What the various models in design?

- Waterfall model
- Iterative model
  - UCD model

What is User-centered design process (UCD)?

User-centered design process (UCD) is also called human-centred design process. Human centred design processes for interactive systems, ISO 13407 (1999), states: "Human-centred design is an approach to interactive system development that focuses specifically on making systems usable. It is a multi-disciplinary activity." In UCD, all development proceeds with the user as the center of focus.

UCD is a user interface design process that focuses on usability goals, user characteristics, environment, tasks, and workflow in the design of an interface. It follows a series of well-defined methods and techniques for analysis, design, and evaluation of mainstream hardware, software, and web interfaces. The UCD process is an iterative process, where design and evaluation steps are built in from the first stage of projects, through implementation

What are the UCD Principles?

1. Early focus on users and tasks
   a. Structured and systematic information gathering (consistency)
   b. Designers trained by experts before conducting data collection sessions
2. Empirical Measurement and testing of product usage
   a. Focus on ease of learning and ease of use
   b. Testing of prototypes with actual users
3. Iterative Design
   a. Product designed, modified and tested repeatedly.
   b. Allow for the complete overhaul and rethinking of design by early testing of conceptual models and design ideas.

What are the assumptions in UCD?

- Result of a good design is a satisfied user
- Process of design is a collaboration between designers and user.
- Design evolves and adapts to users' changing concerns, and the process produces a specification as an important by-product
- The user and designer are in constant communication during the entire process

What is the waterfall model?

- It models the design process as a sequence of stages. Each stage results in a concrete product – a requirements document, a design, a set of coded modules – that feeds into the next stage.
- Each stage also includes its own validation: the design is validated against the requirements, the code is validated (unit-tested) against the design, etc.
- The biggest improvement of the waterfall model over previous approaches to software
- development is the discipline it puts on developers to think first, and code second.

What are the drawbacks in Waterfall model?

- Validation is not always sufficient; sometimes problems are missed until the next stage.
- Trying to code the design may reveal flaws in the design – e.g., that it can't be implemented in a way that meets the performance requirements.
- Trying to integrate may reveal bugs in the code that weren't exposed by unit tests.
- So the waterfall model implicitly needs feedback between stages.
- The danger arises when a mistake in an early stage – such as a missing requirement – isn't
- discovered until a very late stage – like acceptance testing. Mistakes like this can force costly rework of the intervening stages.

Why Waterfall model will not work for UI design and development?

1. First, UI development is inherently risky.
    a. UI design is hard for the following reasons:
        i. You are not the user; the user is always right, except when the user isn't; users aren't designers either.)
    b. There is no easy way to predict how whether a UI design will succeed.
2. Second, in the waterfall model
    a. users appear in the process in only two places:
        i. requirements analysis
        ii. acceptance testing.
    b. if UI design is different from users requirements, the waterfall process won't tell us until the end.
3. Third, when UI problems arise and create a need for fixes such as:
    a. new requirements or new design

How does Iterative design manage the inherent risk in user interface design?

- The software is refined by repeated trips around a design cycle:
- First imagining it (design) → then realizing it physically (implementation) → Testing (evaluation) → valuated and redesigned several times → Actual implementation & deployment of the UI

What need to be first considered in UCD?

The first step of user-centered design is knowing the following:

- Who your users are and understanding their needs.
- Who are they?
- What do they already know?
- What is their environment like?
- What are their goals?
- What information do they need, what steps are involved in achieving those goals?

These are the ingredients of a Task analysis(will be covered in later lectures), which involves interviewing real users and watching them do real tasks.

- ➢ Knowing the user is a a never ending process because there is so much to know and because the users keep changing

What should an interactive system designer consider?

Human factors that characterize users based on their

- ➢ Perception: our ability to perceive our surroundings
    - – Can be visual, auditory or haptic (touch)
- ➢ Cognition: the way we process the perceived information in our "mind" and take decisions

- Motor action: this is the mechanism through which we interact with the surrounding
    - Example: hand movement, eyeball movement, Speech

<u>Other factors (user characteristics) that vary with</u>

- Age, gender, physical and cognitive abilities, personality
- Education, cultural or ethnic background
- Training, motivation, goals

<u>User level of experience with a UI</u>

- Novice or first time users
    - Know nothing about the task or interface concepts
    - Often anxious about the computer and its functionality
- Knowledgeable or intermediate users
    - Have stable task concepts and broad interface concepts
- Expert users
    - Thoroughly familiar with the task and interface concepts
    - Want to get their job done quickly