Design of human resource information system for micro small and medium enterprises

W Baswardono*, R Cahyana, S Rahayu and M R Nashrulloh

Department of Informatics, Sekolah Tinggi Teknologi Garut, Jalan Mayor Syamsu 1, Garut, Indonesia

*wiyoga.b@sttgarut.ac.id

Abstract. The articles aim to analyze and design of human resource information system (HRIS) for micro small and medium enterprises in Indonesia. The problem sometimes occurred in human resource when the business starts to grow. To solve this start with analyzing and design in this HRIS system using RUP (Rational Unified Process) to handle a problem such as attendance, payroll, manage employee and other Human resource problem in the scope of small or medium business. The result is a design of HRIS that can be a start for a blueprint and can be implemented for micro small and medium enterprises with condition and regulation that fit in Indonesia and also will provide the results of a design document analyzing the business needs of the process and the design of the HRIS system using the RUP method.

1. Introduction

Economic growth is overgrowing in Indonesia, one of the drivers of its economy is small and medium micro enterprises, which has a significant contribution to economic growth, the total existing business units, the number of small and medium micro business units is 98.6% of the total and employment is also calculated to be as high as 96.99% of the total workforce [1]. Absorption of a fairly high workforce makes managing human resources in small and medium micro enterprises very important. One of the challenges in dealing with small and medium micro enterprises is to deal with human resources is the difficulty in the process of recruitment, developing employee competencies, setting employee wages, evaluating work and other problems [2–5]. The problem with human resources with micro small and medium enterprises can be overcome by the existence of a human resource information system. To solve this human resource problem in micro small and medium enterprise, it needs to be adjusted to the needs of the micro,
small and medium enterprises themselves and regulations supported by the government. The scope of the study for this research is to identify and analysis the business process, also design the system according to its needs. So the results of this study will be design of HRIS that can be the beginning of a blueprint and can be applied to small and medium micro businesses with conditions and regulations that are appropriate in Indonesia.

2. Method
Research conducted to create an information system for human resources has several stages of an activity to achieve the objectives of analysts and designs that refer to the RUP (Rational Unified Process) method. The stages in the RUP Method are divided into four stages face inception, elaboration, construction, and transition [10]. The type of research here is research design and the goal is to analyze business process and design information system for human resources for micro small and medium enterprises.

2.1. Inception
This stage has obtained business processes that are running and producing data for analysis and design. The data is obtained from a document, interviews, books, government regulations, also previous research journals. At this stage identifying users who will use the system, the needs of the system and the business processes of the system made at this stage will result in a description of the process business and general needs. Business process in this stage need to be identified for planning of making information HRIS successful, also needs to detail and define based on function or per module also follow the need of users and the rules that apply for module/function according to regulation in Indonesia if need it.

2.2. Elaboration
This stage will be analyzed according to the results of the previous inception stages. The results obtained from the Inception stage will be made an analysis which at this stage should produce use cases, activities, sequences and for the preparation of the baseline for the application to produce class diagrams for resource information systems human. Design in this stage will be using UML for the use case, activity and class diagram, all of this design have to follow from previous stage.

In this research paper only discusses the inception and elaboration phases. If this has been done and the results are by the needs, then later it will be developed for the construction phase, for the making the application of the human resource information system itself [11].

3. Results and Discussion
Result and Discussion of research from the analysis and design of human resource information systems in micro, small and medium enterprises:
3.1. Inception phase

The purpose to make business Process Architecture like the figure above is to define which are the function of the business process is need it. The Figure above is to show all the function of the business process and also hardware databases that will be designed for the HRIS system.

The following is an explanation for the needs of the Business Process Architecture that is designed; the possibility can be changed according to the needs of the development of the application:

3.1.1. Architects for databases and servers (hardware). In this system, it is recommended to use a multitenant database, where one master database for the configuration of the system to manage its business and tenant database to manage the system because one owner can have multiple business types [12,13].

3.1.2. Subscription and main user module. This module is a subscription, and the main user should only be used when using a multitenant system. The main user is to manage the overall user and subscription is for setting master of the system itself.

3.1.3. Master setting module. A collection of modules that are both on a system basis and for the entire application or system for several modules. Some settings in the master such as:

- Master employee employment: this is for data storage of employee and employment contract data. In general, this data on employment and employee will later be connected with other modules;
- Master Payroll: This setting is connected later to the payroll module. Settings here to support payroll calculations and additional components such as PTKP (non-taxable income), PPh 21 (income tax), employment BPJS. This is needed to prepare if later there is a change in regulations, especially changing only in terms of valuation, there is a setting;
- Master Other and Company: The other master settings for the other data, examples of holiday data to determine what days are considered holidays, can be set because it will affect other modules [3,6].

3.1.4. Attendance module: Attendance system. In this module there, can be done manually through the application or with tools such as fingerprints, retinal eyes or other attendance devices. This module is
needed for management level to help find out whether employees follow the rules of attendance at the business.

3.1.5. Payroll module: This payroll module is for salary calculation. This payroll affects other parameters such as the master payroll. Examples such as PPh 21 are taxes on income in the form of salaries, wages, honorariums, allowances and other payments in whatever name and form in connection with work or position, services, and activities carried out by individuals subject to domestic tax [9]. Then this calculation is usually included in the salary, and this regulation comes from the state for every citizen in Indonesia.

3.1.6. Recruitment module: this module is for recruiting employees. If the business requires employees, can open vacancies with the system and provide specifications for the job requirements. After the selection process is done, for the problem the stages must be able to be done differently for each job, then a master setting is needed for recruitment, and after that, the selection process is accepted or not, which is later connected to the assessment and training module.

