Researcher distinguished RFID's iTrack Application for Financial Document Tracking System to be a viable research that reduces the potential for bulky and piled up submitted Liquidation Reports.

The iTrack Application for Financial Document Tracking System is designed to track the usage and availability of all financial records. The solution allows the advantage of barcode and RFID technologies to identify each record as a unique object. Each document is assigned with an RFID label which is unique and this label is used to track each file.

RFID iTrack Application for Financial Document Tracking System can track all the financial documents workflow within the Schools Division of Catanduanes, Accounting Office. This reduces time for the Accounting Unit Personnel to manage all financial documents; Liquidation Reports and Cash Advance Request of School Maintenance and Other Operating Expenses (MOOE) Fund. Also the system would deliver SMS notification to all Elementary and Public School Heads in the Province of Catanduanes on status of approval of their submitted financial documents and reports.

Furthermore, the Senior Bookkeeper designated is the primary account manager, the Accountant III as the secondary account manager and the Schools Division Superintendent as the tertiary account manager. The Accounting Unit of Catanduanes Schools Division Office will know

immediately when a document has already been stored in the database with the use of RFID Registry tags and RFID fixed readers and antennae are placed. The Senior Bookkeepers will safekeep the registered RFID tags in a secured storage area wherein automated passkey will then be authorized to each primary user.

Through iTrack Application for Financial Document Tracking System, users can view a document's details, such as content summary of submitted Liquidation Reports and will then be monitored if submitted in due time or with remarks on their lacking documents.

With an RFID iTrack Application for Financial Document Tracking System in place, documents, file folders are quickly found with a simple search by using an RFID tagging. Features of iTrack are to locate documents quickly, increase workforce productivity, and reduce operational costs, database storage of critical financial records / files. It is also for the creation of auditable trails of access to sensitive Liquidation Report documents, automatically generate required reports, to serve the Elementary and Secondary Schools Finance Officers with utmost reply on their concerns with Accounting Unit financial records on approval of Liquidation Reports and Cash Advance Requests. It also reduces time spent searching for documents, unauthorized access alert, reporting, and document workflow management.

RFID technology provides registration of RFID tags by providing more recovered staff productivity. Consulting studies indicate that a typical office worker loses up to four (4) weeks of productivity annually looking and waiting for file folders. Tasks are interrupted which causes other work duties to be delayed while staff wait for the file folder(s) that they need to complete their current task. In addition to causing productivity losses, customer service is compromised because task completion is delayed. The most cost effective method of ensuring that staff receives Accounting file folders 'right when needed' is by periodically inventorying files-in-circulation with RFID tags.

Specific Objectives

Specifically, the study aimed:

1. To passively track all Accounting files, file movements, finding files and securing files that consists of:
    1.1 Software that is integrated with RFID technologies for tracking Liquidation Reports and Cash Advance Requests placed throughout the Accounting Unit Office facility, beside the Senior Bookkeepers' table for file tracking of reports submitted.
    1.2 iTrack Database updated with the financial report's for the Monitoring of Schools Division Superintendent, Accountant III and Senior Bookkeeper for database query, dramatically reducing lost staff productivity in just looking and waiting for critical financial reports file folders.
2. To incorporate in the system an SMS Notification feature for all School Heads of Department of Education, Schools Division of Catanduanes for easy tracking of approved Liquidation Reports and downloaded Cash Advance Requests.
3. To heighten security alert system if the financial documents are pulled out in an expected location that will create a sound alarm for the user and administrator of this system.
4. To evaluate/validate the developed system in terms of:
    4.1 functionality
    4.2 reliability
    4.3 usability

