Continuing Education Program
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Information Search and Analysis Skill

(ISAS)

Artificial Intelligence (AI) Technology In Google Assistant

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PREFACE

Praise be to Allah Almighty, Most Merciful, because thanks to His grace and guidance, the writer can arrange and present a paper that contains about AI Technology In Google Assistant. The writer also thanked to Mr. Listyo Edi Prabowo as our faculty that have provided guidance to the writer in the process of preparing this paper. Not to forget the writer thank the various parties who have given encouragement and motivation.

The author realizes that in the preparation of this paper there are still many shortcomings and far from perfection. Therefore, the authors expect constructive criticism and suggestions to improve this paper and can be a reference in preparing the papers or subsequent tasks.

The authors also apologize if in writing this paper there are typos and errors that confuse the reader in understanding the author's intent.

TABLE OF CONTENT

TABLE OF FIGURE

CHAPTER I
INTRODUCTION

I.1 Background

The development of this new technology is very fast so that the creation of artificial intelligence can be create by humans, artificial intelligence or AI is intelligence that is added to a system that can be arranged in a scientific context, Michael Haenlein defines artificial intelligence as "the ability of the system to interpret external data correctly, to learn from that data, and to use that learning to achieve certain goals and tasks through flexible adaptation.

An ideal intelligent machine is a flexible agent which perceives its environment and takes actions to maximize its chance of success at some goal or objective. As machines become increasingly capable, mental faculties once thought to require intelligence are removed from the definition.

At present the term AI for successfully understanding human speech, competing at a high level in strategic game systems, self-driving cars, and interpreting complex data. Some people also consider AI a danger to humanity if it continues to progress at its current pace.

Google recently created artificial intelligence by humans as called is Google Assistant, And In this ISAS, we will explain about Artificial Intelligence Technology In Google Assistant. And also, explain how AI can be works in Google Assistant Application.

I.2 Writing Objectives

The purpose of writing this Paper is to answer the following questions:

1. What is Artificial Intelligence.

2. Type of Artificial Intelligence?
3. What is Voice Recognition?

I.3 Problem Domain

Accordance with the title of ISAS "AI Technology in Google Assistant" We will discuss:

1. Explain About Google Assistant
2. Device in Google Assistant
3. What Can Google Assistant Do
4. How Does it Work

I.4 Writing Methodology

Writing methodology used is to search for sources of information and references from the internet, ask the relatives and read the articles in some resources.

I.5 Writing Framework

Analysis of this ISAS is written with this systematics:

- **CHAPTER I : INTRODUCTION**
  In this section, describe the background, problem analysis, writing objectives, writing methodology, and systematics of writing.
- **CHAPTER II : BASIC THEORY**

  In this chapter contains theories such as definition, history, basic concepts and related information interms of analysis, especially on problem analysis.

- **CHAPTER III : PROBLEM ANALYSIS**

  This chapter deals with problem analysis such as explain of google assistant, device in google assistant, what can google assistant do and how does it work in google assistant.

- **CHAPTER IV : CONCLUSION AND SUGGESTION**

  In this chapter contains the conclusions of the results of writing and suggestions.

- **BIBLIOGRAPHY**

  In this section will contains the references that we use.

CHAPTER II
BASIC THEORY

II.1 Definition of Artificial Intelligence (AI)

Artificial intelligence (AI) is an area of computer science that emphasizes the creation of intelligent machines that work and react like humans. Some of the activities computers with artificial intelligence are designed for include Speech recognition, Learning, Planning, and Problem solving.

Knowledge engineering is a core part of AI research. Machines can often act and react like humans only if they have abundant information relating to the world. Artificial intelligence must have access to objects, categories, properties and relations between all of them to implement knowledge engineering. Initiating common sense, reasoning and problem-solving power in machines is a difficult and tedious task.

Machine learning is also a core part of AI. Learning without any kind of supervision requires an ability to identify patterns in streams of inputs, whereas learning with adequate supervision involves classification and numerical regressions.

