

ETBA2024 ASSIGNMENT 02

(Due Date: October 21, 2024)

Instructions: The following points should be noted.

- *If you complete this assignment, the maximum bonus is 50.*
- If you use a word processing software to edit your answer, please make sure that the file to be submitted is either in WORD or PDF format. (My computer is unable to read those files generated by Macintosh.)
- You need to submit the answer file before the due date to the Gmail account `johnsum.nchu@gmail.com`.
- Email heading must be conformed to `ETBA2024_Assignment02_studentID`.
- File name must be conformed to `ETBA2024_Assignment02_studentID`.
- It is a bonus assignment. If you are too busy to complete the assignment, you can just skip it.
- You can answer the questions in Chinese or English. I prefer English.
- *To determine your score in this assignment, your answers will be passed to ChatGPT, Google Gemini and other LLMs checking the correctness of your answers.*

The assessment of this course is solely depended on your work in the course project including your written report and your oral presentation. The score obtained from this assignment is bonus. It is marked up on your project score.

Question 1

In the lecture note on *Emerging Technology (20240909)* Section 1.3, a number of areas of technologies are listed.

- (a) Did we have computing technology 2000 years ago? If yes, state one of them.
- (b) Did we have information technology 2000 years ago? If yes, state one of them.
- (c) Did we have communication technology 2000 years ago? If yes, state one of them.
- (d) Did we have military technology 2000 years ago? If yes, state one of them.
- (e) Is Tesla the world first car manufacturer making electric car?

Question 2

In the lecture, I have introduced the concepts of 4G/5G/6G and WiFi.

- (a) Is WiFi a technology included in the 4G/5G/6G technology?
- (d) Is WiFi the only method for an iPhone (resp. Android phone) connecting to the Internet?
- (c) If there is no WiFi access point around, can we use Siri (resp. voice assistance) in an iPhone (resp. Android phone)?
- (d) What is the name of the voice assistance developed by Microsoft for Windows PC?

Question 3

In Section 2, I have introduced the concept of technology management.

- (a) State the definition of technology management.
- (b) By the same principle, what should be the definition of *emerging technology management*?
- (c) By the same principle, what should be the definition of *information management*?
- (d) By the same principle, what should be the definition of *human resource management*?

Question 4

In Figure 4, the technologies on the left blocks and the tools on the right blocks are all technologies.

- (a) State five hardware technologies which can be found in your smartphone.
- (d) State five hardware technologies which can be found in a PC.
- (c) State five hardware technologies which can be found in an electric car.
- (d) State five hardware technologies which can be found in a classroom.
- (e) State a tool which can help a software engineer to develop a software.

Question 5

Section 3.3 has mentioned a number of emerging technologies. One of them is the so-called global positioning system (GPS).

- (a) State the reason(s) why GPS is important.
- (b) Today, there are four satellite systems providing GPS services. State the names of these systems and the countries controlling such systems.
- (c) Have you ever used any one of these GPS services? If yes, state under what situation you need to use it.
- (d) Owing to deliver a satellite orbiting around the earth, what technology is needed?
- (e) In the history, which country in which year delivered the world first satellite in the space?

Question 6

WhatsApp and Line are now two widely used App in Taiwan.

- (a) If you have installed either WhatsApp and/or Line in your smartphone, state the reason(s) why you use it.
- (b) We are able to make a voice call to our friends whose smartphone have installed WhatsApp and/or Line. State the key technology which supports for this voice call service.

- (c) State the years when WhatsApp and Line firstly launched.
- (d) State the number of WhatsApp users and the number of Line users in 2024.

Question 7

In Section 6, a few business administration processes have been introduced.

- (a) State five technologies that have been applied in streamlining the *order placement and payment* process.
- (b) State five technologies that have been applied in streamlining the *order fulfillment* process.
- (c) State five technologies that have been applied in streamlining the *replenishment* process.
- (d) Consider the works to be accomplished in the above three process, Figure 6-8, which work consumes the most of the time?

Question 8

In the lecture note *Evolution of Technology*, I have briefly introduced the history of AI research.

- (a) Was AI research started before or after the invention of computer?
- (b) Under what reasons, scholars are interested in AI research?
- (c) In which year, the term *Artificial Intelligence* was introduced.
- (d) State five pioneers who were working on AI research during the 1950s and 1960s.
- (e) State your definitions of *intelligence* and *artificial intelligence*.
- (f) State the difference(s) between *intelligence* and *artificial intelligence*.

Question 9

With the advancement of AI tools, a number of jobs will likely be replaced and a number of jobs will likely be diminished.

- (a) State five jobs which are possibly replaced by AI.
- (b) State five jobs which are possibly diminished or obsolete due to AI.

Question 10

IBM Deep Blue and Google AlphaGO are designed to play chess games.

- (a) What are the commercial values for the technologies developed from these chess game playing systems?
- (d) For how many years, IBM had spent on the development of the Deep Blue to beat the world champion.
- (c) For how many years, Google had spent on the development of the AlphaGo to beat the Korean top Go player.
- (d) What are the reasons behind the IBM and Google to develop Deep Blue and AlphaGO?

Question 11

Recently, OpenAI has released a new AI model called OpenAI o1. This model has already been integrated in ChatGPT 4. The new integrated tool is named GPT-4o (GPT-4o preview and GPT-4o mini).

- (a) In term of functionality, what is the key difference between the OpenAI o1 model and the ChatGPT model.
- (b) In which areas, including but not limited to language proficiency and economics, the GPT-4o performs well.
- (c) Is GPT-4o (either GPT-4o preview or GPT-4o mini) more intelligent than ChatGPT-4? How do you justify?
- (d) Are you more intelligent than GPT-4o? How do you justify?

Question 12

In recent years, many technology firms have developed their own processors. For instance, Apple developed M series processors. Google developed tensor processing unit (TPU).

- (a) Apart from Apple and Google, state five technology firms which have been developing new processing units.
- (b) What processing units you can find in Apple M3? State the reason(s) why those processing units are embedded.

- (c) What processing units you can find in an Intel Core i7 processor? State the reason(s) why those processing units are embedded.
- (d) What processing units you can find in an AMD Ryzen AI processor? State the reason(s) why those processing units are embedded.

Question 13

TSMC is a Taiwanese technology firm and a leading chip fabrication firm in the world.

- (a) What technologies TSMC have developed making it leading the world in chip fabrication?
- (b) Is TSMC able to replace Intel? If yes, why. If no, why?
- (c) Explain why TSMC has to work closely with ASML.

Question 14

MediaTek is a Taiwanese technology firm developing telecommunication products.

- (a) Which firms are the competitors of MediaTek?
- (b) Which firms are the customers of MediaTek, in which product(s)?
- (c) Does MediaTek have research center? Where is(are) they? What is(are) the research center(s) doing?
- (d) State five technologies which are developed by MediaTek.