Week 2-Introduction and Overview

Objective if the study:

At the end of the lecture, you should be able to:

1. define HCI with examples
2. list the importance of user Interface
3. list the benefits of good design.
4. understand what usability means.

Definitions of HCI

HCI (human-computer interaction) is the study of how people interact with computers and to what extent computers are not developed for successful interaction with human beings as seen in figure 1..

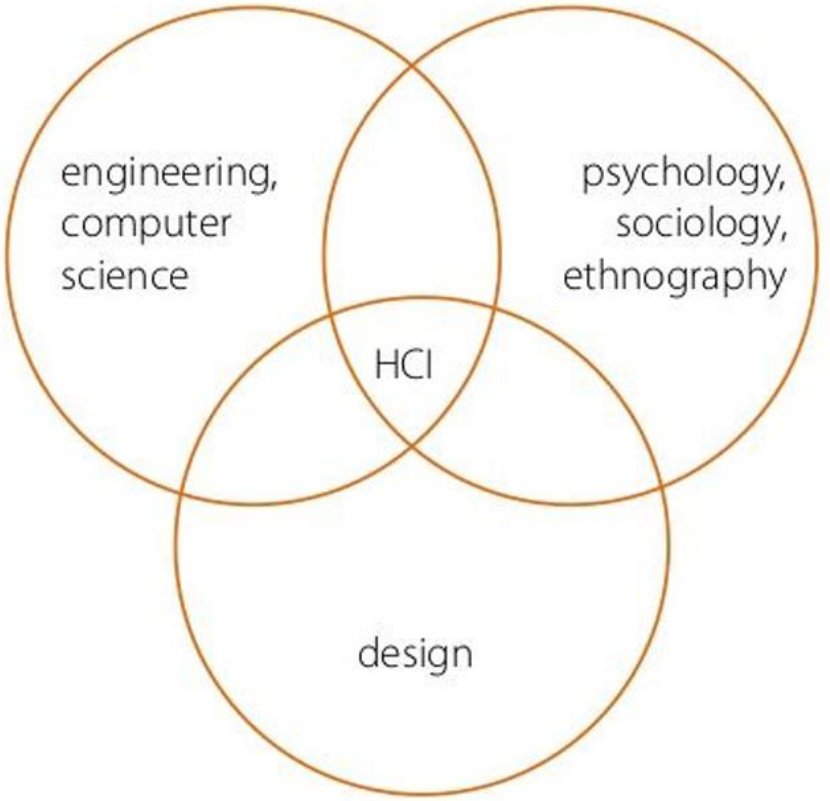


Figure 1. illustration of HCI

Introduction

Human–computer interaction (HCI), alternatively man–machine interaction (MMI) or computer– human interaction (CHI) is the study of interaction between people (users) and computers. With today's technology and tools, and our motivation to create really effective and usable interfaces and screens, why do we continue to produce systems that are inefficient and confusing or, at worst, just plain unusable? Is it because: We don't care? We don't possess common sense? We don't have the time? We still don't know what really makes good design?

Goals of HCI

1. A basic goal of HCI is to improve the interactions between users and computers by making computers more usable and receptive to the user's needs.
2. A long term goal of HCI is to design systems that minimize the barrier between the human's cognitive model of what they want to accomplish and the computer's understanding of the user's task

