AROROY ELECTRONIC CENTRALIZED PAYROLL AND REMITTANCE SYSTEM

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Abstract. COVID-19 proved to be a real daunting challenge. As it swept all forms of life and industries across the globe. Such industries were forced to adapt or shutdown.

Since a government has no choice but to face it head-on, several strategies have been implemented but focused mainly on one important factor – social distance. In order to provide valuable time for the medical world to find viable cure, separateness was the key.

Now then is the best moment to radically adopt to change in the workforce. With a web-based human resources – payroll – payment – remittance work flow in place it is one way to equivocally minimize human-human physical interaction thus meeting the demands of the moment.

The AROROY ELECTRONIC CENTRALIZED PAYROLL AND REMITTANCE SYSTEM encompasses a solution that solved the redundant tasks of human resources and payroll to remittance. It drastically bridged the crucial time element factor that normally played a great factor in terms of actual accomplishment and human management. The system was evaluated using the industry-accepted standard – ISO 25010.

Technical evaluation results of the system guaranteed the implementation of the system to LGU Aroroy, as the overall result showed that the system achieved an overall mean of 4.1354 with a verbal interpretation of "more than what is expected". As to the system's functional suitability, efficiency, compatibility, usability, reliability, security, maintainability, and portability, the system was declared by the evaluators as more than what is expected from what it was meant to do.

Along with the result of the evaluation, the developer recommended the implementation of the system to the Local Government Unit of Aroroy. The system will be a great invaluable tool to the departments involved in human resources payroll-remittance management and operations.

Key Words: Accounting System, Centralized System, Electronic System, LGU Software, Payroll System, Remittance System

INTRODUCTION

In Philippine Governance, the Local Government (Municipal and Barangay) is the smallest unit in the hierarchy[1]. However, in spite of the fact that the LGUs are the ones directly delivering public service to the constituents, rarely has the LGUs have the capability to adhere to the demands of technological advancements except for those that are highly capable in terms of budget and manpower.

Aware of these factors, the National Computer Center (NCC) has embarked on a massive project dubbed as eLGU wherein the key concept of local governance is to make LGUs electronically enabled thereby improving the delivery of public service, promoting transparency in government transactions and increasing public access to government information services[2].

Three big projects were implemented by the NCC, the Electronic Real Property Tax System (eRPTS) that automates the four key functions in the LGUs real estate taxing operations, Electronic Business Permit and Licensing System (eBPLS) that automates the processing of business permit application, assessment, collection and release and report generation. Electronic Treasury Operations Management System (eTOMS) covers business processes performed by the Treasury Office of an LGU[3]

They were all excellent systems, however it did not address one simple factor, an internal system that can be utilized by the LGU that will upgrade Human Resource Management. A system that will provide a platform for a centralized payroll system with the ability to automate Remittances as well as generate government reports fully catered to a Local Government Operations.

This study aimed to address the interoperability of Human Resources, Accounting Department, and the Treasury department in terms of Employee Management, Payroll and Remittances. This provides a platform that is cost effective, flexible and up scalable.

Unlike private establishments or corporation, government fiscal management is different. A Local Government must operate under the boundaries of its mandate that is Civil Service Commission[i] laws as well as COA guidelines[4]. In a Local Government Settings human resource, accounting and treasury are different entities with each separate but complimenting function and interoperating as one.

Process is a little bit complicated compared to private entities. Under the ultimate supervision of the Local Chief Executive and bounded by Civil Service Commission laws, the HRMO is mandated to manage human resources effectively giving it over all control from hiring of personnel, personnel development and career advancement. Furthermore, the HR is responsible of keeping track of leave privileges of each employee vital to the employee's benefits claim as well as the usual payroll accorded to him based on the *plantilla* of positions or staffing patterns of the LGU. Certain documents are prepared, this includes Monthly Report of Attendance (MRA) taken meticulously from the Daily Time Records of each employee duly computed devoid of their absences.

Meanwhile in order to accord the proper benefits, every employee must have rendered the minimum services required in order to claim payment for such rendered service. This now becomes

a job of the Accounting Department, the one in charge for payroll computation and preparation wherein reflected are the employees' benefits, mandatory and other personal deductions. They are also tasked to process the payroll afterwards create remittance vouchers to other government agencies or other entities that the Municipality has had commitments in terms of loans and other monetary obligations. This process will not commence not until the HRMO has forwarded to the accounting department the MRA. This is a manual process making an average payroll period preparation of at least a week.

