Available online at www.scientiaresearchlibrary.com

Scientia Research Library

ISSN 2348-0424
USA CODEN: JETRB4

Journal of Engineering And Technology Research, 2019, 7 (2):1-10
(*http://www.scientiaresearchlibrary.com/arhcive.php*)

CLOUD-BASED HUMAN ASSET MANAGEMENT PORTAL (CHAMP) WITH IMPACT FACTOR FOR CONTINUOUS QUALITY IMPROVEMENT

FERNANDO S*. VIRAY JR.
[1]*Pangasinan State University*
Corresponding Author: [1]*skyfher@gmail.com*

ABSTRACT

This study aimed to identify the current human resource processes of companies with regards to human asset inventory, project and tasks management, and compensation management to enumerate the functional and non-functional requirements, features, processes, and components of a cloud-based Human Asset Management Portal (CHAMP) and assess its impact whether the use of the system has become instrumental in achieving continuous quality improvement. This paper utilized the descriptive method of research in describing the current manual processes of the subject businesses and its requisites for a cloud-based human asset management and the developmental type of research together with the Scrumban as the System Development Life Cycle method and the Input-Process-Output (IPO) software development framework, respectively, in creating and developing an output system. The findings of this study exhibited that a number of human resource-related drawbacks are being encountered by the subject businesses in their current HR processes in performing human asset inventory, project and task management, and compensation management and the implementation of CHAMP helped to alleviate the said problems while at the same time ensure the provision of quality service. One of the highlights of the findings is the significant evidence of an attained degree of quality improvement since the system has been integrated with the other best practices of the companies.

Keywords : cloud-based human asset management portal, continuous quality improvement, CQI, CHAMP

INTRODUCTION

Modernization and the massive utilization of the benefits of information technology are among the key factors why most industries integrate and rely on the power and capabilities of computerized systems. Since the conception of business machines and computers, we are all witnesses of how the humble computer has evolved and flourished along with computer applications, integrated systems, and information systems. Indeed, the computer has been a great tool for us, humans, regardless of race, field of work, or industry.

Today, here in the Philippines, the widespread use of customized computer systems can be observed among medium to large enterprises. Meanwhile, a number of small businesses can be observed

integrating third-party business systems, especially freeware computer applications.

Among the popular or most commonly used computerized business applications include payroll, accounting, inventory, billing, and point of sale systems. The use of biometric devices for daily attendance monitoring has also proliferated companies with a larger number of employees. These computerized systems are implemented most of the times with the aide of the internet to support mobility and real-time processing while at the same time transcending the boundaries of distance, time, and financial budget.

The main goal of companies utilizing computer systems or applications is to reduce repetitive manual errands, retrieve important business-related information in real time, and moderate human asset while at the same keeping a high degree of work result effectiveness and efficiency. The remaining unused resources such as energy, time, money, supplies, etc., can then be applied on product or service quality improvement efforts.[1]

This is the same concept that business companies wanted to achieve – to minimize, or if possible, remove repetitive manual tasks that can be solved using a customized computer system and designate remaining available resource to enhance provision of quality service to construction projects or clients. This is where the Cloud-based Human Asset Management Portal (CHAMP) will stand out which primarily targets to ease up the hiring, tasking, and payroll preparation functions of the human resource department and ensure a high degree of quality in performing such functions.

MATERIALS AND METHOD

Objective of the Study

The main objective of the study is to design and develop an effective, efficient, cost-effective, and reliable Cloud-based Human Asset Management Portal (CHAMP) for business companies.

Specifically, it sought to:

Identify the current manual processes of business companies with regards to human asset inventory, tasks and projects management, and compensation management;

Ascertain the functional and non-functional requirements, processes, features, and components of a cloud-based human asset management system; and

Assess whether the implementation of the cloud-based human asset management system has become integral in the business company's aim to have a continuous quality improvement in terms of its human resource management.

Conceptual Framework

The Input-Process-Output (IPO) Model was used to identify and organize the context of the proposed Cloud-based Human Asset Management Portal. Using this model, input corresponds to the existing processes involving asset inventory, tasks and projects management, and compensation management, the functional and nonfunctional requirements of the system, as well as the integral features and components of the system. Process corresponds to the methods of research used by the researchers which includes descriptive and developmental methods of research, and Scrumban as the SDLC (System Development Life Cycle) method which includes iterations of planning, daily standups, feature demonstration, production and continuous improvement as shown in Figure 1.