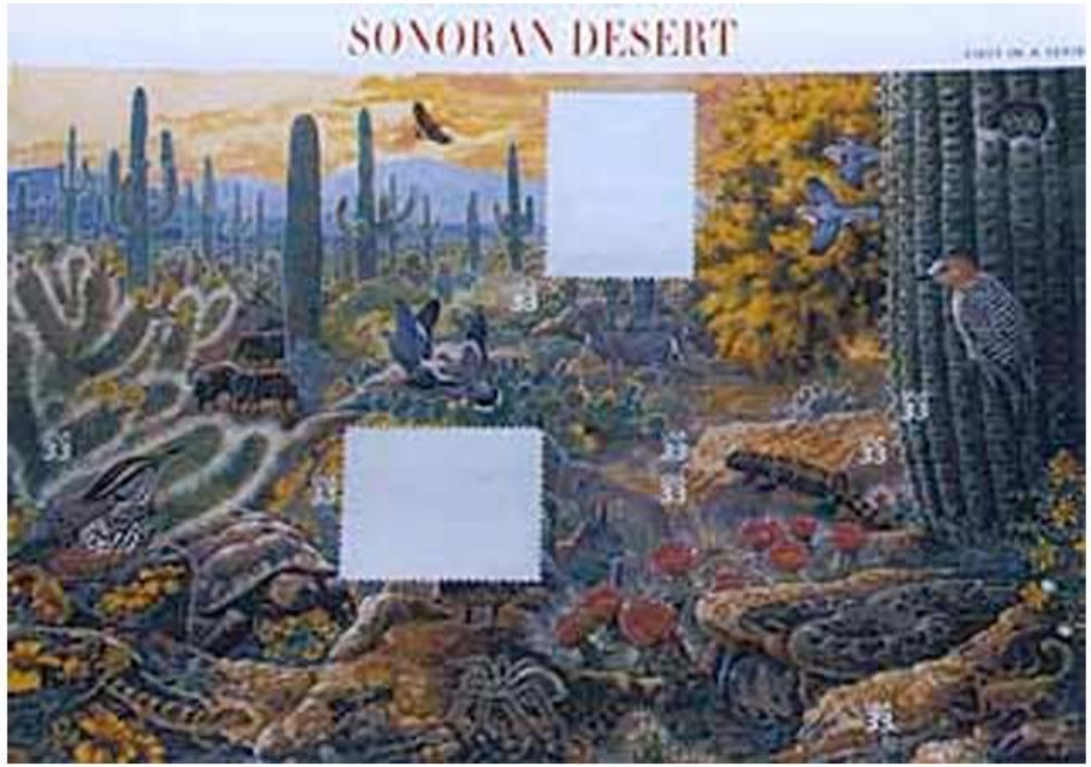
Why do we need HCI?

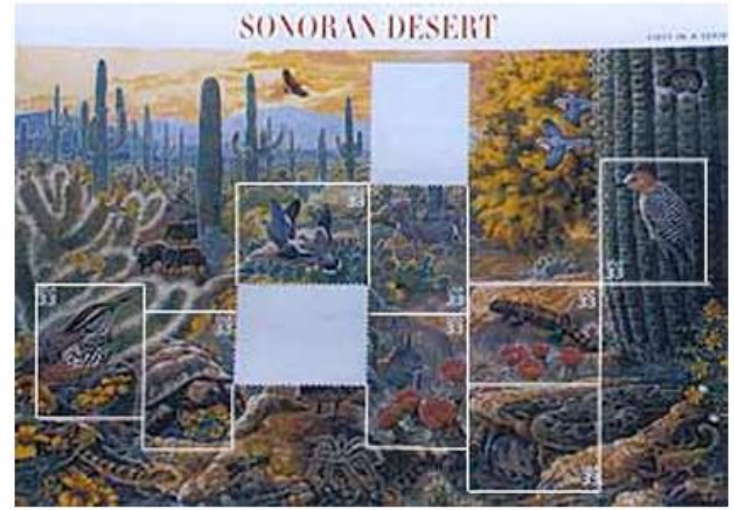
The world is full of badly designed things…

Why do we need well designed tools?

And well designed things…

And things that look good but don’t work





Does it matter?

If things are badly designed?

http://baddesigns.org

- You may camp in the wrong place
- You may crash your car and get injured.. Or worse!
- … in the best case – you might angry, make mistakes and things will take longer than they should

The Importance of Good Design

With today's technology and tools, and our motivation to create really effective and us-able interfaces and screens, why do we continue to produce systems that are inefficient and confusing or, at worst, just plain unusable?

- Is it because: We don't care?
- We don't possess common sense?
- We don't have the time?
- We still don't know what really makes good design?
- But we never seem to have time to find out what makes good de-sign, nor to properly apply it. After all, many of us have other things to do in addition to designing interfaces and screens. So we take our best shot given the workload and time constraints imposed upon us. The result, too often, is woefully inadequate. Interface and screen design were really a matter of common sense, we developers would have been producing almost identical screens for representing the real world. Example bad designs o Closed door with complete wood o Suggestion : glass door

The Benefits of Good Design:

- Poor clarity forced screen users to spend one extra second per screen.
- Almost one additional year would be required to process all screens.
- Twenty extra seconds in screen usage time adds an additional 14 person years.
- The benefits of a well designed screen have also been under experimental scrutiny for many years. One researcher, for example, attempted to improve screen clarity and readability by making screens less crowded.

