

LAN-BASED APPLICATION OF FILE MANAGEMENT IN THE COMPUTER LABORATORY OF SCHOOL OF APPLIED SCIENCE

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ABSTRACT

Computer laboratory is important infrastructure in supporting the process of teaching and learning activities at the School of Applied Science of Telkom University. Lecturers use computer laboratory as an infrastructure in achieving competence for programming courses that requires practicum by using computer. The obstacle found in the practicum is an interruption in the internet network. Lecturers cannot upload the files of learning materials and the results of students' competence test. Based on these reasons, an application is built that can distribute files without the internet network. The application is built by using the Visual Basic programming language. This research uses the prototype model of software development. This model is suitable for use as developer and user can interact during the process of system development, so that the process of application development is faster and according to the user's needs. The features of this application include the files distribution from the server computer to the client computer, the files retrieval from the client computer to the server computer, and the inclusion of notifications of files distribution and retrieval activities. The results showed that this application can facilitate the practicum activities, which supports the competencies achievement of programming courses in the computer laboratory of School of Applied Science of Telkom University.

Keywords: *Applications, LAN, File Distribution, Server, Client*

1. INTRODUCTION

Computer laboratory is important infrastructure in supporting the process of teaching and learning activities at the School of Applied Science of Telkom University. Various programming courses use computer laboratory to do programming practice/practicum. In the practice/practicum activities the lecturer usually gives learning materials in the form of soft copy files or sometimes gives competence test and collects students' test results.

Before the class begins lecturers distribute the learning materials by uploading the files using a computer via lecturers' portal or in the computer laboratory before teaching. Each student then retrieves the materials given by the lecturers by downloading them via students' portal by using a computer in the laboratory.

Until now, those activities are done via a computer connected to the internet network. It causes the process of files (learning materials)

distribution and retrieval should always be done online. The obstacle found in those activities is the files distribution and retrieval cannot be done when the computer network is offline.

Based on these reasons, a LAN-based Application of File Management in the Computer Laboratory of School of Applied Science is built so that the process of files distribution will not be hampered even though there are problems with the internet network.

Based on explanation above, the research problems that can be formulated namely:

1. How to build an application that can distribute the learning materials in the form of files from the server computer to the client computer offline.
2. How to build an application that can backup files from the client computer to the server computer.
3. How to build an application that can include a status notification of materials that have been distributed and files



retrieval from each client computer to the server computer.

The aims of this research are:

1. to build an application that can help the teaching and learning activities in the computer laboratory and can distribute, retrieve, and provide a status notification of files distribution and retrieval without the internet network.
2. this application is expected to be able to assist the practice/practicum activities in the computer laboratory so that the practice/practicum activities continue to run smoothly without any obstacle caused by problems in the internet network that often occur at the School of Applied Science.
3. to build a client server-based application using the Visual Basic application development software with network technology.

2. PROTOTYPE MODEL

The software development process model used in this study is the Prototype Model. As stated by Roger S. Pressman, Ph.D. in his book entitled *Software Engineering: A Practitioner's Approach*, this model is one of software development methods that are widely used. With this prototype method, developer and user can interact during the process of system development. The user often simply defines in general what they want without mentioning in detail the output needed, the process, and the data needed.

On the contrary, the developer gives less attention to the efficiency of the algorithm, the ability of the operating system and the interfaces that connect human and computer. To overcome the incompatibility between the user and the developer, a good cooperation between the two is required so that the developer will know exactly what the user wants by not ignoring the

technical aspects and the user will know the processes in building the desired system. Thus it will generate a system that is in accordance with the turnaround time schedule that has been determined. The key to this prototype model works well is by defining a set of rules at the beginning, that is the user and the developer must agree that the prototype is built to define the needs. The prototype will be partly or fully eliminated and the actual software is engineered with predetermined quality and implementation.

According to McLeod and Schell (2007), a prototype model is divided into two (2) types, namely:

1. Evolutionary Prototype, is a prototype that has been continuously developed until the prototype meets the functions and procedures required by the system.
2. Requirements Prototype, is a prototype that is built by the developer by defining the functions and the procedures of the system, in which the user or the owner of the system cannot define the system.

