

## Chapter 3: Support for HMI design and modeling

- ❖ The field of HMI is a field of 'non-exact' science.
- ❖ The design methods used in this field are the classic design methods used in software engineering.
- ❖ To produce software that takes the user into consideration, it is necessary:



Involve the user in the development process

# Know the users

- ❖ **L' user is the most important element in a system** computer comprising an interface.
- ❖ The importance of understanding users is often underestimated. However, this is a critical point because there is often a difference between the designers of a system and its users (in terms of training, knowledge, skills, attitude, point of view, vocabulary, etc.)
- ❖ Users must be taken into account fairly early in the process. **the analysis phase of a software project.**

# Know the users

❖ It requires, from designers, **technical knowledge** which translate into:

- A good **listening and communication skills**
- The faculty of power **extract important information** among unstructured data
- The ability to **put oneself in the other's place**

# User-centered development

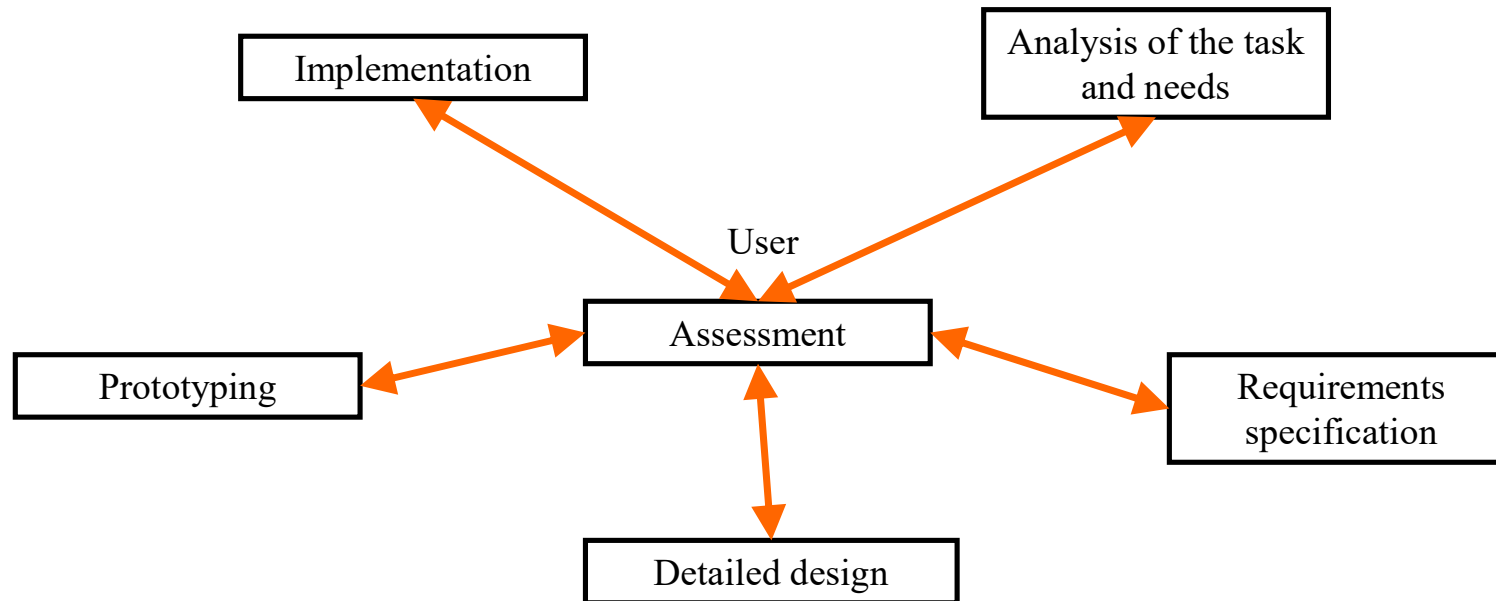
- ❖ A good knowledge of user behavior makes it possible to create software that is adapted to them (concept of ergonomics).
- ❖ Various development methodologies tend to take users into account from the initial phase and involve them throughout the software development cycles.
- ❖ These approaches are known as:  
***User-centered development***  
***(User-Centered design)***

# User-centered development

**User-centered development**(*User-Centered Design*)brings several advantages:

- ✓ Communicate with all people who have different backgrounds, strengths and languages.
- ✓ Focus on the functions you really want (avoid developing unnecessary options)
- ✓ Reduced training and maintenance costs
- ✓ Reduction in learning time
- ✓ More efficient use of the software
- ✓ Increased user satisfaction

# User-centered development



**“Star-shaped life cycle”**

# User-centered development

- In the hub-and-spoke life cycle, the user is at the heart of the development process.
- The user intervenes in all phases: Analysis, Design, Evaluation...
- The engineer and management are no longer the only designers

# The steps of the user-centered method

We generally start with:

- The analysis of the **stain** (*how it is done*)
- The analysis of the **work situation** (*in what conditions*)
- Design
- Prototyping
- The implementation
- The evaluation



# Type of users

- ❑ If an interface is intended to be used by a **large user population (websites, software freeware, etc.)**, there will be a great diversity in the level of users.
  
- ❑ We are going to find :
  - **beginners (novices)**
  - **intermediaries**
  - **experienced**
  
- ❑ **Conclusion** : There is still a large population of users Intermediaries on which the main effort will be concentrated when designing an interface.

# Developer ≠ User

❑ As a developer of an app or website, there is one essential point to keep in mind:

***You are not the user!***

❑ It is imperative to optimize the design of interfaces by taking into account **external users** and not based on users involved - in one way or another - in the project development cycle.

❑ The solution to avoid falling into these kinds of problems is to:

- Create some **prototypes (from the early stages of design)**
- **Organize** of the **testing usability by choosing** users correctly.

# Heuristic Evaluation

- Method proposed by Nielsen and Molich(1993)
  - make a judgment about an interface
- Procedure:
  - systematic inspection of the interface (or a prototype)
  - based on 10 heuristic rules
  - encouraging the evaluator to focus on specific points of the interface

# Heuristic Evaluation

**H1) Simple and natural interface**

**H2) Use user language**

**H3) Minimize user memory load**

**H4) Uniformity**

**H5) Feedback**

**H6) Visibility of means of exit**

**H7) Flexibility**

**H8) Quality error messages**

**H9) Prevent errors**

**H10) Help and documentation**

# Heuristic Evaluation

- Conducting the heuristic inspection
  - Inspection carried out by groups of 3 - 5 assessors
  - For each usability problem, associate at least one heuristic rule
  - For each usability problem, associate a difficulty level
  - Consolidate individual assessments into one assessment

# Heuristic Evaluation

- **Benefits**

- Easy to implement
- Anyone can practice using this method
- Cost/benefit ratio!

- **Disadvantages**

- Results strongly linked to the experience of the evaluators
- Coverage limited to a certain number of problems only