HCI != Usability

A usable system is easy to learn, easy to remember how to use, effective, efficient, safe, and enjoyable to use. Usability is only one part of HCI, but has been one of the main goals For example, HCI has contributed to the development of guidelines and standards that support designers HCI has also developed methods of evaluation that help us to evaluate the usability of a given product/system (and other aspects of the user experience)

HCI uses mathematical models to predict users' performance with a system (e.g., Fitt's law to predict mouse movement time, or models that predict search time or mental effort) HCI also investigates new interaction paradigms or new ways of integrating technology in our daily lives (think smart clothes, touch displays, VR/AR, Voice-based interfaces …)

Why is HCI important?

User-centered design is getting a crucial role! It is getting more important today to increase competitiveness via HCI studies (Norman, 1990) High-cost e-transformation investments Users lose time with badly designed products and services Users even give up using bad interface Ineffective allocation of resources

How to Design Interactive Technology

- (and future stuff!)

To make better interactive technology …. We need to

- Know about how people **interact** with things
- Know about what people **can and can't do**
- Know about the **situations** in which people do things
- Know about the **basics** of good design
- Understand people's **goals**

Poor designed products in Nigeria

2 minutes exercise. Think about two products you know in Nigeria that were poorly designed and never last or saw the light of the day. Be ready to share at random

Defining the User Interface:

User interface, design is a subset of a field of study called human-computer interaction (HCI). Human-computer interaction is the study, planning, and design of how people and computers work together so that a person's needs are satisfied in the most effective way.

HCI designers must consider a variety of factors:

- What people want and expect, physical limitations and abilities people possess,
- How information processing systems work, What people find enjoyable and attractive.
- Technical characteristics and limitations of the computer hardware and software must also be considered.

Cont’d of User interface

The user interface is the part of a computer and its software that people can see, hear, touch, talk to, or otherwise understand or direct.

The user interface has essentially two components:

- input and output.
- Input is how a person communicates his / her needs to the computer. Some common input components are the keyboard, mouse, trackball, one's finger, and one's voice.
- Output is how the computer conveys the results of its computations and requirements to the user. Today, the most common computer output mechanism is the display screen, followed by mechanisms that take advantage of a person's auditory capabilities: voice and sound. The use of the human senses of smell and touch output in interface design still remain largely unexplored.

Proper interface design will provide a mix of well-designed input and output mechanisms that satisfy the user's needs, capabilities, and limitations in the

- Proper interface design will provide a mix of well-designed input and output mechanisms that satisfy the user's needs, capabilities, and limitations in the most effective way possible. The best interface is one that it not noticed, one that permits the user to focus on the information and task at hand, not the mechanisms used to present the in-formation and perform the task.
- Separate items, which had been combined on the same display line to conserve space, were placed on separate lines instead. The result screen users were about 20 percent more productive with the less crowded version Proper formatting of information on screens does have a significant positive effect on performance. In recent years, the productivity benefits of well-designed Web pages have also been scrutinized.

Benefits Cont'd

- Training costs are lowered because training time is reduced.
- Support line costs are lowered because fewer assist calls are necessary.
- Employee satisfaction is increased because aggravation and frustration are reduced.
- Identifying and resolving problems during the design and development process also has significant economic benefits How many screens are used each day in our technological world? How many screens are used each day in your organization? Thousands? Millions? Imagine the possible savings. Proper screen design might also, of course, lower the costs.

Week 3. The History of HCI

Objective of the study

At the end of this lecture, you should be able to:

- Give detailed history of HCI
- List the benefits of HCI on the society, economy and culture
- Know where are in terms of technology and where we could be!

