

# **EMPLOYEE SELF SERVICE-BASED HUMAN RESOURCES INFORMATION SYSTEM DEVELOPMENT AND IMPLEMENTATION. CASE STUDY: BCP INDONESIA**

**Lestari Margatama**

*Faculty of Information Technology, Budi Luhur University, Jl. Cileduk Raya No. 99  
Petukangan Utara, Jakarta Selatan 12260, Indonesia  
Email: margatama@najwaputrilarasati.com*

## **Abstract**

Human Resources Information System is a Decision Support System that provides necessary information regarding human resources in an organization. Web-based e-HR is one of the best practical solutions in human resources management that allows employees to focus more on their job instead of HR administration procedures. By implementing Employee Self Service (ESS) it is expected that worker satisfaction can be improved and in turn will also improve employees' performance. The web-based ESS is characterized by personalized information approach which offers personal and management services on information access and structured workflow process. The object covered in this research is HR administration of PT.BCP to create and implement ESS with system prototype development and UML modeling tool. The resulting system is designed to quickly access the information and company procedures to shorten the time for BCP's employee administration and documentation.

*Keywords* : Employee Self Service, Electronic Human Resources(e-HR), Unified Modelling Language (UML), Decision Support, System (DSS)

## **1. INTRODUCTION**

Human Resources Management in an organization is one of the most important factors of the sustainability of the organization, since organizational management is basically managing the individuals within it. The process in an organization includes: planning, organizing, directing, and controlling human resources to reach the goal. Human Resources Information System is a Decision Support System that provides a multitude of necessary information. Complexity in managing and expanding human resources will increase significantly when the organization has multiple locations of operations, where time and location functions became decisive factor for human resources service quality.

As an organization that fits both above conditions, BCP Indonesia identifies that the current data storing and information retrieving is inadequate due to being not centralized and integrated. Therefore an Employee Self Service (ESS) system is developed to transform the tasks that handled by Human Resources Division, which often causing bottleneck, into mutual task to facilitate employees and executives an accurate and up to date information and data. The benefits offered by ESS are: employees are less dependent to HR Administrator for administrative purposes so they can concentrate more on their task, enables self approval by the employees' superior for higher efficiency in the management, allows HR administrator to do final checking/approval for administrative

works which significantly increasing the efficiency and effectiveness, and faster administrative process and comprehensive data and information.

## **2. EMPLOYEE SELF SERVICE (ESS)**

Employee Self Service (ESS) is an application that offers online human resource services and personnel information management [1]. It allows employees a multitude of functions, such as updating their own information for home, mailing, and work address instead of usually done by HR department, although some concerning directly to salary grade is still restricted, such as education background, qualification, bank account, pension, and taxes. In this case, employees needs to submit relevant official document(s) to their superior and verified by the HR department. Employees can also view the remaining annual day-off and the cumulative overtime hours. The ESS can also schedule employees qualification improvement, such as training scheduling, based on the duration lapse since last improvement completed by the employee, this will maintain a stable and sustainable improvement of the employees and in turn will significantly improve the organization's competitiveness and efficiency.

## **3. RESEARCH FRAMEWORK**

The challenge in managing and developing the human resources in an organization is to keep the costs as low as possible but still retains quality of service. The complexity is dramatically complicated when the organization has several work locations, where distance and time becomes a factor for HR service quality. With the maturity of internet and information technology, automation in human resource management systems is a necessity; this process is called Employee Self Service (ESS) which involves all aspects of the organization: employees, their superior, and human resources administrator. ESS allows employees to handle his/her own administration process (self administration) and reduces employee's dependence on his/her superior and HR administrator for administrative works, therefore the employees can focus more on their work assignment and increase productivity. For the HR department, ESS reduces the task into checking and/or approval of requests so they can focus more on the strategic functions with the support of information technology.