From the two types of prototype models, the one that will be used in building the application of file management is the requirements prototype. This prototype model is chosen because it is considered suitable in building the application of file management because it has several advantages namely:

1. Saving the development time
2. There is good communication between the developer and the customer (user)
3. The developer can work better in determining the customer's needs
4. The application becomes easier because the user knows what he expects
5. The user can actively participate in the development of the system.

The following is the picture of the stages in the requirements prototype:

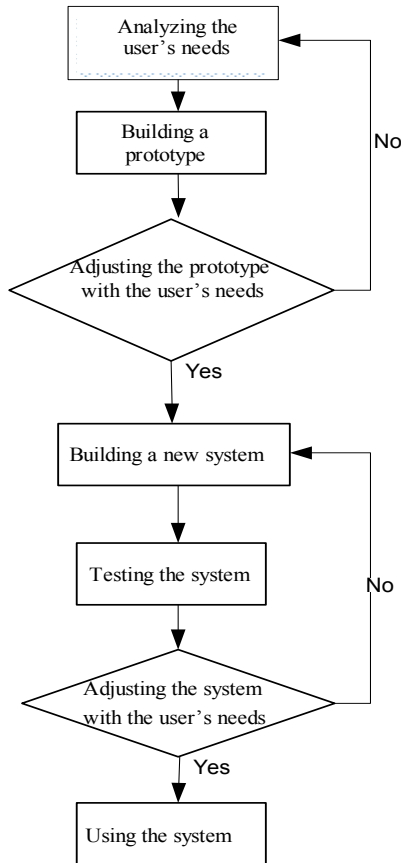


Figure 1: Requirements Prototyping Model

The stages in the requirements prototype, according to McLeod dan Schell (2007), namely:

1. Analyzing the user's needs. The developer and the user or the owner of the system have a discussion, in which the user or the owner of the system explains to the developer about the needs of the system he wants.
2. Building a prototype. The developer builds a prototype of the system that has been described by the user or the owner of the system.
3. Adjusting the prototype with the user's needs. The developer asks the user or the owner of the system about the prototype that has been built, whether it is in accordance with the needs of the system or not.
4. Building a new system. The developer uses the prototype that has been built to build a new system.
5. Testing the system. The user or the owner of the system carries out test on the system that has been developed.

6. Adjusting the system with the user's needs. The system is adjusted with the user's needs and the requirements of the system. If it is suitable, the system is ready to use.
7. Using the system.

3. RESULTS AND DISCUSSION

In the practicum activities in the laboratory of School of Applied Science, the lecturer usually gives learning material in the form of files that should be distributed to students. Besides giving learning materials for practicum, the lecturer also often gives competence test to the students and collects the test results in the form of files. In distributing and backing up the files of learning materials, assignments, and test results the lecturer currently relies on the internet network. The lecturer distributes the files of learning materials by uploading them to lecturers' portal and students retrieve the files from students' portal. This also applies to the process of backing up the files. Students send the files of assignments and test results via students' portal and the lecturer retrieves the files from lecturers' portal by using the internet network. When the internet network is in offline mode, the lecturer and students distribute and backup the files by using flash disk. The description of the existing system of files distribution and backup in the laboratory can be seen in Figure 2

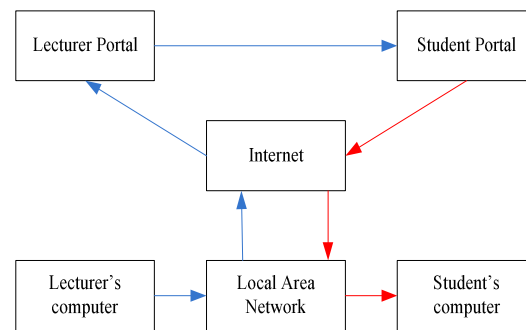


Figure 2: The existing system

4. THE PROPOSED SYSTEM

In overcoming the dependence on the internet network, it is proposed to build an application of file management. This application is used to deal with the process of distributing files from the server to the client computer and

the process of backing up files from the client computer that is stored in the server. The proposed application not only has a function for distributing and backing up the files, but also for deleting files or emptying the folder in the client computer. The description of the proposed system can be seen in Figure 3.