History of HCI

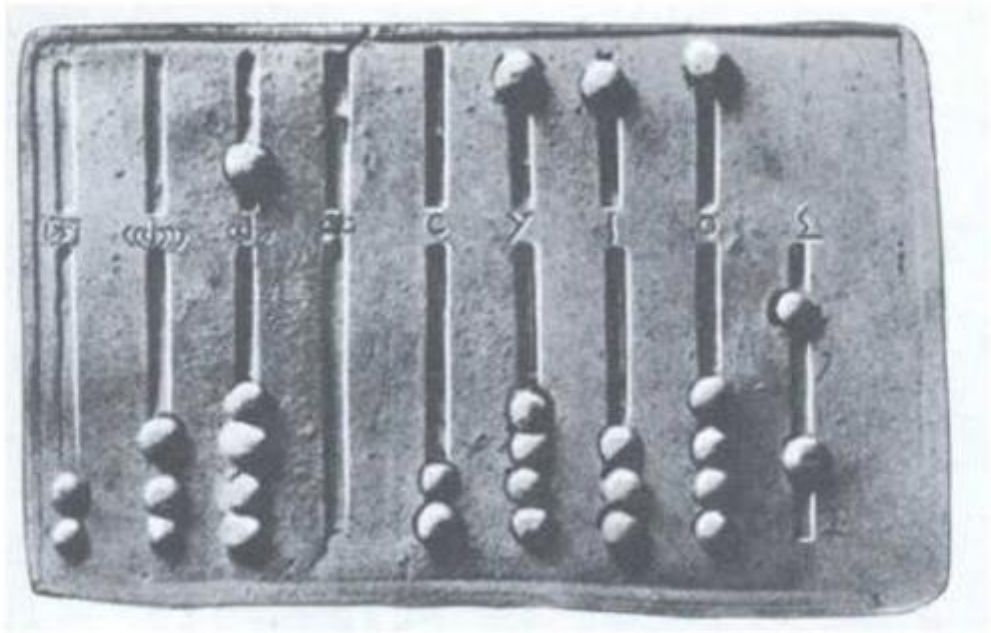
- The need for people to communicate with each other has existed since we first walked upon this planet.
- The lowest and most common level of communication modes we share are movements and gestures.
- Movements and gestures are language- independent, that is, they permit people who do not speak the same language to deal with one another.
- Most people can speak one language, some two or more.
- A spoken language is a very efficient mode of communication if both parties to the communication understand it.
- At the third and highest level of complexity is written language. While most people speak, not all can write. But for those who can, writing is still nowhere near as efficient a means .of communication as speaking.

History of HCI Cont'd

- In modem times, we have the typewriter, another step upward in communication complexity. Significantly fewer people type than write. (While a practiced typist can find typing faster and more efficient than handwriting, the unskilled may not find this the case.)
- The human-computer dialog reflected the computer's preferences, consisting of one style or a combination of styles using keyboards, commonly referred to as Command Language, Question and answer, Menu selection, Function Key Selection, and Form Fill-In.
- Throughout the computer's history, designers have been developing, with varying degrees of success, other human-computer interaction methods that utilize more general, widespread, and easier-to-learn capabilities: voice and handwriting. Systems that recognize human speech and handwriting now exist, although they still lack the universality and richness of typed input.

History of HCI Cont'd

Calculating devices in antiquity



History of HCI Cont'd

Konrad Zuse (1910-1995)

Invented the world's first programmable computer (in 1941)

This remained the only working computer in Europe up to 1951

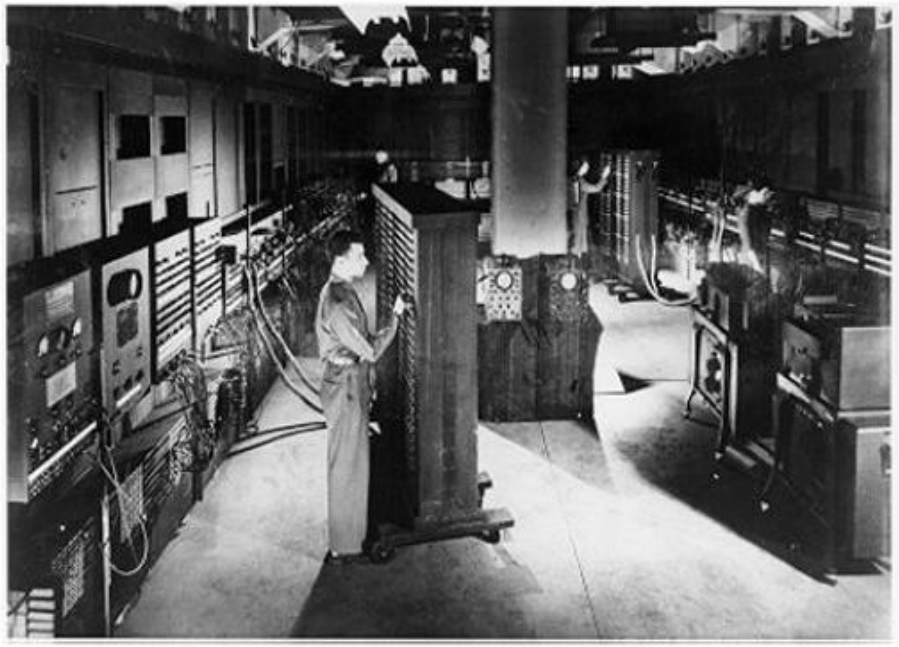
History of HCI Cont'd

ENIAC (~1946)

