AN APPLICATION PUZZLE 31 GAME ON LOCAL AREA NETWORK (LAN)

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ABSTRACT

Puzzle Game 31 is a numbers game played on a 6 x 4 square, where each column contains numbers from 1 to 6 such that the first row contains the value of all one, the second line contains the value of two all and so on. The first player will start selecting a number in the box and mark it so that it cannot be used again. All values taken will be added up. The goal of the game is to score 31 points, which means that the player who reaches 31 first wins the game. This game is usually played by two players.

1   INTRODUCTION

Puzzle Games31 is a numbers game played on a 6 x 4 square, where each column contains a number from 1 to 6 such that the first row contains the value all one, the second line contains the value two all and so on. The first player will start selecting a number in the box and mark it so that it cannot be used again. All values taken will be added up. The goal of the game is to score 31, which means that the player who reaches 31 first wins the game. This game is usually played by two players.

To increase the complexity of this Puzzle 31 game, this game can be played by more than two players, with the size of the box will also be enlarged according to the number of players participating in the game. For example, suppose three people are involved in a game, then the number of squares becomes 6 x 6, and if four people are involved, then the number of squares becomes 6 x 8, and so on. Until now, there is no Puzzle 31 game application that can be played on a local area network (LAN).

Based on the description above, the author intends to design a puzzle game number 31 on a local area network (LAN) by taking a thesis entitled "Application of Puzzle Game 31 on a Local Area Network (LAN)".

2   LITERATURE REVIEW
2.1.   Application

According to Pramana (2010), an application is a computer software that utilizes the capabilities of a computer directly to perform a task that the user wants. Usually compared to system software that integrates various computer capabilities, but does not directly apply these capabilities to perform a task that benefits the user. The main examples of software are word processors, worksheets and media players.

Several applications that are bundled together into a package are sometimes referred to as an application suite. Examples are Microsoft Office and OpenOffice.org, which combine a word processing application, a worksheet, and several other applications. Applications in a package usually have a user interface that has something in common making it easier for users to learn and use each application. Often times, they have the ability to interact with each other to the benefit of the user. For example, a worksheet can be included in a word processing document even if it is created in a separate worksheet application.

The definition of the application according to experts:
1.   According to Pramana

An application is a software unit that is created to serve the needs of some activity such as a commerce system, community service game, advertising, or all processes that are almost done by humans.

2. According to Hendrayudi

An application is a collection of program commands that are created to perform certain tasks.

3. According to Ibisa

The application is a tool to simplify and speed up the work process and is not a burden for its users.

2.2.   Games

Gameshas played an important role in daily life in relieving stress, providing entertainment in leisure time and so on. Games or computer games have existed around 1952 with the emergence of the Tic-Tac-Toe game. The following is a description and description of the game.

Based on the way (rules) of the game, computer games can be divided into:
1. Adventure Games(Adventure Game), for example Metal Flug.
2. RPG (Role Player Games), for example Final Fantasy Series.
3. Simulation Games, for example the Capitalism Series.
4. Strategy Games, for example Star Craft.
5. Puzzle Games, for example Tetris, the Related Words quiz.
6. Shooting Games, for example Raiden Series.
7. Racing Games, for example the Grand Tourismo Series.
8. Fighting Games, for example Street Fighter.

Meanwhile, based on the number of players, computer games can be divided into:
1. single user, games which only one person can play.
2. Multi User, gamewhichcan be played by several people at once.

2.3.   Puzzle Games 31

Puzzle Games31 is a numbers game played on a 6 x 4 square, where each column contains a number from 1 to 6 such that the first row contains the value all one, the second line contains the value two all and so on. The first player will start selecting a number in the box and mark it so that it cannot be used again. All values taken will be added up. The goal of the game is to score 31, which means that the player who reaches 31 first wins the game. This game is usually played by two players.

The workings of the game can be detailed as follows: Suppose it is determined that two people will play Puzzle 31. The number of boxes is 6 x 4, which is 24 boxes. The first person will choose the highest available value and mark it himself. The second person will choose the other highest value. However, the selected values cannot be the same. If the selected value has been used by someone else, then the value will not be counted and the turn will be continued to the next player. The first player to reach the value of 31 will win the game.