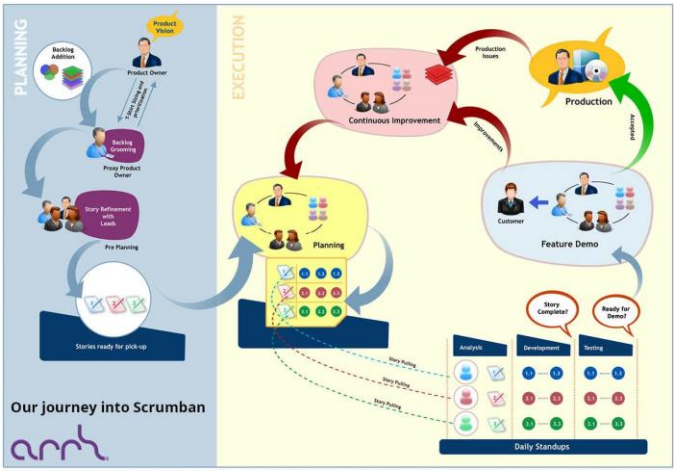

Figure 1. Scrumban Framework used as System Development Life Cycle method by the researchers. (*Image source: arrkgroup.com*)

After substituting all the requirements of the study and undertaking the software development methodology, the anticipated result of the project is the Cloud-based Human Asset Management Portal.

Review of Literature

Existing Process. Key processes under the a Human Resource Management Information System usually include (1) employee inventory which pertains to employee profiling to determine human capital value of each department and for the whole company; (2) tasking which involves work assignment to each employee according to his skillset, competencies, and talents; and (3) payroll preparation and computation.[2] Other core processes consist of systematic personnel and workplace development and conflict management. All these processes are included in CHAMP, the big difference between CHAMP and any HRMIS is that CHAMP is available to several companies practicing standardized HR processes and not exclusively developed or custom-built only for one company.

Functional and Non-Functional Requirements. A requirement is classified either as functional or non-functional. Functional requirements pertain to the requisites that a system must basically comprise of. These requirements govern how the system would perform and what sorts of effects it will produce once installed and run.[3]

The most important functional requirement of any cloud-based human asset management is its cloud capabilities and power to support all simultaneous transactions. Other core functional requirements are real-time and efficient processing capabilities, proficient file management and organization, and swift data transmission and processing.

In contrast, non-functional requirements are associated to progressing system properties such as reliability and accurate response to vital system properties.[4]

Among the core non-functional requirements for a cloud-based human asset management include user account protection, database backup, report exporting functionalities, and web browser support for most common web browser apps both for mobile devices and personal computers.

Features of the System. The Institute of Electrical and Electronics Engineers Standard Number 829 states that computer system feature is the distinguishing characteristic of a software item. If a computer system has a collection of choices and capabilities that an end user can perform, it can be

said that the computer system is feature-rich.[5]

Essential features of a cloud-based human asset management are staffing, employee profiling, employee performance evaluation, promotions, human capital valuation, project management, project calendar, salary management, benefit management, and pension management.

Acceptability of the System. User Acceptance Test (UAT) is the the final test process being conducted before final software deployment and live run of the system. UAT seeks to find out if the computer system created and developed is fully prepared to be used and can execute the set of tasks and functionalities it is intended and expected to perform. The three methodologies that can be chosen as UAT are the formal acceptance testing, informal acceptance or alpha testing, and the beta testing.[6]

Methodology

a. Research Design. In order to identify the current manual processes of business companies in terms of human asset management and in order to specify the functional and non-functional requirements of the cloud-based system and its fundamental features and components, the researchers utilized the descriptive method of research.

The descriptive method of research is an approach or technique to describe and explain occurrences, situations, or events based on factual information garnered through direct experiences or observations. Factual information can be gathered using survey tools such as interview, observation or a survey questionnaire.[7]

Meanwhile, in order to create and develop CHAMP, the researchers employed the developmental method of research along with the use Scrumban as a method of SDLC (Software Development Life Cycle).

The developmental method of research is the progressive changes that occur to a thing or person as development occurs over an extended period of time.[8]

b. Research Population and Sample. The research is conducted over business companies with established human resource department. The research population of the study is comprised of:

Forty-five (45) Human Resource Department Heads belong from different enterprise categories and sectors

Seven (7) computer systems evaluators

The forty-five HR Heads served as the key persons who provided priceless first-hand information on the actual daily processes of the Human Resource Department in terms of human asset inventory, tasks and project management, and compensation management. The HR heads participated in the final User Acceptance Test (UAT) together with the seven computer systems evaluator who gave invaluable assessment to the totality of the cloud-based system developed.

Table 1 shows the distribution of the HR head-respondents in their respective enterprise category and sector they belong.

