

## DESIGN AND IMPLEMENTATION OF RANDOM WALK STOCK ANALYSIS FOR CONSTRUCTING INVESTMENT ANALYSIS ON CAPITAL MARKET

Satia Nur Maharani  
Faculty of Economics  
Universitas Negeri Malang, Indonesia  
Email: tiamaharani@ymail.com

Ludi Wishnu Wardana  
Faculty of Economics  
Universitas Negeri Malang, Indonesia  
Email: ludiwisnu@yahoo.com

Agus Wedi  
Faculty of Education  
Universitas Negeri Malang, Indonesia  
Email: aguswedi123\_um@yahoo.com

---

### ABSTRACT

*Lack of effective learning medium for students to hone and improve investment analysis in particular on the subject Investment Management Capital Markets propel this research. Done by design, build and implement a prototype of software random walk stock analysis that is built through collaboration software Navqat MySQL, Adobe Dreamweaver CS 5, processing images Adobe Photoshop Cs 5 and notepad where software designed object-oriented (Object Oriented with UML notation) approach Software Development Life Cycle (SDLC). Object Oriented Approach (with the notation UML) and the Software Development Life Cycle (SDLC) build a media that has the ability to transform the user (student) to act as investor and as an investment analyst in the real world. Thus far has not been available a prototype of software random walk stock analysis that is built in the form of instructional media constructively where students play an active role in solving models of computation analysis macromultimedia both formulas quantitative and graphs using the approach Object Oriented (with the notation UML) and the Software Development Life Cycle (SDLC). In general, the research design used in this study is based on research design development proposed by Borg and Gall (1983) and for the construction of software collaborated with the approach of Software Development Life Cycle (SDLC) which was initiated by McLoead-Jr et al. (2009). Software Development Life Cycle (SDLC) in accordance with the purpose of software random walk stock analysis is to transform the role of investors and investment analysts in the real world to students so as if students enter the world of investors and analysts. Software Development Life Cycle (SDLC) is implemented in phases Develop Preliminary form of Product proposed by Borg & Gall.*

Key words: Investment Analysis, Random Walk Stock Analysis, Instructional Media

---

### I. Introduction

Investment when viewed from the meaning of the word has two dimensional sense: first, placing the funds on financial assets that are financial assets or real assets to get the results later in the day. Second, investment is capitalizing time, matter, energy to earn income at a later date (Victor et al, 2009). The basic philosophy is the higher investment rate of return it will be followed by an increase in risk. To reduce risk and obtain optimal results of investment is needed for effective management. Conducting investment analysis before making investment decisions is one form of effective management. Effective management of a portfolio of one indicator is through the analysis of a variety of information in the market. The information is divided into two categories: fundamental information and a technical information (Alan et al, 2011).

In the capital market education one of the strengths of students to be able to face the dynamic practice in the field is the ability to conduct a technical and fundamental analysis by analyzing financial reports and graphs volatility of stock price movements. But would require a huge cost and time consuming when the analysis was conducted by transactions in real terms. Therefore, most students do not choose an alternative investment in real terms to cultivate and hone analytical skills but simply rely learn the theory without being followed by practice. This condition affects the student's inability to fully comprehend the capital market so that there is a gap between the world of education with practice.

A hundreds of financial ratios, inflation, economic events and thousands of charts of stock price movement is very difficult to understand by students when learning patterns done traditionally. Students are not able to think constructively because of the difficulty of capturing and understanding the process of analysis of stock trading by investors on the trading floor. Therefore we need other alternatives through the development of instructional media effectively and efficiently able to sharpen and improve the ability of a technical and fundamental analysis as the real picture of the behavior of investors in the capital market.