Classification determines the category an object belongs to and regression deals with obtaining a set of numerical input or output examples, thereby discovering functions enabling the generation of suitable outputs from respective inputs. Mathematical analysis of machine learning algorithms and their performance is a well-defined branch of theoretical computer science often referred to as computational learning theory.

Machine perception deals with the capability to use sensory inputs to deduce the different aspects of the world, while computer vision is the power to analyze visual inputs with a few sub-problems such as facial, object and gesturerecognition.

Robotics is also a major field related to AI. Robots require intelligence to handle tasks such as object manipulation and navigation, along with sub-problems of localization, motion planning and mapping.

II.2 Types of Artificial Intelligence (AI)

AI can be classified in any number of ways there are two types of main classification.

Type 1 :

1. **Weak AI or Narrow AI**: It is focused on one narrow task, the phenomenon that machines which are not too intelligent to do their own work can be built in such a way that they seem smart. An example would be a poker game where a machine beats human where in which all rules and moves are fed into the machine. Here each and every possible scenario need to be entered beforehand manually. Each and every weak AI will contribute to the building of strong AI.
2. **Strong AI**: The machines that can actually think and perform tasks on its own just like a human being. There are no proper existing examples for this but some industry leaders are very keen on getting close to build a strong AI which has resulted in rapid progress.

Type2 (Based and Functionality) :

1. **Reactive Machines:** This is one of the basic forms of AI. It doesn't have past memory and cannot use past information to information for the future actions. Example:- IBM chess program that beat Garry Kasparov in the 1990s.
2. **Limited Memory:** AI systems can use past experiences to inform future decisions. Some of the decision-making functions in self-driving cars have been designed this way. Observations used to inform actions happening in the not so distant future, such as a car that has changed lanes. These observations are not stored permanently and also Apple's Chatbot Siri.

3. **Theory of Mind:** This type of AI should be able to understand people's emotion, belief, thoughts, expectations and be able to interact socially Even though a lot of improvements are there in this field this kind of AI is not complete yet.
4. **Self-awareness:** An AI that has it's own conscious, super intelligent, self-awareness and sentient (In simple words a complete human being). Of course, this kind of bot also doesn't exist and if achieved it will be one of the milestones in the field of AI.

II.3 Explain About Voice Recognition

Voice or speaker recognition is the ability of a machine or program to receive and interpret dictation or to understand and carry out spoken commands. Voice recognition has gained prominence and use with the rise of AI and intelligent assistants, such as Google Assistant, Amazon's Alexa, Apple's Siri and Microsoft's Cortana.

Voice recognition systems enable consumers to interact with technology simply by speaking to it, enabling hands-free requests, reminders and other simple tasks.

CHAPTER III

PROBLEM ANALYSIS

III. 1 Explain About Google Assistant

Google Assistant is Google's voice assistant. When it launched, Google Assistant was an extension of Google Now, designed to be personal while expanding on Google's existing "OK Google" voice controls.

Originally, Google Now smartly pulled out relevant information for user. It knew where user worked, user meetings and travel plans, the sports teams user liked, and what interested user so that it could present user with information that mattered to user.

Google has long killed Google Now, but Assistant lives in the same space, fusing these personalised elements with a wide-range of voice control. Google Assistant supports both text or voice entry and it will follow the conversation whichever entry method you're using.

III. 2 Devices In Google Assistant

Google Assistant originally launched on the Google Pixel smartphones and Google Home, but it is now available to just about all modern Android devices, including Wear OS devices, Android TV, and Nvidia Shield and in some cars if they offer support for Android Auto.

Google Assistant is native to Google Home smart speakers, but it's also widely available on other smart speakers from third-party manufacturers including Sony, LG and Panasonic.

Smart home devices like Philips Hue, Nest products and Ikea's Home Smart range, for example, can be controlled by Google Assistant and not just through Google Home, but wherever you happen to interact with Assistant.

III. 3 What Can Google Assistant Do

Google Assistant offers voice commands, voice searching, and voice-activated device control, letting you complete a number of tasks after you've said the "OK Google" or "Hey, Google" wake words. It is designed to give you conversational interactions.