First electronic numerical integrator and computer in the US

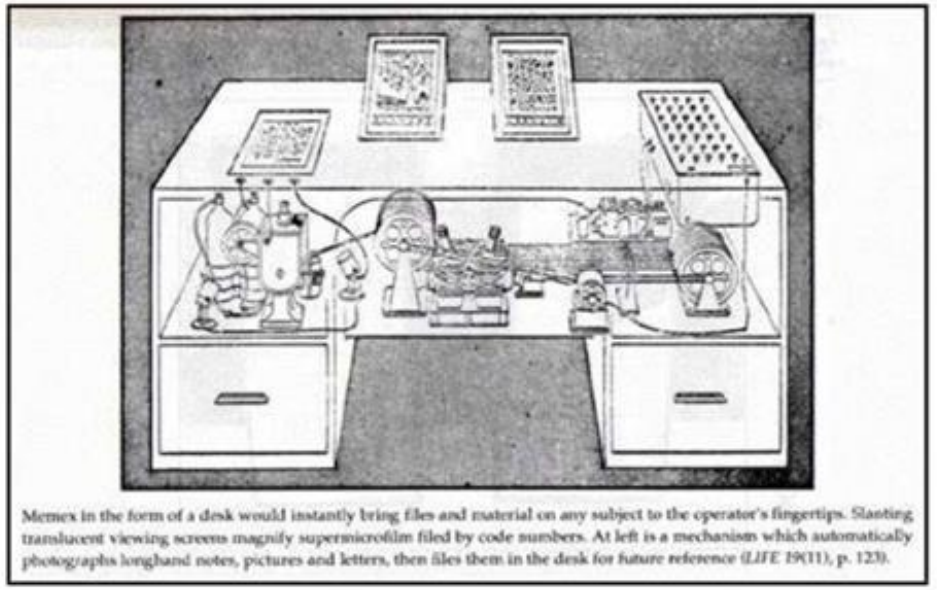
Construction contract was signed in 1943

The first programmers of the ENIAC were six women ("Refrigerator Ladies")



History of HCI Cont'd

Memex (1945)



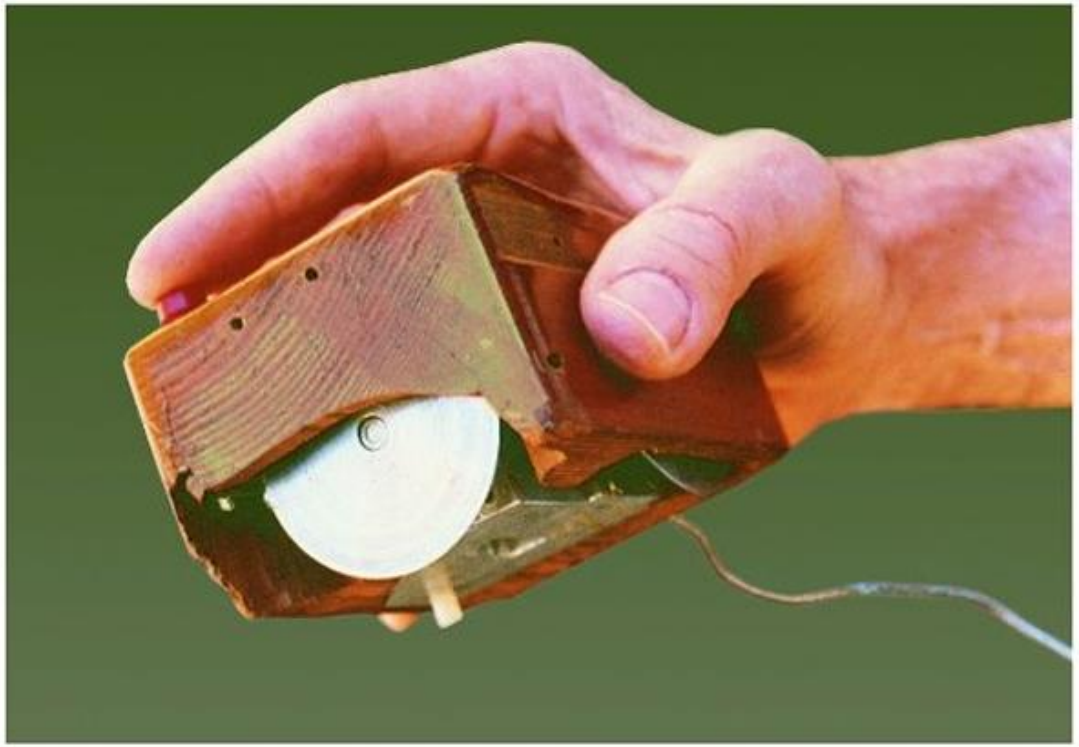
Memex in the form of a desk would instantly bring files and material on any subject to the operator's fingertips. Slanting translucent viewing screens magnify supermicrofilm filed by code numbers. At left is a mechanism which automatically photographs longhand notes, pictures and letters, then files them in the desk for future reference (*LIFE* 19(11), p. 123).

