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# Introduction

# 2. Background

# 2.1 Processes and Frameworks for Interaction Design

There are several frameworks that are used to predict and explain human behaviours. There are five main theories in relation to interaction design; however, the three discussed below will be taken into consideration for the design.

**Mental Models**

Mental models are the conceptual ideas that humans have regarding how things work. This can be based on assumptions or facts. Assumptions are usually based on previous experience. An example is the distinction between a running tap and central heating. We assume that because a running tap increases “flow” when the tap handle is repeatedly turned, that the same is true for the speed at which the temperature rises with central heating, the higher temperature we set it at. This conceptual model of how a central heating system works is flawed, yet it persists. The mental model does not have to be correct in its interpretation to exist.

Therefore, the interface for the mobile web application should aim to follow standard concepts, by providing intuitive ways to interact, with clear instructions and where necessary, context relevant guidance.

**Theory of Action**

The theory of action framework is related to the concepts of “gulf of execution” and “gulf of evaluation”. This is a goal driven framework. A user has a goal, they decide how they will achieve it, they perform actions (this could be a specific sequence). They then receive feedback from whatever interface they have used to perform the actions (such as a browser), they interpret the information they receive and evaluate whether the information received has met the original goal. The aim should be to reduce the cognitive effort of the user. The main goals of visitors to the mobile web application will be to preview video and music content, with an underlying possibility to purchase. The aim of the web application should be to easily allow users to view or listen to the desired content.

**External cognition**

External cognition has three main activities / processes. The first is externalising. This reduces the memory load for the user and relies on visual cues, which could be user generated, such as a to-do list. The second is computational off-loading, which requires a tool to solve a problem, such as a calculator to answer a mathematical question. The third is annotating and cognitive tracing, which is the manipulation of external data, such as crossing off items on a shopping list list (annotation) or re-sequencing items, such as a shopping list, to be more effective when in store (cognitive tracing). The interface design can use externalising, by providing visual clues as to what pages have been visited, such as visited links, or if a product is already in the users basket, highlighting the product in some way. Another cue that could prompt the user is the use of showing the number of items in the shopping basket, to prompt the user to complete their transaction.

# 2.2 Cognitive Psychology

Cognitive Psychology is about the way people learning and thinking about things around, it’s about how people visualize things in the real life. Cognitive Psychology is divided into two main points, reflective cognition and experiential cognition. Reading, listening or having a conversation is kinds of experiential cognition, it is the way we take action and reaction to things around effectively. On the other hand, reflective cognition is about the process of people’s thinking, solving problem, and decision making. Cognitive processes are involved:

* **Attention**

Recognition and Perception

The process of perception follows on from attention, in that it mainly regards how information is presented. To ensure that users are able to correctly perceive the meaning of the information presented to them, careful consideration should be given to the following: icons (and other graphical representations) should clearly define meaning and where the visual representation is abstract, should be clearly labelled; grouped items should be spaced well and where possible, defined by borders, rather than coloured backgrounds. Where on the same page, text should be legible, with good text to background colour contrast.

* **Memory**

Memory is the recalling of knowledge. This could be through having to provide the answer to a question, or through recognition, when shown a picture and asked to recall a fact. It has been shown that a change of context can affect the ability to recall knowledge, despite the information being previously known. However, the more frequently a task is completed, the easier it becomes to recall. Therefore, it is necessary to ensure that the user is not required to undertake complicated tasks to achieve their goal in watching a preview or listening to a sound clip. The use of icons, buttons and links should work in a familiar way, to promote recognition, rather than recall, which will simplify the tasks for the user and reduce memory load.

* **Learning**

Learning in terms of human-computer interaction can be thought in two ways: learning how to use or using to learn. User tend to learn through doing rather than reading , therefore the interface should encourage exploration, but also guide users into selecting the most appropriate actions such as it should be achieved by using the correct icons to play a video or add a purchase to the shopping cart.

* **Listening, Speaking and Reading**

Language processing is governed by “Reading, Speaking and Listening”. This is how information is actually taken in by the user. As this will be a mobile web application, the main issue will be regarding the ability to read the text on screen. This could be thought of as an accessibility consideration, as the main design implication is that text on screen should be able to be resized by the user. The quality of the audio and video files could also be taken into consideration, as this is the main reason that visitors will be using the mobile web application.

* **Problem solving, Planning, Reasoning and Decision making**

The principle issue surrounding problem-solving and decision-making is that a user of the mobile web application should be able to make rapid decisions. The interface should not be so complex, that the user must figure out how to use it, before they proceed. By following some standard and anticipated conventions, the user will be able to quickly adapt to using the interface. The conventions would be using familiar icons such as the standard “play” and “pause” icons when viewing or listening to the media clips.

