

Ubicomp definition:

- Invisible or disappearing computing, naturally integrating device into our everyday activities. There are two levels of meaning in invisibility – physical invisibility (as hidden into everyday objects) vs. human-attention invisibility (a computing device as a tool with good usability and not getting in the way of the human task and occupying attention). Invisibility depends on people skill levels with the computing tools. Note that every generation of humans has different skill levels.
- People pay attention to abnormalities, flaws, differences in objects, colors. Present information in a way that is more susceptible for humans.
- People learning ability is limited and may not catch up with technology advancement. Ubicomp is important so that people's lack of keeping up with the skills can still be able to use the technology.
- Ubicomp is a tool to enhance people's ability without bothering them with the focus on the tool. Doesn't have to be physically invisible.
- Make computers less annoying, less frustration, and more intuitive input is a start.

Why are computers so frustrating to use?

- Many digital devices have too many functions and features, and do not represent real life usage.
- They may demand too much learning from users.
- New software and software upgrades need re-learning
- Frustration depends on users with different skill levels. More expert users may have less frustration in using computers than novice users.
- Some people don't want to learn because they don't see their personal need in using them (older people)
- Good user interfaces leverages existing knowledge of using other software from users. One approach is consistency in input system / interface / GUI usage.
- It's not a natural way to interact; videophone is more natural so you can interact more natural.
- Reliability is a big issue. Poor reliability leads to not trusting the device. Errors are easily happening with less predictable results.
- Error messages do not suggest how, what, and where went wrong. A computer is like a black box where errors / software internals are hidden. General purpose machines, due to more levels of software abstraction, are more likely to have more of these types of errors.
- They are impolite by untimely demanding our attention, such as phone ringtones.

Group 1:

- Frustration already mentioned, added: development goes to fast, multi-functionality is limitation on usability and learnability.
- How to reduce frustration? Design simple devices for specific tasks, having no or intuitive interface. There needs to be a balance between multi-purpose devices and special-purpose device, because there are always people wanting an all-do device at hand.
- All-do device can be tiring in usage and an intuitive user interface needs to be made for it.

Group 2:

- Computer frustration: learning can be frustrating; however, it is often required prior to usage. Other frustrations: incomprehensive error messages; system management such as software installation and upgrades; unintuitive feedbacks; digital interaction not following the 'natural laws we all know'.
- How to reduce frustration: Divide computer purposes. Design one computer do one thing with special-purpose device. Making Robust system. Link to traditional usage, bring information without active search. Active information showing / attention asking.

Group 3:

- Examples of disappeared UbiComp technologies: MRT card, water system to the home, reading glasses: easy use, not knowing it's there, also fashionable.
- How to create disappearing technologies: minimize size and form factors, affordable in price, simple to

use. Possible examples: watch as identifier, smart wallet, etc.

Group 4:

- Disappeared tech: invisible: motor in car, cpu in pc and visible: bulletin board (intuitive to look, doesn't distract), RFID tech, cellphone (because we use it naturally and easy to use), pen, newspaper  
Bring to home: low entrance barrier (not much learning required), shouldn't be confusing from doing what the user wants to accomplish, assist user in finishing task, less annoying, cost down. It always need time to get used to using. Human computer interface needs to be better integrated. Input devices is not intuitive enough.