     4.4   efficiency/speed

     4.5   maintainability

     4.6   Portability

Plan

In order to gather data necessary for the development of the system as accurate as possible, the developer devised an open ended checklist questionnaire for three (3) different respondents from the stakeholders mainly; The Schools Division Superintendent, Accountant III and the Senior Bookkeepers of t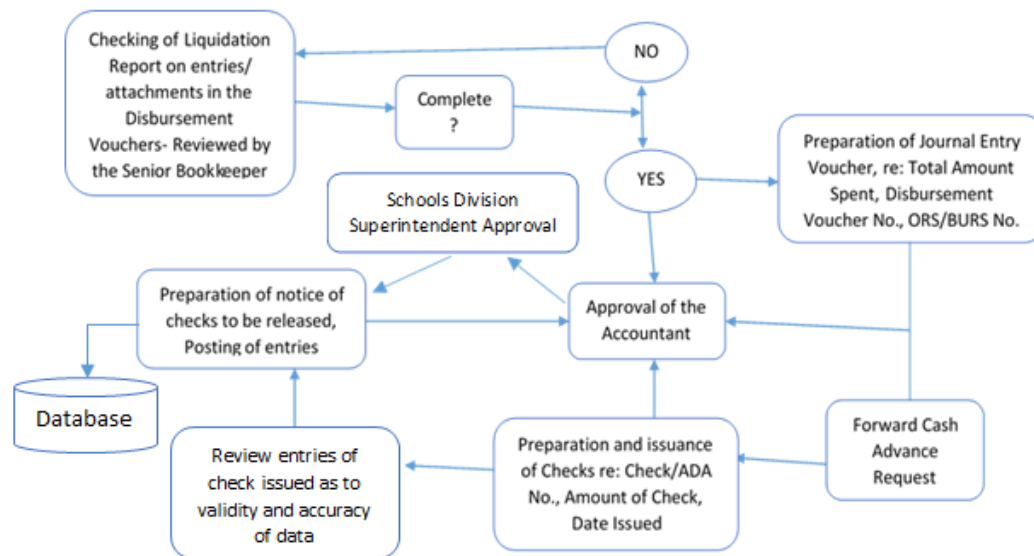he Department of Education- Schools Division of Catanduanes. Ten (10) IT Professionals and Experts were evaluated the system.

The researcher investigated, observed and analyzed the current flow of the Liquidation Reporting and Cash Advance Request Approval System. The gathered data were collected, tabulated and analyzed to formulate the best solution encountered by the respondents.

After due consideration and careful analysis of the data gathered, the researcher proposed the iTrack Application for Financial Document Tracking System for Department of Education- Schools Division of Catanduanes with the purpose of providing a convenient and reliable system for the Schools Division Superintendent, Accountant III and the Senior Bookkeepers of the Department of Education- Schools Division of Catanduanes.

Figure 4.1 - Data Flow Diagram of the Developed System

Requirements

The researcher had communicated with the Department of Education- Schools Division of Catanduanes Schools Division Superintendent, Accountant III and the Senior Bookkeepers on the hardware and software materials needed (see Table 3.1, Table 3.2) in the development of the

system. The proponent also gave the details and explained the project including the time frame on the deployment of the developed system *(see Table 3.3)*.

Table 3.1 – Software Requirements

Required Software	Software Specifications
Database Management System	MySQL Server 2014
Programming Language	VB.net 2015 32/ 64 bit; iframe 4.2
Operating System	Windows 10
Application Software	C#, C++

Table 3.1 referred to the software requirements needed in the development of the proposed system. The MySQL Server 2014, VB.net, Windows 10, C#, and C++ were used as the programming languages because of their simplicity and easy to used features in developing the system software. Likewise, MySQL was utilized as the database management system because of its wide capability in handling large amount of information. In connection with the SMS module, XAMPP MySQL, VB.net 2010 and Smart broadband modem were used for sending SMS notification and updates, GSM SDK was installed in the computer along with the broadband configuration. The proposed system could work in windows 7 and higher operating system.

