Implementing Historical Aspects of Majapahit Empire in A Turn Based Strategy Game

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Abstract—Introducing a nation to the outsider is to introduce the history of the nation. History is an identity, pride and the origin of a nation. If we want to know a nation, then we will find out the history of the nation first. From the nation's history, we will understand what kind of life values upheld by the people and also their culture.

Game is a media that is easily understood by people of all ages and easy to understand all the nations because they do not involve a certain language. Games also have standard and simple rules which are easy to be understood. With these advantages, a game is a medium which is suitable for presenting history of a nation to the world. At the same time, as a means to introduce the nation's history to its own citizens in interesting ways. Game strategy is chosen because it would give players an experience. This experience is an effective way to take someone on an understanding of the conditions which are experienced. Therefore, building a game that simulates an experience of the history of the nation is an effective way to guide the future generation to understand and appreciate the values of existing as well as maintaining the good things that have been championed by his predecessor.

This paper describes a game which simulated an important history of Indonesia. This game will give its players an experience how to conquer all the kingdoms in Indonesia at Majapahit time. Majapahit conquered almost the same area as modern Indonesia. So, Majapahit can be a representation as Indonesia at the ancient time. The main goal of this game is how to make the player understand that Indonesia, contains many people groups, will be unite if we have a common goal and not only surpass other groups but also keep all the group save from enemies from outside region.

The aim of this game is to present political system, socio-cultural and trade in the era of the Majapahit as background preparation of a strategy to unite all regions in Indonesia. These aspects impact each other and still have influent upon modern Indonesia. So, this game can be a representation of Indonesia.

Keywords—Historical Aspect, Majapahit Empire, Turn Based Strategy Games, Majapahit's conquest

I. INTRODUCTION

History is important because it explains the civilization and culture of a nation. The fame of a nation can be seen from its history. However, studying the history often becomes difficult because there are only few historical sources, such as artifact, history documentation, or culture sites. Another obstacle in introducing history to the next generation is the lack of interesting and interactive media to represent the history. In information technology era, if only rely on print media such as text book, will be less desirable for IT generation. For this generation, multimedia such as game is more potential and powerful [1][2][3].

Many countries present their history on many kinds of media. Appropriate media which make history accepted more easily [2]. Therefore, not only their own people who interested to know and learn national history, but also other nations will be interested to know more deeply. Multimedia used are picture books, movies, cartoons, dramas, and games.

In the case of Indonesian history, there many kingdoms rose and fall. Some kingdoms became powerful kingdoms and expand their territory almost the entire territory of Indonesia today, such as Sriwijaya, Mataram, Singasari and Majapahit [4][5]. One of the great empires that ever existed in Indonesia is Majapahit.

In its heyday, Majapahit controlled the area that similar to Indonesia's area today [4][5][6][7]. Administrative center was located in East Java, with its capital city, Mojokerto. Majapahit is an agricultural country and had a strong maritime. Not only the region, but the governance and socio-economic structure of society are also similar to the people of Indonesia today. Therefore, Majapahit kingdom Indonesia can be regarded as representation of the Indonesian history.

In this research, we developed a strategy game with the theme of the history of the kingdom of Majapahit. The main purpose of the making of this game is to present a glimpse of Indonesia's history to the next generation using interesting and interactive multimedia. The main objective of this game is not to explain the history, but to raise an interest to study the history deeper.

In developing a game, the plot is in the hands of players [8]. Therefore, presents the history in chronological order is impossible to do [9]. Players also need to be directed at a specific goal to be accomplished in the game. These two things will be major concern in the game design.

II. Theory

A. Strategy Game

Strategy game is a game genre that emphasizes thinking and good planning to achieve goal [10]. Players must plan a series of actions against one or more enemy and trying to weaken the opponent with as efficiently and quickly as possible. There are various actions the player can take, such as doing the construction, set up resources or preparing a defense to face the enemy attack. A strategy games take the challenges from AI's strategy which adopted from the opponent leader personality. Most of the game involves an element of war strategy, and give priority consideration a combination of tactics and strategy. This kind of game is often challenging the ability of players to explore and regulate the economy. In strategy games, the main purpose of the session of the game is to beat all the other players and become a winner.

Game strategy is generally subdivided into two subgenres, which is turn-based strategy and real-time strategy. In subgenre turn-based, players can only run the action on the turn only. Actions can be taken are limited, for example, the player can only do two actions on their turn. Turn-based strategy provides flexibility to the players to think without being limited time. While the real-time strategy, game run without a turn. All actions are done by player and AI in the game will have a direct impact on the course of the game. This subgenre encourages players to think fast and concentrate on the game.

B. Game Based Learning for Learning History

Zin, Jaafar, and Yue mention that using learning games could help students in some subjects such as history [2]. There are several factors that must be considered in making game, such as

• Background Story on Game needed to recount events that happened in history. The event consists of the time and location.

• Rules of the Game necessary for the player to follow the existing gameplay[2]. Rules of the game are also important to deliver the value to players [11].