Once payroll and remittance vouchers are created, they are forwarded to the Budget Office for corresponding check and balance as to status of appropriations and obligations making sure that the vouchers are valid, within the scope of the allotted budget and shall be duly signed by the Local Budget Officer in order for the payment to push through. Document attached is named as Obligation Request (OBR). This process alone takes time since every entry in the employee is cross checked even thought it might seem repetitive but it is the process.

After the Budget Office approved the payroll it goes to the Local Chief Executive office for final approval. Afterwards, it is forwarded to the Treasury Department for Cheque issuance. Cheque is issued per individual and done manually thereby adding additional time frame for the payroll process only. This process however does not mean it is ready for payment. Actual cheque must go back to the Executive Office for signature of the Mayor, then forwarded to … no it is not Treasury yet, it is forwarded to Accounting Department again for final approval of the Municipal Accountant. After which, payroll shall proceed to Treasury again where they will prepare Bank Advice on Cheque, it will be submitted to the bank as pre-requisite for encashment. Only by then shall the actual claiming of benefits of the employee actually occurs.

After the employee duly attested that he/she has received that benefits (may it be salary or other forms of compensation), the process of remittances preparation begins. Every corresponding agency where the Local Government has due has its own separate mode of preparation for the remittances. This too takes some time to pick up individual entries on the payroll and creating a list of remittances then payment process begins again. Accounting – MTO – MO – Accounting – MTO – MO – Accounting – MTO – Actual payment. These processes occur as repetitive or redundant and waste a whole lot of time and resources.

This is a typical bureaucracy run on a semi-automated environment (yes, they are using computers!) but without a fully functioning electronic system, mistakes are bound to happen along the line. Mistakes that one day may prove too costly. One sample occurrence is that the LGU Aroroy has to pay additional surcharges for GSIS due to late or erroneous remittance / payments[ii]. Not only does it cost a material amount, employees might not get the benefits they are accorded to as members of social security or health insurance due to suspension of benefits on the grounds of failure or erroneous remittances and payments.

One of the main reasons why the author has taken up MIT is the drive to be an instrument of change that one day regardless of the current administration, they will see the importance of Information Communication Technology as an awesome tool towards effective governance. All the years I have stayed as government employee I had been dreaming that one day AeCPRS will materialize. Now is the perfect time. A product of years of being employed at the Local Government Unit of Aroroy, this system will primarily jumpstart the digitization of the LGU and shall benefit directly all offices involved in human resources, payroll and payment and indirectly benefit the clienteles of the Municipality.

The primary purpose of this system was to provide a seamless transition of the old manual human resources filing cabinet as well as semi-automated processing of payrolls and remittances.

This system provided a basic road map or foundation of a networked system for interoperability of the different department/sub department of a local government organization.

This is implemented on the Local Government Unit of Aroroy and selected Barangays of Aroroy.

AeCPRS is a web based electronic system that can work both on an internal network and online via Tunneling or web application hosting.

The system is hosted on a capable machine and installed on a network. The Human Resources Office, Accounting

Department and Treasury Department all have access and functionality that varies depending on the level of their pre-determined functions in the organization.

Specific Objectives

Specifically, the study aimed to:

1. To design and develop AROROY ELECTRONIC CENTRALIZED PAYROLL AND REMITTANCE SYSTEM, a web based Human Resources with Payroll and Remittances system that shall adhere to the standards set by the Civil Service Commission, Department of Budget and Management (DBM) Position Classification Plan (PCP) and Compensation Plan (CP) as well as Commission On Audit regulations and shall contain:

   1.1 A module for the human resources department that shall contain the following functionalities;
      1.1.1. Employee management (add, edit & delete);
      1.1.2. Employees benefit and compensation management;
      1.1.3. Leave management;
      1.1.4. Upload 201 documents in different formats (.pdf, .csv, .xls);
      1.1.5. Generate Human Resources Reports (Notice Of Salary Adjustments, Notice Of Salary Increment, Monthly Report of Attendance, Personal Data Sheet and other customizable reports);

   1.2 A Module for Accounting Department that whose functionalities shall include;
      1.2.1. Manages employees' records of payrolls and deductions;
      1.2.2. Adjust payroll entries;
      1.2.3. Generate payrolls and pay slips;
      1.2.4. Generate remittances;
      1.2.5. Generate customized reports;

