Web Based Virtual Agent for Tourism Guide in Indonesia

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Abstract. The development of tourism sector in Indonesia is increasing rapidly, judging from the number of local and foreign tourists which is always growing every year. The rapid development of technology is also very influential in the development of this tourism sector, for example using the web to provide information on tourism in Indonesia, where only display text and images and also not interactive. So, an application system of virtual intelligent agent that connects human and computer is created. It makes an intelligent and interactive tour guide. This paper tries to present Smart Indonesian Tourism Agent (SITA) as visual tour guide. This is a web based information system that provides to access location of tourism in Indonesia. This application uses A.L.I.C.E server and Artificial Intelligence Modeling Language (AIML) interpreter. Hence, the information generated in the web can be displayed in text, visualization, image, and the chat box for questions.

Keywords: AIML, SITA, Tourism, Virtual Agent, Web.

1 Introduction

Indonesia is one of the country which has high fascinating tourism attraction spread in all over region from nature tourism until shopping tourism. It is one of the factor that makes tourism sector in Indonesia was improving from year to year. In 2010, the number of tourist improves about 10,79% from 2009 that is 7 million people. Foreign exchange earnings is also improving about 20,63% to be US$ 7,6 billion[1].

The growth of tourism industry is also impacted by advanced technology, such as using of web site as promotion facility. Information which is displayed on the web sites generally in text and less interesting to read. Therefore, this paper creates a concept of web interactive using virtual agent.

Agents are systems that interact with an environment using sensors to receive perceptual inputs (called percepts) from it, and actuators to act upon it [2]. A agent is a computer system that is situated in some environment, and that is

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capable of autonomous action in this environment in order to meet its design objectives. Usually the agent only has partial-actions might not have expected consequences, control systems, software demons [3]. From those definitions, we have two important points. First, an agent has ability to do any task or work. Second, an agent does any task or work for anything or for another people [4][5]. So, it can be concluded that virtual agent is a human like character in animation form and it can do direct communication with human interactively. This paper prepares that virtual agents use natural human modalities such as speech and gesture. They are capable of real-time perception, cognition and action that allows them to participate in a dynamic social environment.

Smart Tourism agent was created to help the tourist to get the information about tourist attraction in Indonesia. User can do direct interaction to ask about tourist attraction and culture in Indonesia. So, it can makes the tourist feels like communicate with a human tour guide.This paper will be discussed about the concept of web based virtual agent to promote tourism in Indonesia and then will be explained about the smart tourism agent interface.

This paper will be divided to some sections. The explanations start with the introduction. Section 2 explains about related work for the agent concept. Section 3 explains about smart tourism agent architecture.It explains about how agent can communicate with the user and its tools. Interface design for smart tourism agent will be created in section 4. Section 5 explains conclusion and future work.

2   Related Work

Virtual Agent has been widely used for various applications, such as agent for tutoring system. The Application of Intelligent Tutoring System (ITS) into e-learning system that is expected to improve the quality of learning [5]. This paper tried to provide an alternative way to support the creation of intelligent tutoring system, especially the learning of communication systems by presenting the figure of teacher in the form of Virtual Agent Character. This character agent is obtained from Ms. agent. Virtual Agent for e-learning created with Visual Basic programming language. This virtual agent is related part to create Intelligent Tutoring System, especially in presenting an intelligent and communicative virtual teacher. Agent is part of intelligent tutoring system, especially in intelligent and communicative virtual teacher. This paper will develop another virtual agent with Indonesia characteristic to get information a place of tourism in Indonesia using chat box.

An emotion is needed to make real virtual characters. Vallapureddy Rajender Reddy [6], discuss about "Communicating Emotions To Virtual Agents: An Emoticon-Based Approach". This research focuses on using emoticons to communicate emotions in human computer interaction. The use of emoticons has an advantage that it requires no external hardware devices. Emoticons can be used as an added communication channel augmenting natural language input in human computer interaction. A prototype has been developed which consists of a virtual character with natural conversation and appropriate facial expression abilities. The natural language understanding capabilities were extended

to allow for the use of emotions when talking to the agent. A group of users was asked to interact with the agent and asked to submit a feedback pertaining to certain questions. The analysis of the feedback suggests that conversational agents having emotions in them will significantly improve the interaction and believability.

This paper provide facility for user to make direct communication with agent.The work of Marcel Ritschel [7], explain AI Chat Bots and Digital Assistants.This paper explained about how to feed the AIML matching algorithm. So, the system can give the answer based on pattern.

Many papers discuss agents problem with different objectives. This paper tries to create web-based virtual agent with chat box concept that users can interact directly with the agent. Virtual agent is made using real emotion so it looks like a real tour guides by using the background information on AI and AIML method.

3   System Architecture

3.1   Architectural Design of the System

Fig. 1 describes a tourism agent architecture, an agent designed to assist foreign and local tourists as the user to find a place of tourism in Indonesia. Furthermore, users are given a choice of tourist attractions and the system will read it in the database server. After finding it in the database server, then agent will give a feedback to user and user will get information of tourist attractions they want. However, if users find a difficulty or require more information, there is facility to chat with Smart Indonesian Tourism Agent (SITA). The users type their input in the text box and by pressing the enter key or confirm ask button. Next, system will connect to A.L.I.C.E server and patterns will be checked in the AIML interpreter. After the pattern is matched, system will find the answer in database. The agent will response immediately with appropriate face expression.

