DESIGN OF BUILDING CONDITION LEARNING MODELS SEMAPHORE PASSWORDS BY USING VISUAL STUDIO PROGRAMMING

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ABSTRACT

The design of Semaphore Password Learning Mode Using Visual Studio Programming is an application designed for semaphore coding learning. So far, learning has been done manually by means of drills from the instructor. With this application is expected to accelerate the learning process. Learning is done by clicking the alphabet button in the application, then the system will display the image of the letters in the application. To test skills, it can be done by the instructor sending practice questions to the server application, then the students will answer in the client application. In making the application the author uses the System Development Live Cycle (SDLC) in building software.

Keywords: Semaphore and Lesson Application.

1. INTRODUCTION

1.1 Background

The skill of playing semaphore is one of the skills that must be mastered by Indonesian Navy Communications personnel to support their main duties in the service. However, memorizing the semaphore code until proficient and skilled is not easy and it takes a long time. Many factors influence the learning process, including learning modes that are less attractive so that interest in learning will decrease.

A soldier who has sufficient provisions will be able to work professionally because speed and security in sending information is one of the necessities in sending information, in exchange of information to the Indonesian Navy, especially on KRI using several means either through audio, visual media or a combination of the two . Along with the development of technology, modern ways of sending news in the form of data communication are also available, however, audio and visual transmission is still used. One of the visual media for sending news is the semaphore signal.

Semaphore is a coding art used in the Indonesian Navy for

send and receive news using a flag device by reading the final movement of the hand. Information obtained from Semaphore codes based on hand position. In the Indonesian Navy, the process of delivering news is usually carried out on the deck, a signal carried by two personnel, one person as a player holding the semaphore flag, then another personnel as an assistant who will

assist in the process of sending and receiving messages.

The use of Semaphore Codes for training and operations in the Indonesian Navy. Using Semaphore Codes as a simple way of conveying information without using electronic devices is one way to avoid hacking information. Along with the development of increasingly rapid technology, it is possible to create a learning system based on computer electronic devices to simplify the current learning process for the Semaphore Password Signals and to complement existing conventional learning methods, namely by direct drill from the instructor.

To follow up on these problems, the writer wants to raise this problem into a final project entitled Design and Build Learning Mode Password Semaphore Using Visual Studio Programming..

1.2 Problem Formulation

Based on the description of the background, the problems can be formulated:

a. How to create a semaphore crypto learning system using Visual Studio programming as an interactive, interesting and easy-to-understand learning medium to complement existing conventional methods?

b. How to make a semaphore cipher learning system using Visual Studio programming that can display a semaphore cipher signal visualization in the form of an image using the C # program?

c. How to make a semaphore password learning system using Visual Studio programming that is integrated with the teaching computer via TCP / IP client-server *?*

1.3 Research Objectives

The Research Objectives of this research are:

a. To create a semaphore crypto learning mode using Visual Studio programming as an interactive, interesting, and easy-to-understand learning medium to complement existing conventional methods.

b. To create a semaphore cipher learning mode using Visual Studio programming that can display semaphore cue visualization in the form of an image using the C # program.

c. To create a semaphore password learning mode using Visual Studio programming integrated with the teaching computer via TCP / IP client-server*.*

1.4 Research Benefits

The benefits of designing a semaphore cipher learning mode using visual studio programming are:
a. Obtaining a semaphore cipher learning mode by using visual studio programming that is interactive, attractive, and easy to understand to complement existing conventional methods.
b. Obtaining a semaphore cipher learning mode using visual studio programming with visualization in the form of an image using the C # program.
c. Obtain a semaphore password learning system using visual studio programming that is integrated with the teaching computer via TCP / IP client-server*.*

1.5 Limitation of Problems

The problem limitations of the design of the semaphore Password learning mode using Visual Studio programming are:

a. Using MYSQL database for data storage.

b. Works wirelessly using TCP / IP client-server.

c. Using the C # programming language with the Visual Studio editor

2. LITERATURE REVIEW

2.1 Learning Media

(Arsyad, 2011), "The word media comes from the Latin medius which literally means middle, intermediary or introduction. In Arabic, the media is an intermediary or messenger from the sender to the recipient of the message.

According to Gerlach and Ely cited by (Arsyad, 2011), "Media when it is understood in broad terms is human, material and events that create conditions that enable students to acquire knowledge, skills or attitudes. In this sense, teachers, textbooks, and the school environment are media ".

According to (Arsyad, 2011), "The main function of learning media is as a teaching aid which influences the climate, conditions and learning environment that are organized and created by the teacher".

Based on some of the opinions above, it can be concluded that the media are all objects or components that can be used to transmit messages from sender to recipient so that they can stimulate students' thoughts, feelings, attention and interests in the learning process.

