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MAKING AN APPLICATIONS FOR CALCULATION OF RAW MATERIAL, MACHINERY OF WATER JETLOOM AND DATABASE DEVELOPMENT FOR PRODUCTION USING VISUAL STUDIO 2019

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Abstract: Calculation in production planning, which is done manually in several small industry, takes longer and sometimes has less precise accuracy than using technological assistance. Therefore, technology, both hardware and software that can support and simplify the production process is very much needed in an industry in order to increase productivity and production efficiency. The purpose of this research is to make it easier to perform calculation and determine the number of machines and raw materials to be used without the need to do calculation manually and can be completed in a short time. Program design consists of the preparation of program, program creation, database creation, program implementation, and system testing of the program that has been created. Based on the test results, it can be concluded that the program made can be said to be successful because the results of manual calculation and using applications, there are no significant differences apart from decimal rounding.

Keywords: Programming, Visual Basic, Software, Weaving

1. INTRODUCTION

Manual calculation of the number of raw materials as well as machines needed which is commonly carried out to run a weaving process takes longer time and lack of accuracy for repetition. Therefore, the presence of artificial intelligence such as programming on computers will help to speed up and make the preparation process easier. At the same time, the database can be developed in stages, so that in the end it can become a reference for the subsequent similar processes. The definition of programming itself is the activity of developing a computer application program (software), which is a collection of instructions or commands using a computer programming language that is arranged in such a way that it has the right sequence of reasoning to solve a problem. While programming language is a type of computer application that is used in making computer programs/applications (software). So, in other words programming language is a tool in programming.

Planning in the weaving process is the main thing that is done before the implementation of the production process. This will determine how long the product will be completed, how much raw material is needed or how many machines must be used to achieve the production target. So planning must be done quickly and precisely, especially when the number of orders that enter the company. Production planning is also one of the most important parts in the smooth running of a production. If the planning is not done properly, it will affect the course of production which can result in production barriers.

For this reason, a study was conducted to design a program that can simplify the calculation of the number of raw material and machine, as well as to minimize manual planning errors and help speed up production planning calculations. The calculation process is carried out by changing the form of the mathematical system into a programming language in Visual Basic so that the application user only enters some of the requested and known data so that the calculation results can appear directly in the application.

The purpose of this research is to make it easier to do calculations and determine the number of machines and raw materials to be used without the need to do calculations manually and can be completed in a fast time.

Weaving

Weaving is a cross between warp and weft yarns which are perpendicular to each other. In fact, there are many ways to cross the warp and weft yarns. Each different method will produce a different fabric (Adanur, 2001). Weaving is a craft in the form of cloth made from yarn, which is done by inserting the weft crosswise on the warp yarn. Weft thread is a thread that moves from right to left or vice versa in a horizontal direction, while warp or warp threads are threads that are stationary in a vertical direction as a place to make motifs. (Suhendra, 2019).

Planning is an activity or process of making plans that will be used by the company in order to achieve its goals. In its activities, companies are often faced with various resource limitations such as manpower, funds, time, equipment and capabilities (Drs. Husein Umar, 2000). Production planning includes the planning of raw materials and machines needed to make a product. Therefore, both planning must be appropriate so that production runs smoothly and effectively and efficiently (Agustina Eunike, 2018).

Visual Basic

Visual Basic is the third generation event-driven programming language from the Integrated Development Environment (IDE) from Microsoft which was introduced in 1991. Visual Basic is one of the legendary programming languages because it has been developed for a long time and is still surviving today. Visual basic can be developed by using one of the Microsoft programming software called Visual studio (Jubilee, 2017). Microsoft Visual Studio is an integrated development environment (IDE) from Microsoft that can be used to develop Windows applications and is designed to focus on productivity. (Jubilee, 2015).

Visual Basic has developed into Visual Basic .NET which was developed by Microsoft .NET. Microsoft Visual Basic .NET is a tool for developing and building applications that run on the .NET Framework system, using the BASIC language. (Blazing, 2018).

Microsoft Visuala Basic .NET Components

Visual Basic programs display a checkered form in which you can enter (type) information and clickable buttons to initiate actions. (Sianipar, 2017).