3.1.7. Assessment and training module: Assessment module is the assessment of work for employees for promotion or salary or other. This module is for processing the assessment. Job assessment has many methods; it can be done differently according to work and type of business. So it is suggested here to be made in stages, for example, one of the common methods is SAW (Simple Additive Weighting), so this can be created in the master setting as one of the parameters. Later the user makes a component of the assessment [2,8].

3.2. Elaboration phase

3.2.1. Use case. Use Case provides an overview of a series of activities that are processed in a case to produce results (output) of the case. Each process shows how an external user triggers an event so that the system responds according to what is designed [14,15]. In the design of use cases here there is for the application tenant does not discuss the main user application, this human resource information system is used by the tenant (user) itself.
In this Use Case depiction there are three actors: User: Employee, User Candidate, and User Owner/Manager. There is a Management user who divides for application settings. Dividing roles such as user: the employee here is defined as the user who uses this system, but does not have the authority to regulate it. Therefore, the description here is for the User according to the roles. However, later on, the real application needs to be adjusted for the Business model and function. In this use case also the setting master and employee module do not describe this as a whole to facilitate the depiction of this writing.

3.2.2. **Class diagram.** Class diagrams are class descriptions of object-oriented systems, consisting of fields and methods and connections between those classes. Moreover, class diagrams show relationships between classes that are constant in the system being designed. Below is a Class diagram of any Class that is used and connected to generate payroll, to provide an overview of this system design which will be developed to provide a complete description of class diagrams for this human resource information system.
In this Class Diagram above it shows one of design for module payroll. This Class diagram show how to design generate payroll Classes, that later will be implemented in HRIS system that later on will be implemented payroll module. This is just one of the example of a class diagram, but in this research design it will need it to draw all the class diagram based on function, or the module need it.

4. Conclusion

The analysis and design of this human resource information system are quite large based on these results in the inception phase here, the business procedure is explained, but the discussion and design are not complete. The discussion and design that is not exits are functional and non-functional of this system. Moreover, it must follow the regulations of the government/authorities of Indonesia Analysis and design in inception and elaboration phases can be more clearly explained and detailed, and updated according to new regulations in the future.

Analysis and design of this system based on the results of the Elaboration phase illustrate use case; here, there are many setting components needed to meet the needs of all function modules working according to their needs. In the construction stage later, it is better to plan hardware or software used in the earlier stage to make the application that was previously planned with the team.

Deployment of activity diagrams and class diagrams to be more explaining and easy to read by the team who will later work on this analysis and design for the next phase, try to be as detailed as possible according to business processes also easier to understand so that all functions that need it and the purpose of making this resource information system for micro, small and medium enterprises so it can be fulfilled and if this design has been developing later can be integrated with other applications such as information systems warehouse, accounting, the point of sale application and others to become an enterprise system.
Acknowledgment
Authors wishing to acknowledge Sekolah Tinggi Teknologi Garut that supports and funds this research publication.

References
[1] Bank Indonesia 2015 *Profil Bisnis Usaha Mikro, Kecil, Dan Menengah (UMKM)* (Jakarta: Lembaga Pengembangan Perbankan Indonesia (LPPI))

[2] Piening E P 2018 Human Resource Management Systems: Exploring the Construct’s Hidden Potential *Acad. Manag. Proc.* 10277

[3] Stone D L, Deadrick D L, Lukaszewski K M and Johnson R 2015 The influence of technology on the future of human resource management *Hum. Resour. Manag. Rev.* 25 216–231

[4] Singh L 2016 Human Resource Management, Gaining a Competitive Advantage *Rev. Prof. Manag. A J. New Delhi Inst. Manag.* 5 101

[5] Jannah R, Handajani L and Firmansyah M 2018 The Influence of Human Resources, Use of Information Technology and Public Participation to the Transparancy and Accountability of Village Financial Management *Int. J. Sci. Res. Manag.* 6

[6] Silva M S A E and Lima C G D S 2018 The Role of Information Systems in Human Resource Management *Management of Information Systems (InTech)* 113–126

[7] Muda I, Afrina A and Erlina 2018 Influence of human resources to the effect of system quality and information quality on the user satisfaction of accrual-based accounting system *Contaduría y Adm.* 64 100

[8] Marire M I, Okonkwo A and Ugwu J N 2018 The Effect of Human Resources Management to an Organizational Control Process *Management and Economic Journal* 173-185

[9] Republik Indonesia 2008 *Undang-Undang Republik Indonesia Nomor 20 Tahun 2008 tentang Usaha Mikro, Kecil, dan Menengah* (Jakarta: Sekretariat Negara)

[10] Kruchten P 2003 *The Rational Unified Process* (Addison-Wesley)

[11] Kurniadi D, Abdurachman E, Warnars H L H S and Suparta W 2018 The prediction of scholarship recipients in higher education using k-Nearest neighbor algorithm *IOP Conf. Ser. Mater. Sci. Eng.* 434 012039

[12] Septiana Y, Kurniadi D, Mulyani A and Baswardono W 2018 Design of decision support system for blood analysis *3rd Annu. Appl. Sci. Eng. Conf. (ASEC 2018)* 197 03018

[13] Septiana Y 2018 Design of prototype decision support system for flood detection based on ultrasonic sensor *MATEC Web of Conferences* 197 03017

[14] Kurniadi D, Sasmoko, Warnars H L H S and Gaol F L 2017 Software size measurement of student information terminal with use case point 2017 *IEEE International Conference on Cybernetics and Computational Intelligence (CyberneticsCom)* 164–169

[15] Kurniadi D, Mulyani A, Septiana Y and Aulawi H 2018 Estimated software measurement base on use case for online admission system *IOP Conf. Ser. Mater. Sci. Eng.* 434 012062