Table 3.2 – Hardware Requirements

Required Hardware	Hardware Specifications
Had Disk	1 TB or Higher
Memory	4 GB RAM
Processor	Intel Core i3, i5, i7 or Higher
Router/ Switch	Any Type
RFID scanner	Arduino UNO RC 522 with 5 to 9 volts capacity
SMS Requirement	GSM Module SIM 300D Shield/ GPS
Broadband and Sim card	Any Network
Monitor	LCD/LED
Keyboard	USB
Mouse	USB
UPS	APC-back-UPS 625

Table 3.2 showed the hardware requirements of the proposed system. The above stated requirements were used in the development of the proposed study and therefore, it is the specification that is recommended in the deployment of the system. For the processor, the system requires at least 1 TB or higher; the memory is 4GB RAM processor; the processor Intel Core i3, i5, i7 or Higher; any type of Router/ Switch; the RFID scanner is Arduino UNO

RC 522 with 5 to 9 volts capacity; the SMS requirement is GSM Module SIM 300D Shield/ GPS; any network of broadband and Sim card; LCD/LED monitor; keyboard, mouse and APC-back-UPS 625 UPS.

Design

Systems design was the process of defining the architecture, modules, interfaces, and data for a system to satisfy specified requirements. Systems design could be seen as the application of systems theory to product development.

The purpose of the system design process was to provide sufficient detailed data and information about the system and the system elements to enable the implementation consistent with architectural entities as defined in models and views of the system architecture. The system and software design was prepared from the requirements identified in the previous phase. The developer thought about what the product or solution will look like.

The conceptual design of the iTrack Financial Document Tracking System for Department of Education- Schools Division of Catanduanes is shown on Figure 4.2.
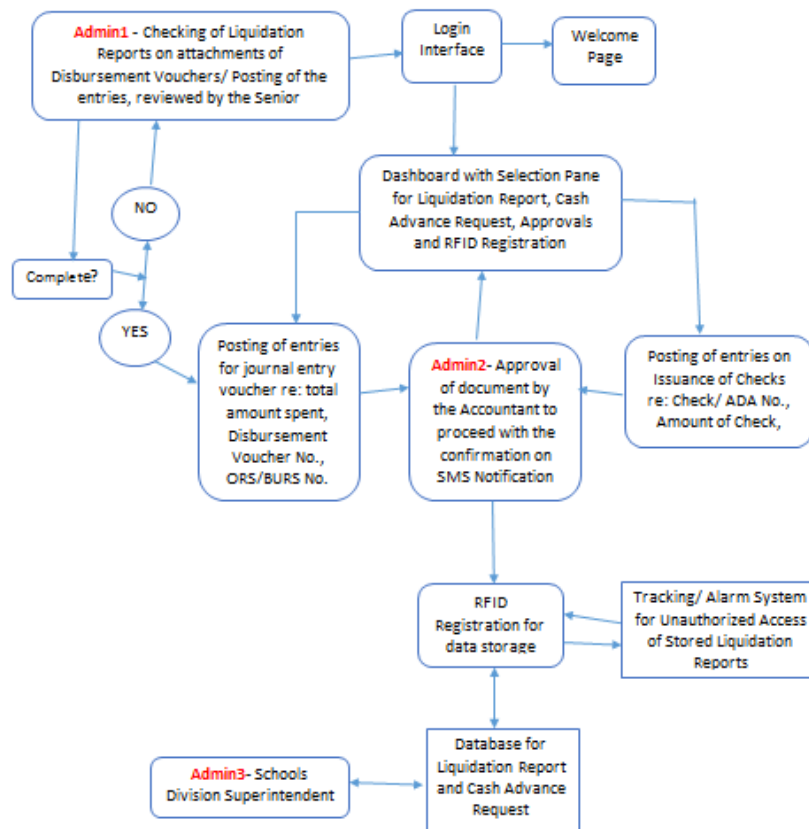
Figure 4.2- iTrack Financial Document Tracking System