2.2 Semaphore

(Agus S & Anwari, 2015), "Semaphore (in Indonesian, the standard word is semaphore) is one of the scouting techniques for delivering news cues in addition to morse". One of the easiest methods to memorize semaphore cue codes is to use the 8 cardinal point method or sometimes referred to as the clockwise method with this method, memorizing the semaphore is not done in alphabetical order, but memorized per key consisting of 7 keys.

In this method, the position of the hands is arranged in 8 points around the body which include the points below the body, lower left of the body, left side of the body, upper left of the body, upper body, upper right of the body, right side of the body, and right below the body. Details are in the following image :

Figure 1 Semaphore Composition

Semaphore signals are sent in pairs, meaning that they consist of two parties, where one party is the sender and the other party is the recipient, in delivering and receiving semaphore signals there are several provisions, including:

a. The sender and receiver of the semaphore signal face each other and wear the semaphore flag.

b. Upright posture with both legs slightly open. The position of the flags is crossed under the body.

c. To start sending, the sender gives a signal "Attention sign" in the form of the letters "R-Close" or "U-R" repeatedly.

d. When the recipient is ready, the recipient sends the letter "K" while not ready to send the letter "Q".

e. When ready, the sender starts sending news (messages) letter by letter every single word closed with a closed position.

f. If the recipient can receive the message, it sends the signal "C".

g. If the sender is wrong, it sends an "E" signal.

h. When finished sending the message ends with a signal "A-R" and the recipient sends a signal "R".

2.3 C# Language

(Hakim, 2018), "Visual C-Sharp or C # is an object-oriented programming language issued by Microsoft. The project was signed by Aders Helsberg and was first introduced in July 2000. Visual C # is a modern object-based programming language which is the main programming language in the Microsoft.Net Framework platform. Visual C # is a combination of the efficiency of C ++ programming, the simplicity of Java programming and the simplification of the Visual Basic program. Currently Visual C # can be found in the Microsoft Visual studio package".

3. RESEARCH METHOD

3.1 Research Design

The research design uses a model approach "System Development Life Cycle (SDLC) is a gradual approach to analyzing and establishing a system design using a more specific cycle for user activities," (Kendall & Kendall, 2003). SDLC is also a center for the development of an efficient information system. "SDLC consists of four stages, namely: planning and selection, analysis, design, implementation and operation," (George, Valacich, & J.A, 2012).

Based on the above understanding, SDLC can be concluded as a cycle that builds its own system and gives it to users by searching and selecting conditions and processes to support all user needs. To use SDLC, the source data from the user as a reference will be incorporated into planning, analysis, design and implementation. The use of references is intended to build a system that can represent the user's needs for the problems it faces. The stages in the SDLC model are as shown in Figure 3.1.
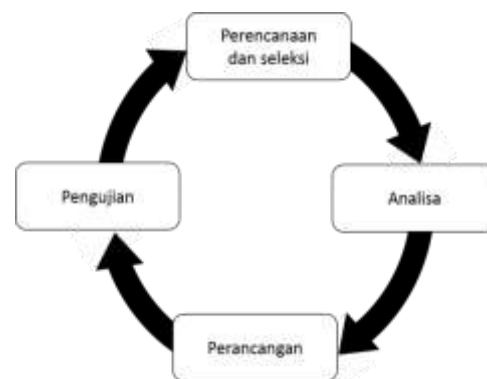

Figure 2 *Development life Cycle* System Design Research

This study uses a design method. "design is a series of procedures for making system analysis results into a programming language to explain in detail how system components are implemented," (Pressman, 2002), while the definition of "building is the creation of a new system or to change or modify an existing system or part of it," (Pressman, 2002) Thus the definition of design is to make

the analysis results into a software package and then create a system or improve an existing system..

3.2   Research Procedure

The research process carried out starts from the designs to be implemented, the work system flow to completion, the expected system inputs and outputs. Figure 3 below is a picture of the overall research process mesh process.
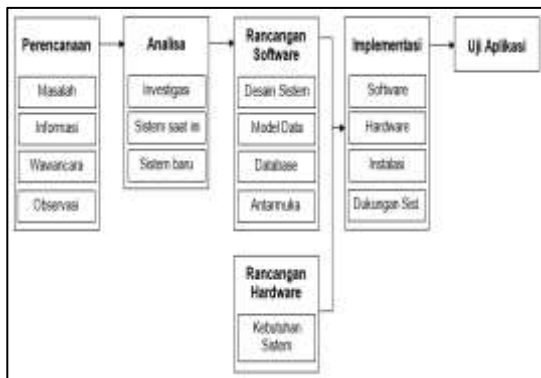

Figure 3 Development Life Cycle System Design Research

3.2.1 Research Location and Time

The time and place of this research began in July 2019 at the Moro Krembangan Naval Technology College, Surabaya.