Visual Basic itself actually comes from an environment that is often called the Integrated Development Environment or IDE. IDE helps build a large application, write a program, run the program, and generate an executable file that is independent, and therefore the file can be run on a computer without having to install Visual Basic. The following are parts of the IDE (Integrated Development Environment) (Aminudin, 2016).

a. Menu Bar, is an option in the form of a menu strip that serves to perform commands to manis a feature that can display errors, warnings on typing the code made. For example, in the code that has been made there are invalid characters. If there is a code that is wrong or lacking, the error list will immediately display an error in what line and in what file. Then you only need to press twice on the error list item to go directly to the section where the code is wrongage the IDE, develop, maintain, and access programs. The commands on the Menu Bar are grouped into several sections according to the type of command. Part of the Menu Bar deals with advanced Visual Basic (Vivian S., 2019).

b. Toolbar, is a special menu that can provide certain functions to support the user in using the program. Contains buttons that execute frequently used commands such as O*pen Project, New Project, Save, Cut, Copy, Paste*, dan *Undo* (Christopher, 2014).

c. Form Designer, Form is an object that is used as a place to work application programs to design the appearance of the program. The form is used when placing any objects that will be used in the program, the objects contained in the toolbox, placed and designed in the form section. (Christopher, 2014).

d. Solution Explorer, is a collection of modules, and in this section it is possible to manage the currently open project files, and move from one code file to another easily. If you want to see a list of commands contained in each item, do it by right-clicking on each item listed in the solution explorer. (Mesran, 2009).

e. Toolbox Visual Studio provides controls that can be used in applications. In other words, if you want to place various controls in the form (application window) such as textboxes, radio buttons, check boxes, and labels, you need the Toolbox panel. (Jubilee, 2017).

f. Error List, is a feature that can display errors, warnings on typing the code made. For example, in the code that has been made there are invalid characters. If there is a code that is wrong or lacking, the error list will immediately display an error in what line and

in what file. Then you only need to press twice on the error list item to go directly to the section where the code is wrong (Mesran, 2009).

g. Properties Window, Properties used to determine the settings of an object usually have several properties that can be set directly from the properties window or through the program window. To use the property, first press the control we want to set (Mesran, 2009).

2. RESEARCH METHODS

In describing the flow of data, Data Flow Diagrams (DFD) are used to help understand the system logically, structured and clearly.

The methods used in this observation are:

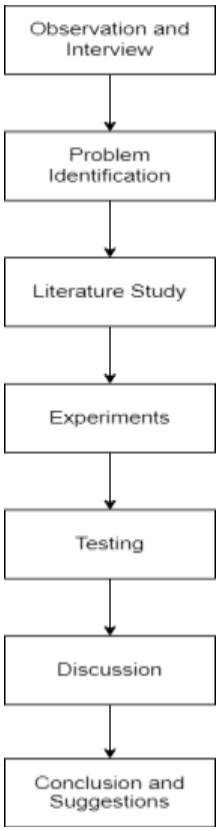

Figure 2. 1 The methods of this observation

1. Observation and Interview
   Conducted to obtain information about production planning and provide suggestions about making this program
2. Problem Identification
   The problems found are searched for and researched the causes of the problems, then problem assumptions are made.
3. Literature Study
   Conducted to obtain theoretical research materials regarding the calculation of the need for raw materials and machines as well as the Visual Basic 2019 program.
4. Experiments
   Making calculation and database application programs using Visual Basic 2019.
5. Testing
   Testing of calculation application programs and databases that have been made.
6. Discussion
   Discuss the results of the research and discuss them in more detail.
7. Conclusion and Suggestions
   Provide conclusions from the results of the entire research process and provide suggestions so that these problems are resolved and do not occur again.

3. RESULT AND DISCUSSION

The calculation process is carried out by changing the form of the mathematical system into a programming language in Visual Basic so that the application user only enters some of the requested and known data so that the calculation results can appear directly in the application.
The following is an image of the flow chart for making the application program.

