Info 102 – Introduction to Information Systems
Individual Assignment

Assignment title: **Disruptive Technologies and the Business Case**

Introduction and background

There are continuous and far-reaching socio-technological developments in information technologies with the affects being seen in both the social and technological contexts; these developments may be viewed as *disruptive technologies*. If organisations (of all types) fail to understand such developments and do not conduct research and development with effective implementation strategies, they will fail to compete effectively in the technology market.

Wearable technology is an example of a *disruptive technology*. Consider the following examples:
- Google is developing wearable technology which has considerable computing power along with artificial intelligence applications.
- Apple computer is developing wearable technologies which include interconnected devices (e.g., smartphones, watches, and health monitors) to monitor users health and exercise.
- There are many other companies globally developing similar wearable technologies in a broad and diverse range of domains and systems.

Google glass (a wearable technology) is a [relatively] new category of technologies with a headset that resembles a pair of lightweight glasses. The device connects to the Internet using wireless connectivity (as does a mobile telephone). However, to be fully mobile, the glasses must be paired to a mobile telephone configured as a 'hotspot' which relies on the cellular carrier's mobile network (generally 4G minimum) to remain connected.

Google glass is a work-in-progress and it has not been without technical and societal problems. In practice, developers consider the Google glass system to be an *always-on* device empower users to:
- Take photographs.
- Take videos.
- Send and receive phone calls.
- Send and receive text messages.
- Post messages on social network platforms.
- The small display (in the upper corner of the wearers visual field) adds further capabilities which include:
  - The user can carry out Internet search.
  - Air travellers can call-up current flight data as they approach a boarding gate at an airport.
  - With GPS, wearers can view navigation maps and plan routs based on their current position and required destination.

In practice. The device (when correctly configured) incorporates functionality to enable it to operate as a standalone computer with a (relatively) high powered processor running the Android operating system. To operate the system the user can speak a variety of simple verbal (spoken) commands, for example:
- OK Glass take a picture.
- OK Glass share this with my network.
- There is also a tiny touchpad on the headset frame.

However, wearable technologies such as Google Glass face significant challenges with many factors affecting their take-up and use. Such factors include head-mounted devices providing a visual display, but human vision (the eyes) is not designed to view details a such a close visual range.

Therefore, the display must fool the person's retina with an image that appears to be further away. Google glass uses a prism with mirrors positioned over the wearers eye to accomplish that.

The Assignment Problem

Advanced Technologies is a technology company which, in the late 1990's and early 2000's, developed a revolutionary mobile telephone that was a market leader. However, *Advanced Technologies* has fallen behind other technology companies which have taken the lead in research and development (R&D) and have overtaken *Advanced Technologies* in R&D, sales, and market position.

A new Chief Executive Officer (CEO) has been appointed with the primary task of improving the market position of *Advanced Technologies* in the technology marketplace. She has investigated developing technologies and has read reports over the Internet which addressed *Google Glass* (along with other similar technologies developed by technology companies) and has identified *wearable technologies* as a technology that *Advanced Technologies* can develop to improve its position in the technology marketplace.

The Assignment Task

You are a technology consultant employed by *Advanced Technologies* to investigate the current 'state-of-the-art' in wearable technologies and prepare a report to be submitted to the CEO and directors of *Advanced Technologies* setting out:

a) The current technological developments in wearable technologies by technology companies including why particular wearable technologies have succeeded and also why others have failed.

b) The business case for wearable technologies including the financial implications in R&D, marketing, and sales of such product lines.

c) A proposal with recommendations for suitable wearable technologies Advanced Technologies can develop and market.

d) The current and potential market for wearable technologies including the market competition your recommendations will face from competing technologies and technology companies.

e) The proposed unique selling point (USP) for your recommendations (why buyers will choose the proposed wearable technologies).

f) How wearable technologies will affect (and be affected by) Cloud Computing Systems, fog computing, edge computing, and the Internet-of-Things (IoT).

g) The potential implications (positive and negative considerations) resulting from wearable technologies from the following perspectives as they relate to (a) use by the general public, (b) use by employees in organisations, and (c) use by students in general tutorial sessions and examination situations:

    a. The social perspective.

    b. The technical perspective.

    c. The legal, statutory, regulatory, and compliance perspective including how potential issues identified may be addressed.

    d. The ethical and moral perspective including: *privacy*, *security*, and *acceptance* (by users and all stakeholders in wearable technology systems).