3.2.2 Tools and Material

To support this research, equipment and materials are needed to make it easier to design and test. The tools and materials used in this study include:

a. Laptops are used as processing student side learning systems.

b. Laptops are used as processing systems for the teaching or trainer side of the learning system.

c. XAMPP is used as a database management system processor.

d. Visual studio software is used as a programming learning system on the student and teacher side.

Block diagram of the Design of Semaphore Password Learning System Using Visual Studio Programming which can be seen in Figure 4.
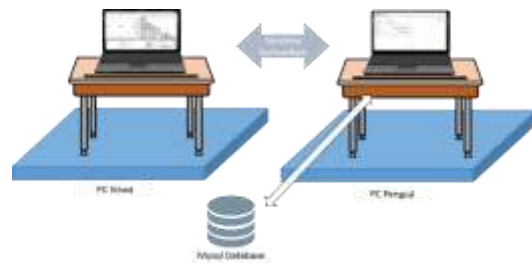
Figure 4 Circuit Diagram Block

3.2.3   Research Design

In this research design will explain about document flow and design data base requirements. Document flow is the document flow of the Semaphore Password Signal Learning System Design Using Visual Studio Programming, divided into 2 parts, namely the document flow for how the system works, and document flow processing data. Analysis of the document flow system in the Design of Semaphore Password Learning Systems Using Visual Studio Programming is seen in Figure 3.4, and the document data processing flow in Figure 3.4. The following is an explanation of the document flow and designing database requirements.

a.   Document Flow How the System Works

The work process of Designing a Semaphore Password Learning System Using Visual Studio Programming can be illustrated in Figure 3.4. In the document flow how the system works, it explains how the system works through student computer devices, supervisor or teacher PC devices. Where students run the system then connected to the teaching computer via wireless communication. The teacher PC will send question data or questions to the student PC and will save the test results into the database.

b.   Document   Flow   of   Data Processing

The document flow of the system data processing process is shown in Figure 3.5 where the document flow of data processing explains through the user, storage system, and MDBS (database management system). Where students as users of the learning system will run the system then receive question or question data and then answer questions on the learning system and display them on a PC and send the answers to the supervisor or teacher.
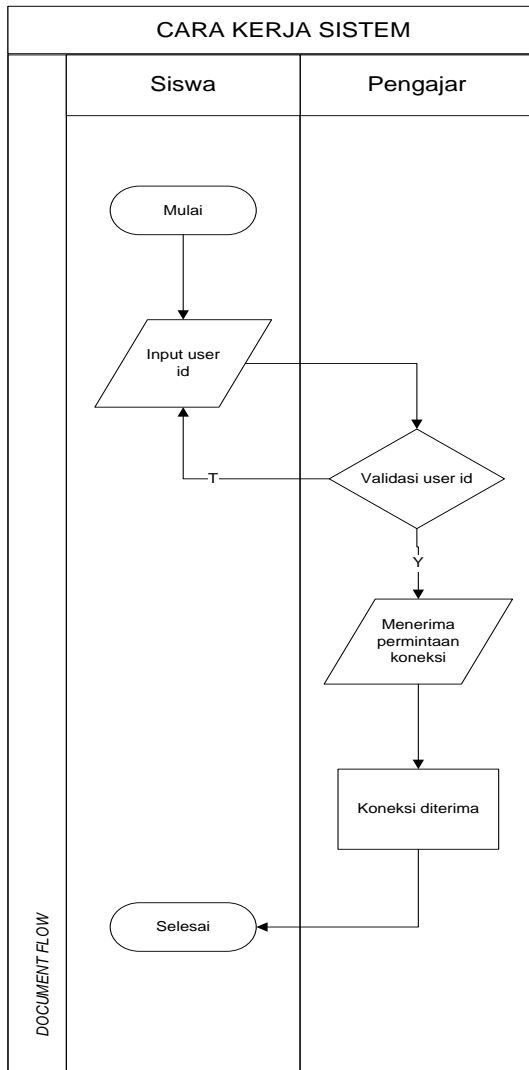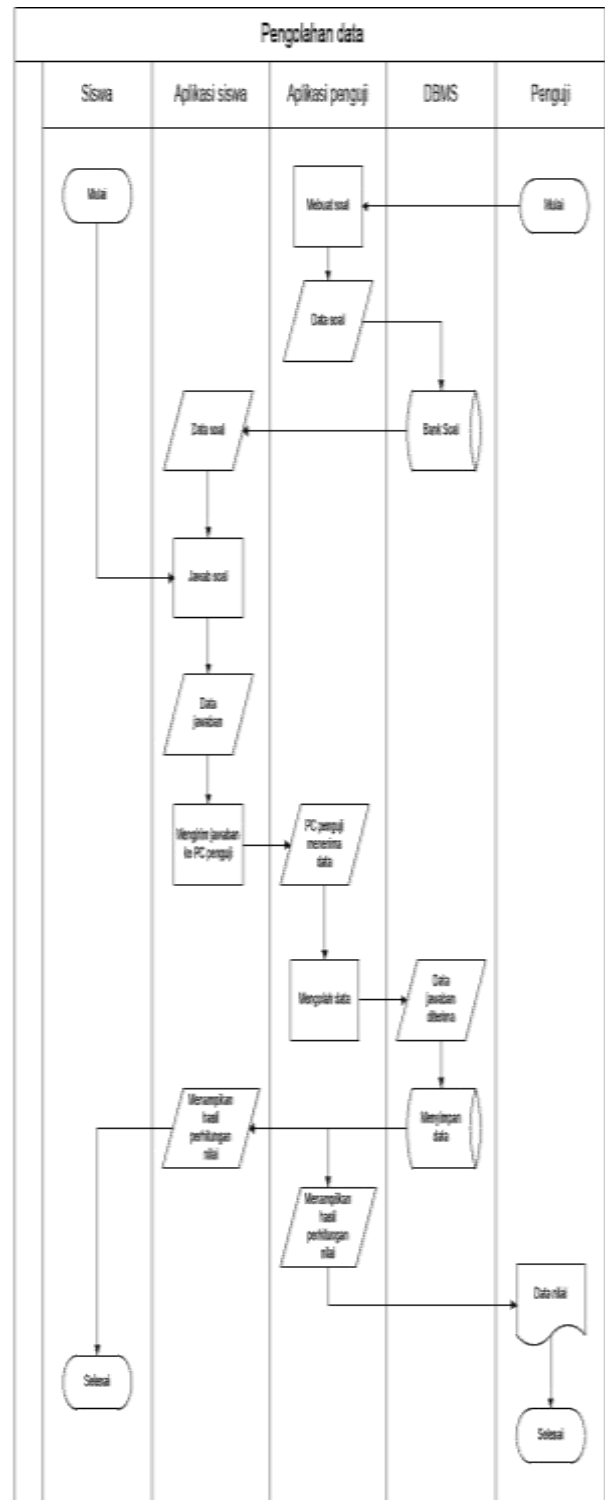
Figure 5 Flow Chart of System