Lack of effective learning medium for students to sharpen and improve investment analysis in particular on the subject Investment Management Capital Markets encourage research by designing, develop and implement random walk stocks analysis

software. built through collaboration software Navqat MySQL, Adobe Dreamweaver CS 5, the image processing Adobe Photoshop Cs 5 and notepad where applications designed object oriented (Object Oriented with UML notation) using the approach of Software Development Life Cycle (SDLC)

Through the collaboration of various language programs will be awakened application macromultimedia serving the data analysis of a technical and fundamental visual and audiovisual in graphic form, economic information, the Charta, and visualization of historical data connected automatically to each issuers (companies that list in capital market). Transform the object-oriented design analysis model is created, using object-oriented analysis into a design model that serves as a blueprint (blue print) building software. SDLC is the process of how an information system (IS) can support business requirements, designing the system, build it, and send (deliver) to the user.

#### Instructional Media

Media is a tool that has the function of conveying the message (Bovee, 1997). Instructional media is a tool that serves to convey a message of learning. Learning is a process of communication between learners, teachers and teaching materials. Communication will not run without the help of conveying the message or media. The forms of stimulus could be used as a medium of which is the relationship or human interaction; reality; moving images or not; written and recorded sound. The fifth form of stimulus will help learners to study physics. However, it is not easy to get the fifth form in one time or place.

Good instructional media must meet several requirements. Instructional media should increase learner motivation. The use of media has the goal to motivate learners. In addition, the media also should stimulate learners remember what they have learned in addition to providing new learning stimuli. Good media also will enable the learners to provide responses, feedback and also to encourage students to practice correctly. There are several criteria for judging the effectiveness of a media. Hubbard proposes nine criteria to vote (Hubbard, 1983). The first criteria is cost. Costs had to be judged by the results to be achieved by the use of the media. Other criteria are the availability of facilities such as electricity, compatibility with class size, conciseness, the ability to be changed, the time and effort to prepare, the effect that, the complexity and the latter is usability. The more the learning objectives that can be helped hence the better the media.

## II. Basic Theory

### 2.1 Object-Oriented Analysis

Object-oriented technology is a software engineering approach that is based on the object and class. Approach using object modeling for system analysis is called object-oriented analysis. Object-oriented analysis (object oriented analysis) by Eleanor et al. (2002) used to (1) study the existence of the object, and the object can be re-used or adapted for the use of new and (2) determination of the new objects that will be combined with existing object into a useful business computing applications.

### 2.2 Object-Oriented Design

Object-oriented design to transform the analysis model created using object-oriented analysis into a design model that serves as a blueprint (blue print) building software (Eleanor et al. 2004). Generating object-oriented design or designs that achieve a number of different levels of modularity. The nature of this unique object-oriented is on the ability to build four software design concepts are important, namely: abstraction, information hiding, functional independence and modularity.

### 2.3 Object-Oriented Programming

Extend object-oriented programming design models into executable domain. Object-oriented programming language used to translate classes, attributes, operations, and messages into a form that can be executed by a machine. Object-oriented programming is to combine data and functions for accessing the data into a unified unit. Units in known object (object). Three main characteristics of object-oriented languages are encapsulation, inheritance, and polymorphisms.

### 2.4 Unified Modeling Language (UML)

In general the Unified Modeling Language (UML) is used for the two interests, namely for modeling software development and business modeling. UML does not specify a method of system development, only a notation that is now widely accepted as a standard object modeling. Viewed from the standpoint of system modeling in UML then there are different aspects.

1. The viewpoint of functional use case shows that the system is done by external actors.
2. The logical viewpoint shows how the functional design of the system, in relation to the static and dynamic behavior of the system.
3. Viewpoint component shows the organization of code components.
4. viewpoint concurrency show concurrency in the system, addressing issues with communication and synchronization are presented in concurrency system.
5. viewpoint deployment shows the deployment system into the physical architecture of the computer and devais called nodes.