Table 1. Distribution of Respondents

SECTOR	ENTERPRISE CATEGORY			
	SMALL	MEDIUM	LARGE	Total
Agriculture,	5	5	5	**15**

Fishing and Forestry				
Industry	5	5	5	**15**
Services	5	5	5	**15**
Total	**15**	**15**	**15**	**45**

c. Instrumentation and Data Collection. The researchers employed several instruments and techniques to achieve the objectives of this research by using questionnaires, personal interviews, observations, and analysis of pertinent documents to develop CHAMP and finish the study.

c.1. Observation. The researchers utilized the observation method in acquiring data related to the study. Observation is the process of empowering researchers to fully understand the relevant actions and responses of people who are subjects of a study in their natural workplace or environment through keen observation and activity participation.[9]

Under this method, the researchers enjoined and cooperated with the HR heads in their respective offices and observed the current processes performed in the Human Resource Department in terms of human asset inventory, project management and compensation management. The observation commensurate with personal interview. The flow of information concerned in accomplishing the manual processes were fully studied, analyzed and noted accordingly.

The good techniques, drawbacks, limitations, and conflicts concerning the execution of the manual business processes of each subject business were identified by the researchers.

c.2. Interview. Another method used by the researchers in collecting data is the interview method. Interview is an organized set of significant questions enquired to stakeholder-respondents who provide an in-depth explanation of situations, events, processes, responses, results, or occurrences.[10]

In this method, the researchers prepared an interview script and arranged a schedule with the HR Head-respondents to personally ask them the questions in order to identify the functional and non-functional requirements appropriate to the creation and development of CHAMP. Significant answers were noted while vague answers were fully elucidated and discussed with the respondents.

The researchers also readied sets of survey questionnaires which were used and distributed as follows:

- ***During the Planning and Design Phase -*** The HR heads were given questionnaires to identify the common problems encountered by their department and its corresponding mitigating measures.
- ***During the Final User Acceptance Test –*** The HR heads were provided with questionnaires to assess all the system modules of CHAMP. Seven experienced software developers and I.T. consultants were also requested to assess the output system and were also given a set of computer system evaluation form to evaluate the cloud-based system as a whole and in terms of performance, information, economic, control and security, efficiency, and service aspects.
- ***During the implementation of the M-Commerce –*** After a month from the commencement of the live run of CHAMP, the HR heads were surveyed again to confirm the degree of quality and existence of continuous quality improvement in their department's processes in terms of human asset inventory, tasks and project management, and compensation

management along with the integration of CHAMP. The researchers used the relative frequency in order to produce a frequency distribution of the survey results floated among the 75 HR head-respondents. The relative frequency formula is as follows:

$$F_R = \frac{f}{\sum F} X\ 100\%$$

where:

F_R = Relative Frequency rate in %

f = Frequency result

$\sum F$ = Sum of frequencies

All the respondents were initially briefed as to the purpose of the survey and were guaranteed that their individual answers and personal information will be held and kept private. Questions raised by respondents during the survey were accommodated accordingly and ensured that ambiguous matters were clarified.

The results of the tabulated answers of the respondents were incorporated in the design and development of MHRMS.

c.3. Analysis of Documents. The researchers also employed document analysis as a tool for data collection. Document analysis is the process of gathering documents and other forms connected to actual business functions. Documents gathered are then analyzed to identify the goals and flow of the business functions. Documents may include written protocols and guidelines.[11]

The relevant business forms gathered include hiring orders, résumés, application forms, job vacancies form, employment contracts, F201s, F202s, employee's manuals, Daily Time Record (DTR) Forms, pay slips, payroll reports, Project Orders, Over Time (OT) Request and Fulfillment Forms, performance evaluation forms, service records, employment certificates, pension contribution agreement, fringe benefit agreement, labor codes and memoranda. These documents served as guides for the developers in identifying the data and its flow for every phase of the business functions.

RESULTS AND DISCUSSION

Findings

After the observation, interview and survey, the current manual processes of the subject HR offices were identified. Tables 2, 3, and 4 exhibit the frequency distribution and ranking of the degree of major problems encountered by the HR head respondents in performing their present manual system in terms of human asset inventory, tasks and project management, and compensation management, respectively.