Figure 6 Data Processing *Document Flow*

c. *Context Diagram*

In making this system, a design is made using context diagrams. The context diagram in the figure illustrates the system in outline of all the relationships that exist in the Semaphore Coding Learning System. Context diagram as in Figure 7.
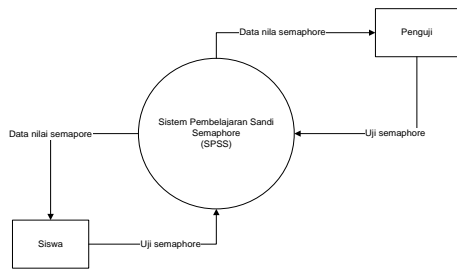
Figure 7 Context Diagram Sistem of Semaphore Lesson

d. *Data Flow Diagram (DFD) level 1*

Data flow diagram (DFD) is a diagram that describes a new system. DFD is developed logically without considering the physical environment, where the data flows or will be stored. In this diagram using certain symbols with the aim of making it easier for readers and understanding in analyzing a system. The following is an example of designing a Semaphore Password Learning System Design Using Visual Studio Programming. Data flow diagram level 1 as in Figure 8.
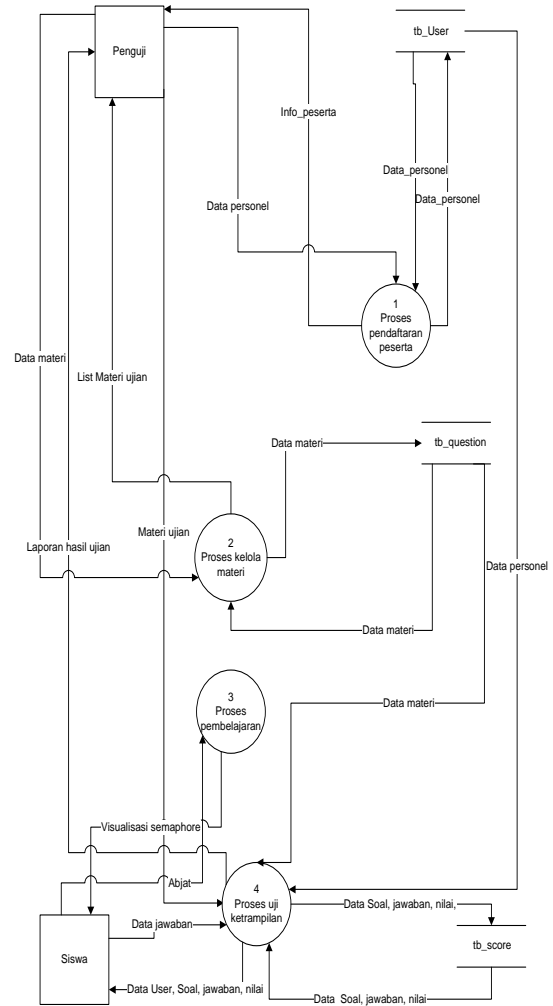
Figure 8 DFD Level 1 Semaphore Lesson System

