



Implementation Of The Spiral Method For Analyzing And Designing Financial Information Systems And Financial Archive For Cashier Financial Management Section (Cash Information Replacement)

Muammar Khadapi

STMIK Kaputama

Jalan Veteran No.4A-9A Binjai, North Sumatra

khadafi5@gmail.com

Abstract

This title is backgrounded by financial management employees in the PT Telekomunikasi Indonesia.Tbk Cooperative in the form of Application. There are many problems happened such as the data did not saved well and the financial data was mixed with the other archive. The purpose of this research is to build a cashier application system which will enumerate employees in its financial arrangement, both income and from the cooperative and then become a file which is computerized will facilitate the employees. The methods which is used in this application development method is Spiral.

It is the systematic approach and sequentially to software, start from users' specification necessary until the planning, modeling, construction, and deployment. After analyzing the problems that occur then made the improvement to the current problem by build an application that supports web-based financial processes.

Keywords: *Spiral, Finance, Cooperative PT Telekomunikasi Indonesia.Tbk, Employee, Web.*

1. Introduction

Global developments and the information age spurred the Indonesian nation to improve the quality of human resources, because quality human resources are the main capital in development in all fields so that it is hoped that the Indonesian nation with its human resources can compete with other, more advanced nations. And it cannot be denied that technology has also become a primary need for people, companies or other agencies in carrying out their work. Then from these deficiencies there are many problems that occur such as financial documents that are sometimes not properly archived and even financial data that likes to be mixed together in the same archive . Apart from that, employees are confused about finding archives in filing cabinets where there are lots of other files. The purpose of this research is to build a cashier application system which will make it easier for employees to manage their finances, both income and expenses from the cooperative and then the archive is in the form of a computerized file which will make it easier for employees.

Koptel is a secondary cooperative within PT. TELKOM under the name Cooperative Services Joint Business Telecommunications and lastly changed its name to Cooperative PT. Telekomunikasi Indonesia (KOPEL) , whose members are KOPEGTEL throughout Indonesia are directed to provide guidance and development both in business development, funding needs, and improving the quality of human resources for its members to realize all that requires an easy and efficient financing process.

However, the existing system is deemed unable to meet financing needs. In connection with the matters mentioned above, the researcher intends to conduct research with the title " **Implementation of the Spiral Method for Analyzing and Designing Financial Information Systems and Financial Records for the Financial Management Section (Cashier)** ". Identification of the problem that the author will raise, namely, there is no system that regulates financial processes and is still carried out manually by several related actors. (in the *Execl application*) The financial process is not yet structured, so it takes a long time and makes all financial reports waiting a long time in the financing process. Employee confusion in finding financial archives in the form of documents in filing cabinets. The purpose of conducting this system analysis is to prevent errors in the financial process so that there are no losses. Make better financial reports. Create computerized financial reports . In making the design analysis of this system there are several problem limitations that the author has limited, namely the Cashier system design analysis made using the Spiral method. This procedure applies in all work areas of the Indonesian Telkom Cooperative.

2. Research Methods

2.1 Web Application

Web applications called " *webapps* " are a category of network-centric software that includes a wide variety of applications. In their simplest form, *webapps* can be *informative hypertext links* that use limited text and graphics. However, with the advent of Web 2.0, *webapps* evolved into sophisticated computerized environments that not only provide end-users with stand -alone features, computing functions, and content, but also integrate with enterprise databases and business applications[2].

2.1.1 HTML (Hyper Text Markup Language)

Web pages are created using *Hyper Text Markup Language (HTML)*, which is the *authoring language* used to create *World Wide Web (www) documents*. *HTML* uses special sets of instructions called tags or markup to define the structure and layout of web documents, and determine how pages are displayed in a browser[3].

2.1.2 XAMPP

web server bundle used for trial and error on Windows because of its easy installation. The *open source* program bundle contains a *web server, Apache, a PHP interpreter, and a MySQL database*, among others[4].

2.1.3 PHP (Hypertext Preprocessor)

PHP is the most popular web development language in the market today. *PHP is just an HTML markup generator*. If you look at the *PHP source code* on a web page, you'll only see *HTML tags*, maybe some *JavaScript* as well but no raw *PHP code* [5].

2.1.4 Framework

Framework as it means in Indonesian, namely a framework can be interpreted as a collection of *libraries (classes)* that can be derived, or its functions can be directly used by the modules or functions that we will develop.