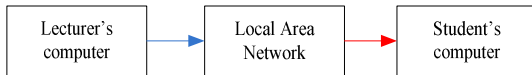


Figure 3: The Proposed System

This chapter will describe the stages of the research results namely the stages of building an application using requirements prototype models. The followings are the descriptions of the research results using requirements prototype model [1].

4.1. Analyzing the User's Needs

At this stage, the user is interviewed to get the ideas of what the user wants from the system. After that, the next stage is doing functional requirements analysis of the application of file management that will be built. The results of functional requirements analysis of the application of file management can be seen in Table 1.

Table 1 Functional Requirements Analysis

No	Functional Requirements	Description
1	Choose folder	To collect the folders of students' assignments that will be saved to the server.
2	files	To backup folder that has collected the folders of students' assignments. The folder will be backed up in the format of zip and named "Backup Folder Tugas (the date of backup was created). The default storage of backup results of the folder will be stored on drive E. Just like the function of creating folder, backing up folder can be run in two ways: manual or automatic. The manual backup is run by clicking the backup folder button and the automatic backup is run by using a timer that has been set (if the clock

		shows 00:00:00 or midnight, the program will perform the function of backup folder. The function of backup will work if there is a folder of students' assignments, otherwise the program will give message "process backup failed, Folder Doesn't Exist". The activities of the function of making folder will be stored in the log, both in the application log and in the log in form of txt file named "Log.txt" that will be stored on drive D.
3	Distribute Files	To copy the folder containing the files of learning materials that is intended for students, this function is run manually by clicking the source and destination buttons. The source button is used to specify which folder that we are going to copy and the destination button is used to determine where we are going to copy the files we have chosen earlier. All activities in copying the folder will be recorded in the txt file named "Log Chat.txt" that will be stored on drive D.
4	Delete Files	To delete files in the folder of client computer that is shared from the server computer. All kinds of files can be deleted
5	Chat Server	To be a chat server for communication between the server computer with the client computer. This function will run automatically when we open the application, in which the chat server will open port 5001. Chat server will record the clients that have been connected to the server. Chat server could send a message to all clients

		that are connected to the server.
6	Chat Client	To be a chat client that will be installed for the client computer. The client computer only has the function of connecting to the server and receiving messages from the server that will be displayed in the system tray. The function of connecting to the server will run automatically when the application is run.

4.2. Building a Prototype

The next stage after performing the functional requirements analysis is building a prototype namely designing the application of file management by using use case diagrams, activity diagrams, and interface design. The use case diagram of the application of file management can be seen in the following figure.

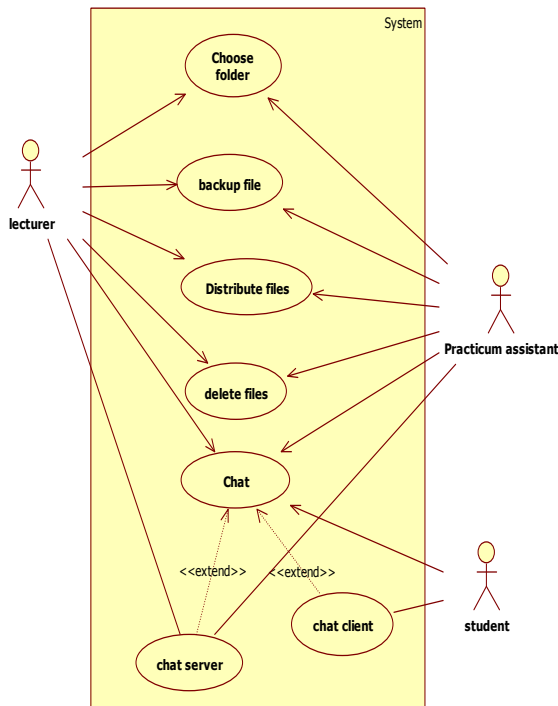


Figure 4: The Use Case Diagram of the Application of File Management

The followings are the explanations of the order of activities in each process described in the Activity Diagram.