   1.3 A module for the Treasury Department that shall have capability to;
      1.3.1. Cheque Printing;
      1.3.2. Generate payroll funds reports;
      1.3.3. Generate statistical data on payrolls and remittances;
      1.3.4. Generate certification of Net Take Home pay;

   1.4 Module with Kiosk functionality intended for the regular employees that shall have the ability to;
      1.4.1. View and generate certification of payments;
      1.4.2. View current leave privileges balance;
      1.4.3. Update basic information on Personal Data Sheet;
      1.4.4. Generate Personal Data sheet;
      1.4.5. Apply for leave of absence;

   1.5 Module for Technical Administrator that shall primarily have the following critical

functionalities;
       1.5.1. Maintaining database;
       1.5.2. Back-up database;
2. Evaluate/validate the developed system in terms of:
       2.1   functional suitability;
       2.2   performance efficiency ;
       2.3   compatibility;
       2.4   usability;
       2.5   reliability;
       2.6   security;
       2.7   maintainability; and
       2.8   portability

Development Time Frame

One major constraint of the researcher is the adversity of time. With the pandemic on going as of this writing, it has brought considerable changes as well as daunting challenges to every individual. More specifically, the pandemic has brought additional challenges to the work force extending its normal man hours operations adapting to several measures that needs immediate attention thus, the researcher has a little opportunity to focus on the immediate completion of the study.

In order to better address the challenges of time constraints, researcher has studied vital factors of the study and derived a time frame from conception to deployment. Table 3.7 shows the project development time frame by the developer. The proposed systems' completions target is for a period of 6 months' time frame. In order to check viability of the system, the first two (2) weeks were devoted in conducting dialogues, meetings as well as interviews. An entire week was devoted in early scoping and identifying operational work flow. After careful deliberation, the system requirements were derived fully catered to the stakeholder's needs with room for up scalability and future improvements. The next two weeks was to establish needed system requirements, derive if it is feasible and shall be determined and tested to ensure correctness of the systems standards and requirements. Further Requirements of the system brought by meetings were validated by actual observation of the manual processes as outlined in the specific objectives. Early estimates were the output of this phase.

The second month was for spent on planning all phases of the system development. Prioritization of requirements were made here. Different approaches were considered, possible technical, legal and other pertinent issues in terms of compliance to all existing policies were considered here. Initial system architecture was created and was subjected to feedback by the client.

The succeeding month was fully devoted in designing the system with periodic consultation to stakeholders to attain the most effective and efficient design. After this phase, fourth and fifth months were spent in actual development of the system. Coding, internal debugging, testing and pre-roll our procedures were done here. Unit and integration testing were conducted here.

Remaining months were spent in the rigor testing, roll-out / installation of the system in its actual environment, post development meetings were also be held in order to know if all expectations were met and shall have room for minor revisions/improvements. User's training was also be done on this phase until final review and evaluation is done. Production commenced here in this phase.

Table 3.7 - Project Development Time Frame

ACTIVITIES	MONTH 1				MONTH 2				MONTH 3				MONTH 4				MONTH 5				MONTH 6			
	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
VISION & APPROVAL	█	█																						
Meeting the Client	█																							
Conduct Interviews	█																							
Early Scope	█																							
Identifying operational work		█																						
EXPLORATION PHASE			█	█																				
Requirements Gathering			█																					
Interview of Operations			█																					
Early Estimates			█																					
Conduct On-site Observation				█																				
ITERATION PLAN					█	█	█																	
Requirements Prioritization					█																			
Iterative Estimates					█																			
Review Feedback					█																			
Initial Architecture					█																			
ANALYSIS, DESIGN, CODING, AND TESTING						█	█	█	█	█	█	█	█	█	█	█								
Design Inspection						█																		
Coding							█	█	█	█	█	█	█	█	█									
Code Inspection									█	█														
Unit Testing														█										
Integration Testing																█								
RELEASE PHASE																				█				
Rigor Testing																			█					
Pre-Release																				█				
Acceptance and Testing																				█				
Production																				█				

Vision and Project Approval

A significant portion of the study is in establishing with the vision or inception phase that deals primarily of analyzing the current work flow, its current strength and weakness thereby establishing general objectives wherein the final system is set to address. At this level, objectives are apparent but still uncertain.