These are independent in processing things, only one thing can get many different cognitive processes. For example, here is the process when we found a special information in an application, at first, we have to take attention on the key words or images, read it carefully, think about it many times and finally, we always try to remember it as long as possible. Cognitive Psychology plays an important role in designing a mobile application. Many applications have the same functions but the one which having attractive and creative design will determine the success of the application. People will tend to use the more attractive application, applying Cognitive Psychology in designing application will lead the application getting not only repetitive users and also new users.

# 2.3 Interaction Design Theory

Interaction design can be understood in simple terms that is the design of the interaction between the user and the product. It is often abbreviated as IxD, which is "the practice of designing interactive digital products, environments, systems and services". When people talk about interactive design, the goal of the interaction design is to create products that allow users to achieve their goals in the best possible way.

interactions between the user and the product often involve factors like aesthetics, movement, sound, space, and more. And of course, each of these factors could be related to more specialized areas, like sound design for creating sounds used in user interaction.

In general, interactive design is based on the methodologies, including:

* Goal-oriented design: Satisfying the specific needs and wants of the end user is given the highest priority.
* Usability: Your application should be easy to use so that Users will be able to easily grasp it
* Affective interaction design: Designers must be aware of elements that influence user emotional responses. For instance, products must convey positive emotions while avoiding negative ones.

# 3. Design Process

3.1. Design Principles

To develop a perfect mobile application design, developers must follow the design guiding ideologies, they are a set of standards in designing application. Following these standards will help developers can design a perfect t more friendly, attractive and want to use it. Design principles are described below:

* **Consistency and Familiarity**

Consistency and Familiarity is the key point of a high quality user interface. The prototype of the application must be designed consistently through all screens from button’s style design, background color, effects and layouts. Moreover, the application prototype must be consistent with its feature group, such as other applications do have the same functions. The user interface must be defined at the beginning of the designing process to be sure the beginning of the designing process to be sure the prototype will be consistent.

Consistency in my prototype:

* + Language chosen: Language in my prototype is English, it’s the most popular language. I use it to describe day of the week, it is easy to understand for most users.
  + User interface elements: I use some elements such as image button, icons, symbols, colors which are consistent through all screen.
  + Layout: I arrange all functions into a standard layout

On the other hand, the user interface must be sure it is designed familiar with users’ experience. The prototype should be designed in a familiar way to users’ experience, and using properly metaphors.

Familiarity in my prototype:

* + Abc
* **Simplicity**

Simplicity is one of the most important principle in designing user interface. The users will find it easy to use a simple design rather than a complexity. However, developers should not make the prototype too much simple and forget about the main functions, it is not a good design also. We should have a balance between them, full functionality in a simple way.

I apply this to my prototype as much as possible to help users don’t be confused when using the application. For example, I don’t put too much icons, buttons or images on any screen.

* **Accessibility**

Accessibility related to the maintaining standards. It includes text size, fonts, images and colors used in the prototype. Text size must be large enough for all users to read it easily and correctly. Text font must be clear enough to read, don’t use special fonts that are not supported in some devices, it will lead to errors. Background colors, font colors must be chosen that are suitable for the content. Don’t use too many colors, it will make users confuse in using the application.

* **Usability**

The application must be designed that it can be used as easy as possible. It must allow users to complete their task in an easiest and fastest way. If users find that the application is complex to use, that means the design is a not a good one, developers must keep in mind that usability is on the top priority. The application must have enough functions that are listed in users’ requirements, developers should avoid adding more unnecessary functions that will make the application become useless.

* **Color contrast**

Color contrast plays an important role in the application, it affects the way people can receive information on the application. That’s the reason why we have to a suitable color combination between text and background of the application.

* **Sound Effects**

Sound effect play an important role in the application. By apply metaphors to visualize the real world, the application can be more attractive to users.

* **Fitt’s Law**

Fitt’s Law is one of the principle that needs to be considered in designing prototype. Based on the law, the design will have buttons that large enough for users to interact with the application.

# 3.2 Conceptual Design

3.2.1. Identifying users

The target of application is aimed more towards middle aged men and women, but could also be for 20+ year olds, who are serious enough about their health to use for a more exclusive workout environment.

3.2.2. Design Requirements

* Users will be able to register to the application with their personal details.
* Registered users will be able to sign in and post a workout routine to the application.
* Registered users will be able to sign in and search for a list of user submitted exercise programs and save them to their own personal list.
* Registered users will be able to apply positive or negative ratings to programs hosted within the application.
* Registered users will be able to monitor their health.
* A

3.2.3. Identifying user tasks

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| --- | --- | --- |
| G | User actions | System response |
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# 4. Prototype

# 5. Research Study

# 6. Conclusion

# 7. References