One of the many PHP frameworks that is quite popular among PHP developers. *Yii* was developed by Qiang Xue on January 1, 2008, a Chinese programmer who had previously developed a PHP framework called *Prado*. Therefore, it is not surprising that Qiang also adopted the techniques used by *Prado* when developing *Yii*. Apart from being inspired by *Prado*, *Yii* is also inspired by external frameworks, namely *Ruby On Rails*, especially in its *ORM mechanism*. And there are many other inspired *Yii* frameworks like *Symfony* and *Joomla* [3].

2.1.5 Bootstrap

Bootstrap is a *framework and tools* to facilitate *responsive web applications or websites* quickly, easily and for free. *Bootstrap* itself consists of *CSS and HTML* to produce *grids, layouts, typography, tables, forms, navigation* and others. *Bootstrap* also includes a *jquery plugin* to generate beautiful UI components such as *transitions, modals, dropdowns, scrollspy, tooltips, tabs, popovers, alerts, buttons, carousels* and others [3].

2.1.6 Database

A *database is a collection of logically connected data* (a description of the data) designed to meet the information needs of an organization[6].

2.1.7 MySQL

MySQL is a fast and powerful *relational database management system*. A database allows users to store, search, sort and retrieve data easily. *The MySQL server* controls access to data to ensure that users can work at the same time, to support fast access and to ensure that only isolated users have access rights. *MySQL* uses *SQL (Structured Query Language) language*, which is the standard database *query language* for the whole world. *MySQL* has been duplicated since 1996, but with an *open source license*, but a commercial license is also available if needed[4].

2.1.8 Definition of BPMN

BPMN stands for *Business Process Modeling Notation*, which is a new methodology developed by the *Business Process Modeling Initiative* as a new standard in business process modeling, as well as a design tool for complex systems such as message-based e-Business systems. The main goal of *BPMN* is to provide a notation that is easy to use and understandable to everyone involved in the business, including business analysts who model business processes, engineering developers who build systems that carry out business, and various levels of management who must be able to read and quickly understand process diagrams that can aid in decision making. The new *BPMN* notation is also designed for the nature of web service-based systems, and the business rules that limit those occurrences. *BPMN* allows business processes to be mapped to *XML-based business execution languages* such as *BPEL4WS (Business Process Execution Language for Web Service)* and *BPML (Business Process Modeling Language)*[7].

2.1.9 Unified Modeling Language (UML)

2.1.9.1 Definition of Unified Modeling Language (UML)

UML (Unified Modeling Language) is a collaboration methodology between *Booch methods, OMT (Object Modeling Technique)*, and *OOSE (Object Oriented Software Engineering)* and several other methods, is the methodology most often used today for analysis and system design with the object-oriented adapting the widespread use of "object-oriented programming" (OOP) languages[8].

2.1.9.2 Steps to Use Penggunaan Unified Modeling Language (UML)

the steps for using the *Unified Modeling Language (UML)* are as follows:

1. Make a list of *business processes* from the highest level to define the activities and processes that may arise.
2. Map the *use cases* for each *business process* to define precisely the functionalities that must be provided by the system, then refine the *use case diagram* and complete it with *requirements, constraints* and other notes.
3. Based on the *use case diagram*, start creating *activity diagrams*[9].

2.1.9.3 Model Unified Modeling Language (UML)

Some literature states that *UML* provides nine types of diagrams, others say eight because there are several diagrams that are combined, for example communication diagrams, sequence diagrams and timing diagrams combined into interaction diagrams. However, these models can be grouped based on their nature, namely static or dynamic. These types of charts include:

1. *Class diagram (Class Diagram)*; Static in nature, this diagram shows a set of classes, between interfaces, collaborations, and relationships. This diagram is commonly found in object-oriented system modeling.
2. *Package diagrams (Package Diagrams)*; Static. This diagram shows a collection of classes, is part of the component diagram.

3. use-case diagram (*Usecase Diagram*); Static. This diagram shows the set of *use-cases* and actors (a special type of class) [10].

Research methodology is a theoretical analysis of a way or method. Carry out a series of ways or steps to solve a problem based on data obtained from the results of a study. Research is a systematic investigation to increase some knowledge, it is also a systematic and organized effort to investigate certain problems that require answers. This model is based on the need for application on an ongoing basis to screen those needs and estimate the overall project. This model applies a more dynamic design process model by continuously adapting to the needs of future business processes so that the application version continues to grow with features that have improved from time to time.