There is a crucial need to identify critical uses of the system, level of uncertainty of the system, overall estimation of size and duration of the system using algorithmic or no algorithmic approach. Further, systematic analysis is performed to identify the feasibility of the system at operational and economical level with clearly specified requirements. It is concerned with technical possibility of the system with incurring risk associated with it specially that it will contain data not just employee data but data that shall pass the standards of data privacy, numerical data that encompasses DBM, CSC and COA standards.

After several dialogues, a clear conceptual work flow has been clearly defined and was divided into several snippets involving Human Resources Management and the Actual Payroll – Payment and Remittances.
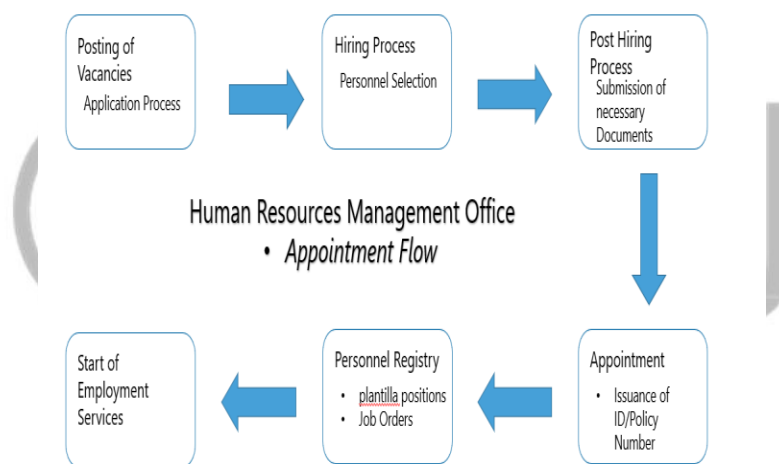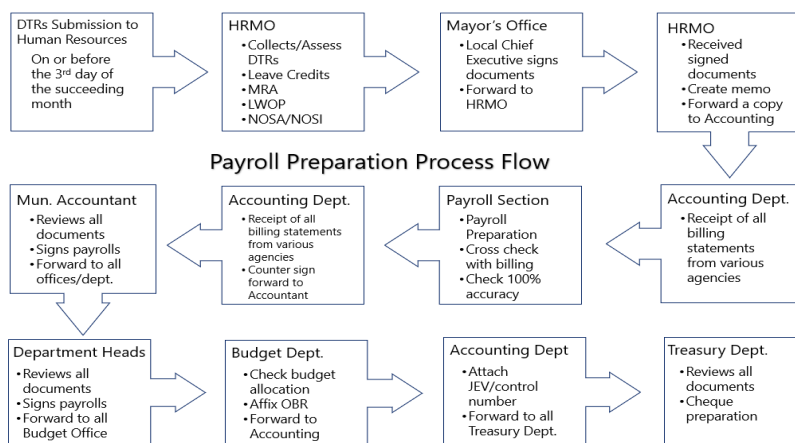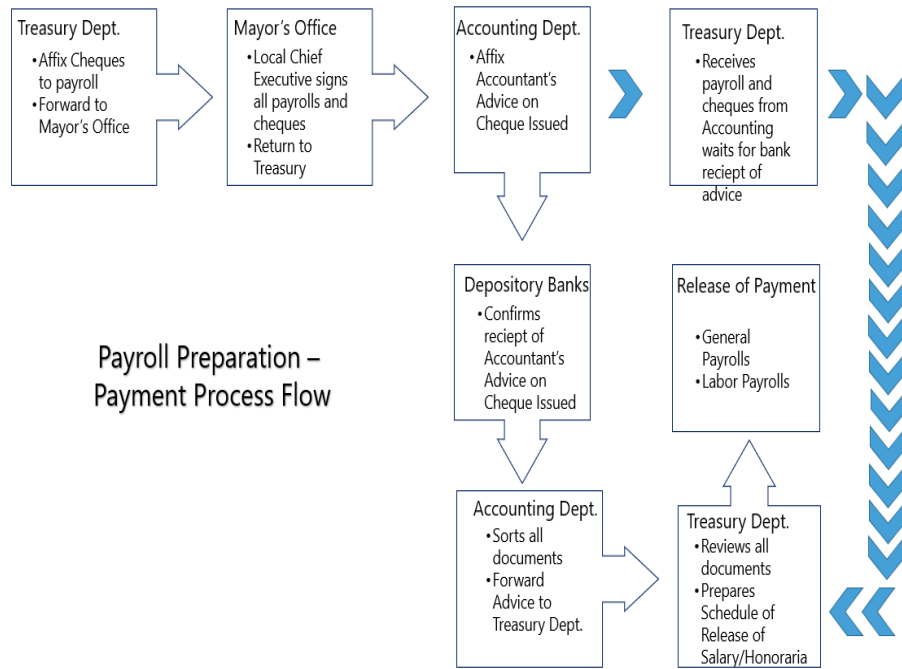