1. Choosing/Organizing Folder

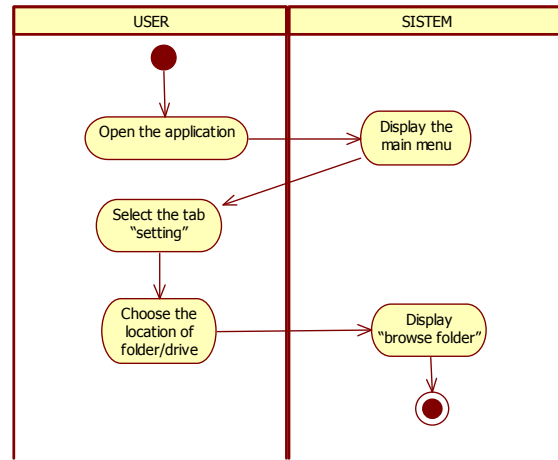


Figure 5: The Activity Diagram of Organizing Folder

2. Distributing Files

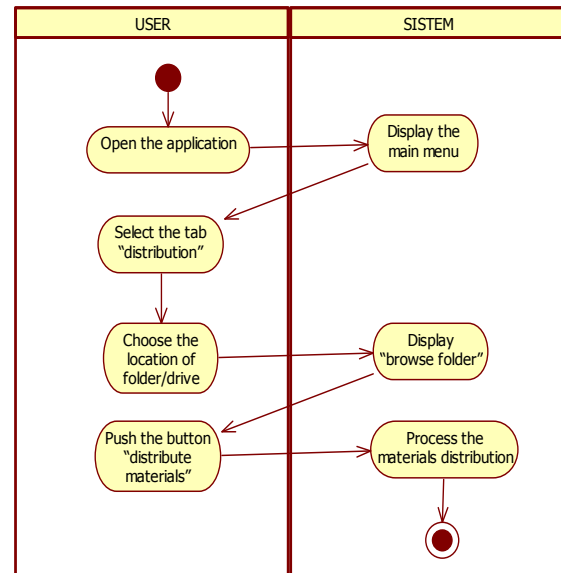


Figure 6: The Activity Diagram of Distributing Files

3. Backing up Files

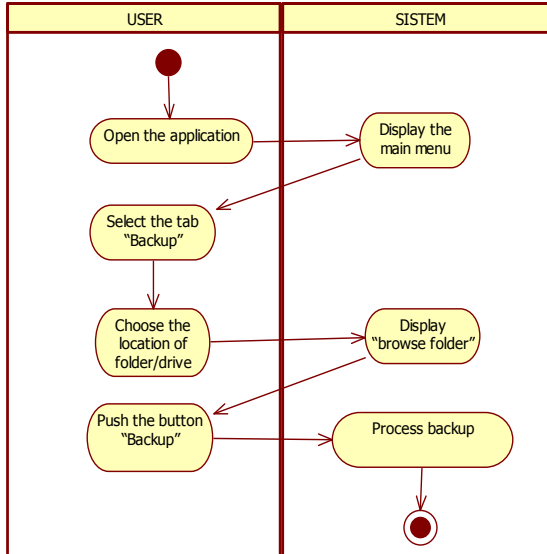


Figure 7: The Activity Diagram of Backing up Files

4. Deleting Files

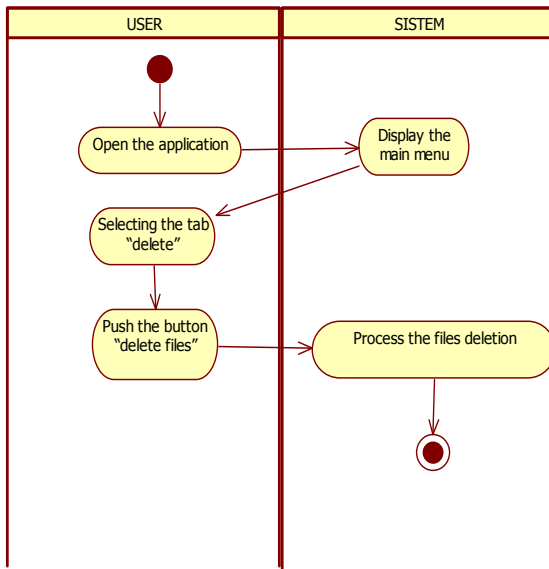


Figure 8: The Activity Diagram of Deleting Files

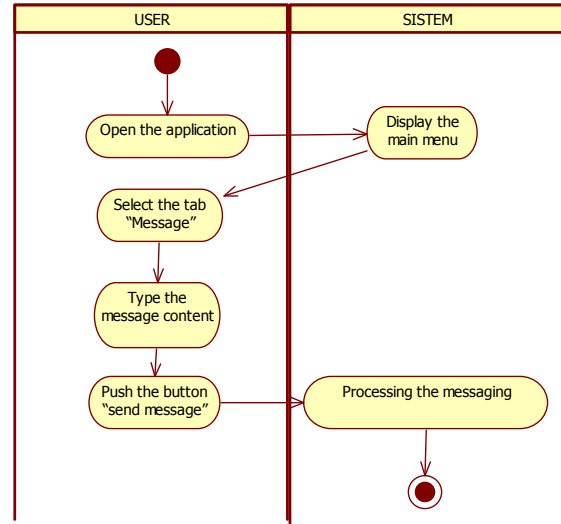


Figure 9: The Activity Diagram of Sending Messages

5. Hatting

The results of interface design of the application of file management that has been implemented by using Visual Basic programming language can be seen in the following figures.

1. Form of Organizing Folder

This form is used to determine the location where the backup results are stored. This form has two components, namely:

1. Text Box to display the folder where the backup results are stored
2. "Cari Lokasi" (Find Location) command button to search the folder

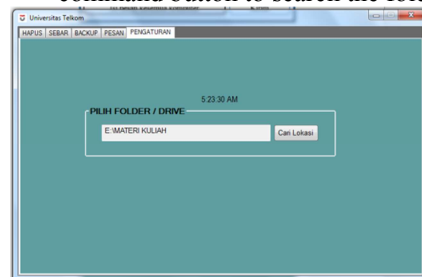


Figure 10: Form of Organizing Folder

2. Form of Distributing Files

This form is used to distribute the files of learning materials or assignments that will be given to students. This form has four components, namely:

1. Text Box to display the address of the file or the folder location of the files of learning materials or assignments
2. Progress Bar as a marker for the process of materials distribution
3. “Cari Lokasi” (Find Location) command button to search the files of learning materials
4. “Sebar Materi” (Distribute Files) command button to distribute the learning materials

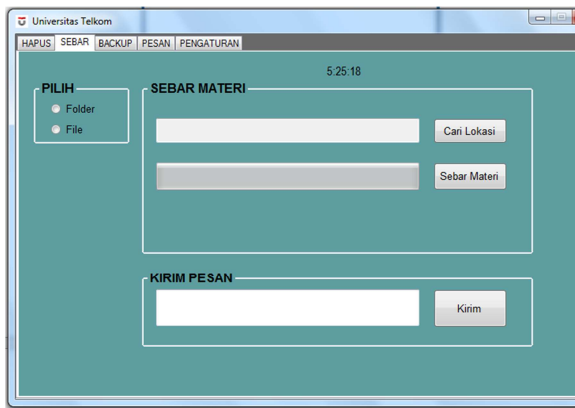


Figure 11: Form of Distributing Files

3. Form of Backing up Files

This form is used to backup the folder that has collected the folders of students' assignments and tests results. The folder will be backed up in the format of zip and named by the date of the backup is done. This form has four components, namely:

1. Text Box to display the address of the folder where it is backed up
2. Progress Bar as a marker for the process of backing up
3. “Cari Lokasi” (Find Location) command button to search the address of the folder to be backed up
4. “Backup” Command Button to the files

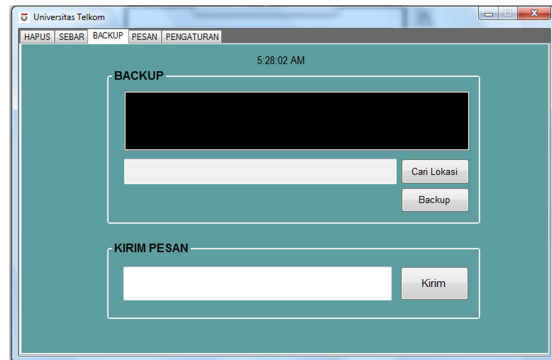


Figure 12: Form of Backing up Files

4. Form of Deleting Files

This form is used to delete folder that has collected the folders of students' assignments and tests results as well as the learning materials from the lecturer. This form has two command buttons, namely “hapus” (delete) command button and “keluar” (exit) command button.