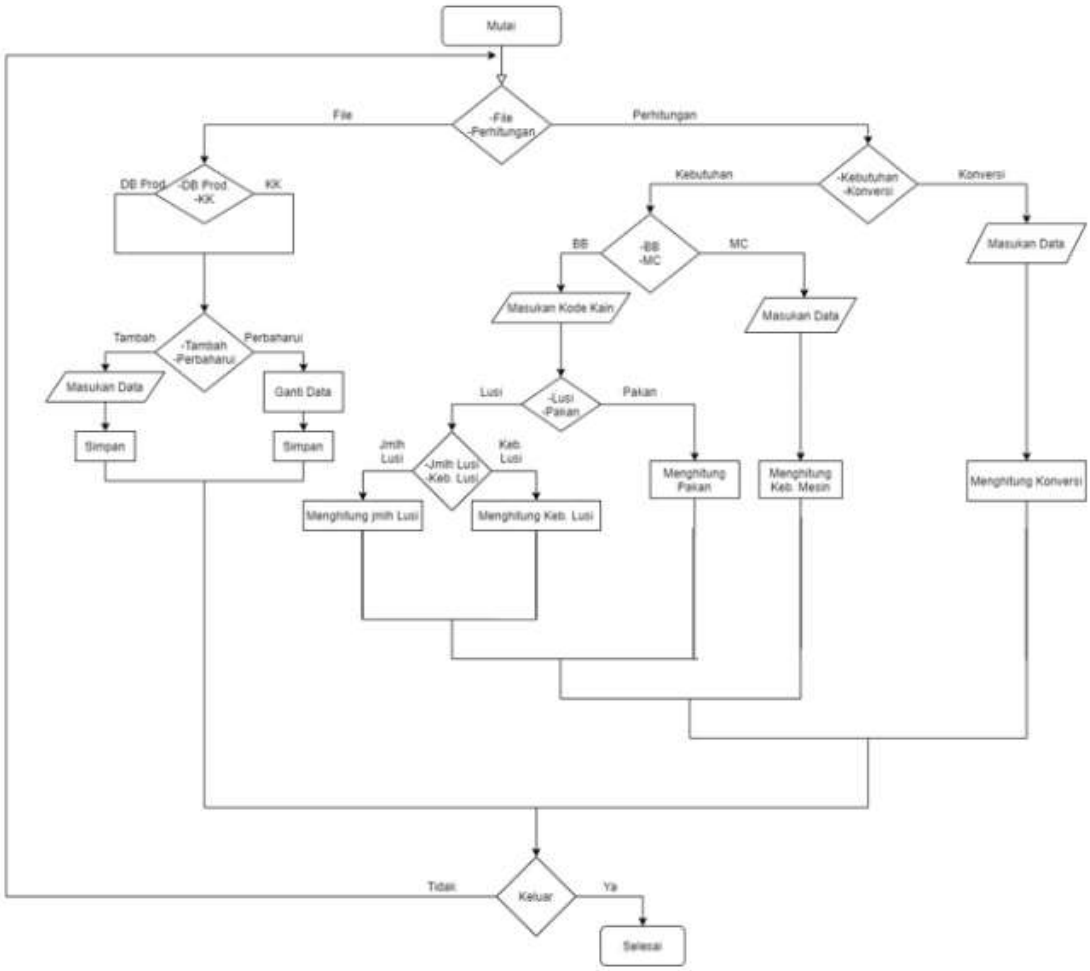

Figure 3. 1 *Flow Chart Database and Weaving Calculation*

The following is a mathematical formula used for calculating the need for raw materials and machinery.

1. number of warp=TL×LK+P
2. warp needed=100100-ML100100-WL×PK×LusiNe×1693
3. feed need=100100-MP100100-WP×PK×TP×LKNe×1693
4. machine need=Target ProduksiKapasitas Mesin/hari×Waktu Pengerjaan
5. conversion=Tex≈Td/Denier9591Ne1000Nm

Where :

SL : warp width
LK : Fabric Width

P : Fabric Edge
ML : warp drag
MP : Squeezing the Feed
WL : warp Waste
WP : Feed Waste
PK : Fabric Length

3.1. Preparation for Programming

The calculation and database application program that will be created later, is the result of a build from Microsoft Visual Studio 2019 and with the addition of Management SQL Server Studio 18 as a support for database creation. The computer or laptop that will be used for programming must be installed with both applications before use. The installation of the application is carried out according to the features needed in making application programs, so that features that are not needed and used will not hinder the program creation process.