e. *Etinty relationship diagram*

Entity Relationship Diagram (ERD) is a graphical representation of an information system that shows the relationship between people, objects, concepts or events in a system. Developed according to the requirements of the existing process in DFD design up to level 1. ERD in semaphore code learning mode using visual studio programming can be seen as in Figure 9.

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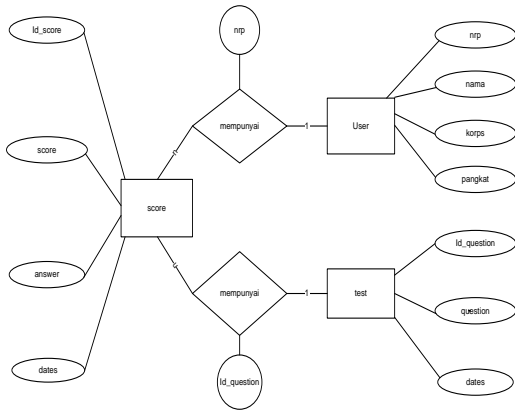
Figure 9 *Entity Relationsip Diagram*

f.   *CDM (Conceptual Data Model)*

The Conceptual Data Model (CDM) describes in detail the database structure, namely the meaning, relationship, and boundaries in logical form and is the basic concept in planning a database. In the planning of the semaphore coding learning system using visual studio programming, there are three interrelated tables, which can be seen in Figure 10.
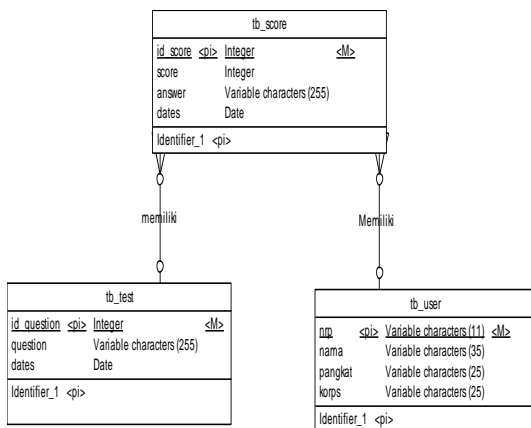
Figure 10 *Conseptual Data Model (CDM)*

g.   *PDM (Physical Data Model)*

Physical Data Model (PDM) is a detailed description of the database in physical form. The PDM design depiction shows the data storage structure that will be actually used, in the semaphore code learning mode using visual studio programming obtained from the Generate Conceptual Data Model which describes three interrelated tables

equipped with table attributes as in Figure 11.
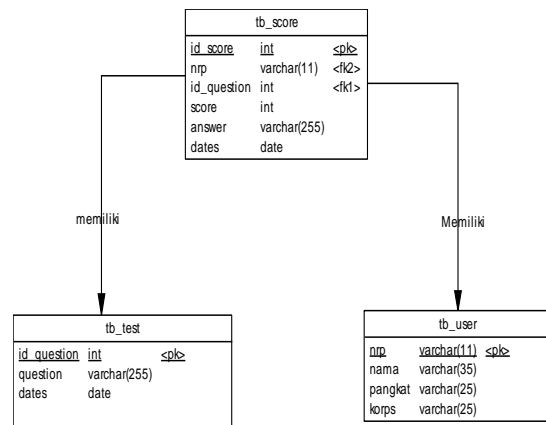
Figure 11 *Physical Data Model (PDM)*

f.   Interface Design

In the Design of Learning Mode Password Semaphore Using Visual Studio Programming, it consists of a display design from the client side as a student and a display design on the server as a tester. The following is the design of the client form design and server form.