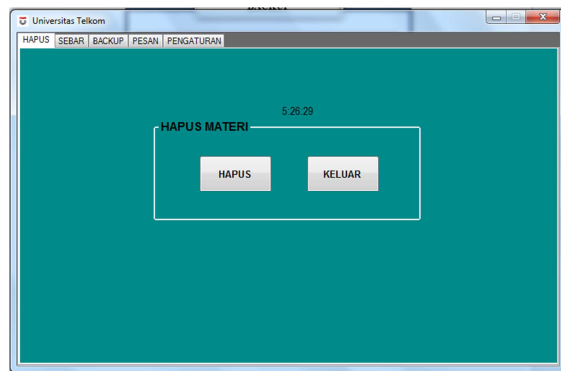


Figure 13: Form of Deleting Files

5. Form of Sending Messages

This form is used to send messages from the server computer and received by the client computer. This form has two components, namely:

1. Text Box to type the message content
2. “Kirim” (Send) command button to send the message

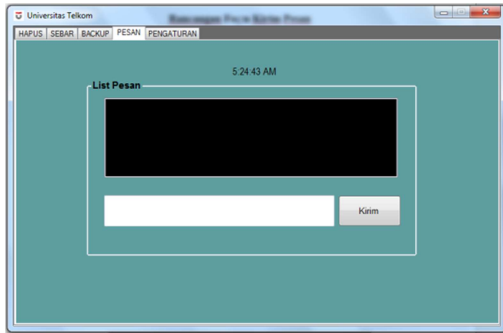


Figure 14: Form of Sending Messages

4.3. Adjusting the Prototype with the User's Needs

At this stage a prototype demonstration is done to the user, to see whether the prototype is in accordance with the needs of the system or not. The results of this stage become a reference to build a new system, which is completing the development of the application of file management. If the prototype has been in accordance with the user's needs, it will be proceeded to the next stage. If the prototype has not been in accordance with the user's needs, the prototype will be revised by repeating the steps 4.1, 4.2.

4.4. Building a New System

By using the prototype that has been built, a new system is built by implementing the results of functional analysis. The new system is built by making a programming code (coding) that uses visual basic programming language.

4.5. Testing the System

At this stage, a system testing on the application of file management is done with the user by using black box testing. The following table is the test results on the application of file management:

Table 2 Black Box Testing on the application of File Management

No	Testing Scenario	Test Case	Expected Results	Test Results	Conclusion
1	Choose Folder	Folder or the location of drive is empty	The message "Folder/Lokasi drive tidak boleh kosong" (The drive folder/location may not be empty) appears	The message "Folder/Lokasi drive tidak boleh kosong" (The drive folder/location may not be empty) appears	OK
2	Distribute Files	"Cari Lokasi" (Find location) button is not clicked	The message "Pilih Lokasi/folder yang akan disebar" (Choose the location/folder to distribute) appears	The message "Pilih Lokasi/folder yang akan disebar" (Choose the location/folder to distribute) appears	OK
3	files	<ul style="list-style-type: none"> "Backup" button is clicked if "cari lokasi" (Find location) button is not chosen "Backup" button is clicked 	<ul style="list-style-type: none"> The message "Pilih lokasi backup" (Choose the backup location) appears The process of backup succeeds, shown by the appearance of progress bar 	<ul style="list-style-type: none"> The message "Pilih lokasi backup" (Choose the backup location) appears The process of backup succeeds, shown by the appearance of progress bar 	OK
4	Delete Files	"Hapus" (Delete) button is clicked	The message "Isi Folder akan dihapus?" (Delete the contents?) appears The folder is deleted	The message "Isi Folder akan dihapus?" (Delete the contents?) appears The folder is deleted	OK

