Chess Game Software Design

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Abstract. Along with the development of information technology (IT) which is rapidly increase. There is development of technological and electronic tools that are able to create efficient time. In the Design of the Chess Game Software, users use computerization to find solutions to chess game by using the method (Alpha-Beta). Alpha-Beta method is one of the first discoveries in reducing the number of positions that must be searched so as to increase the depth level of the search that can be achieved in one game. The idea is in a large part of the tree we are not looking for values exact of a position, but only interested if it is better or worse than what we found before only the value of a position that fulfills the main conditions must be determined (the main provisions include the change between the player's best move and the opponent's best step from a root into a tree). And the Programming Language used in Chess Game Software Design is Visual Basic 6.

1. Introduction

At the beginning, humans used computers only to process existing data, to produce information and make good decisions. Along with the development of time the computer functions are getting bigger until now. When the computer runs the data process, humans must convert the data into information that can be used in processing knowledge to produce decisions [1]. If the computer works on information processing, also includes data processing, then humans can have simply work on processing knowledge to make decisions[2][3].

With the development of the times, computers are not only a tool for office purposes or as a place of typing but also as an entertaining medium to eliminate boredom. Most computers are now equipped with various entertainment facilities ranging from MP3s, Media Video Players, Games and others to entertain users so they don't get bored [4] with a job that uses computers as a place to work.

In this case all computer users agree with the facility, because the entertainment will reduce the boredom that is so great because taking much time for work will be slightly reduced because it can entertain themselves with entertainment facilities that are on his computer. One that can be used as an entertainer after a long time working at the computer is a game. Games in Indonesian means "Games". The game referred to in the game refers to the notion of intellectual agility [5]. While the word ordinary game is interpreted as an arena for the decisions and actions of the players [6][7]. There are targets that want to be achieved by the owner. Intellectual agility, to a certain degree, is the extent to which the game is interesting to play optimally.
2. Related Works
Designing and creating a game application program requires a lot of programming procedures and techniques [8][9]. In game programming that must be considered include management of memory usage, setting screen resolution, color palette control, use of Artificial Intelligence (AI), hardware specifications (Hardware) and others [10][11]. No wonder in making games involves a reliable team work that usually consists of program makers (programmers), system designers (system design) or game storyline designers (game stories), image designers (picture animation design), sound design (Sound design) and implementers (testers) and game marketing (marketing).

3. Research Methodology
3.1. Data Source
In this study, the author requires related data Chess Game Software. From the observations, researchers need data that will be processed as follows:

1. Primary Data
   Primary data is data obtained directly from the field, namely data that is directly related to customer software Chess Game [12][13].

2. Secondary Data
   It is data obtained directly in the form of publications or reports obtained from library study sources that are related to the object of research, namely Chess Game software where the data is theoretical.

3.2. Data Analysis
Data analysis can be defined as decomposition of data obtained with the intention of defining and evaluating problems and obstacles that may occur [14][15]. To solve the problem [16] by using a method of using a computer requires a system that is built and designed in such a way as to enable the success of the computer in carrying out its tasks [17][18], namely collecting data, classifying and analyzing so that it can provide an overview or information needed about the data.

3.3 Flowchart
To overcome this problem, an application program is needed that can entertain the use of computers, so it can eliminate boredom when overworked. Here is a flowchart that describes the steps of Chess Game software. The following is an explanation of the chess game software flowchart:

1. At the initial stage is to start the program.
2. Player one moves (White Chess).
3. Looking for the road or move the pieces forward.
4. The second player moves (Black Chess).
5. Look for a way for black pieces.

3.4 Algorithm
Algorithms are sequences of logical steps (reasonable) to solve problems that are arranged systematically and logically [19][20]. Logical words are keywords in the algorithm. The algorithm contains steps for solving problems and methods used. Computers are only processes. In order to be implemented by computers, algorithms must be written in programming languages so that they are called programs. The program is an embodiment or technical implementation of an algorithm written in a particular programming language so that it can be implemented by a computer and processed according to an algorithm written so that the problem is solved. And the method used by the Alpha-Beta Search method.

The Alpha-Beta Search Method is one of the first discoveries in reducing the number of positions to be searched to increase the depth of the search that can be achieved in a game. The idea is a large part of the tree we are not looking for the exact value of a position, but only interested if it is better or
worse than what we found. Only the value of a position that fulfills the main requirements must be determined (the main provisions includes changes between the player's best steps and the opponent's best steps from a root to the depth of the tree).

![Flowchart](image)

**Gambar 1. Flowchart Chess Game Software**

The Alpha-Beta search procedure has 2 additional arguments that indicate the boundaries where the procedure is interested in calculating the exact value of a position that the profit obtained from the minimum window search is greater than the loss every time a case of a repeat search occurs. Next is the algorithm program Chess Game Application that is used when the computer starts: [21]

```c
int PrincipalVariation (pos, depth, alpha, beta)
{
    if (depth == 0) return
    Evaluate(pos);
    Succ =Successors(pos);
    pos = RemoveOne(succ);
    Best = -PrincipalVariation(pos, depth-1, -beta, -alpha);
    while (not Empty(succ) && best < beta)
```


```c
{  
    pos = RemoveOne(succ);
    if (best > alpha) alpha =
    best;
    value = -
    PrincipalVariation(pos, depth-1, -
    alpha-1, -alpha);
    if (value > alpha & value < beta)
    best = -
    PrincipalVariation(pos, depth-1, -
    beta, -value);
    else if (value > best)
    best = value;
}
return best; }
```

### 4. Result and Discussion

#### 4.1. Design

In designing an application, it takes a site map design from the application program to be designed. The following is the site map design of the Chess Game application design can be seen in Figure 2 below:

![Gambar 2. Site Maps](image)

System design is a useful step that makes it easy to design the program flow, in this case the author uses an algorithm. The system design stage can be described as a stage to build a system and describe the program's path. [22]

#### 4.2. How the application works

How the application works in the stacking blocks game using Visual Basic 6.0 is as follows:

1. The Chess Game application starts directly with the main display, the main menu.
2. To start the game the user presses the Ctrl + N key
3. Then the direction buttons on the keyboard are used as controls in the game
4. Users can exit the application by pressing the EXIT button or Ctrl + E

In order for this Chess Game software to run properly, there are several devices that must be met before executing this software, there are devices that are needed to run this software, including:

1. Hardware
a. Micro Processor core 2 duo  
b. Hard drive for the place where the system operates and as a data storage media.  
c. Memory minimum 512 Mega Byte  
d. Monitor Super VGA  
e. Mouse dan Keyboard  
f. Printer

2. Software
   a. The operating system used must be at least Microsoft Windows XP, Microsoft Windows Vista or Microsoft Windows Seven.
   b. Anti Virus to prevent the possibility of system damage caused by viruses that enter both from floppy disks and other input media.

3. Human or User Devices (Brainware)
   a. People who understand how to operate a computer  
   b. People who like computers

5. Conclusion
After completing this study the author can draw some conclusions:
1. The final result of this research is an application of Chess Games developed using Microsoft Visual Basic 6.0 programming.
2. The advantage of this application is that it is easy to use so that it can be used by even novice users.

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