The focus of the framework in this research is formulating the problem at BCP, where human resources administration still done manually and data is still not yet integrated between main office and its branches. Classification of problems results in four categories: payroll, leave, health, and overtime and performance evaluation. In the case of Leave request, after checking the available remaining leave days, employee fills the online form through ESS that indicates their start and end of leave dates. Similar process is also employed for overtime tasking order; the difference is there is time parameter in addition to the date. The system then sends notification email to the employee's superior for checking and approval or decline of the request. Employees can also use ESS for capability improvement, in this case, through in house trainings scheduled by BCP. Annual training schedule is stored in the ESS so employees can look up the calendar and decides to select which course based on the availability. ESS then sends notification email to employee's superior for approval, which contains hyperlink to the application. The form also comes with additional functions, such as asking for required attachments. After the process has been concluded, either approved or declined, then the request is removed from the work process and stored in the historical record. The existing process is described as follows:

For manual Leave procedure, employee fills leave application paper form and submit it to HRD, HRD then manually search the individual data to check the remaining leave days

available and stated it in the form. If there are leave days remaining are available, then the employee takes back to request written approval from supervisor. Supervisor cannot make approval of a form if there is no check result from HRD. For branch offices, this is done through facsimile to and from main office. The supervisor-approved form is then sent back to HRD at the main office for execution and documentation. This process takes 1-2 work days time.

Healthcare procedure is nearly identical with Leave, the difference is the amount of the remaining healthcare allowance quota and employee must submit payment receipt that must be checked by the HRD for approval. This process takes 1-3 work days.

For manual Overtime request procedure, employee fills the form and signed by supervisor before submitted to HRD at the main office for approval and fee calculation. This process takes time for a few hours to 1 work day.

Employee evaluation is done monthly by the supervisor, they fill the evaluation form and then send it to the HRD. Most often, due to workload, supervisors are late for filling in the evaluation and done that after HRD asks when next evaluation is due to commence, this could affect the employee's performance record.

#### **4. SYSTEM DESIGN**

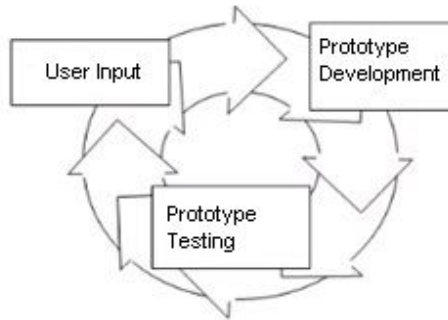
The basic analysis concept is divided into two parts: design analysis and data management oriented analysis. Generally, system design analysis uses Unified Modelling Language (UML), which consists of Use Case Diagram, Activity Diagram, and Sequence Diagram [2]. Use Case Diagram is a function description of a system from the user's perspective; it works by describing typical interaction between user and the system. Activity Diagram is a technique to describe procedural logics, business process, and workflow. Activity Diagram is similar to flowchart, but it can support parallel actions. Sequence Diagram describes the behaviour of a system in a preset scenario. Prototype is a software development method that focuses on the design, function, and user interface aspects where software developer and user meets to define the specification, function, and the behavior of the proposed system.

This research uses quantitative method to analyze the performance of the system by comparing the ESS to the existing procedures. Case study aims to obtain complete and in depth observation through user feedback after experimenting with ESS prototype. The first phase is to collect relevant documents and data for modelling the existing system. Since the designed system is to be self service, the main aspects are the components supporting the self service concept of the system.

After the existing system model is completed, it is analysed to design the ESS which includes Use Case Diagram and Activity Diagram that describes all activities in the ESS which includes Main Page, Employee, Supervisor, and Administrator pages. The next phase is designing the database and its relations. Employee page related to personal data, family, education, trainings, leave, overtime, presence, performance evaluation, health, and salary. For Supervisor level, in addition to Employee's page, there are list menu that shows proposals and requests by the subordinate employee(s), such as approval for leave, overtime, and subordinate performance evaluation form. Administrator holds the master data and all functions related to Human Resources administration, such as payroll and employee hiring/firing/termination.

#### **5. SYSTEM ANALYSIS AND IMPLICATION**

The analysis of the system comprised of two parts: functional and administrative. Functional analysis is based on User Acceptance Tests performed by various levels of employees.