The system is capable of making a natural conversation with the users. At present the system has just a few patterns to support the conversation. With the increment of the patterns and improving the patterns hierarchy, the system can be made much more effective in the natural conversation. The flow of the conversation with the SITA can be like the example given below[8]:

User : Where is Museum Gajah??

SITA : Museum Gajah is located on Jalan Medan Merdeka Barat no.12, Jakarta Pusat

User : what kind of object i can found there?

SITA : There are ancient stuff from Indonesia such as Ancient Statues, ceramics, textiles.

User : what is the other tourist attraction around Museum Gajah?

SITA : There is Monument National. It's about 1 km from Museum Gajah.

User : ok . thank you

SITA : Your Welcome !!!

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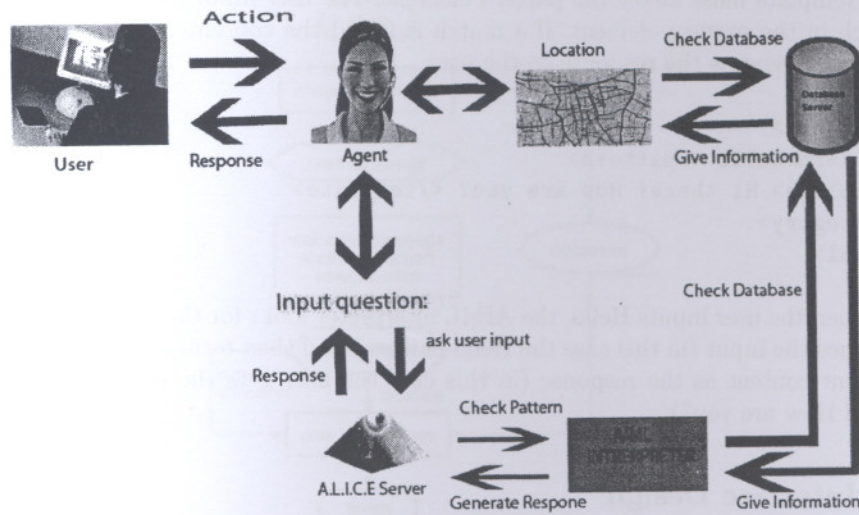pattern is a
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Fig. 1. Smart Tourism Agent System Architecture

3.2   AIML

AIML objects are made up of units called topics and categories, which contain either parsed or unparsed data. Parsed data is made up of characters, some of which form character data, and some of which form AIML elements. AIML elements encapsulate the stimulus-response knowledge contained in the document. Character data within these elements is sometimes parsed by an AIML interpreter, and sometimes left unparsed for later processing by a Responder[9].

A typical AIML formation is made of:

```
<aiml>
<category>
<pattern> </pattern>
<template> </template>
</category>
</aiml>
```

The AIML tag is the root tag, which marks the beginning and end of the AIML document. A category is a top-level element that contains exactly one pattern and exactly one template. A category does not have any attributes. A pattern is an element whose content is a mixed expression. The pattern must always be the first child element of the category. The contents of the pattern are appended to the full match path that is constructed by the AIML interpreter at load time. A template is an element that appears within category elements.
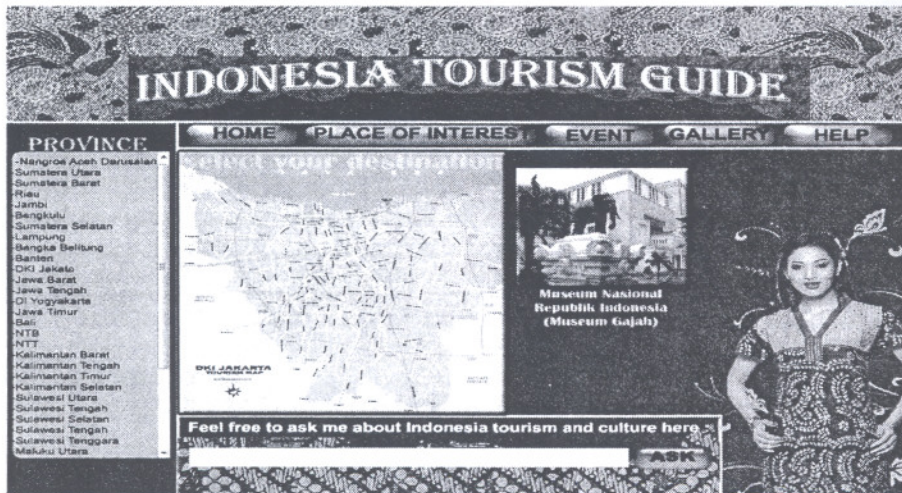
Fig. 4. Province Page

Fig. 5. Tourist Attraction

5   Conclusion and Future Work

SITA is an intelligent and communicative virtual agent and it is created to give information about tourism in Indonesia. SITA is very helpful for local and foreign tourist to get information of tourist attraction. Beside that, user also can interact directly with the agent if users want to know more about the attraction or have difficulty when getting information. The information generated in the web can be displayed in text, visualization, image, and the chat box for questions.