The approach is usually used for modeling the functional aspects of a system called use case modeling (use case modeling). Use case modeling is the process of modeling the functional systems in business processes, who is doing the action (event) and how the system responds. Use case is a software behavior associated with the sequence of steps either automatically or manually. The actor is an entity that interacts with the system, an actor can be a user, rules, other systems, external organizations, external devais, and other external entities that interact with the system.

### 2.5 Business Modeling

Business modeling is a modeling technique that is used to describe a model of business. In an organization there are many business processes are a series of logically connected tasks performed to achieve the end result of business that has been determined. Business processes can be a set of activities designed to produce a specific output for the customer. A business process emphasizes on how a job is done by an organization. The process is a sequence of certain activities with respect to time and place. Some elements used in the modeling business is a business use case model and a business object model. Business use case model consists of business actors, business use case and activity diagrams, while the business object model consists of business workers and business entities.

#### 2.6 Relational Database Management System (DBMS)

The database has become an integral part of almost every human life. Without the database, many things that he would be very boring and not well structured, it may even be something that can not be done. Libraries, universities, government offices and banks are some examples of organizations that rely heavily on database systems, especially on the order data or search data. In the world of the Internet, search engines, online shopping (online stores), and every website that provides a wealth of data will not work without using the database. The database already implemented or used in a computer is usually connected to the database server. In general terms RDMB this could be interpreted as "DB" which means the database is the repository collection, "MS" or the management system (management system) is software that helps process the data, which include insert, retrieve, modify, or delete a record in the database data and "R" or "relational" means any attachment or a good relationship in DMBS are interlinked information stored in a table with information in another table.

#### 2.7 Investment Management

Investment is any activity placing funds on financial assets that are financial assets or real assets to get a result in later days. To reduce the risk of investment and obtain optimal results of investment is needed for effective management. The process of managing property or money is referred to as investment management. The money management process to be done if someone who is professional in the field of financial knowledge is referred to as the investment manager. Investment managers perform a wide range of understanding and analysis of various types of financial assets, financial assets and creates assessing investment strategies for selecting and evaluating the financial assets to be included in the investment portfolio.

### III. Research Design

In general, the research design used in this study is based on research design development proposed by Borg and Gall (1983) and for the construction of the program collaborated with the approach of Software Development Life Cycle (SDLC) which was initiated by McLoead-Jr et al. (2009). This collaboration is done because previous research has awakened database but still using traditional applications and has some problems that have been described in the previous section. Software Development Life Cycle (SDLC) is a method that is able to accommodate the design and implementation of systems that are perfect from what has been awakened before. In addition to the Software Development Life Cycle (SDLC) in accordance with the purpose of software random walk stock analysis is to transform the role of investors and investment analysts in the real world to students so as if students enter the world of investors and analysts. Software Development Life Cycle (SDLC) is implemented in phases Develop Preliminary form of Product proposed by Borg & Gall.

Systematic development of media in the model program Borg & Gall focuses on media issues that have a tendency to be utilized in the process of formal education. In addition, systematic development model Borg & Gall to give freedom to the researcher to combine a variety of other research methods in designing and building a learning media. In the systematic development, there are steps to be undertaken in order to achieve the expected results. The steps include: (1) Research and Information collection; (2) Planning; (3) Develop Preliminary form of the Product; (4) Preliminary Field Testing; (5) Main Product Revision; (6) Main Field Testing; (7) Operational Product Revision; (8) Operational Field Testing; (9) Final Product Revision; (10) Dissemination and Implementation.

