

# Implementation of content business process reengineering framework in an information system

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**Abstract.** The Accounting Information System in the Drinking Water User Association (HIPPAM) is a system that manages the financial flow of an organization. In general, this information system manages customer data, water usage transactions, reports needed on web-based systems. This system has been running for 3 years. The purpose of this research is to produce the requirements for accounting information system software needed. This study uses the Reengineering Software Framework method, namely Business process Reengineering (BPR) which focuses on the reengineering framework of accounting information systems. The results of this study in addition to implementing the framework, also produce standard document content produced at each stage in the BPR. The implications of this study are expected to be used as a reference for future similar studies.

## 1. Introduction

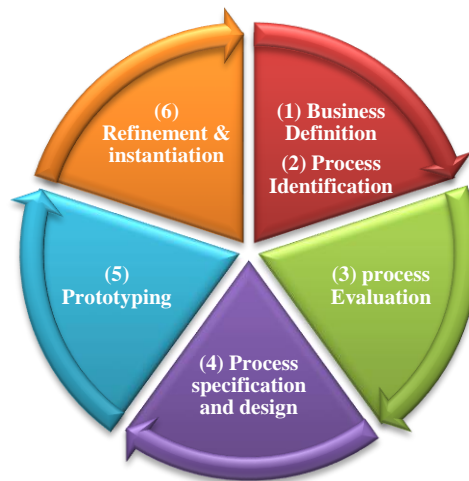
Development of information systems in an organization needs to be done, because this requires adjustments for the development of an organization. Every development of a functioning information system requires a way to avoid a software crisis, for example by misplacing the needs of information system users. To avoid the software crisis, it is necessary to implement a software reengineering framework found in Business Process Reengineering (BPR) [1]. The BPR framework will help developers as information system developers as a guide to doing their work [2]. The topic of this research is implementing this BPR framework that will be able to produce data analysis in accordance with the requests of clients who wish to develop the system [3]. Based on observations in drinking water user management association organizations abbreviated as HIPPAM, managers want to develop a customer side system so that there are services to view bills and billing history based on cellular systems, this is related to the number of customers often forget and do not have time to collect proof of bill payments and this is a problem in their financial system. In the previous study, the BPR framework was made to analyze business processes from the development of payment information systems that were originally done manually. It would be developed to make a payment information system application that would later save their service time so that it became effective and efficient [4,5]. In this study, the purpose of specifically developing the accounting information system that has been running before is to take the case in the Accounting Information System that manages the financial flow of the organization. The purpose of this study will be to re-engineer the financial information system at HIPPAM by implementing the BPR framework related to the development of the HIPPAM accounting information system on the customer side to find out monthly water use payments and to find out the previous month's



billing history based on the mobile application so that it can help with payment problems to the organization.

## 2. Research method

This research method uses a Business Process Reengineering (BPR) framework which has six stages, can be seen in figure 1 below [6]:



**Figure 1.** Business process reengineering framework model.

In figure 1 there is a BPR framework consisting of 6 stages:

- **Business definition.** At this stage the data is collected related to the process or service provided in the HIPAM System Reengineering which includes: Right of access to the existing system, Feature of each User access right, developed on cellular-based customer access applications, software needed to create applications such as Android Studio. at this stage of the research carried out by a team of analysts who produce the required software specifications [7].
- **Process identification.** At the identification stage, the process of data obtained from the four elements in the business definition is then grouped based on the interests and needs of product reengineering aimed at system development. in this stage of the research carried out by a team of analysts that produce a table of functional requirements of the system, namely customer logins, bills, history and complaints [8].
- **Process evaluation.** Process evaluation is carried out as a measure of the success of the definition and identification of the process. Increase or reduce the activities needed in the process of reengineering products or evaluating the quality of performance during the process of defining and identifying processes. At this stage carried out by the analyst team, resulting in the design of the system dashboard menu in the customer's access rights.
- **Process specifications and design.** In the fourth stage began designing a reengineered product line. Such as making the flow process using a use case as an initial guide in making product designs to later become re-engineered products. At this stage the analyst team makes: see the customer billing menu, see the History Bill menu and see the Complaints menu.
- **Prototyping.** Before re-engineered products are used by the user, interface design is made in advance to find out the initial description of the location of the function in the application, then applied to the creation of the application. To design this interface, use the GUI Design Studio application [9]. In this phase of research the programmers produced a GUI design from the results of the stages of the Specifications and design processes that were made previously.