Google Assistant will :

1) Control your devices and your smart home
2) Access information from your calendars and other personal information
3) Find information online, from restaurant bookings to directions, weather and news
4) Control your music
5) Play content on your Chromecast or other compatible devices
6) Run timers and reminders
7) Make appointments and send messages
8) Open apps on your phone
9) Read your notifications to you
10) Real-time spoken translations

III. 4 How Does it Work

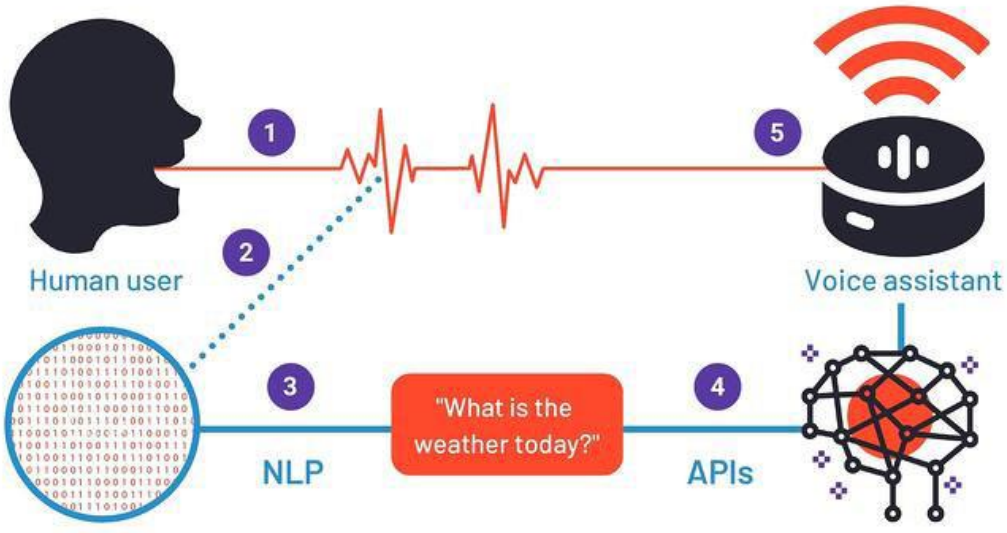

Figure 3.1 How do Voice Assistant Work

1. Some bots use passive listening : This essentially means the assistant is constantly monitoring its surroundings for trigger words. Once the trigger word is said loud enough for the bot to hear, it will begin listening to the user's query.

2. Voice recognition kicks in : The bot has been activated and now it's ready to listen, Sound waves are converted into structured, more understandable data for the machine to process. Everything from tone, pitch, volume, and the precision of speech will be factored in with voice recognition.

3. Followed by natural language processing : This includes things like context, user intent, slang, accents, and other loosely formal aspects of the human language. Voice assistants rely on natural language processing software to step in and resolve any barriers to understanding.

4. Information retrieval takes place : After processing the user's query using voice recognition and NLP, it's now time for the voice assistant to retrieve information related to the question. Voice assistants do this by calling on various APIs and accessing something called a knowledge base, which acts as a central repository to draw information from.

5. Information is then output : Outputting relevant information for the user, A lot has led up to this point. Different tones, vibrations, and volumes are standardized for the machine with voice recognition. Then, information is retrieved from a variety of sources as is an answer that hopefully satisfies the user's request.

CHAPTER IV

CONCLUSION AND SUGGESTION

IV.1 Conclusion

This artificial intelligence will always develop, one example of that is Google Assistant, he strives to be a part of human life in order to help or facilitate human desires. This artificial intelligence is indeed sophisticated, so expect greater innovations to help humans.

IV.2 Suggestion

In this era many artificial intelligence technologies are produced and used by humans. Google Assitant is one of them, you can use Google Assitant to help with activities at home or wherever you are. Google Assitant makes it easy for users like finding information, opening applications,play music and videos, Search for Files in the Application and much more that Google Assitant can do. With current technological developments, it is hoped that AI technology will continue to develop to help humans. therefore, hopefully this paper will benefit us all and make it a motivation in developing technology in the future.

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