### IV. Result

1. Research and Information collection. Research and information gathering, which included a literature review, observation or classroom observation and preparation of the initial report. Early research or analysis needs is essential in order to obtain initial information to carry out the development. The first step taken by the researchers are extracting information to the Indonesia Stock Exchange to make a comparative study, dig up information to faculty adviser subjects Financial Management (as a prerequisite subjects) as well as courses Investment Management Capital Markets, observations on the availability of hardware, software, intranet, the Internet, the amount of bandwidth that has been used in the Faculty of Economics, University of Malang as a means of research, as well as the study of literature. Thus, the developers get information, a picture and input in the design and implementation of media in order to meet the learning objectives of courses Investment Management Capital Markets. The substance of the media is able to accommodate all the interests of learning that through the media, students have the ability to make investment analysis as a basis for formulating investment strategy as in practice in the real world.
2. Planning. Develop research plan, including the abilities required in the conduct of research, the formulation of the goals to be achieved by the study, design or research steps, the possibility of testing in a limited scope. The most important aspect in planning is a statement of objectives to be achieved by the products that will be developed. As described in the previous chapter that in the aspect of learning, especially in the subject of Capital Markets Investment Management discusses the fundamental concepts in investment theory, the theory of capital market and investment portfolio theory. After studying this course, students have the knowledge and understanding of essential concepts, techniques contained a mechanism in investment management to make investment decisions, prepare investment strategy, analyzing investments, preparing

investment portfolios, evaluate investment portfolio as well as to implement in practice. The basic foundation for achieving the expectations mentioned above is the mastery of a technical and fundamental analysis are covered for one semester starting from basic level until ready to practice. Therefore, the goal is to increase the ability of constructive media students in a technical and fundamental analysis as a basis for making investment decisions, prepare investment strategy, analyzing investments, prepare and evaluate investment portfolio investment portfolio.

3. Develop Preliminary form of Product. After initiation in the planning is complete, the next step in R & D is to develop an early form of learning products that can be tested. In the development stage of this product, in addition to preparing the grains of material also makes the instrument to get feedback from users. Before the trials conducted so require responses peers in this case the expert lecturers on the course Financial Management, Capital Markets and Investment Management Educational Technology. Additionally, the Develop Preliminary stage form of Product, collaborative approach to Software Development Life Cycle (SDLC) which was initiated by McLoead-Jr et al. (2009) for the construction of the software is done. The grains of the material that is built into the software random walk analysis stock adapted to the purpose built media. This media program provides random walk stock analysis of all listed companies listed on the Indonesia Stock Exchange in the period 7 tahun from 2005 to 2015 (the financial statements for 2012 published in 2013) for the purpose of enhancing the effectiveness of teaching and learning courses Investment Management and Analysis Capital Markets, Data financial accounting report and the movement of the stock price volatility is taken from the following sources yahoofinance.com, Indonesia Capital Market Directory (ICMD) published by the Institute for Economic and Financial Research (ECFIN) and web Indonesia Stock Exchange is idx.co.id. Content material divided in two on the above analysis that is formulated as follows:

a) Fundamental analysis:

- The financial statements of the issuer
- The state of the economy such as inflation, interest rates, trade balance, etc.
- Analysis of financial ratio is the ratio of profit to shares outstanding (earnings per share EPS), the ratio of EPS growth, the ratio of stock price to earnings per share (price earnings ratio), the ratio of stock price to earnings growth the company (price earnings growth ratio), share price to sales ratio (price / sales ratio), the ratio of stock price to book value (price book value), the company's debt ratio (debt ratio), net income margin (net profit margin).
- Consumer Price Index (CPI), Employment Cost Index (ECI), Employment Report, Gross Domestic Product, the Producer Price Index
- The condition of the issuer's industry (JCI, the German DAX, Down Jones US)
- The price of other industries such as oil, precious metals and foreign exchange, the value of the shares of competitors.

b) Technical analysis

- The movement of stock prices is presented in a line chart, bar chart and chandelstick chart.
- reference indicators used are either Moving Average Simple Moving Average (SMA) Weighted Moving Average (WMA), and Exponential Moving Average (EMA).