The time requirement for fast application development with a relatively small project capacity is very relevant to this spiral model. Customer engagement with the software development team will be very frequent as the customer will provide *feedback* and approval at every stage in the software application development. With *feedback* from customers, the estimated time for completing software projects becomes clearer.

Software development using the spiral model has a weakness because there are no *milestones* as a transition and testing point, so it is feared that the system development process will experience chaos in terms of the completion time of the system solution. Therefore this model is only suitable for small applications that are not integrated and distributed.

The spiral model is divided into four *quadrants*, where each *quadrant* represents a management process with the stages of *identify*, *design*, *construct* and *evaluate* (Dean Muench, 1994). The system will go through the stages of the process which will repeat as follows:

1. Defining business goals and requirements, developing conceptual designs, concept designs, test plans, and risk analysis with the involvement of users.
2. Defining system requirements, developing a logical design, compiling (*software-build*) initial designs, evaluating results by involving users.
3. Defining subsystem requirements, generating physical designs, compiling the next designs, evaluating results by involving users.
4. Defines the requirements for each unit, produces the final design, compiles the final design, evaluates the whole.

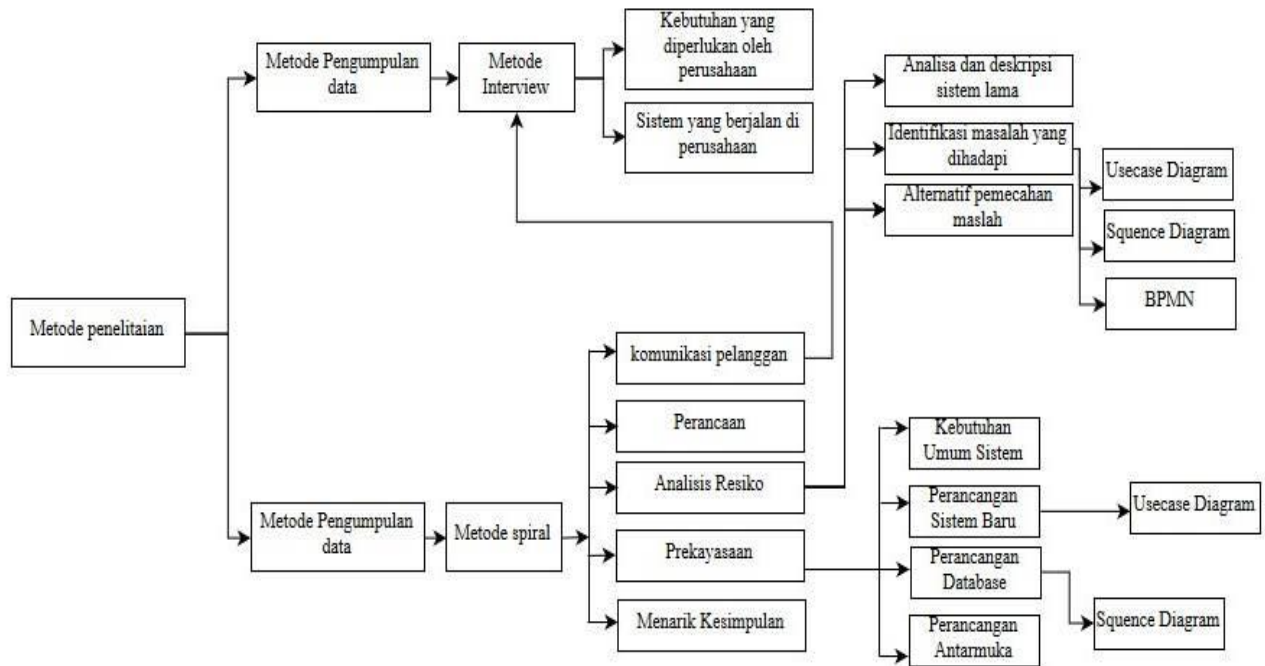


Figure 2.1 Stages of the spiral method that is applied

The following are the stages of the Research Methodology flowchart that will be used are as follows:

1. *Customer communication*: Activities needed to build effective communication between developers and users / customers, especially regarding the needs of customers.
2. *Planning*: This planning activity is needed to determine the resources, estimated time of completion, and other information required for software development.
3. *Risk analysis*: This risk analysis activity is carried out to analyze both technical and managerial risks. This stage may not exist in the process model which also uses the iteration method, but is only carried out in the spiral model.
4. *Engineering*: Activities required to build 1 or more technical representations of the application.
5. *Construction & Release*: Activities needed to develop software, test, install and provide user / customer support such as software use training and documentation such as software use manuals.
6. *Customer evaluation*: Activities required to get *feedback* from users / customers based on their evaluations during software representation at the engineering stage as well as during software installation during construction and release stages.