5	Chat	“Kirim” (Send) button clicked	A message received in the Client	A message received in the Client	OK
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4.6. Adjusting the System with the User’s Needs

The prototype that has been built and tested is adjusted with the user’s needs. If the test results are in accordance with the user’s needs, it will be proceeded to the next stage

4.7. Using the System

At this stage the implementation of the system will be done, that is preparing the application to be used by the user in the laboratory. The descriptions of the steps in using the application of file management are as follows:

1. Installing the application on the server computer
There are several steps in installing the application on the server computer, namely:
2. Select the drive partition and create Folder Share
 1. Open the windows explorer
 2. Specify the drive partition (E:) and create the folder to be shared (*MATERI KULIAH*) (LEARNING MATERIALS) with the client computer (E:*MATERI KULIAH*) (LEARNING MATERIALS)
 3. Add new folder in the folder “*MATERI KULIAH*” (LEARNING MATERIALS) with the folder name “PC”, the number of folders is adjusted with the number of computers that will be connected to the server computer.
 4. Right-click on the computer icon, select the Map network drive

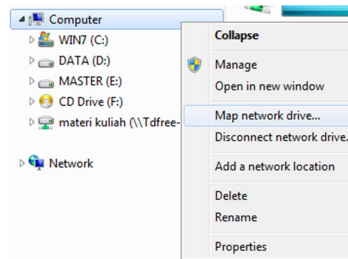


Figure 15: Creating Map Network Drive

5. Select the browse button, click the drive E: select the folder “*Materi Kuliah*”

(Learning Materials) (\\Tdfree-pc\materi kuliah), click Finish. Until it appears as the following figure.

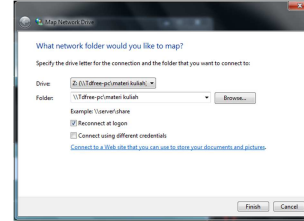


Figure 16: Selecting the Folder of Map Network Drive

3. Installing the application of LAB UT
 1. Prepare the application that is already available in the flashdisk.
 2. Select the server folder, run the application with the filename “setup.exe”
 3. Follow the instructions in the application until completion
 4. if completed double-click the shortcut of LabUT on the desktop

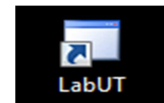


Figure 17: The Shortcut of the Application

4. Installing the application on a Client computer
 1. Prepare the application that is already available in the flashdisk.
 2. select the client folder, run the application with the filename “setup.exe”
 3. Follow the instructions in the application until completion
 4. Wait until the main menu of the client application appears
 5. Input the number of server ip (the example of server ip that have been set: 192.168.1.1)
 6. The number of port is automatically filled
 7. Click the “Save” button
 8. Click the "Connect" button to connect the application with existing applications on the server computer

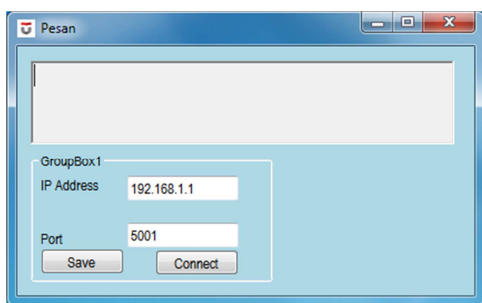


Figure 18: The Menu of the Client Application

5. CONCLUSIONS AND SUGGESTIONS

The conclusions that can be drawn from the implementation of this research are:

1. The LAN-based Application of File Management has been built and completed by several features, namely files distribution, files retrieval, and notification of the status of the files distribution and files retrieval by using LAN.
2. The application development is ready to be and has been implemented in the computer laboratory of School of Applied Science.
3. The application of file management built by using the Visual Basic software can be applied to a LAN computer network technology.

Suggestions for further development are:

1. The application that has been built can be developed and used by using wireless.
2. Other features can be added to complete and enhance the application that has been built to meet the needs of the users of laboratory in the School of Applied Science.

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