4. Based on the identification of objectives and assessment material on top, then drafted the manuscript media in the form of software program design random walk stock analysis using the System Development Life Cycle initiated by McLoead-Jr et al. (2009) in A Project Management of System Development Approach. System Development Life Cycle or SDLC is hereinafter referred to as the manufacturing process as well as the conversion of systems engineering and software engineering as well as the models and methodologies used to develop these systems. Therefore, in the script writing stage of construction media or media using SDLC initiated by McLoead-Jr et al. generally refers to the computer or information systems. The main stages and steps of each stage is divided into three main activities, namely the analysis, design and implementation.

Each activity in the SDLC can be explained by objective (purpose) and the results of its activities (deliverable). If the main activities are translated into measures that can be described in more detail as follows:

I. Analysis Phase. In this analysis phase, used by systems analysts for:

1. Make the decision when the system that had been built previously had problems or is not functioning properly and the results of analysis used as the basis for improving the system
2. Knowing the scope of work to be handled.
3. Understand that the previous system.
4. Identify problems and find solutions

II. The activities carried out in the analysis phase are:

1. Problem detection

- a) Purpose: Detecting system, if the system is now diminishing benefits (worse).
- b) Results: The preliminary report on the problems that occur in the system.

2. Initial investigation

- a) Purpose: Menomerikan current system with an emphasis on areas - areas that cause problems.
- b) Results: Explanation of the current system.
- c) Requirement analysis (determination of ideal systems)

Objective: Obtain the consensus of the community of users of information systems are ideal. A replacement system will cause the distance between the current system with the ideal system (which refers to computerization).

III. Results: Explanation needs analysis of the system.

Generation of system alternatives

- 1. Objective: Explore difference of an alternative system to reduce the distance (gap) between the current system with a system ideally.
- 2. Results: The documents of the alternative system to be used to improve the system.

Selection of proper system

- 1. Objective: To compare alternative-alternatif system using structured methodologies, selecting the best alternative system, and sell (sell) to management.
- 2. Results: The results of the study system.

IV. Phase Design / Design.

In the design phase (design) has the objective to design a new system that can resolve the problems faced by alternative election system is the best. Activities undertaken in the design phase are:

1. Output design

a. Objective: describing the forms of reports and documents system.

b. Results: The form of the documentation output (output).

2. Input design

a. Objective: describing the shapes on the screen to input didokumen and information systems.

b. Results: The form of documentation input.

3. File design

a. Purpose: To provide forms of files that are needed in information systems.

b. Results: The form (forms) of the documentation file.

III. Implementation Phase. In the implementation phase has several objectives, namely to:

a. Conducting logical design specification into actual activity of an information system that will be built or developed.

b. Implement the new system.

c. Ensure that the new system may be optimized.

The activities carried out in the implementation phase are:

1. Programming and testing

b. Purpose: Convert the logical design into the operations of coding by using a particular programming language, and test the all programs and make sure all the functions / modules of the program can be run properly.

c. Results: Coding program and program specifications.

2. Training

a) Purpose: Lead (conduct) training in using the system, site preparation training and other tasks related to the training denganp (guidebooks system).

b) Results: Training plan systems, modules katihan and so on.

3. System changeover

a) Purpose: Changing the use of the old system to the new system of managed information system dibangun. Perubahan system is the responsibility of the user to the designer team sistes (user organization).

b) Results: The plan (timetable and methods) changes in the system (contract).

## Implementation Program

After the production design random walk software stock analysis conducted, then the next stage is building prototypes. This stage is an activity where all the things that had been developed in its production design is implemented in an integrated computer applications and content with a dish that has been prepared. In making the simulated learning, there are six important criteria that must be met and does not only apply to the simulation, but for the whole learning experience. Six criteria are grouped into two parts, namely: the content and delivery. Content section consists of systems, cycles and linear; while the delivery consists of a simulation, games (games) and learning or pedagogy (Clark, 2005).

b. Application For Server Side

Simulation is the main part of the application program on the server side, serves to set the type of simulation used online or offline, carry out simulations offline or online, and download the data (in the offline simulation) for a specific time period. The following prototype for simulation aspects:

The function of each component can be described as follows.