Table 2. Existing Major Problems in Performing Manual Process of Human Asset Inventory

Problems	Extremely High		High		Moderate		Low		Extremely Low		TOTAL		RANK
	f	%	f	%	f	%	f	%	f	%	f	%	
Lack of Personnel	13	29%	9	20%	2	4%	11	24%	10	22%	45	100%	3
Lack of Personnel's Competency	20	44%	7	16%	6	13%	4	9%	8	18%	45	100%	2
Disorganized Performance Evaluation	10	22%	12	27%	10	22%	7	16%	6	13%	45	100%	4
Slow/Tedious Hiring Process	30	67%	10	22%	1	2%	3	7%	1	2%	45	100%	1

Table 3. Existing Major Problems in Performing Manual Process of Tasks and Projects Management

Problems	Extremely High		High		Moderate		Low		Extremely Low		TOTAL		RANK
	f	%	f	%	f	%	f	%	f	%	f	%	
Job Order Creation, Enlistment & Execution	10	22%	9	20%	9	20%	9	20%	8	18%	45	100%	2
Job Mismatch	26	58%	6	13%	8	18%	4	9%	1	2%	45	100%	1
Overlapping of Responsibilities	8	18%	7	16%	11	24%	16	36%	3	7%	45	100%	3

Table 4. Existing Major Problems in Performing Manual Process of Compensation Management

Problems	Extremely High		High		Moderate		Low		Extremely Low		TOTAL		RANK
	f	%	f	%	f	%	f	%	f	%	f	%	
Slow/Tedious Promotion Approval	10	22%	9	20%	9	20%	9	20%	8	18%	45	100%	4
Slow/Delayed Fringe Benefits	18	40%	10	22%	9	20%	0	0%	8	18%	45	100%	2
Miscalculation of Payroll	13	29%	16	36%	14	31%	1	2%	1	2%	45	100%	3
Delayed Salary	24	53%	14	31%	6	13%	1	2%	0	0%	45	100%	1

These problems were noted by the researchers and mitigating measures were incorporated in the planning and designing phase of CHAMP.

The functional and non-functional requirements for the cloud-based system are also determined by the researchers after the observation and interview with the subject company's key personnel.

The functional requirements of the CHAMP are as follows:

- The system must support online hiring schemes.
- It must have employee's evaluation capabilities.
- The system must have daily time recording of employees work details.
- The system must support creation, modification, and deletion of employees, positions, projects, and user accounts.
- The system must show the System Dashboard only to those system users with Admin or Super Admin access level.
- DTR Reports can be exported to Microsoft Excel.
- The system must support salary preparation and payroll computation.

In contrast, the following are the non-functional requirements of the Cloud-based Human Asset Management:

- The system should guarantee that user login credential be kept and retrieved in a secure way.
- The system must support concurrent throughput transactions.
- It should provide 24/7 updated information to users.
- It must support most commonly used web browsers (Mozilla Firefox, Safari, Google Chrome, Internet Explorer, etc.) and mobile device OS such as iOS and Android.

The said system requirements were also incorporated in the development of the CHAMP. After carefully following the IPO framework, the Scrumban methodology, and considering the good techniques and mitigating measures to counter the problems encountered during the manual

processes in the respondents' offices in terms of human asset inventory, tasks and project management, and compensation management, CHAMP was developed and deployed. CHAMP is consisted of two main modules: the front-end module to be utilized by end users in inputting data relative to the functionalities of the system; and the back-end module for administrative control and management of the system such as user accounts, database backup, and file management. Figure 2 shows the framework of CHAMP.

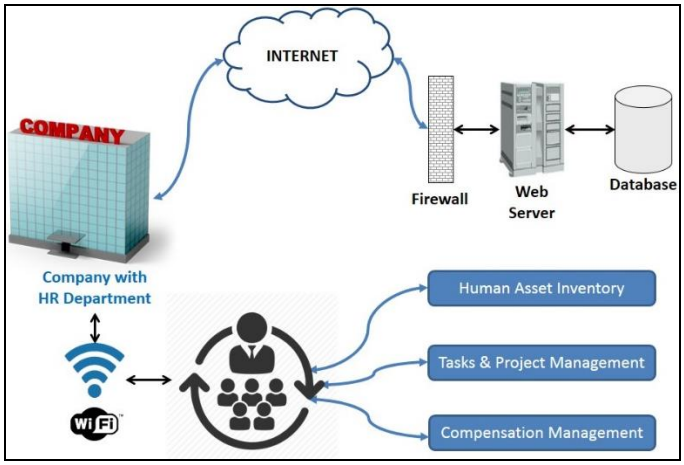

Figure 2. Framework of Cloud-base Human Asset Management.

The researchers conducted a formal User Acceptance Test (UAT). According to the results of the questionnaires floated to the respondents who participated in the UAT, no system part of CHAM has been found faulty nor require GUI modification.

Table 5 presents the rating given by the 7 computer system evaluators after evaluating the cloud-based system in its totality in terms of its performance, information, economic, control and security, efficiency, and service aspects. It shows that CHAM has passed the formal acceptability test with an average rating of 93.52%.