• Immersive: Game design that there should be able to make players feel involved in the events that occurred on each gameplay.

• Enjoyment: The pleasure in playing the required player so that the player still wants to play the game there [3].

• Feedback: Feedback is required by a player to give a clear interaction with the game being played.

• Technology Multimedia: The Role of 2D or 3D multimedia necessary to draw the attention of the player [12].

• Competition and Challenge in the game should be able to adjust to the capabilities player that plays.

• Reward or acknowledgment required by the game so that the player keen to continue to play games created.

C. Designing A Game

Game designing is a process by which developers plan a game they will make. The process consists of several steps, beginning with imagining the concept of the game and defining how the game works, and planning elements that will build the game. At the planning concept of the game, the designer suggested that adheres to a philosophy of work focused. In game design, there is a philosophy called player-centric game design. This philosophy is a design concept in which to design a game, the designer had to imagine beforehand exactly the type of candidate the player / target audience for these games [8]. From there, the designers had to hold on a few things during the game design

• Creating an entertaining game. The main objective of the game is to entertain players. Therefore, if there is a feature or concept in the game as opposed to this, the feature should be abolished.

• Creating a player orientation game, not according to what designer wants. To achieve this, designers have really imagined himself as a candidate for player of the game that will be created.

After planning the concept games, designers can start designing components of the game. There are two main components that are required in every game, the core mechanics and user interface [8]. Core mechanics is a set of rules that would be the basis of a gaming system. Rule can be simple as how quickly the player character is running, or the more complex as what action will be taken when player meets the enemy. User interface will be a bridge between the players with the core mechanics. User interface captures input from the player and turn it into action. Action is then received by core mechanics. Core mechanics of the action process and send the results back to the user interface. Then, user interface accepts the result and display it as an output that can be understood by the player.

III. Game Design

The game developed in this research is called Majapahit Conquest. The important thing designing this game is determining what is the goal the player should achieve and how does he achieve it. The goal of this game is conquer kingdoms at Indonesia archipelago. In the real history, this mission is important for Majapahit. In order to survive from Mongolian attack, all kingdoms in the same territory should unite. Otherwise, the Mongolian will be easy to attack Majapahit or other kingdom by making alliance with one of the kingdoms.

A. Goal of Game

The next step in this game developing is designing how the player can conquer all the other kingdoms. To achieve the goal, the player should arrange his strategy. Determine how many troops and what kind of troops he will send to conquer a kingdom. If the kingdom weaker than the player's, it will be subject to Majapahit (the player's kingdom). Some neighbor kingdom will be subject to Majapahit with fight, some others with peace, based on their army power. Figure 1 show the

relationship diagram of what supports the important component in achieving the goal.

B. Game Rule

The main component to conquer other kingdom is how many and how powerful the troops. Majapahit has a great marine corps. Not only marine, it also has army. To have such a great troops, first recruit people, train them and send them. The number of populations shown in the game is the productive people. 5% of them can be recruited as troops. 20% will be bureaucrat, 40% farmer, 20% merchants, 15% industry worker. Every year the population will increase by 0.2% - 1% depend on the food supply. To train the recruited people, army base is needed. This army base has capacity. To build an army base needs enough money. The government gets the money from taxes, livestock, industries and trading. Government also takes tax from field but not paid with money but with grain.

To send the troops to other kingdom, weapons and or ships are needed. Weapons are supported by metal industries and ships are built by ship workers. Both metal industries and ship workers should be paid some amount of money. Raw material of metal can be taken from certain regions which are metal mines in Indonesia until now.

The basic component needed by all the population, worker, and troops, is food. Commonly, an Indonesian eats approximately 100 kg per year. The harvest will fulfill the need of grain for the entire population. Normally, Indonesia gets 4-5 tons per hectar, twice a year in Majapahit time [6]. If the government support the farm with good irrigation, with build dams, use good technologies, it will yield abundant corps. If farming starts lately, the harvest will fail. If there surplus of rice, it will be trade for spices (from Maluku), ceramics, silk and metal utensils (from China, Thailand or Arab). The key of getting successful harvest is irrigation. To have good irrigation, should build dams. The others way to have a good harvest are technologies such as plow, hoe, and anticipating pest. In Indonesia, there are 8 kinds of pest in 8 years which come periodically [6]. If the anticipating action is wrong, the harvest result will reduce by half. Technically, rice filed would be available if the government clearing forests, cultivating the land using technology. Once a rice field is opened, a number of the population will automatically be allocated as farmers.

Trading only can run if government builds the market places. The market places are only can be built on certain locations, based on history. They are Curabhaya, Trung and Canggu, the name of modern cities are Surabaya, Gresik and near Mojokerto respectively [6]. The harbors should be built on those Tuban, Gresik and Surabaya as three major harbors in Majapahit. The commodity also based on history. The grain will be trade for spices and sandalwood from East Indonesia. Later the spices and sandalwood will be trade for garment, ceramics and silk. Metal industries only run on two cities, Jember (Kendeng Lembu) and Pacitan (Punung).