- **Improvement and instantiation.** In the last stage, the system functionality test is carried out which aims to determine whether the application meets the customer's information needs. Then re-engineered products are ready for use by users. Although it has gone through six stages of the process, maintenance is also needed to maintain the function of product re-engineering. at this stage the software tester team produced a functional system trial document with the Black box technique which aims to determine the suitability of the user's needs with the finished system [10].

### 3. Results and discussion

The results of the research on the implementation of the BPR framework for the development of information systems produce documentation of specifications for the requirements of soft information systems in the subscriber, namely the user access rights involved, menu features, system functional table requirements, the main usecase diagram for customers, the GUI designer customer menu and an application customer user.

#### 3.1. Results of stage 1 business definition

**Table 1.** Access rights to existing systems.

Access rights	Information
<b>Chairman</b>	Responsible for the HIPAM organization
<b>Treasurer</b>	Financial Management Section
<b>Secretary</b>	Record information on customer bills and data collection

**Table 2.** Features of each user access right.

Uses Access	Features
<b>Chairman</b>	Reports: income, expenses, all income, customer bills, losses / profits. Print: usage bill, proof of payment, meter last month. Find customers. Complaint report.
<b>Treasurer</b>	Transaction: Expenditures, income. Customer Bill: Input customer meter, pay bill, bill data. Pay arrears Reports: income, expenses, all income, customer bills, losses / profits. Print: usage bill, proof of payment, meter last. Search for Customers.
<b>Secretary</b>	Transaction: Expenditures, income. Customer Bill: Input customer meter, pay bill, bill data. Pay arrears Reports: income, expenses, all income, customer bills, losses / profits. Print: usage bill, proof of payment, meter last. Search for Customers.

- Developed on mobile-based customer access applications needs :  
Functional requirements that will be developed in the customer section are: Login, Billing, History, Complain.

### 3.2. Results of stage 2 process identification

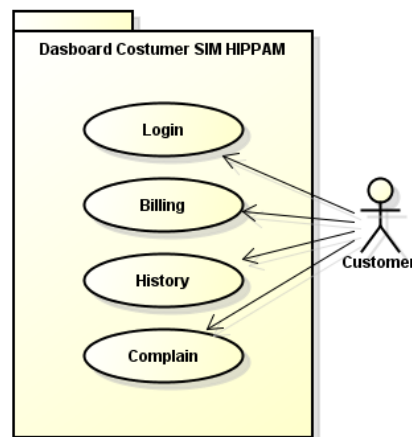
The process identification produces a table of functional requirements for the system to be developed, namely in the customer section are:

**Table 3.** Functional requirements for the system.

id	Function	Information
C01	Login	to exercise access rights.
C02	Billing	to find out bills every month.
C03	History	to find out the billing history of the previous months.
C04	Complain	to fill customer complaints

### 3.3. Results of stage 3 process evaluation

In this process, increase or decrease the activities needed in the process of reengineering the product or evaluating the quality of performance during the process of defining and identifying processes. At this stage, create a system dashboard in the customer's access rights, can be seen in figure 2 below:



**Figure 2.** The main use case design diagram to be developed.

### 3.4. Results of stage 4 process specification and design

After going through three stages of the process then in the fourth stage began to design the reengineered product flow. Such as making the process flow using a use case as an initial guide in making product designs to later become re-engineered products. At this stage there are Login, View Bills, View History Bills and Complaints, can be seen in figures 3 and 4 below :

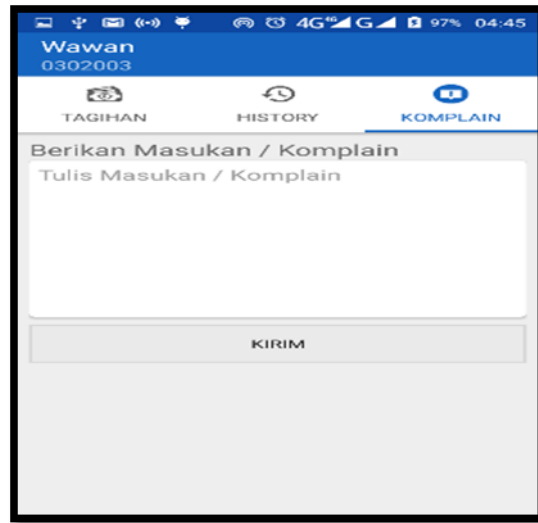


Figure 3. Login, view bills, view history bills and complaints display.