3. Results And Discussion

Research methodology is a theoretical analysis of a way or method. Carry out a series of ways or steps to solve a problem based on data obtained from the results of a study. Research is a systematic investigation to increase some knowledge, it is also a systematic and organized effort to investigate certain problems that require answers. This model is based on the need for application on an ongoing basis to screen those needs and estimate the overall project. This model applies a more dynamic process model design by continuously adapting to the needs of business processes in the future.

3.1 Data Analysis Processed by Storage

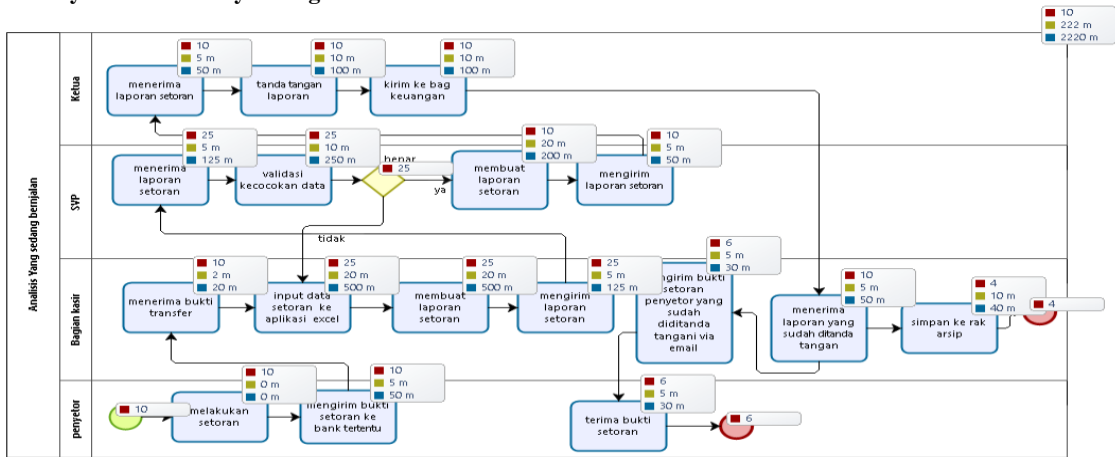


Figure 3.1 Ongoing Business Processes

3.2 Ongoing Data Analysis is Processed by Borrowing

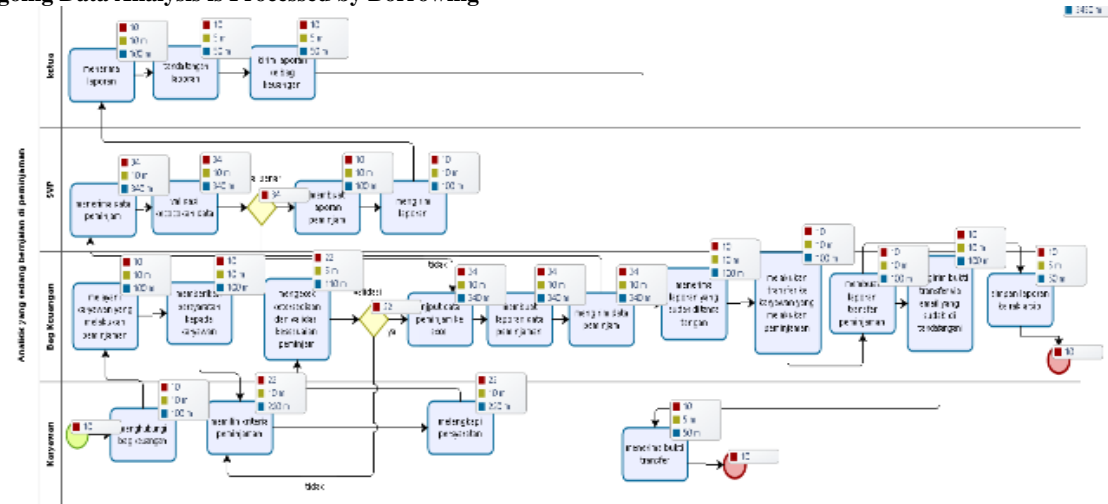


Figure 3.2 Ongoing business process lending

3.3 Analysis of the system to be built

The cashier application in the finance section is a financial application that functions to assist the finance section in making financial deposit forms, then the finance section is also tasked with making financial reports through a system that will be built later after the entire process, the finance section is also in charge