**Fig. 1. System Development Life Cycle**

**6. EMPLOYEE FUNCTION**

ESS allows employees to see and edit basic personal information online, such as personal data, family, and work experience. ESS also enables employees to see their performance evaluation, presence, and benefits. ESS shortens the processing time on personnel administration by eliminating the need to send request forms from branch offices to HR Department at the main office by facsimile. ESS automatically displays the remaining leave days, and health allowance left. Requests that exceed the remaining limits will automatically be declined, while requests that are still under the limit will be stored and automatically forwarded to supervisor. The employee will receive notification email about the result of the request.



**Fig. 2. Employee Page**



Fig. 3. Employee level Use Case Diagram

## 7. SUPERVISOR FUNCTION

Supervisors of each department has the authority to forward, approve, or decline employee’s request by online forms, recommend subordinates for training, and making performance evaluation of subordinates by referring to the key performance indicator online.

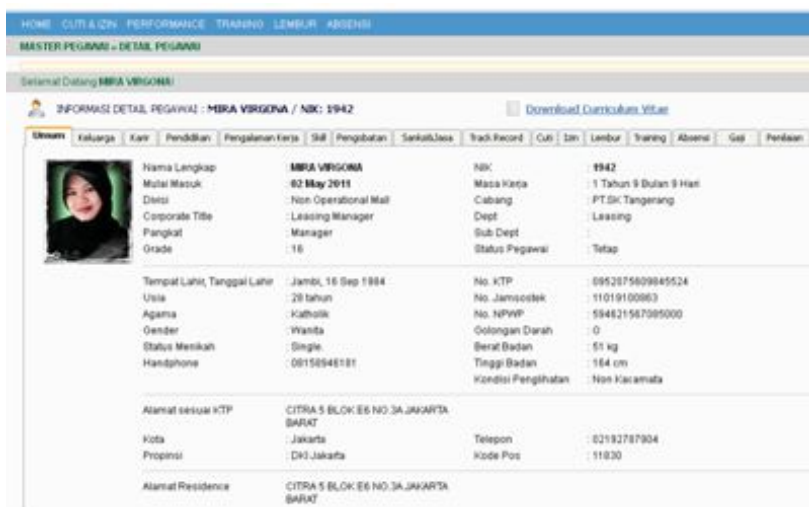


Fig. 4. Supervisor Page

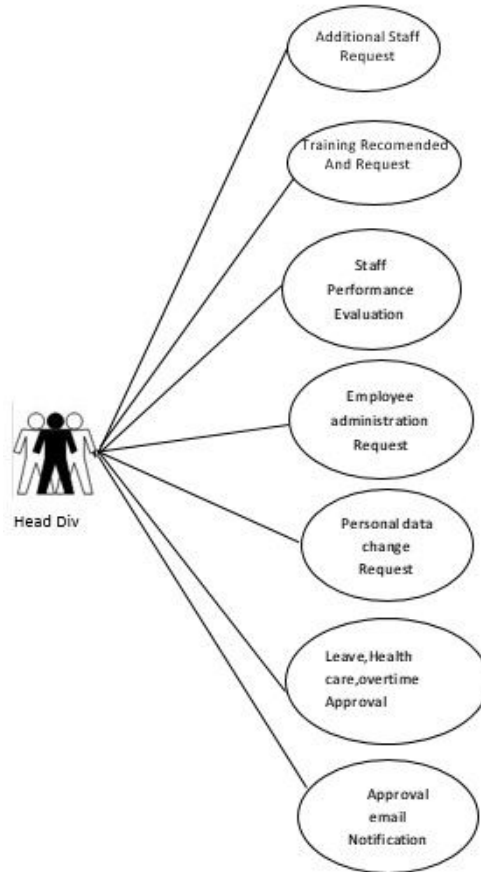
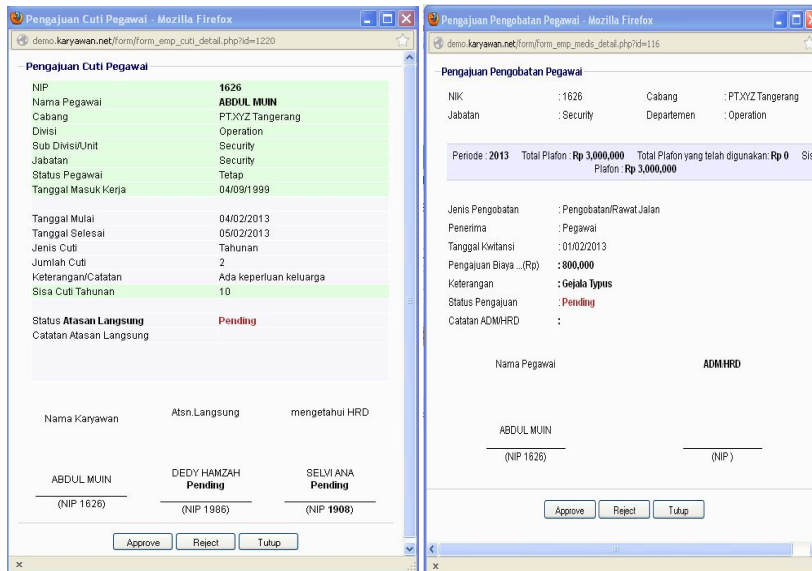