1. Each class will begin random walk stock analysis maka must enable the "SIMULATION PROGRAM RESET" beforehand. The data will be used for simulation must be arranged in advance through this button. Reset simulation program has two functions, namely the sense in re mengetaur previous data or reset data to be used in the simulation. The effect of this process is the data of previous transactions (if any) will automatically be deleted, the user on the previous games in the logout automatically by the server, the user's financial position is automatically the same as the initial capital is given, and the value of shares to 0 (empty).
2. The type of simulation to be used. Applications random walk this stock analysis can serve a simulation in two activities, both online and offline. If the user wants to use an application program random walk analysis online stock then enter the online menu and click the START button on kotek online. Of course before starting the random walk simulation activity online stock analysis, an internet connection must have been successfully executed. Instead, apabila user choose to do a random walk in offline stock analysis, the user enters the offline menu and click the START button. To run the random walk stock offline analysis, there are some things that need to be prepared. First, the random walk stock offline analysis does not require an internet connection. Second, the historical data base application must be activated in advance where historical data can be in download through <http://finance.yahoo.com> site. Third, the service is offline and offline menu also provides several functions ie "Pause" is used to pause the simulation process. Can be used if desired during the simulation there is a "break time" eg "recess" for participants to eat, pray or there is a problem on one of the computers of participants so that the simulation is paused until the problem can be addressed participants on the computer, and others. "Continue" is used to continue the simulation process after the "break time" and "Stop" are used to stop the simulation process .
3. Indicator Simulation. Serves as a progress indicator and simulation is running. Stock Database shows the historical data used for random walk stock analysis secara offline. For example, as the example below, written Database Stock earliest date 25 September 2005 and the end date of November 7, 2015. This shows the application software stocks random walk analysis has historical daily stock trading data 25 september 2005 to november 7, 2015. While the period of simulation shows the use of historical data on the random walk stock trading stock analysis. For example, the simulation period are listed starting from 15 July 2010 until 15 September 2011, the random walk analysis uses historical data of stock trading that occurred starting on July 15, 2010 to 15 September 2011. It automatically every minute of this data will change in a trading range which occurred on July 15, 2010 until September 15, 2011, while progress Friday, December 17, 2010 shows the "as if" on the trading activity carried out. User management is part associated with the prototype set of client functions. This user management including substance part in running the random walk stock analysis.

The menu configuration has an important role to regulate the course of the simulation. General configuration menu consists of 3 parts, the user configuration, the configuration of online and offline configuration. User Konfigurasi serves to regulate some aspects of the simulation is the first initial setting, determining the initial capital provided to each user (client / participants). The amount of capital for all users are the same and will turn increasingly large or small depends on the ability of the user in the trading activity. Second, what is the number of shares set yang traded in 1 lot. For riel stock trading in the Indonesia Stock Exchange, shares 1 lot is 100 shares. For purposes of flexibility, then Simulation software stock trading can be set as desired. Third, set the percentage purchasing fee. Real stock trading in the Stock Exchange Indonesia require some costs such as transaction costs, costs for brokers and dealers, and others. Investors in real transactions should provide fee  $N\% + \text{VAT } 10\%$  of the transaction value to brokers.

In this simulation the value of the fee can be set so as to adjust the actual development of the condition. This section is also used to accommodate the existence and function of brokers on actual transactions. In addition to brokerage fees, the investor is also required to issue a seeling fee on each sale for  $N\% + \text{VAT } 10\% + \text{Income taxes } 0.1\%$  of the transaction value to brokers. In this simulation value fee (include tax) can be set so as to adjust the actual development of the condition. This section is also used to accommodate the existence and function of brokers on actual transactions. Fourth, set the date of the chart used in the activity of a random walk analysis stock stock. At this stage a technical analysis of the ability of the student or anyone simulated users tested. A technical analysis of the activity of analyzing the behavior of the market through market price movements are represented in graphical form.