To increase the complexity of this Puzzle 31 game, this game can be played by more than two players, with the size of the box will also be enlarged according to the number of players participating in the game. For example, suppose three people are involved in a game, then the number of squares becomes 6 x 6, and if four people are involved, then the number of squares becomes 6 x 8, and so on.

According to Dhoto(2010), a computer network can be defined as a relationship between two or more computers and other peripherals through transmission media to communicate data with one another.Data communication can be interpreted as sending data electronically from one place to another through a communication medium, and the data sent is the result or will be processed by a computer system. In a network there are three main components that must be understood (can be seen in Figure 1. The main components in a computer network), namely,
1. Hostor node, which is a computer system that functions as a source or recipient of the data sent. These nodes can be,
    a.   Serversnamely a computer where data is stored and application programs used in the network,

b. Clientnamely computers that can access resources (in the form of data and application programs) on the server,

c. Shared peripheralsnamely the equipment that is connected and used in the network (for example, printers, scanners, hard disks, modems, and others).

2. Link, is a communication medium that connects one node to another node. This medium can be wired and wireless transmission lines.

3. Software, which is a program that manages and manages the network as a whole. This includes a network operating system that functions as a controller of data communications and peripherals in the network.

Figure 1. Main Components in a Computer Network
Source :http://lecturer.eepis-its.edu/~dhoto/siswa/jarkom/Buku_Jaringan_Komputer-Dhoto.pdf

3   METHOD

In the first stage, the writer collects the materials needed in the preparation of the thesis. The material is collected from the internet, books and other sources on the internet. Puzzle 31is a numbers game played by 2 or more people in a 6 x 4 box. If the number of players is more than two people, then the box size becomes 6 x 6 (for 3 people), 6 x 8 (for 4 people), and so on. . Based on this rule, the formula to determine the size of the box based on the number of people is: Box size = 6 x (2 * n) where: n is the number of people.

The description of the Puzzle 31 game system using context diagrams can be seen in the following figure:
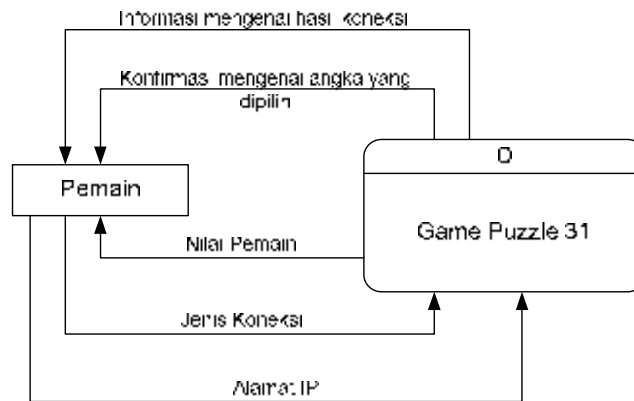

Figure 2. Context Diagram of the System

Details of the work process on the Puzzle 31 game system can be described using DFD Level 0 as shown in the following figure:
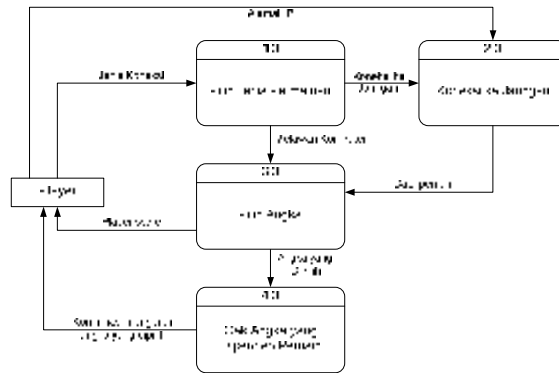
Figure 3. DFD Level 0 of the System

When played, the numbers in the Puzzle 31 game are placed in a box. The selected number will be marked by changing the background color of the number. The following is an example of a game box image:

Figure 4. Design Drawing of Puzzle Game Place 31

The process contained in the Puzzle 31 game application can be described as follows:

The working principle is that one of the computers will determine whether to act as a Client or Server. The computer that acts as a server will run first and wait for the computer that acts as a client to make a connection or connection. After the connection of the two computers is successful, the two computers can interact with each other. The first player to score 31 will win this game. The same applies to the number of players more than 2 people. The first computer that initiates the connection will be the server, and all other computers must connect to the server computer using the IP address of the server computer.