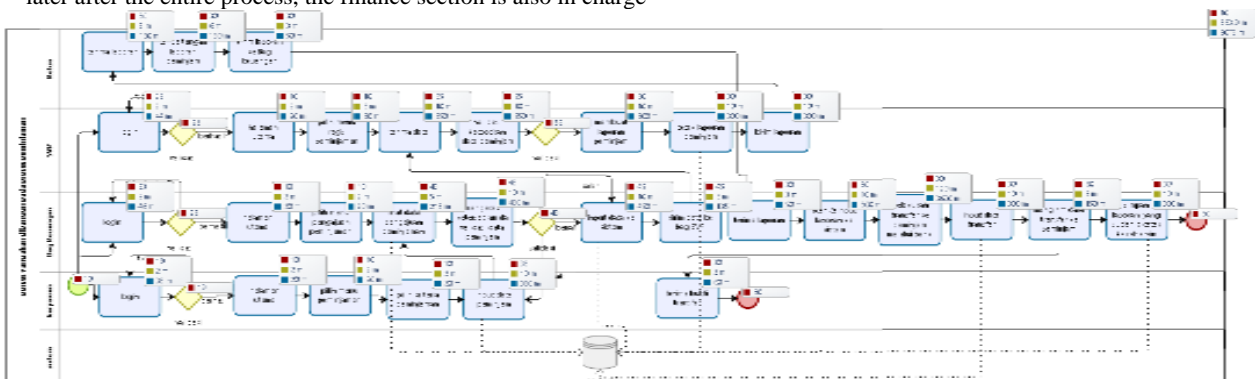


Figure 3.3 Business Processes that will be built on lending

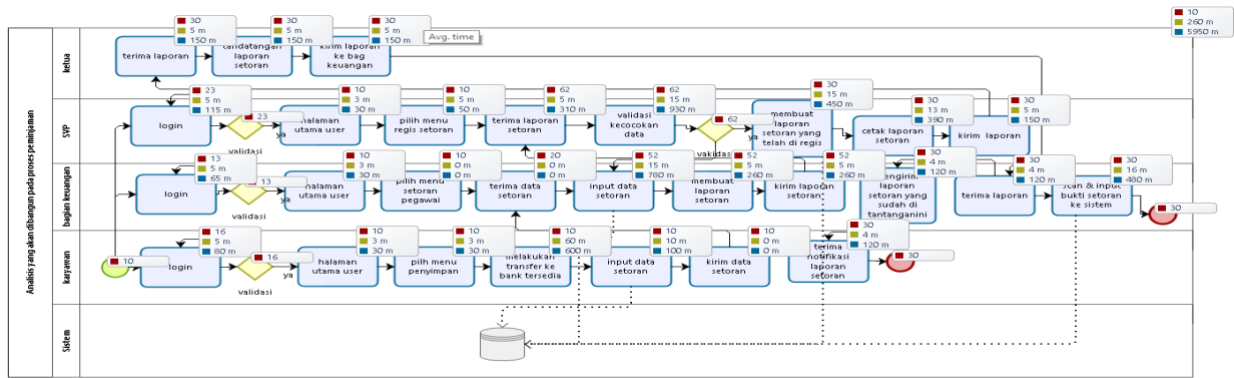


Figure 3.4 Business Process Which will be built on storage

3.4 Use Case Diagram

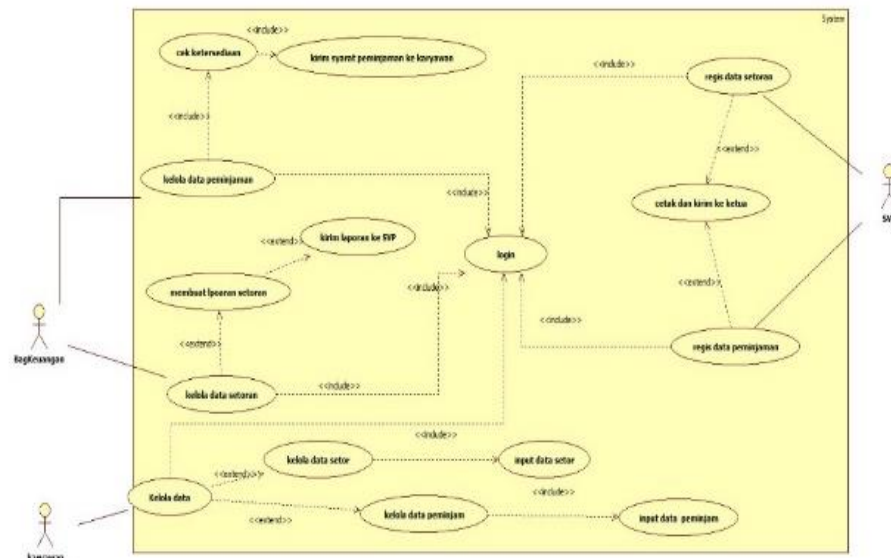


Figure 3.5 usecase diagram

3.5 Class Diagram

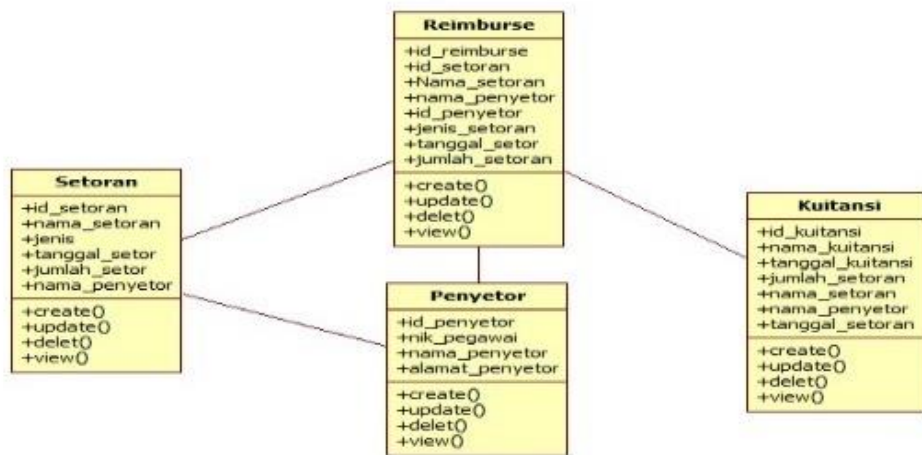


Figure 3.6 Class Diagram

4. Conclusion

After analyzing the problems that occurred in the PT.Telekomunikasi Indonesia.Tbk Cooperative , improvements were made to the problems encountered, namely by building an application that supports *web-* based financial processes .

With the development of this application , the benefits obtained are as follows:

1. Produce applications that can help and facilitate the Finance Department to find out the amount of seller data and deposit amounts in *real time*.
2. Produce applications that can manage the need for data that has been received by the admin.

3. Produce applications that can become web applications that are easily understood by all parties involved in the checkout process, so that this system can be a highly developed application that runs well and according to procedures.

5. Suggestions