1) Client Form Design

This design is a design contained in the semaphore code learning application, as a whole consisting of a learning form design and a skills test form design. The explanation and appearance of each design will be discussed in the explanation of each design.

a)   The design of the learning form, the design on the client side, functions as an interactive learning medium that can be used by students for independent learning. This design consists of a learning form design that can be seen in Figure 12, a skills test form design as shown in Figure 13

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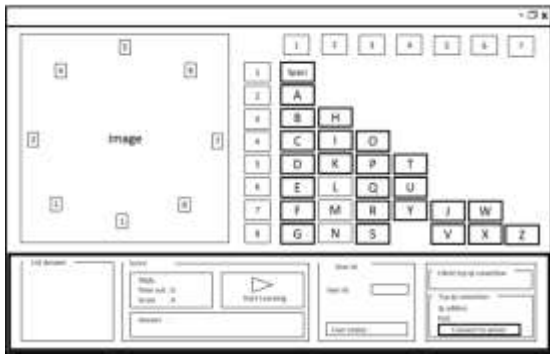
Figure 12 Lesson Form Design
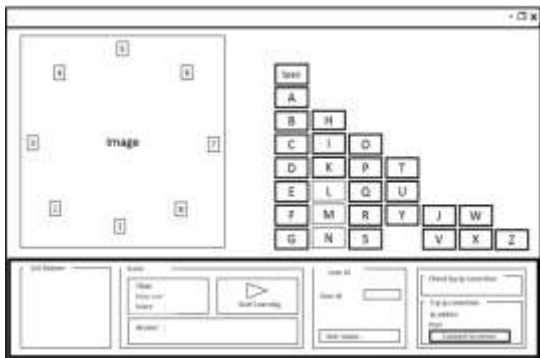
Figure 13 Skill Test Form Design

Figure 14 Main Practice Menu Design

2) Form server design, the design of the interface used by an examiner to manage the learning system starting from creating questions, adding test participants, and viewing exam results.

a) Main menu design pratice, the design on this menu is the main menu display when the application is opened. The main pratice menu design can be seen in Figure 14.

b) Data menu design, interface design that functions as a data manager. In this design it is still divided into several other menu views. This data menu design is divided into data table menu, individual data menu, data chart menu, Add user table. The data table menu display can be seen in Figure 15, the individual data menu is shown in Figure 16, the data chart menu is shown in Figure 17, and the add user menu is shown in Figure 18.
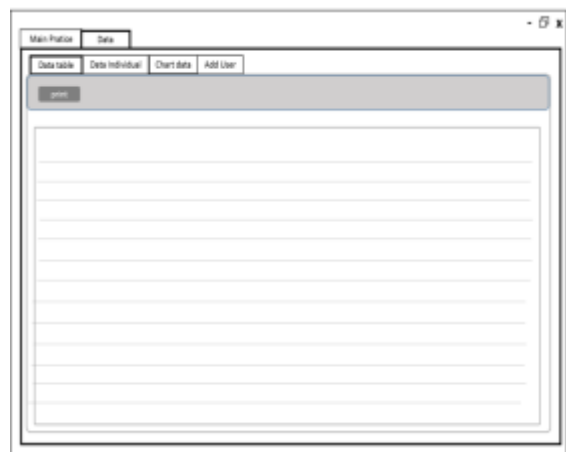
Figure 15 Data Table Menu Design
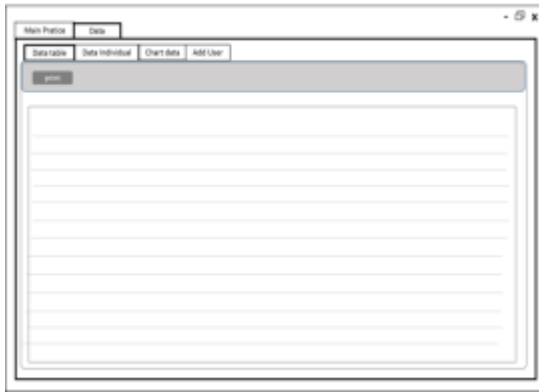
Figure 16 Individual Data Menu Design
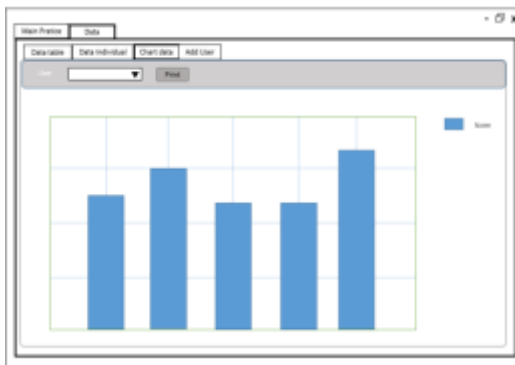
Figure 16 Chart Data Menu Design
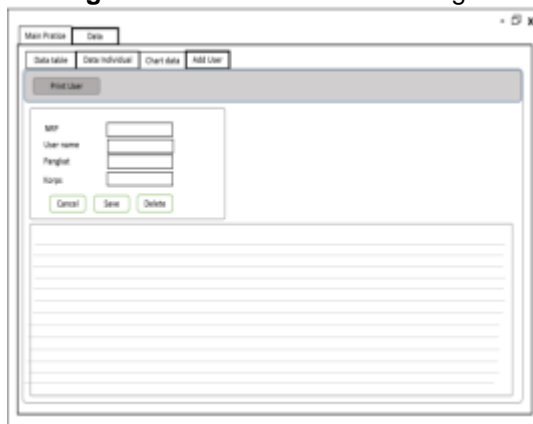
Figure 18 Add User Menu Design