In addition, for the game Against the Computer, the pseudo-player generated by the computer has artificial intelligence. The workings of artificial intelligence on pseudo-players are as follows:

1. Determine the initial Rnd value of 7. Rnd is a random number value generated by Microsoft Visual Basic .NET 2010.
2. If the pseudo-player value is greater than or equal to 25, then do the following:
    a. Subtract the Rnd value.
    b. Choose a random value Rnd1 between 1 and {total number of columns}. The total number of columns is 2 * {number of players}.
    c. If the box(Rnd1, Rnd) has never been selected before and the quasi-player point value plus the value in the box(Rnd1, Rnd) does not exceed 31, then the box(Rnd1, Rnd) is selected.
    d. If not, then repeat steps (a) to (c) above.
3. If not, then do the following:
    a. Subtract the Rnd value.
    b. If the value of Rnd is less than or equal to 4, then reset the value of Rnd with a random value between 1 to 4.

c. Choose a random value Rnd1 between 1 and {total number of columns}. The total number of columns is 2 * {number of players}.

d. If the box(Rnd1, Rnd) has never been selected before and the quasi-player point value plus the value in the box(Rnd1, Rnd) does not exceed 31, then the box(Rnd1, Rnd) is selected.

e. If not, then repeat steps (a) to (c) above.

4　RESULT AND DISCUSSION

The Puzzle 31 game application created provides a 'Computer Against' feature which allows a player to play Puzzle 31 against a pseudo-player created by a computer and a 'Connection to Network' feature which allows two to six players to play Puzzle 31 on several pieces. different computers connected to each other in a computer network. The network used in the Puzzle 31 game can use a LAN (Local Area Network) or Peer-to-Peer cable that uses Wifi on the computer or laptop. In this form there are five menus that can be used, namely:

1. 'Settings' menu.
2. 'Against Computer' menu.
3. 'Connection to Network' menu.
4. 'About Maker' menu.
5. 'High Score' menu.

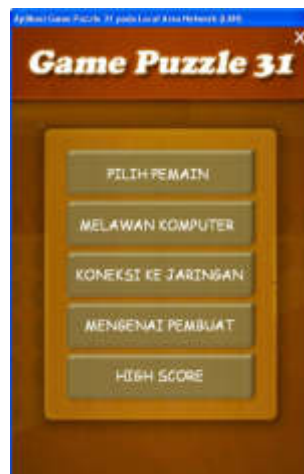When the system starts, the first form that appears is the 'Main' form as shown in the following image:

Figure 5. Main Form

If the user wants to play against the computer mode, then the user can click the link 'against the computer'. However, before playing Against the Computer mode, players must first make game settings, namely by clicking the 'Settings' link, so the system will display the following form:

Figure 6. 'Settings' Form

Some of the information that can be obtained from the results of software construction, namely:
1. The Network Socket method can be used to design a Puzzle 31 game software on a network, where the data sent is in the form of the player's name, the position of the selected value and the selected number.
2. The Network Socket method consists of two procedures, namely the procedure for declaring the server and the procedure for connecting the client to the server, where the server declaration procedure must be executed first.

The Puzzle 31 game application created can be used to play the Puzzle 31 game against several pseudo-players created by the computer. In addition, the application also provides a multiplayer feature that can be used to play Puzzle 31 games with a multi-user system connected via a computer network. This Puzzle 31 game application created cannot be played on the internet. In addition, the software also does not provide facilities for designing the Puzzle 31 board, so the user cannot design the desired board.

5 CONCLUSION

After completing the construction of the software, the author can draw the following conclusions: In multi-user games (via a computer network) the Network Socket method is used for sending data in the form of the player's name, the position of the number chosen by the player and the number of the number chosen by the player. In single player games, the resulting pseudo-players have artificial intelligence. Software cannot be played on the internet. Software does not provide facilities for designing the Puzzle 31 board, so users cannot design the desired board.

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