3.1.1. Data Flow Diagram of the Program that will be Created

Below is a Data Flow Diagram (DFD) of the program that will be created.

1. DFD Contects

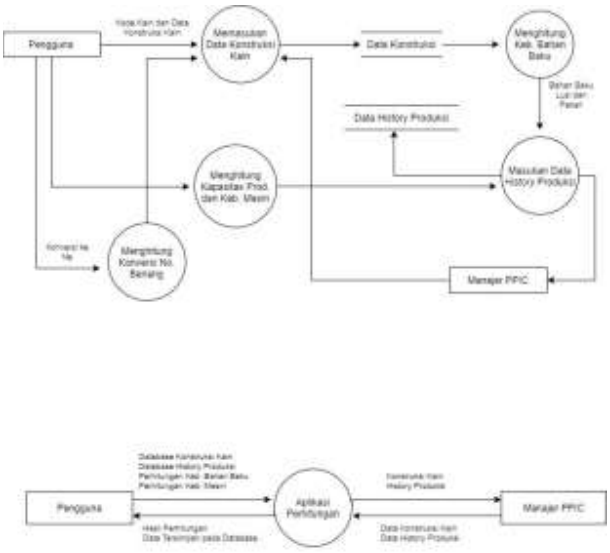

Figure 3. 2 DFD contexts

2. Null - DFD (DFD level-1)

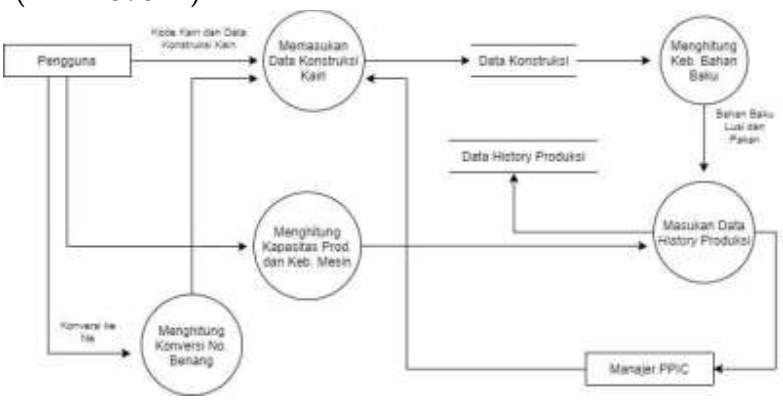

Figure 3. 3 Null DFD (DFD level-1)

1. Program development

The implementation of the program creation is carried out in Microsoft Visual Basic 2019 which was previously installed on the device to be used. Microsoft Visual Basic 2019 or can be called Visual Basic is a part of Microsoft Visual Studio 2019. Program creation is carried out in a work project which contains forms with programming languages that are connected to every feature on the form. The programming language will be created in a module. Each form will have its own module so that one form will not be confused with another form.

The form can be filled with several features that exist in Visual Basic, but according to the needs of making application programs. When all the features have been created and designed on the form, then each of these features will then be connected to a command in a programming language in the module section. The result of the project that has been created will be an executable file that can be run as an application.

3.3. Database Development

Database or database is a collection of data that has a logical relationship and is arranged in a certain order and stored in computer storage media. There are many database formats that can be connected to Microsoft Visual Basic 2019, one of which is Microsoft SQL Server Management Studio. When creating a database in Microsoft SQL Server Management Studio, first connect the device used with the application. Once connected, all the data entered will be connected and stored on the device.

1. Program Implementation

The application program that has been designed and created will then be tested for testing to calculate the need for raw materials and machines with a predetermined construction.

1. Main interface

   The first interface that appears when the application is opened. Contains several menus found on the top bar of the display.

Figure 3. 4 Main interface

2. Fabric Construction Database Page

   This page will appear when we select Construction Database Menu in the File menu section. This page serves to fill in the fabric construction that will be calculated later.