Figure 4.1 - Operational Work Flow of HRMO

Payroll Preparation – Payment Process Flow

Treasury Dept.	Mayor's Office	Accounting Dept.	Treasury Dept.
• Affix Cheques to payroll • Forward to Mayor's Office	• Local Chief Executive signs all payrolls and cheques • Return to Treasury	• Affix Accountant's Advice on Cheque Issued	• Receives payroll and cheques from Accounting waits for bank reciept of advice

Depository Banks	Release of Payment
• Confirms reciept of Accountant's Advice on Cheque Issued	• General Payrolls • Labor Payrolls

Accounting Dept.	Treasury Dept.
• Sorts all documents • Forward Advice to Treasury Dept.	• Reviews all documents • Prepares Schedule of Release of Salary/Honoraria

Figure 4.3 Operational Work Flow of Payroll Preparation to Payment

Remittances Preparation – Payment Process Flow

Payroll Section	Mayor's Office	Accounting Dept.	Treasury Dept.
• Waits until payroll payment is done • Prepares statement of remittances based on pre-format from agencies concerned	• Local Chief Executive signs remittances • Return to Treasury	• Affix Accountant's Advice on Cheque Issued	• Receives remittance vouchers, waits for bank reciept of advice

Mun. Accountant	Treasury Dept.	Depository Banks	Payroll Section
• Reviews all documents • Signs documents • Forward to Treasury for cheque preparation	• Prepares & Affix Cheques to remittances • Forward to Mayor's Office	• Confirms reciept of Accountant's Advice on Cheque Issued	• Files records of payments

Accounting Dept.	Treasury Dept.
• Prepares all electronic files for transmittal • Forward Advice to Treasury Dept.	• Reviews all documents • Remit payments • Forward documents to Accounting Dept.

Figure 4.4 Operational Work Flow of Remittance Preparation to Payment

Figure 4.4 showed the operational work flow of remittance preparation to payment. Based on the diagrams of the actual technical work flow, it is established that there is a great need not only for digitization of repetitive tasks but to streamline the entire process of payroll – payment – remittance flow.

Anent hereto, it is notable to mention that the current system being implemented in the line of work of all departments concerned is a mixture of several unconnected databases utilizing tables using a spreadsheet program as well as word processing software.

After careful analysis and several dialogues, the researcher proposed the Aroroy electronic Centralized Payroll and Remittance System, the proposed system aimed to create a better workflow to serve the public servants as well as providing a modern integral solution that is cost effective, adaptable and covid-19 protocols compliant minimizing risks through contactless solution.

Exploration Phase

Due to several department involved in the processes, the proponent has derived a strategical selection of key informants that served as the primary end users of the developed study. Each office involved on the intensive work flow as stated beforehand would have an entity that served as the backbone specially on the recursive methodology being implemented on the whole duration of the software development cycle.

The exploration phase centered mainly on the actual personnel that were tasked to perform the work flow. Thus, by default all the personnel that were involved in the phase automatically becomes a member of the stakeholders since they are the ones who have a complete grasp of the ideas on the actual mechanisms and policies that is meant to be discussed in order for the system to be fully capable of their needs.

Feedbacking was the critical point that was given emphasis here. In order to fully establish the actual program needs, there was also a need to gather necessary data and inputs.

Selected Core team of primary stakeholders comprises the Municipal Accountant, Payroll Officer, Human Resources Management Officer, Cash Disbursing Officer, Assistant Municipal Treasurer, several computer operators and personnel from the General Services Office.

Iteration Planning

This phase was critical prior to building the actual system, here the schedule and prioritization of each iteration was deliberately considered. Periodic update was being made by the proponent to concerned core team member. Data that need much attention and detail was prioritized.

Generalized individual system design was tackled here as well as the prisonization stack resulting to a much-shortened duration of system development and could theoretically produce a workable system in the least possible time: resources ratio.