The government takes money from the tribute from subordinate kings and taxes [6]. Taxes collected include taxes on land, trade, property taxes and transportation, natural resource tax, industries and taxes from farming in the form of grain. At the time of Majapahit, the land has a value and an important role for the community, any land owned should be best utilized or will be fined. Land tax levied based on several criteria, namely the type of soil and land area. Trade tax assessed on the amount of goods carried. Handicraft business tax is taken by the base material objects that craft, metal or nonmetal materials.

Tax collection time is varies, monthly, pratiwarsa (yearly), twice a year (for example, every full moon Jyestba and Caitra, in farming case), each full moon in the month Asadha (June-July), each Asuji (September- October), every month Karttika (October-November) and so on. Every kind of taxes have its own time to be taken. There is a tax-free area to the kingdom called sima area. If an area designated as an area sima, tax collection was not handed over to the kingdom, but used for the construction and maintenance of sacred buildings in the area [6].

C. Game World

The last step in designing this game is developing the story and creating the game world. The story will begin at year 1293 when Majapahit's history started. This game is based on turn. Every turn is a month in agricultural calendar. These months are not composed the same number of days [6]. Some have just half than the longest months. This calendar system is chosen because Majapahit is an agricultural kingdom and also match the season in Indonesia till this day. At the first time, player will be given a region (the region of Majapahit's capital city), an amount of money and some people. Player can choose at most one action on each aspect. The aspects are based on the diagram on Figure 1, troops, food, trading and money. It means do anything with the troops, determine what to do with the farm and make trading with other area or other kingdom and collect tax. To execute the actions, player should end his turn. After that, other kingdoms will take some actions too. The other kingdoms will be controlled by AI system.

Figure 2 show the map will be used. Since the center of Majapahit kingdom is in Java, so the game will only shows Java with little part of other kingdoms.
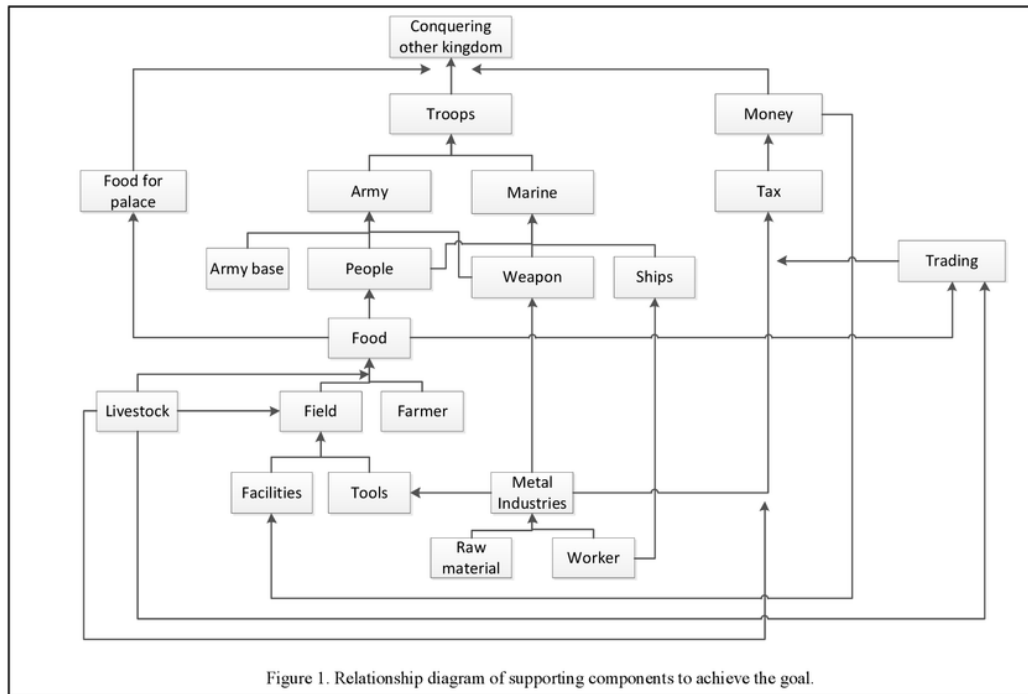
IV. CONCLUSION

Implementing history aspect into a strategy game should concern some significant things, such as the goal of the game, how the player can achieve the goal, the game rule and actions the player can choose. Not all ancient life styles can be modeled because it will limit the player to take the action on the game. The aspect can be modeled are the important aspect that support the goal of the player. In the case of Majapahit's history, the important aspects are territorial expansion and agriculture. The other aspects that support player to achieve the goal are the strength of the army, food supplies and financial.

Strength of army can be reach by train the troops, enlarge the army base and multiply weapon and ship for war preparation. Food supplies can be gotten by open forest and make it field, build irrigation, use farm technology and handle the pest correctly. Start planting rice in the right time. Money come from taxes. The government should collect the right tax on the right time. Through all these actions, player will have an experience similar with ancient life.

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Figure 1. Relationship diagram of supporting components to achieve the goal.

Figure 2. Game Map, Java's landscape

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