This chart formation depends on an increase or decrease in the stock price according dengan historical data base stock is selected. This chart has not been formed at the initial start simulations carried out, but in line with price movements of shares traded, graphic random walk analysis ini stock will move according to the movement of price changes saham. Rumus of the graphic display is as follows: Initial chart = date of beginning of the simulation - distance Date

For example note dated July 15, 2010 beginning of the simulation within a simulation date chart of date = 30 (days), then the program will display a graph of stock fluctuations starting September 15, 2011 until the date when the simulation progress.

Offline configuration. Serves to adjust settings during offline simulations carried out, which includes the replacement interval of historical data, ie data stock value that has occurred in the last period of time and determines the start date and end date of the simulation. The final function of the configuration is Online configuration to adjust the settings at the time of online simulation carried out by the daily share price movements that occur at this time.

#### c. Client Side Application

Applications on the client side is a random walk stock analysis program that is destined for the user / client. Display of client side applications appear in the image below:

SYMBOL	NAME	DATE	PRICE	CHANGE	OPENING	HIGH	LOW	VOLUME
AAII	Astra Agro Lestari Tbk	17-Dec-10	22,170	-1,730	23,900	24,200	23,100	2,815,500
ABBA	Mahaka Media Tbk	17-Dec-10	80	0	80	95	80	0
ABDA	Asuransi Bina Dana Arta Tbk	17-Dec-10	510	0	510	540	510	0
ACES	Ace Hardware Indonesia Tbk	17-Dec-10	2,597	-53	2,650	2,650	2,625	409,500
ADES	Akasha Wira International Tbk Tbk	17-Dec-10	1,710	0	1,710	1,760	1,700	215,000
ADHI	Adhi Karya (Persero) Tbk	17-Dec-10	874	-26	900	920	890	4,029,500
ADMF	Adira Dinamika Multi Finance Tbk	17-Dec-10	12,200	-50	12,250	12,250	12,200	1,500
ADMG	Polychem Indonesia Tbk	17-Dec-10	235	5	230	240	230	15,501,500
AHAP	Asuransi Harta Aman Pratama Tbk	17-Dec-10	104	-3	107	107	107	17,500
AIMS	Akbar Indomakmur Stimec Tbk	17-Dec-10	130	0	130	130	130	0
AISA	Tripla Piar Segahtera Food Tbk	17-Dec-10	760	-30	790	810	750	16,178,500
AKKU	ALAM KARYA UNGGUL Tbk Tbk	17-Dec-10	107	-13	120	120	107	3,000
AKPI	Argha Karya Prima Ind. Tbk	17-Dec-10	960	-50	1,010	1,030	960	199,000
AKRA	AKR Corporindo Tbk	17-Dec-10	1,680	10	1,670	1,700	1,660	14,355,000
AKSI	MAJAPAHIT SECURITIES Tbk	17-Dec-10	101	0	101	102	101	0
ALFA	Alfa Retailindo	17-Dec-10	3,000	0	3,000	3,000	3,000	0
ALKA	Alakasa Industrindo Tbk	17-Dec-10	800	0	800	800	800	0
ALMI	Alumindo Light Metal Industry Tbk	17-Dec-10	812	-48	860	860	860	500
AMAG	Asuransi Multi Artha Guna Tbk	17-Dec-10	145	-3	148	148	145	240,500
AMFG	Asahimas Flat Glass Tbk	17-Dec-10	5,050	0	5,050	5,050	4,950	37,000
ANTA	Anta Express Tour &	17-Dec-10	185	0	185	215	185	0
ANTM	Aneka Tambang (Persero) Tbk	17-Dec-10	2,300	-50	2,350	2,375	2,225	26,384,000
APIC	PACIFIC STRATEGIC FINANCIAL Tbk	17-Dec-10	245	0	245	250	230	95,500
APLI	Asiaplast Industries Tbk	17-Dec-10	90	1	89	91	89	8,000
APOL	Arpeni Pratama Ocean Line Tbk	17-Dec-10	120	10	110	120	110	666,500
ARGO	Argo Parites Tbk	17-Dec-10	1,300	0	1,300	1,300	1,300	0
ARNA	Arwana Citramulia Tbk	17-Dec-10	290	10	280	290	280	338,500