The initial architecture or the Conceptual Design was also critical in this phase, please see next page
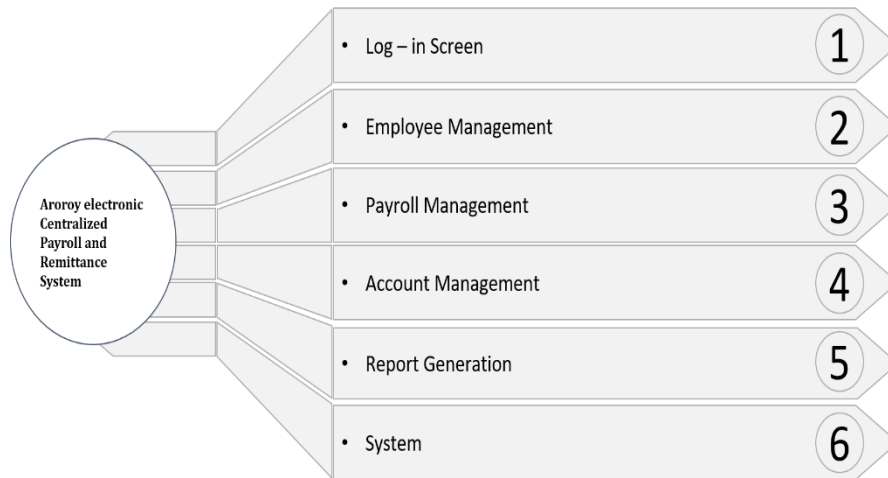
Figure 4.5 Context Flow Diagram of the Developed System

Figure 4.5 represented the actual system development menu that was be built and used by the stakeholders as a mean to fulfill their daily tasks, it has been streamlined after several deliberations, consultations and hands-on at the actual work place of the stakeholders.
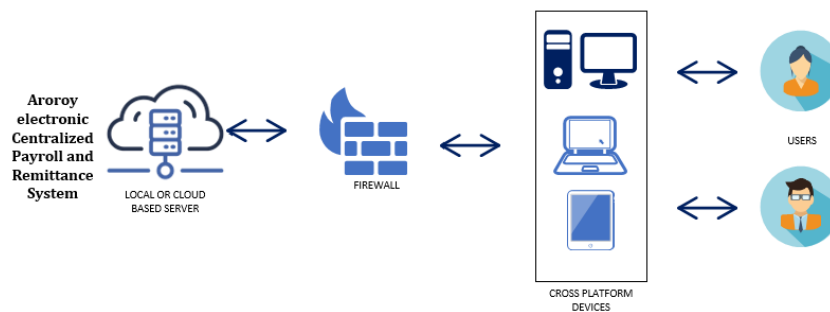

Figure 4.15 System Architecture of the Developed System

Figure 4.15 displayed the System Architecture of the System. Shown here were the components needed in order for the system to function. The System was locally hosted in the Server of the Payroll Department but was scalable that it can theoretically be hosted on a capable cloud-

based hosting. The firewall filters out and blocks unnecessary or invalid requests from users. Shown also were cross platform devices wherein the users can use any devices as long as it belongs to the same network or has access to the server.

Analysis, Design, Coding and Testing (ADCT)

This phase is the actual build-up of the system wherein it includes major activities such as simple designing, maintaining coding standards and rigorous testing as well as functional testing.

During this phase, several iterations were made before the products was made ready for initial deployment.

Continues system evaluation were made by the stakeholders as meetings are regularly conducted as part of the development methodology. Approved system context and architecture were put into actual coding and resulted to the final iterations were derived.

System Evaluation

The different modules comprising the system were tested for implementation and taking into consideration all of the required components were present and was presented to the respondents, wherein the result of the evaluation is "more than what is expected".

Release Phase

This phase was divided into two parts, the pre-release activity and the actual production.

The pre-release entailed extra testing necessary for all components of the system by the will-be end users based on each approved iterations and functional modality. Notable errors or discrepancies were duly noted and added into the iterations for an immediate fix. In no such occurrence shall the second part commence without fully fulfilling the requirements as well as exhausted all possible iterations, possible modifications and improvements.

The production phase was the period where the developed software has been fully rolled out. User's training were done here especially those who were part of the core team. Although during the inception to development phases they have been part of all the processes, the production phase is the actual formal turnover of the system to them. Here after, the system that aimed to provide the client with easy access was turned over.

Moreover, the researcher as part of the umbrella of operations of the Local Government hereby commits to continually develop, provide rooms for improvements, check and maintain the system.