From the conclusions above, there are several suggestions that are expected to help and overcome the shortcomings of this application, namely updating this application can be developed by adding several new features that can facilitate *web use*, such as:

1. There is an Android-Based Application.
2. The construction of a very feasible system that will satisfy all Telkom Group employees.

References

- [1] PengertianAhli”2017.[Online],Available:<http://www.pengertianahli.com/2014/08/pengertian-analisis-apa-itu-analisis>. [Diakses 30 Agustus 2017].
- [2] Alatas, H., *Responsive Web Design dengan PHP dan Bootstrap*, Lokomedia, Yogyakarta, 2013.
- [3] Shelly, G.B., Woods, D.M., & Dorin, W.J., *HTML, XHTML, and CSS Comprehensive (6th Edition)*, Cengage Learning, Boston, 2010.
- [4] Welling, L. & Thomson, L., *PHP and MySQL Web Development (1st Edition)*, Sams Publishing, United States of America, 2001.
- [5] MacIntyre, P., Danchilla, B. & Gogala, M., *Pro PHP Programming*, Apress, New York, 2011.
- [6] Connolly, T.M. & Begg, C.E., *Database System : A Practical Approach to Design, Implementation, and Management (5th Edition)*, Addison-Wesley, London, 2010.
- [7] D. Rosmala dan Falahah, "Pemodelan Proses Bisnis B2B dengan BPMN (studi kasus pengadaan barang pada divisi logistik)", Seminar Nasional Aplikasi Teknologi Informasi SNATI, 2007, pp. J63-J64.
- [8] Nugroho, A., *Rekayasa Perangkat Lunak Menggunakan UML & Java*, Andi, Yogyakarta, 2009.