Figure 4.2 shows the data flow diagram of the iTrack Application for financial document
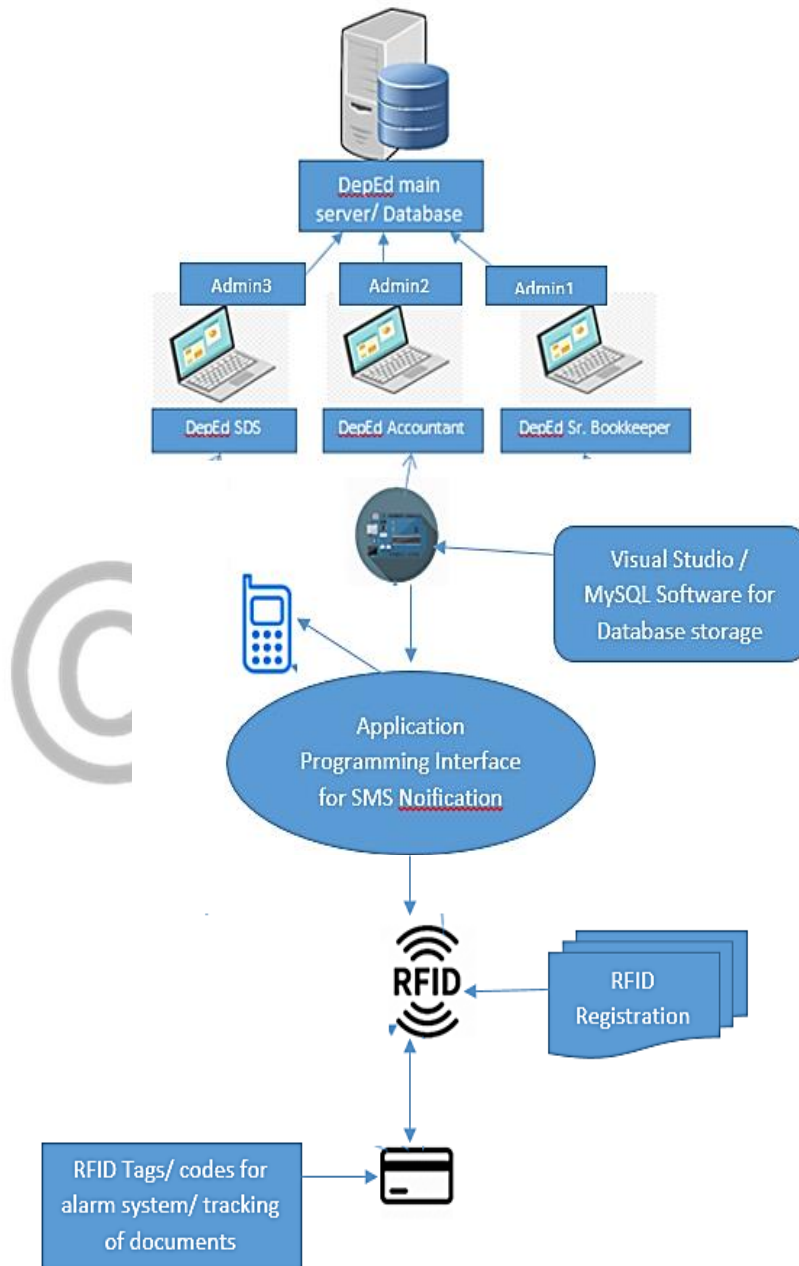
Figure 4.3 - System Architecture of the Developed System

Figure 4.3 shows the system architecture of the Track Application for financial document
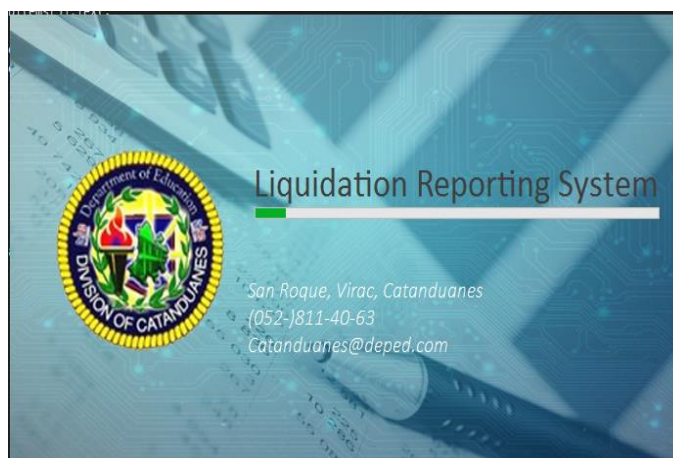
Development

This project study was all about document tracer, iTrack Application for Financial Document Tracking System for Department of Education- Schools Division of Catanduanes using the Agile Methodology. With this, a more manageable and paperless trail approach than that of the existing system was created because Agile process and primary control mechanism in software development use feedback rather than of planning.