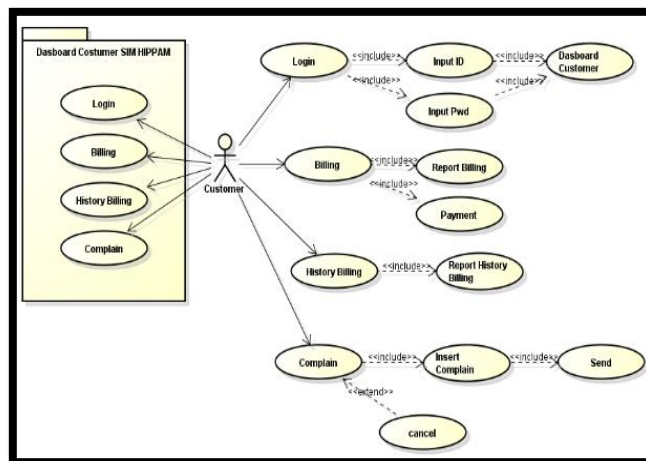
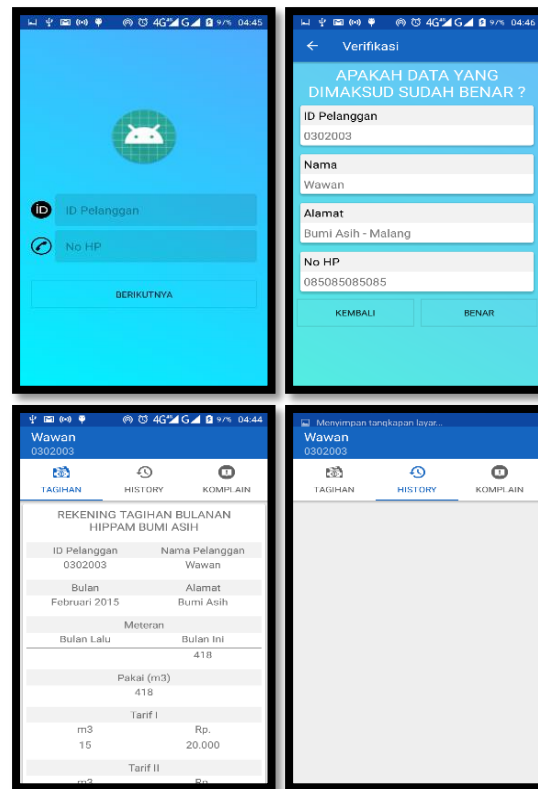


Figure 4. The sub use case design diagram for customer to be developed.

3.5. Results of stage 5 prototyping

Before re-engineered products are used by users, interface design is made in advance to find out the initial description of the function in the application before making the application.



**Figure 5.** Graphical user interface design.

### 3.6. Results of stage 6 refinement and instantiation

At the last stage, a functional test was conducted which aims to find out whether the application meets the user's information needs. Then the re-engineered products are ready to be used by the user. Even though it has gone through six stages of process, maintenance is also needed to maintain the functions of re-engineered products. as for the method of using it: BlackBox Testing: for Fuctionally System test and User Accepted Test: For Approval of Usage by User.

## 4. Conclusion

After implementing the BPR framework with 6 stages above, in this study succeeded in making the development of an accounting information system at HIPAM that was in accordance with the needs of managers and customers. The system developed is a dashboard for customers that can be accessed through mobile computing based applications through smart phones. After testing the system, it can be concluded that the system matches the needs of the customer, namely getting billing payment information every month and can also see the history of monthly bill payments on the owned smart phone. In addition, the implementation of this BPR framework can be used as a reference for application developers so that the system can run effectively and efficiently and avoid software crisis terms.

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