Principles of GUI Design and Programming

User-Centered Design

Contents

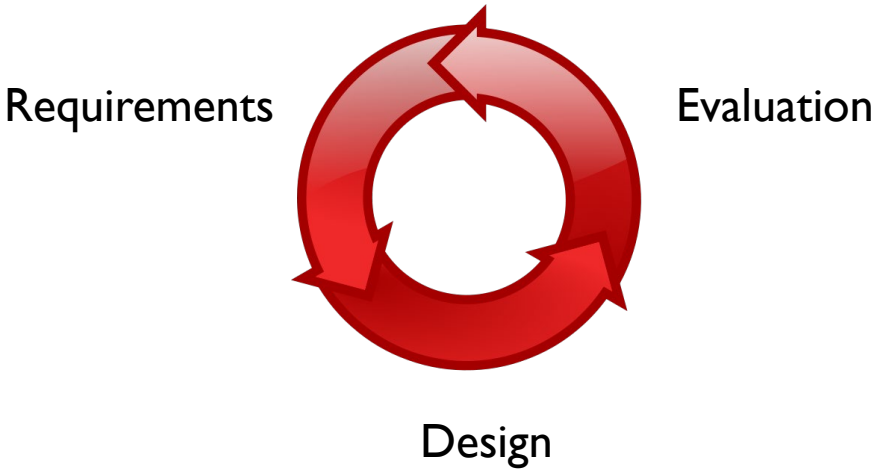
- User centered design
- Design process
- Design in the life cycle

Approaches to Interaction Design

- User-centered design
  - The user guides the designer to develop a design which meets the users needs
- Activity centered design
  - Focuses on the behaviour required to achieve a goal rather than the goal itself
- Systems design
  - Focuses on the whole system of hardware and software to meet the users needs
- Genius design
  - An expert in the field performs the design based on knowledge and experience

The Design Process

- All of the designs perform the same steps
  - Determine the requirements
  - Produce a design to satisfy the requirements
  - Evaluate the design



The Importance of Involving Users

- Many designs were done with minimal user involvement
  - Designers did the design by themselves
  - Designers communicated with managers who described what was done
- It was found that users often did things differently than either the designers or managers thought they did
- This can only be discovered by talking to the users

The Importance of Involving Users

- Expectation management
  - If the users are not involved in the design process, they can have unrealistic expectations
  - This can be tempered by involving them in the process so they know what is possible and what to expect
  - It is better to exceed expectations than to disappoint

How Much Should Users be Involved?

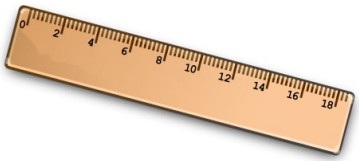
- Involving users makes them feel part of the process and take ownership
- Part-time involvement allows users to go back and forth between other users and developers, conveying ideas and staying in touch with both
- Full-time users involved in design risk becoming designers and losing touch with the other users

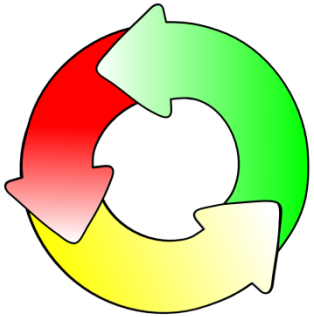
How Much Should Users be Involved?

- Studies show
  - Some user involvement in beneficial
  - If too many users get involved, it can actually have a negative impact on the project

Three Principles of Design

1. Early focus on users and tasks
   - Understand the users by observing them and identifying their characteristics and what they do
2. Empirical Measurement
   - Early in the process, how long it takes users to perform tasks and look up information is measured. This can be used to measure performance gains in the final system.
3. Iterative Design
   - When problems are found in the design, it is revised and retested.





Early focus on users and tasks

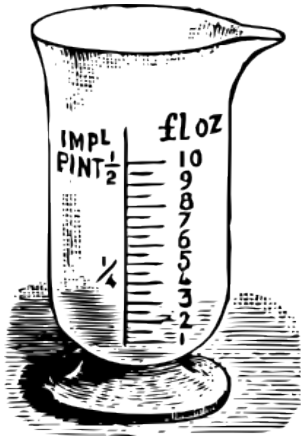
- The design is driven by the goals and tasks performed by the users
  - The goal is to see how the technologies can support the users, not what technologies can we use in the project.
- User's behaviour and context are studied and the system is designed to support them
- Users' characteristics are captured and designed for.
  - The design will take into account the limitations of the users

Early focus on users and tasks

- Users are consulted throughout development
  - Users are involved and the input is respected by the designers
- All design decisions are taken within the context of the users
  - While the users might not be continuously involved, the designers always keep them and their needs in mind when making decisions

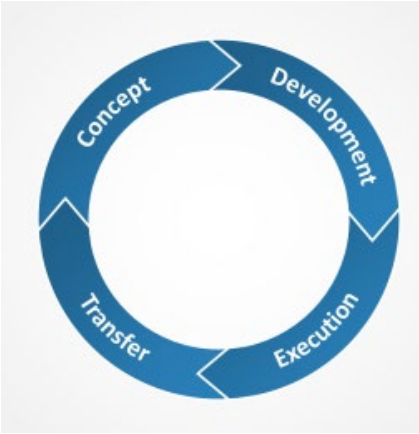
Empirical Measurement

- Specific usability and user experience goals should be identified at the beginning of the project
- This will allow
  - Designers to choose between alternatives
  - Check on the progress of the project
  - The project to be evaluated during development