The developed iTrack Application for Financial Document Tracking System for Department of Education- Schools Division of Catanduanes; with its screenshots shown below:

Figure 4.4 - Login interface
of the iTrack Application for Financial Document Tracking System

Figure 4.4 shows the interface that gives the user access to the system. When the application loads, it will prompt the login interface which requires the user to enter the username and password and click the login button.

Figure 4.5 – Welcome Page
of the iTrack Application for Financial Document Tracking System

Figure 4.5 displayed the interface wherein the user will be connected to iTrack System, incorporated together with the logo of Department of Education Schools Division of Catanduanes.
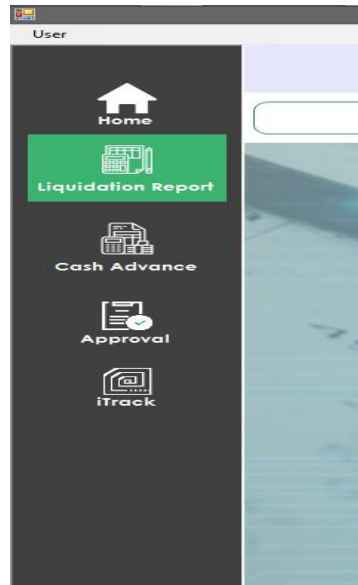
Figure 4.6 Selection Page
of the iTrack Application for Financial Document Tracking System

Figure 4.6 shows the interface wherein the user takes the options for the tracking of all the data entry. Selection buttons are also important for the user to identify if the reports are due for approval.

Testing

After software development, it was tested against the requirements to make sure the system software actually met the customer needs. During this phase, unit testing, integration testing, system testing, and acceptance testing were done. The proponent used statistical tools to get the information organized and had a general view of the whole scenario of the study.

This included: Frequency, used in order to determine the most dominant variable/s in the data, such as the current methods used, problems encountered and possible solutions. Ranking was used in order to determine the order of priority of the variables, the scaling system and weighted mean which was used by the proponent as a technique to monitor the respondent's interpretation of facts.

The formula used to determine the weighted mean was:

$$\text{Weighted mean} = \frac{F_1(1) + F_2(2) + F_3(3) + F_4(4) + F5(5)}{F_1 + F_2 + F_3 + F_4 + F_5}$$

Where: F1 = Total number of respondents who answered Absence of the expectation

F2 = Total number of respondents who answered

Less than what is expected

F3 = Total number of respondents who answered

Presence of the expectation

F4 = Total number of respondents who answered

More than what is expected

F5 = Total number of respondents who answered

Far more than what is expected

The numerical rate:

(1) not applicable, (2) slightly applicable, (3) applicable, (4) very applicable, (5) highly applicable) = Overall Satisfaction.

An interval using a scale was used to show the description and interpretation of the average response in the system. The scale was utilized in order to describe the user satisfaction level of the system. The evaluation rubrics were as follows:

Table 4.1- The Evaluation Rubric

Interval Scale	Description	Interpretation
4.1 - 5.0	*Highly Applicable*	The system efficiently and effectively satisfied all quality model characteristics in terms of functionality, reliability, usability, speed and maintainability
3.1 - 4.0	*Very Applicable*	The system efficiently and effectively satisfied some of the quality model characteristics in terms of functionality, reliability, usability, speed and maintainability.
2.1 - 3.0	*Applicable*	The system minimally satisfied all quality model characteristics in terms of functionality, reliability, usability, speed and maintainability.
1.1 - 2.0	*Slightly Applicable*	The system hardly satisfied the quality model characteristics in terms of functionality, reliability, usability, speed and maintainability.
1.0 or less	*Not Applicable*	The system did not met the quality model characteristics in terms of functionality, reliability, usability, speed and maintainability.