Table 5. Final Evaluation of MHRMS by P.I.E.C.E.S. aspects

ASPECTS	SYSTEMS EVALUATORS RATING							For Implementation
	1	2	3	4	5	6	7	
Performance	92	90	97	97	88	93	96	YES
Information	94	94	94	96	94	88	95	YES
Efficiency	90	94	90	96	95	96	96	YES
Control & Security	92	89	95	95	90	96	96	YES
Economic	95	95	90	94	93	93	92	YES
Service	87	96	94	97	94	93	97	YES
Average	**91.67%**	**93.00%**	**93.33%**	**95.83%**	**92.33%**	**93.17%**	**95.33%**	**YES**
Overall Average	**93.52%**							**YES**

Table 6. Frequency distribution of the Degree of Quality and Presence of Continuous Quality Improvement during the implementation of MHRMS as perceived by the on-site worker-respondents.

Degree of Quality			**Presence of CQI**		
Perceived Assessment	**Count**	**%**	**Perceived Assessment**	**Count**	**%**
Excellent	17	70.83%	Very High	15	62.50%
Very Good	3	12.50%	High	4	16.67%
Good	1	4.17%	Fair	3	12.50%
Fair	2	8.33%	Low	1	4.17%
Poor	1	4.17%	None	1	4.17%
Total	**24**	**100.00 %**	**Total**	**24**	**100.00 %**

As to the degree of quality rendered by each HR-respondents' offices during the implementation of CHAMP, Table 6 shows that majority or 17 out of 24 (70.83%) of the respondents perceived that there is an excellent degree of quality in the current cloud-based human asset management processes in their respective offices as compared to its previous manual procedures. Further, majority or 15 out of 24 (62.50%) of the said respondents perceived that there is a very high presence of continuous quality improvement in the integration and implementation of CHAMP in terms of human asset inventory, tasks and projects management, and compensation management.

CONCLUSION

Based on the findings presented about the Cloud-based Human Asset Management, the following conclusions are drawn from this study:

- The current manual human resource processes of were identified and found out that these processes present a number of problems, limitations and inconsistencies as to human asset inventory, tasks and projects management, and compensation management;
- With the existing manual processes identified, the functional and non-functional requirements of a cloud-based human asset management were determined and were incorporated in the creation and development of CHAMP;
- The implementation and integration of CHAMP with other business functions of the human resource departments have provided an excellent degree of quality in terms of its human asset inventory, tasks and project management, and compensation management, thus, its impact factor has been indicative of a very high presence of continuous quality improvement.

REFERENCE

[1] Berkley, B.J. and Gupta, A. (**1994**). *International Journal for Information Management*, Article: Improving Service Quality With Information Management. Elsevier. ISSN: 0268-4012.

[2] Tripathi, K.P.(**2011**). Role of Management Information System (MIS) in Human Resource. *International Journal of Computer Science and Telecommunications* Volume 2, Issue Number 1. ISSN 0976-8491.

[3] Marsic, Ivan (2012). Software Engineering. Rutgers University, New Jersey. p. 452.

[4] Adams, Kevin (**2015**), Non-functional Requirements in Systems Analysis and Design. Springer. ISBN 978-3-319-38664-5

[5] Wikipedia, Entry - Article: Software Feature.https://en. wikipedia.org/wiki/Software_feature, retrieved **2017**-03-07.

[6] Hambling, Brian and Van Goathem, Pauline (**2013**). User Acceptance Testing: A Step-By-Step Guide. BCS, the Chartered Institute for IT. ISBN-10: 1780171676 / ISBN-13: 978-1780171678.

[7] Fox, William and Bayat, Mohamed Saheed (**2008**). A Guide to Managing Research. Juta and Company Ltd. ISBN 0702176842 / 9780702176845.

[8] Ethridge, D.E. (**2004**). *Research Methodology in Applied Economics*, 2nd Edition. Wiley. ISBN: 978-0-8138-2994-4.

[9] Pelzl & Paar (**2010**). Understanding Cryptography. Berlin: Springer-Verlag. p. 30.

[10] Kumar, Ranjit (**2014**). Research Methodology: A Step-by-Step Guide for Beginners, 4th Edition. SAGE Publications Ltd. SBN-10: 1446269973 / ISBN-13: 978-1446269978.

[11] Creswell, John W. (**2008**). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, 3rd Edition. SAGE Publications, Inc. ISBN-10: 1412965578 / ISBN-13: 978-1412965576

[12] Panneerselvam, R. **(2014).** Research Methodology, 2nd Edition. PHI Learning. ISBN-10: 8120349466 / ISBN-13: 978-8120349469