History of HCI Cont'd

SketchPad by Ivan Sutherland at MIT (1963)

History of HCI Cont'd

First mouse by Engelbard at Stanford (1963)



History of HCI Cont'd

With the emergence of personal computing in the late 1970s, everyone became a potential computer user…

… but computer users still had to deal with arcane commands and system dialogs

History of HCI Cont'd

Apple Lisa (1981)

History of HCI Cont'd

Windows 1.0 (1985)

History of HCI Cont'd

World Wide Web (1990)

The impact of History on Society/Culture/Economy

HCI's impact on society

We can now use computers as an every-moment-partner

Less and less training is required for most application and devices

Some examples

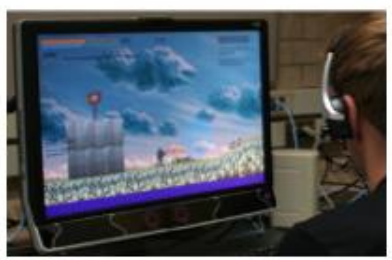
- Touch screen: direct interaction with objects
- Voice control: for some people the only way to interact with computers

HCI’s impact on culture

Smartphones have changed how we spend our "empty times": should we read the news? answer emails? chat with friends? play "2 Dots"? should we just be bored?

Social Media have influenced how we stay in touch with each other and how find new friends and lovers.

Games, more than entertainment, can be used as social and even productive tools.



HCI’s impact on economy

Massive increase in productivity

HCI found how to speed up input and reduce its complexity

People can perform tasks faster than they used to

Reduced need for training

More people can use technology than ever before

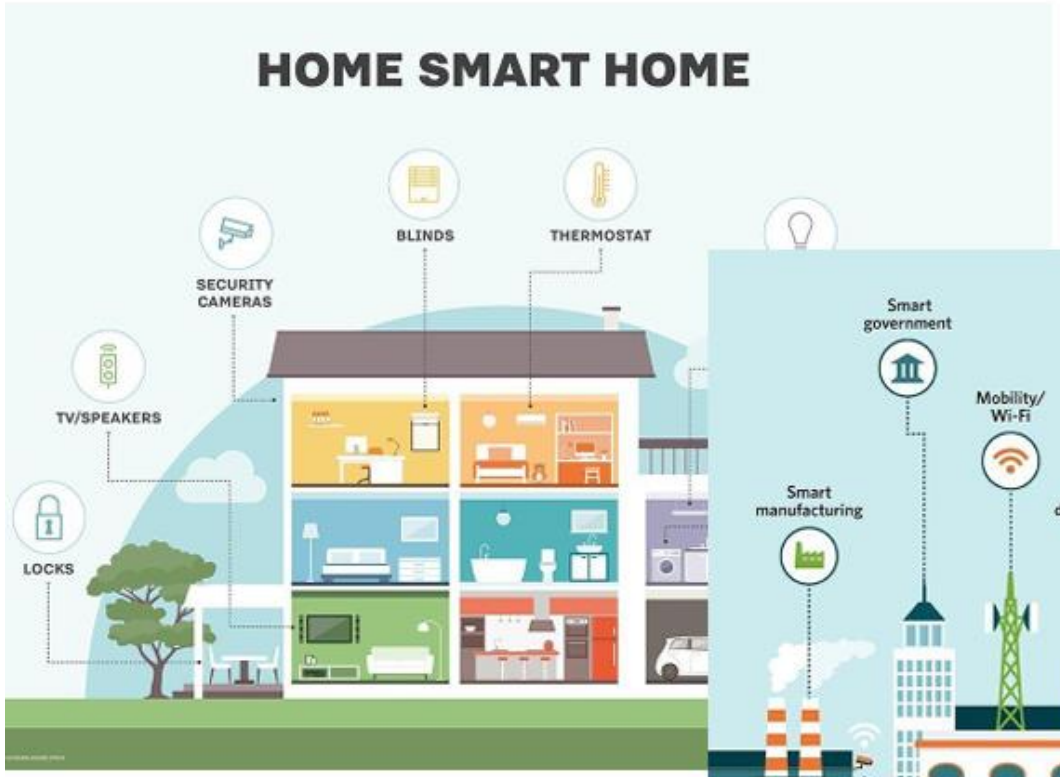
What now???

