

# CS335 – User Interface Design

The purpose of this week's lab is to use some UI design software. Choose one of the following:

<https://www.mockflow.com/> (has free version and can export in a number of formats, best interface)

<https://app.diagrams.net/> (free but doesn't specifically have mobile templates)

<https://pencil.evolus.vn/> (free but need to download software)

<https://proto.io/> (web based, trial version, can export png and pdf)

<https://pidoco.com/> (trial version can export link using project share or can export under the versions tab in the menu bar)

As we saw in lectures:

There are **six** principles of interactive UI design according to Donald Norman. He believed that computers, and interfaces should be functional, easy to use, and intuitive. His idea is that there are two gulfs to consider: the gulf of execution and the gulf of evaluation.

**Gulf of Execution:** This is the gap between the intention of the user's action and how easily the system will allow them to achieve it.

**Gulf of evaluation:** This is the degree of ease with which a user can perceive and interpret whether, or not, the action they performed was successful.

## Example

Gulf of Execution: A person can look at a light switch and easily tell what the current state of the system is (i.e., whether the light is on or off) and how to operate the switch. This means that the gulf of execution is small.

Gulf of Evaluation: if a person looks at a light switch, the gulf of evaluation is very small since, with one switch, the user will immediately know if their action was successful. Thus, the system will give the feedback that the user is expecting.

## Donald Norman's Six principles

### 1. Visibility

Users need to know what all the options are, and know straight away how to access them.

### 2. Feedback

Every action needs a reaction. There needs to be some indication, like a sound, a moving dial, a spinning rainbow wheel, that the user's action caused something.

### 3. Affordance

Affordance is the relationship between what something looks like and how it's used. For designers, it means that as soon as someone sees something, they have to know how to use it.

### 4. Mapping

Mapping is the relationship between control and effect. The idea is that with good design, the controls to something will closely resemble what they affect. A great example of mapping is the vertical scroll bar. It tells you where you are in a page, and as you drag it down, the page moves down at the same rate; control and effect are closely mapped.

## 5. Constraints

Constraints are the limits to an interaction or an interface. Some are really obvious and physical, for example the screen size on a phone.

## 6. Consistency

The same action has to cause the same reaction, every time.

## Lab Assignment

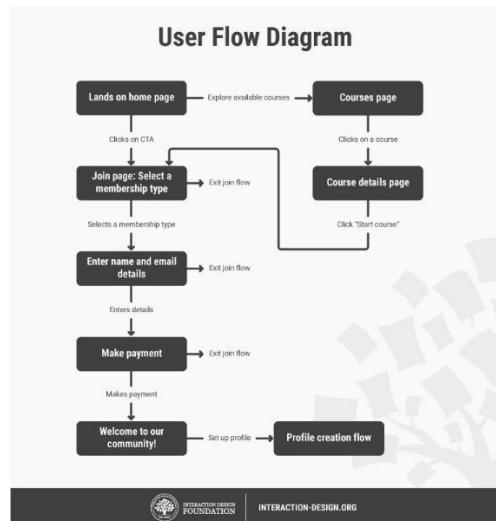
The below figure shows a four-screen layout for an app. Select 2 of these screens to use as a template to:

create a two-screen layout for an app of your choosing in a similar format to below but with sample titles and menu headings, and sample content. Please upload a screenshot to Moodle.

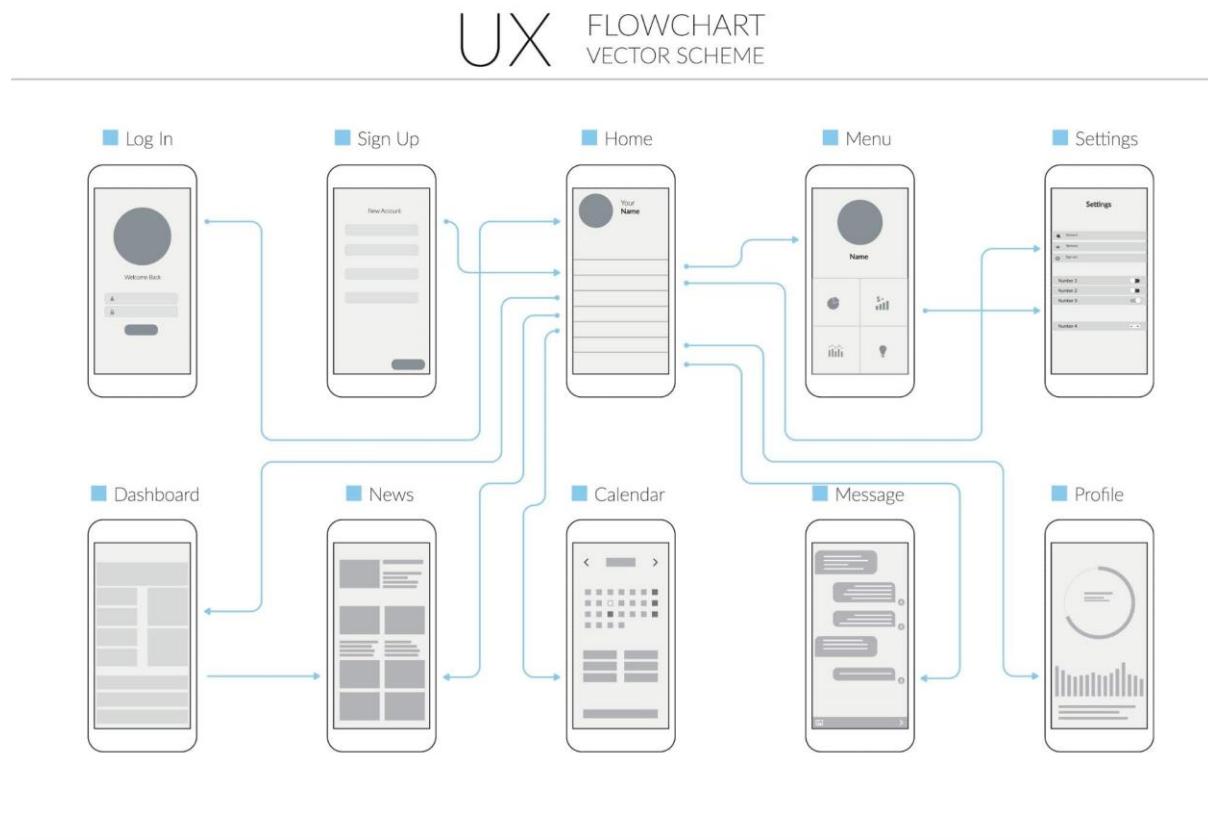
You can create this design for any app - e.g. news app, clothes shopping app, sports updates app. Your design does not have to include as many menu items/options as shown in the below design (if not required for your app).



For information: You could consider a user-flow diagram to help when designing your app as in the examples below.



Also, for information: The diagram above uses blocks to represent the stages while underneath the diagram uses actual screens. This would give a good idea of how the app will look to the user.



1

#### For further information - Notes on UI/UX design:

Some known patterns and design elements:

Full Screen Pattern

Priority+ Pattern

Hamburger menu

Tab Bar

Floating Action button

Gesture-based navigation (e.g. new gestures on Android 10)

Some templates and patterns for a UI design are here:

<https://materialdesignkit.com/templates/>

<https://tapadoo.com/mobile-app-onboarding-patterns/>

<sup>1</sup> <https://www.leanplum.com/blog/user-flow/>

<https://www.mobile-patterns.com/splash-screens>

<https://www.smashingmagazine.com/2017/05/basic-patterns-mobile-navigation/>