During the testing, evaluations were done also. The system evaluation was anchored on the ISO 9126. The areas that were evaluated in the developed system were the functionality, reliability,

usability, efficiency, maintainability, and portability. Thus, the results were presented in series of tables below.

Table 4.2 - Table of Verbal Interpretation

Mean	Verbal Interpretation
0 – 1.0	Absence of the Expectation
1.1 - 2.0	Less than what is expected
2.1 – 3.0	Presence of the expectation
3.1 – 4.0	More than what is expected
4.1 – 5.0	Far more than what is expected

Table 4.9 - Overall Evaluation of the Developed System

Sections of Evaluation	IT Experts (10)	Users/Stakeholders (5)	Mean
Functionality	3.880	5	4.44
Reliability	4.308	5	4.65
Usability	4.326	5	4.66
Efficiency	4.500	5	4.75
Maintainability	4.383	5	4.69
Portability	4.425	5	4.71
Overall Mean = **4.65**			

Table 4.9 provided an overall evaluation of the system as reflected by the different respondents consulted by the researcher. The system in the perspective of the respondents turned to be "Far more than what is expected" with an overall mean of 4.65. The system was considered to be "Very Applicable" as perceived by the different respondents.

Deployment

After testing for several times, the developed iTrack Application for Financial Document Tracking System for Department of Education- Schools Division of Catanduanes will be monitored and still open for suggestions in order to track and monitor the software for a year to give assurance on the proper maintenance status of the developed system.

Summary of Findings

The following findings were obtained from the study:

1. The iTract Application for financial document can track the Accounting files, and file movements. It can find and secure files that consist of: software that is integrated with RFID

technologies for   tracking Liquidation Reports and Cash Advance Requests placed throughout the Accounting Unit Office facility, beside the Senior Bookkeepers' table for file tracking of reports submitted. The iTrack database is updated with the financial reports for the Monitoring of Schools Division Superintendent, Accountant III and Senior Bookkeeper for database query. It dramatically reduces lost staff productivity in just looking and waiting for critical financial reports file folders. It can also send SMS notification to all School Heads of Department of Education, Schools Division of Catanduanes for easy tracking of approved Liquidation Reports and downloaded Cash Advance Requests.

2. The iTrack Application for Financial document has security alert system. If the financial documents are pulled out in an expected location, that creates a sound alarm for the user and administrator of this system.

3. The iTrack Application for Financial document was evaluated by the different respondents. The system passed the international standard evaluation tool - the ISO 9126.

Conclusions

Based on the findings of this study the following conclusions are formulated:

1. The iTract Application for financial document is reliable, efficient and usable having a mean of 4.44, 4.65 and 4.66 respectively. Therefore, it can track the Accounting files, file movements, finding files and secured files that consists of: software that is integrated with RFID technologies for   tracking Liquidation Reports and Cash Advance Requests; updated with the financial report's for the Monitoring of Schools Division Superintendent, Accountant III and Senior Bookkeeper for database query; and can send SMS notification for all School Heads of Department of Education, Schools Division of Catanduanes for easy tracking of approved Liquidation Reports and downloaded Cash Advance Requests.

2. The iTrack Application for Financial document is reliable in the security alert system.

3. The iTrack Application for Financial document is functional and can be used for where it is intended having been rated with an overall mean of **4.65 ,** meaning it is "Far more than what is expected" from it.

Recommendations

Based on the conclusions the following recommendations are hereby offered:

1. The iTract Application for financial document may be installed to be used for tracking the Accounting files, file movements, find files and secure files.

2. The iTrack Application for financial document is secured and can certainly function for alerting the administrator of the system if the financial documents are pulled out in an expected location.

3. Passing the international standard software quality model with a weighted mean of **4.65** would mean that the developed system may be useful to the clientele.

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