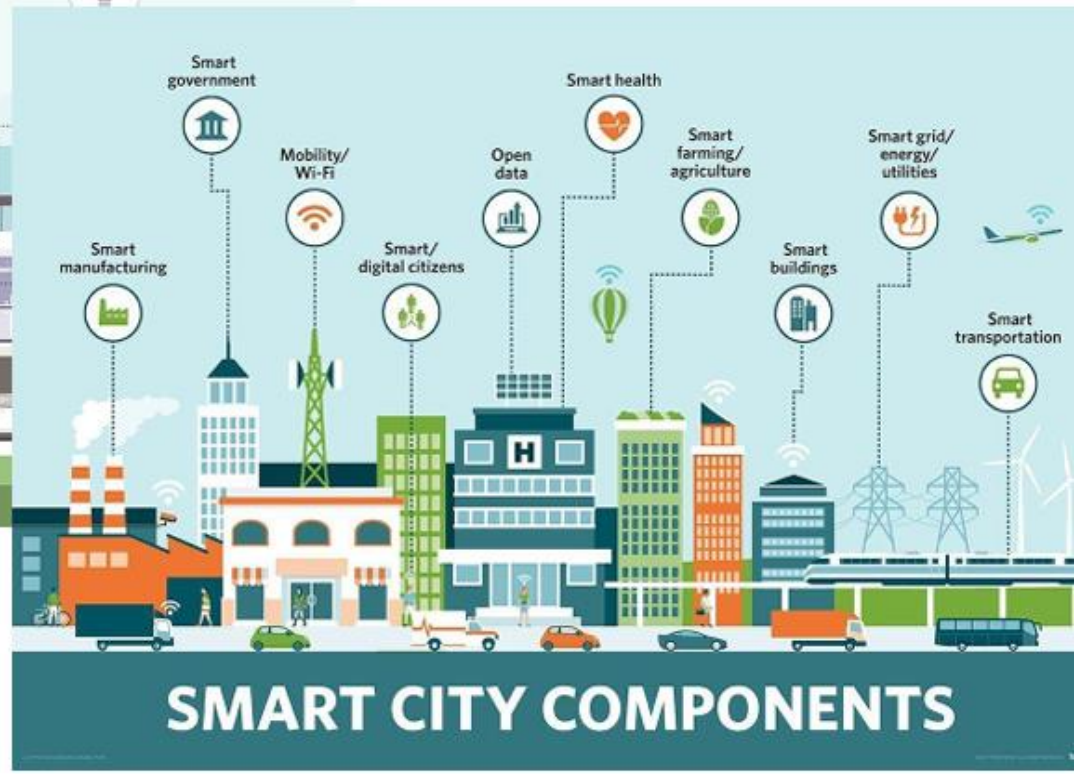
Activity in 10 mins

- Form a group of 5 and think about where we are and where we could be in the next decade

Where you able to think about this?

Society as the next platform





What about this?

And beyond (VR/AR)

Reflection for the next class

- Write a one page thought of where you think the technological world will be in the next 5 decades. Submit first thing before our next discussion.