Figure 3. 5 Fabric Construction Database Page

3. Database Production Page

If the time and production data are stored in the production history, then the data can be entered into the Database section which is on the file menu and a page will appear as shown in the image below

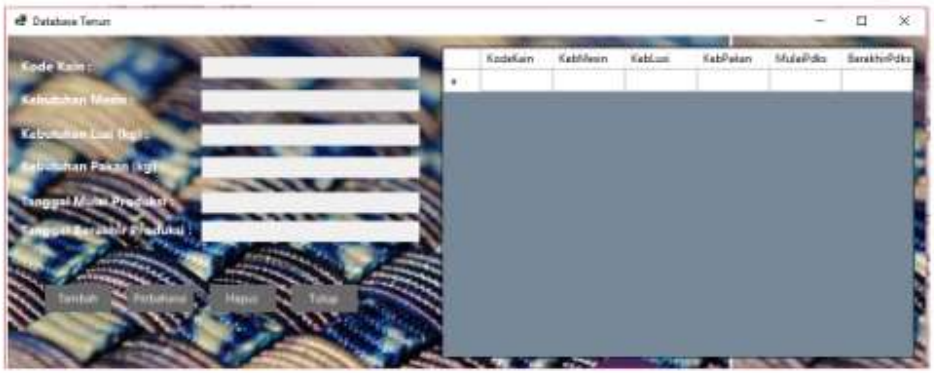

Figure 3. 6 Database Production Page

4. Machine Requirement Calculation Page

The calculation of machine requirements and production capacity is calculated by filling in the blank fields with known information. The results can be obtained by pressing the button according to the calculation needs

Figure 3. 7 Machine Requirement Calculation Page

5. Yarn Requirement Calculation Page

The calculation is done by entering the fabric code that has previously been entered in the fabric construction database section and has been stored there. Users only need to press enter so that the blank column of the fabric construction section will be automatically filled, only need to enter the number of fabric edges.

Figure 3. 8 Yarn Requirement Calculation Page

6. Yarn Number Conversion Page
The yarn number used in the calculation in the program uses Ne, so if the user has a yarn number other than Ne, it can be converted first on this page.

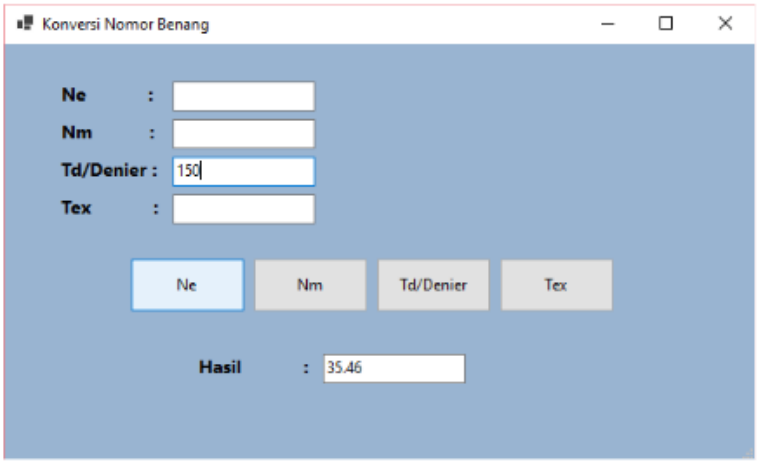

Figure 3. 9 Yarn Number Conversion Page

1. System Testing

Making applications that aim to simplify and speed up the calculation of the need for raw materials and machines, not only has to be fast but also has to be precise. Therefore, a validation is carried out by re-checking whether the results of the calculations by the application and manual calculations are different or not. From the validation results, it is found that there is no difference between calculations using the application and mathematical calculations manually, only the difference in decimal rounding.

4. CONCLUSIONS

The conclusions obtained from the results of the experimental manufacture, trial use, and analysis conducted by the author, that is:

1. From the results of manual calculations and using the application, there is no significant difference other than the rounding of decimal places. So in other words, this application can be said to be successful.
2. Applications made by the author make it easier to speed up the process of calculating raw material needs and machine requirements because they no longer need to be done manually.

3. Application users do not have to be weaving experts, but people who are not weaving experts can still use this application.

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