The client application consists of three main menu OLT (Online Trading), Monitoring Stock and ranking (Top gainer). Menu OLT is a button that enabled the client to buy and sell stocks. Inside the box there OLT menu menus for investors to choose what stocks will be bought or sold and the number of lots to be traded. As for the monitoring menu tock give pilihan for the user to learn the shares will be traded. A technical and fundamental analysis is done the client through the monitoring menu stock. The last menu on the client application is the ranking (Top Gainer) where the function is the same as the ranking on the application server that has been described above, namely to see the position or ranking users on a random walk analysis stock stock. Example of a technical analysis appear in the image below:



Stock movement chart above are arranged in line with the movement of the stock price. There are three lines with different colors in which the black line shows the stock price while the red and blue lines indicate a reference indicator. This indicator helps the user in determining the attitude of the trade whether to buy or sell shares they own.

**Conclusion**

Investment management is a subject that has teorti characteristics and practices. This characteristic has important implications on the achievement of learning goals is the ability of students to understand the concepts and practical aspects of investment in fundamental and a technical analysis. Random walk stock analysis software built in accordance with the adaptive analysis process shares in the Indonesian Stock Exchange is an effective learning media for the achievement of learning objectives of investment management.

Random walk stock analysis software that has been designed and implemented is equipped with the function of a technical analysis of stocks, the financial statements as fundamental analysis tools, as well as using data taken from the site for free finance.yahoo.com. This analysis tool is used to cultivate and hone the skills of a technical analysis and fundamental stock mahasiswa. Program random walk analysis application is a form of random walk integrated stock analysis using a computer, based on historical data (stock price data in the past) or data on line through Internet. The program is designed in the form of packets in a client-server computer network so that it can be played by multiple users or participants simultaneously

## References

- Aldirich, Clark., 2009., *Six Criteria of an Educational Simulation*, www.simulearn.net
- Fakhrudin, M., Firmansyah, M., Hadianto, M., Sopian., 2001, *Analisa Teknikal Saham dengan Metastock*, Buku Satu, PT. Elexmedia Komputindo, Jakarta.
- Husnan, Suad., 1998, *Dasar – dasar Teori Portofolio dan Analisis Sekuritas*, UPP AMP YKPN, Yogyakarta.
- Hartono, Jogianto., 2008, *Teori Portofolio dan Analisis Investasi*, BPFE, Yogyakarta
- Kakiay., Thomas, J., 2004, *Pengantar Sistem Simulasi*, Penerbit Andi, Yogyakarta.
- Kutsurelis., Jason, E., 1998, *Forecast Financial Market Using Neural Net: An Analysis and Design Methods and Accuracy*, Naval Postgraduate School, Monterey, California.
- McLocead-Jr., Raymond., Jordan, Elanor., 2002, *System Development of Project Management Approach*, John Wiley & Sons., Inc.
- Premsky, Mark., 2001, *Digital gamed Based*, McGraw-Hill, New York.
- Santyasa, Wayan, I., 2009, *Metode Penelitian Pengembangan dan Teori Pengembangan Modul*, Makalah Disajikan dalam Pelatihan Bagi Para Guru TK, SD, SMP, SMA, dan SMK Di Kecamatan Nusa Penida kabupaten Klungkung
- Sadiman, S., Arief, 2009, *Media Pendidikan: Pengertian, Pengembangan dan Pemanfaatannya*, CV. Rajawali, Jakarta.