Fig. 5. Supervisor level Use Case Diagram



(a)

(b)



(c)

Fig. 6. Request from subordinate: (a) Leave request, (b) Healthcare request, and (c) Overtime request

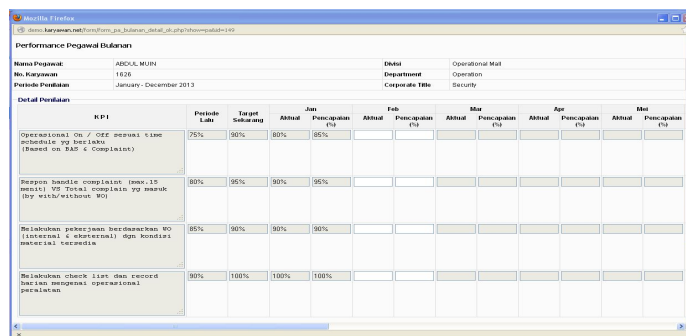


Fig. 7. Performance evaluation

## 8. ADMIN FUNCTION

Human Resources Department acts as the ESS administrator; they can display, record, and update all employees' data, from subordinates and staffs to supervisors and directors. Admin level has access to make periodical report concerning employees, such as leave, healthcare reimbursements, and performance. They can also adds or remove user account in case of new employee and termination.

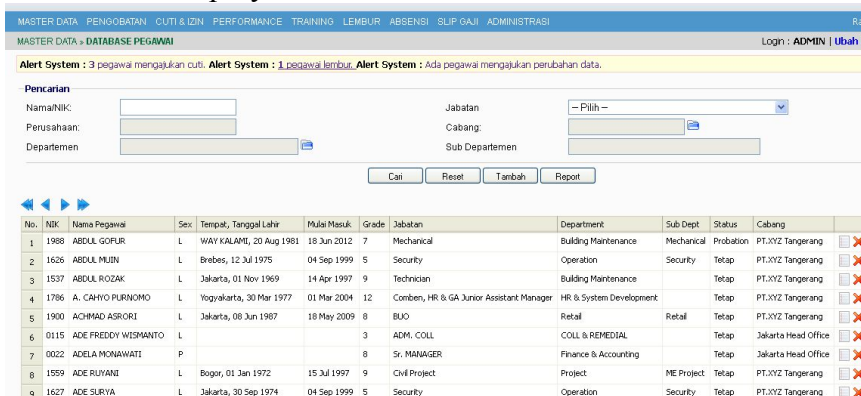


Fig. 8. HR Admin main display



Fig. 9. Healthcare allowance usage of subordinate

### 9. User Acceptance Test

The ESS is expected to achieve or exceed the parameters set by BCP, that are: Corporate security Compliance, Data processing and storing in under 2 minutes, User friendly (easily recognizable and understandable functions), and centralized database accessible by through the internet by authorized personnel. ESS functional testing is done through User Acceptance Test (UAT) which tested all ESS modules to see if the result is as expected. The result is summarized in Table 1 as follows.