c) Design reports, print design of test participant reports. This design consists of the design of the overall exam results report, the design of individual reports, the design of the progress of learning progress graph reports, the design of the exam participant reports. The display of the overall test result report design can be seen as shown in Figure 19, the individual report design is Figure 20, the graphic design of the progress of learning progress is shown in Figure 21, and the design of the exam participant's report is shown in Figure 22.

Figure 19 Printout of Total Exam Report

Figure 20 Printout of Personnel Exam Report
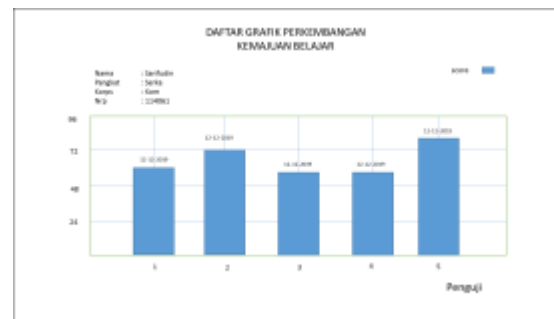
Figure 21 Printout of Lesson Progress Data Chart

Figure 22 Printout of Examinee List

3.2.4 Data Collecting

Data collection is a method of seeking information and data needed in research so that it can present correct and targeted information. In this study, the authors collected data using several methods.

a. Observation Method

The method of observation is a method of collecting data by way of direct observation of the data related to this research. Observations were carried out at the Navy School of Communication with the aim that the system to be built could function optimally according to existing needs.

b. Interview Method

The interview method is a data collection method that is carried out by direct questioning to the informants regarding the data needed in this study. The interview was held at the Naval College of Technology with the object of the communication corps student with the aim that the system to be built could function optimally according to existing needs.

c. Literature Study Method

Method of literature study with data collection is done by looking for references from books, journals in the STTAL library and internet media related to this research.

3.2.5 Data Processing

Data processing is the processing stage of the data that has been successfully collected obtained from STTAL. For further processing, it can be presented and applied in a system that is being researched by the author. Where the data obtained will be used as a reference for making the system. The system will be tested on STTAL Communication Corps students. The main purpose of testing this system is to determine whether the system that has been created can meet the needs of the user and whether the system can provide the expected results. Testing is done by evaluating and testing the functions contained in the system. When an error is found, it will be corrected and then re-evaluated or tested until the system does not experience an error.

3.2.6 Operational Definition

Operational definition is the determination of various definitions that will be used by the author in research. The operational definition makes abstract concepts an operational measure which makes it easier to measure variables. An operational definition can also be used as a defining definition that is used as a guide for carrying out an activity or research work.
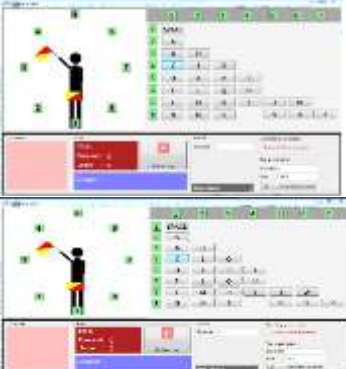
4. RESULT AND DISCUSSION
4.1 Result

The results and discussion of research on the semaphore code learning system is an experimental discussion of client applications, server applications and integrated experiments between client and server using a Wireless Local Area Network (WLAN).

Research on the design of the semaphore code learning mode using visual studio programming was carried out by testing the whole system. The results obtained based on tests carried out on the semaphore code learning application program system are:

a. The learning process by clicking the alphabet starting from A to Z can display the semaphore cue code correctly. Visualization of semaphore code learning in the semaphore code learning system using visual studio programming as in Table 1.