Summary of Findings

The following findings were obtained from the study:

1. The current Payroll – Remittance scheme of the Local Government Unit of Aroroy was de-centralized. A mixture of manual and computerized work intensive process was employed, thus the developed system got an overwhelming support and positive feedback from the stakeholders. Prior to the study the LGU Aroroy has no definite database that housed all the data that pertained to human management, payroll and remittances. Data was divided among several users as well as computer units. This system changed the work field and provided a stable, innovative and practical solutions to the immediate concerns regarding payroll and remittances by establishing a centralized system wherein all data is located on a server but accessible to everyone that has access to it.

2. Any employee that needed to validate records of his/her PDS, requests historical records of payroll and remittances should have a person-person to interaction with the concerned department and individuals assigned to the task. The global COVID-19 pandemic radically dictated a social distanced protocol making it harder for a regular employee to access his records especially there were cases of reduced and limited work force. The implementation of the system answered this situation.

3. The proposed system was evaluated in terms of its functional suitability, efficiency, compatibility, usability, reliability, security, maintainability and portability. In the same way, it was validated by the three (3) set of respondents namely, ten (10) IT Experts, four (3) LGU Admin and ten (5) College Faculties. The eighteen (18) respondents referred to by this study recommends that the Aroroy electronic Centralized Payroll and Remittance System is "Far more than what is expected" from a system, that is vital to the needs of the LGU. It only proves that the system has effectively and efficiently satisfied some of the quality model characteristics. In terms of the system's Functional Suitability, the overall mean is 4.077 which means that the system function is "Far more than what is expected"; In the area of system's Efficiency, the overall mean of 4.238 highlights that the system is "Far more than what is expected"; when it comes to Compatibility, the overall mean of 4.194 shows that it is "Far more than what is expected"; in the system's Usability, the overall mean of 4.20 shows intuitive usage and that it is "Far than what is expected"; in Reliability, the overall mean is 3.933 displays that it is "More than what is expected"; to the system's Security, the overall mean is 3.9.33 displays that it is "More than what is expected"; to the system's Maintainability, the overall mean is 4.227 displays that it is "Far more than what is expected", and to the system's Portability, the overall mean of 4.227 shows that it is "Far more than what it is expected". Summing it up, the system is considered to be "Far more than what is expected" after garnering an overwhelming 4.1354 Mean for all evaluation set in the rubrics thus as perceived by the different respondents as highly applicable to the immediate needs of the LGU workplace.

Conclusions

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

1. Based on the evaluation result and feedback from the user, the proponent hereby concludes that the centralized accessibility feature of the Aroroy electronic Centralized Payroll and Remittance System provides an indispensable and overly significant value to the LGU Aroroy in terms of serving the servants.

2. In relation to the evaluation and feedback from the user, the proponent concluded that the additional feature from the developed system which enables a contactless access to all active employees in terms of updating personal data, viewing and generating of historical payroll and remittances records as well as tentative salary calculator adheres to the social protocols as being mandated by the COVID-19 pandemic.

3. As stated on the overall evaluation result with a mean of 4.1354, the developed Aroroy electronic Centralized Payroll and Remittance System passed the ISO 25010 – (which has been the primary concern when it comes to the definition of quality characteristics to be used in the evaluation of software products). Thereby the system benefited the LGU Workplace and the work force entirely.

Recommendations

Based on the conclusions, the following recommendation are hereby offered:

1. The current work flow system being implemented in LGU Aroroy may be innovated with the implementation of a full system that caters to the different needs of the institution.   By institutionalizing such technological improvements like the implementation of the Aroroy electronic Centralized Payroll and Remittance System, the entire rosters of servants can now serve their constituents more efficiently, easy and accurately.

2. The respondent's viewpoint to the developed system turned to be "More than what is expected" based on the overall mean of 4.1354. Therefore, the system is considered to be very applicable in terms of its functional suitability, efficiency, compatibility, usability, reliability, security, maintainability, and portability. Thus, the developed Payroll and Remittance System may be deployed and used to introduce technical upgrade to the current work force.

3. Additional functionalities and improvements to the system may be studied and integrated in the new centralized Payroll and Remittance System to significantly improve the system's services.

4. Being included in the umbrella of operations of the Local Government Unit of Aroroy, the proponent can provide and conduct necessary trainings for the users on how to use or implement the newly developed Centralized Payroll and Remittance System.

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