Table 1. User Acceptance Test on Healthcare

User Input	Condition	Feedback	Result
Type of healthcare not selected	All required data fields must be filled	Error Message: "Jenis pengobatan harus diisi"	Request denied
Date of healthcare transaction/ payment not filled	All required data fields must be filled	Error Message: "Tanggal kwitansi pengobatan harus diisi"	Request denied
Billing amount not filled	All required data fields must be filled	Error Message: "Biaya pengobatan harus diisi"	Request denied
Transaction date over 3 month ago	Healthcare reimbursement void if over 3 month past current date	Error Message: "Pengajuan tidak dapat diproses, Tanggal kwitansi sudah expired..!"	Request denied
Billing amount is higher than quota	Annual Healthcare allowance is preset at certain amount	Error Message: "Pengajuan tidak dapat diproses, sisa plafon tidak mencukupi..!"	Request denied
Form filled as required	All above condition	Message: "Pengajuan disimpan dan akan diproses"	Request granted, stored in ESS, notification messages sent to supervisor and HRD

The process time of ESS is compared to the preset target based from the manual process, although online system is theoretically instantaneous, in reality, especially when there are persons involved in the process, it is more realistic to set the target to 1 day



or under 1 week at most. The prototype is tested by the HRD and a select other department, ESS process time is from observing the log file for each action in the process. In the Leave and Healthcare requests, employee can readily see the remaining quota of their Leave days and Healthcare allowance, therefore, requests that exceeded quota will not be able to be processed further, while granted request will generate notification email sent to the employee’s supervisor for approving or denying the request. If the request is granted, then it will automatically stored in the main data base at the HRD. This process can be completed in the same day. The following is the sample of ESS Healthcare log data taken from October 2016.

NIK	Nama Pegawai	Tanggal Pengajuan	Jumlah Plafon	Biaya (Rp)	Tanggal Disetujui	Status
'0212020110106	Akhalik	18/10/2016 10:10:09	2,000,000	53,000	18/10/2016 12:10:09	Approved
'0209120110075	Muhamad Romli	18/10/2016 13:20:09	2,000,000	120,000	18/10/2016 14:30:09	Approved
'0213052710153	Dadang Sunaryo	18/10/2016 14:15:10	2,000,000	103,000	18/10/2016 15:45:10	Approved
'0212100310121	Juharman	19/10/2016 11:26:09	2,000,000	279,000	19/10/2016 13:20:59	Approved
'0212020110105	Ade Takjudin	19/10/2016 14:35:09	2,000,000	50,000	19/10/2016 16:05:09	Approved
'0206020110040	Hudromik	20/10/2016 08:20:09	2,500,000	204,000	20/10/2016 10:05:09	Approved
'0210060110083	Arsaman	20/10/2016 10:29:19	2,000,000	201,000	20/10/2016 11:29:30	Approved
'0213052710153	Dadang Sunaryo	20/10/2016 11:30:29	2,000,000	50,000	20/10/2016 12:00:59	Approved
'0205120710038	Muhamad	21/10/2016 10:20:56	2,000,000	50,000	21/10/2016 11:40:50	Approved

**Fig. 10. Healthcare log data from October 2016**

The *Tanggal Pengajuan* column is the date and time when the request is made, and the *Tanggal Disetujui* column is when the request has been approved. It can be seen that the duration of the process is within 2 hours. The following table shows the comparison between manual process and ESS time duration.

Process time comparison		
Request	Manual Process	ESS
Leave	1- 2 Days	1-2 Hours
Healthcare	1- 3 Days	1-2 HOURS
Overtime	1 Day	1-2 Hours
Employee evaluation	30 mins/employee	30 sec/employee
Evaluation report submission to HRD	>5 Days	< 3 Days

**10. CONCLUSION**

Based on the results of the development of employee self service-based human resources information system in BCP, the conclusion can be drawn as follows:

- a. ESS could shorten the process time from day to two hours
- b. User acceptance test shows that the system worked as designed
- c. ESS could overcome the human error in leave, healthcare allowance, and overtime quota calculations, and also facilitates easier evaluation

**11. REFERENCES**

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