The Assignment Specification

In this assignment you will be expected to investigate all aspect set out in the assignment task including:

a) The range of wearable technologies currently available including their technological capabilities.

b) The current 'state-of-the-art' as it relates to wearable technologies including developments in R&D.
c) How the current R&D will affect the future developments with respect to wearable technologies.
d) The potential range of wearable technologies with a suitable and appropriate direction for research for *Advanced Technologies* with the preparation and submission (in the report) of a draft R&D proposal for consideration by *Advanced Technologies*.
e) The range of wearable technologies with recommendations on the positive and negative factors applicable to the technologies and how the factors relate to *Advance Technologies*.

The report submitted will consider the *busines case* using *business intelligence* obtained from all the available sources of data and information and provide an analysis with a detailed discussion relating to the:

- Positive benefits (for *Advanced Technologies*) if wearable technology is successfully developed and marketed (what are the benefits?).
- Negative aspects (for *Advanced Technologies*) in the development and marketing of wearable technology (what are the risks? – prepare a risk assessment).
- Potential market for wearable technology in terms of socio-economic groups (income levels and occupations), demographic profile, and gender. The analysis should identify the potential (and probable) market the wearable technology developed by *Advanced Technologies* will appeal to.
- Potential for wearable technologies to be adopted by organisations for use in their operations.
- The relative costs in terms of *time*, *resource*, *financial*, and *technical difficulty* in the development of different types of wearable technologies. The report will set out the likely return-on-investment (ROI).
- Consideration of methods of development. Consider if *Advanced Technologies* should develop *in-house* applications for the recommendations (or) should *outside developers* be provided with prototype examples of proposed wearable technologies with the aim of developing suitable applications.

The CEO is interested not only in the *business case* as it relates to *Advanced Technologies,* but she is also interested in how wearable technologies may be used (and abused) by users (the general public). Therefore, it is important to consider:

- The ethical and moral implications (for users and *Advanced Technologies*) inherent in the use of wearable technologies.
- How the abuse of wearable technologies may have a positive (or) negative impact on *Advanced Technologies*. This will cover both financial and reputational aspects).

The Report
The report will be submitted in English and will not exceed 2000 words. In this assignment the report will use the following structure:

- An assignment front page setting out (failure to provide the required information in the correct format will result is a grading penalty):
  - The course.
  - The assignment title.
  - Student name (English and Chinese).
  - Student ID.
  - Student email address.
- A title page for the report setting out:
  - The report title (you may choose your own interesting (and appropriate) title for the report.

- o An index page listing the sections and sub-sections in your report.
- o A brief executive summary (this will ideally be 1 (maximum 2) page(s) setting out a summary of your report, analysis, and recommendations.
- o Your investigation(s), analyses, and recommendations.
- o Brief conclusions with your recommendations as set out in your analysis.

Assignment Submission

The assignment report will be submitted in English in *electronic* format as follows:

- The assignment will be issued in Week #5 on Monday 29th March 2021.
- The assignment must be submitted by 12:00 noon (China time) on Friday 23 April 2021.
  - o Late submission will result in a grade penalty.
- The submission will be made as follows:
  - o The report will be prepared using MS Office 365 (Word) with correct formatting and
  - o Careful proof checking prior to submission.
  - o The report will also be submitted as a PDF document.
  - o The report (Word and PDF) will be placed in ONE zip archive file and emailed to the teachers (the submission must be sent to both teachers) using the email addresses set out in the course specification document.
  - o Failure to comply with the set assignment process will result in a grade penalty.

Assignment Conditions

This is an *individual* assignment, and all work and submissions must be *all your own work* with no collaboration.

- At all times when working on and submitting your assignment student must at all times comply with all the Lanzhou University Regulations including regulations relating to plagiarism.
- The grading structure is clearly set out in the course specification document provided in Moodle.
- All questions relating to the assignment and the requirements must be submitted in the 'office-hours' session or by email.