Table 1 Visualization Semaphore Display

No	Nama huruf	Visualisasi huruf
1	2	3
1.	A dan B	
2.	C dan D	

No	Nama huruf	Visualisasi huruf
1	2	3
3.	E dan F	
4.	G dan H	
No	Nama huruf	Visualisasi huruf
1	2	3
7.	M dan N	
8.	O dan P	

No	Nama huruf	Visualisasi huruf
9.	Q dan R	
10.	S dan T	

No	Nama huruf	Visualisasi huruf
1	2	3
11.	U dan V	
12.	W dan X	

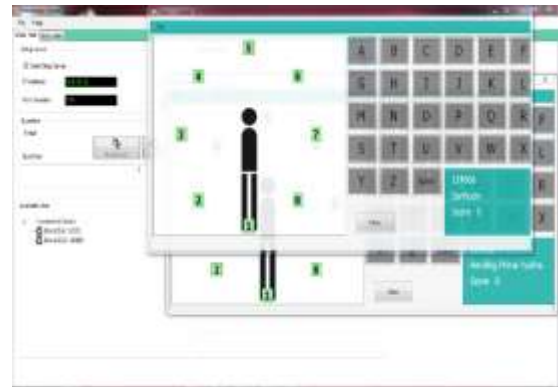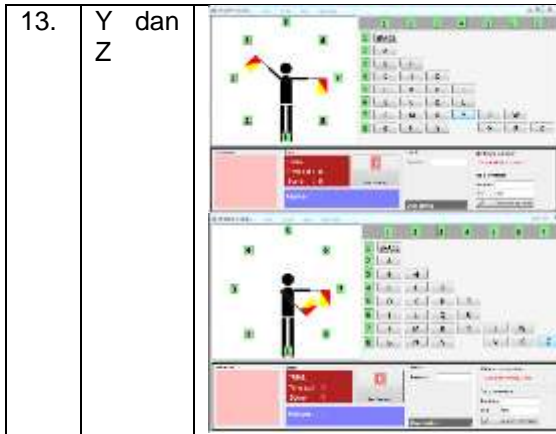| 13.	Y dan Z	

Figure 25 Client and Server Connection

b. The skill test process between the client and server can be well connected and can be used for broadcase questions from the server and answered by the client with the appropriate results between the questions and answers, the results of this skill test are stored and can be displayed if needed. In Figure 23 and Figure 24 shows the first and second client connections successfully connected to the server. The client connected to the server is shown in Figure 25.

Figure 26 and Figure 27, after the client is connected to the server, the server can send the skill test questions to receive the semaphore then the client answers to the client application with the results as shown in Figure 4:18 for the first client with a total of 10 letter character questions gets a score of 10, while the second client with questions 10 character letters get a score of 70.

Figure 28 is a display on the server application to display the results of the semaphore acceptance skills test, where the results on the server application match the results in the Cilent application where with a question of 10 characters the first client letter gets a score of 70 and the second client gets a score of 10.

Figure 23 Client Connection Successful

Figure 24 Next Client Connection Succesful
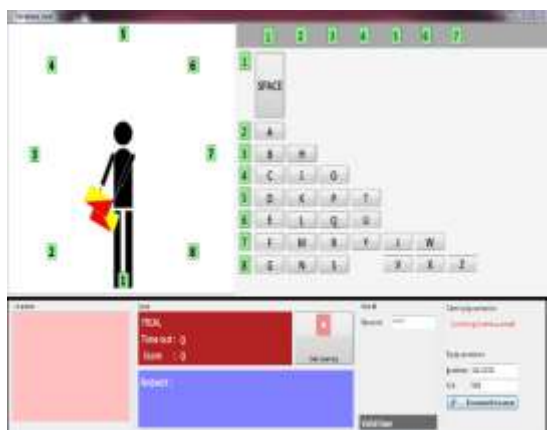

Figure 26 Client Skill Test Result

Figure 27 Next Client Skill Test Result

Figure 28 Test Result on Server

5. CONCLUSION AND SUGGESTION

5.1 Conclusions

Based on the results of the tests that have been carried out on the design of the semaphore learning mode using visual studio programming, the following conclusions are obtained:

> a. This semaphore code learning mode can be used as an attractive semaphore code learning medium and makes it easier to memorize because the semaphore code is sorted by key and is equipped with a self-learning menu.

> b. This semaphore code learning mode is able to display semaphore code visualization in the form of an image.

> c. This semaphore code learning mode is able to integrate the client computer as a student and the server computer as a tester using TCP / IP client-server to test the semaphore acceptance skills.*.*

5.2 Suggestion

The design of the semaphore code learning system using visual studio programming still requires development suggestions based on the results of the tests that have been carried out is modification of the program is required so that in addition to using the alphabet click button for learning media to display semaphore visualization code, it can also use buttons on the touch screen when using a screen on a PC / Laptop that supports touch screen technology.

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