Iterative Design

- Iteration allows designs to be refined based on feedback
- Even the best designers rarely get things right the first time
- Iteration allows them to identify problems and return to the design to correct them



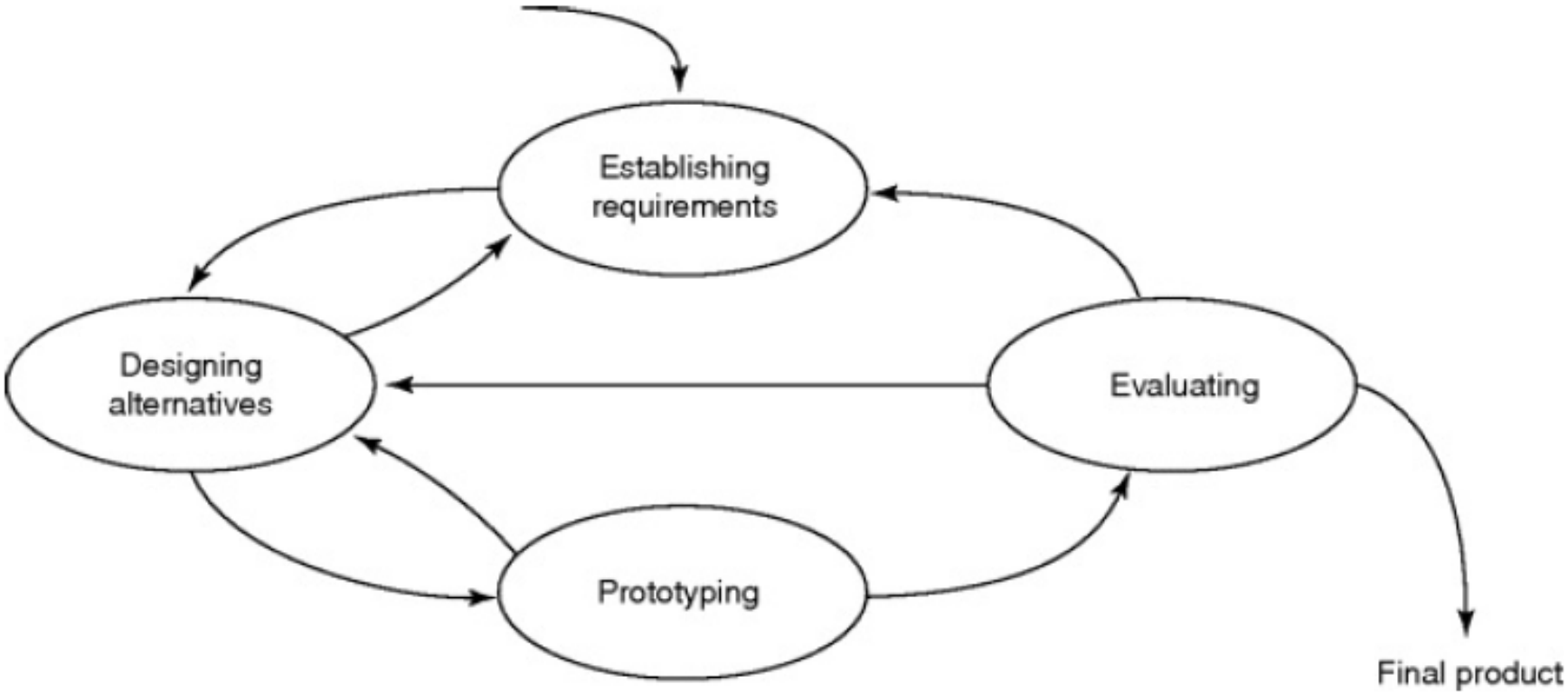
Four Basic Activities of Interaction Design

1. Establishing Requirements
   - Understanding the behaviour and needs of the users is fundamental to a user-centered approach

2. Designing Alternatives
   - Different designs are considered

3. Prototyping
   - Paper based models (or computer based) a built and evaluated
4. Evaluating
   - This determines the usability and acceptability of the design alternatives

A simple interaction design lifecyle model



Who Are the Users?

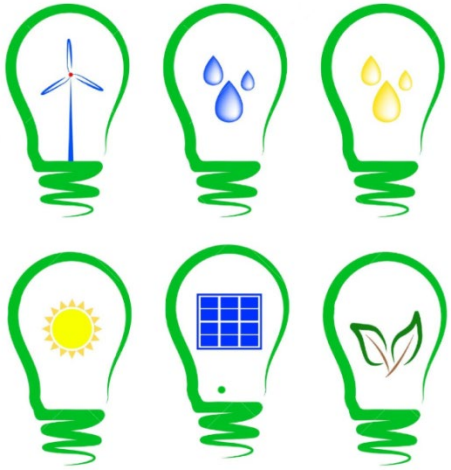
- Direct users of the system
- People who manage the direct users
- One idea was to have primary, secondary and tertiary users
- Better to identify all stakeholders and select those who are best able to identify the requirements

What Do We Mean by ‘Needs’?

- Users often cannot tell you their needs because they do not know what is possible with the technology
- Focusing on people's usability and user experience goals is more promising than focusing on people's needs and expecting them to be able to tell us the requirements for a product.

How Do You Generate Alternative Designs?

- Cross-fertilization of ideas with other designers
- Have stakeholders work with designers to identify analogies between their field and the new area
- Look at other designs you can borrow ideas from



How Do You Choose Among Alternative Designs?

- These decisions will be informed by
  - The information gathered about users and their tasks,
  - and by the technical feasibility of an idea.
- In design there are
  - Externally observable features and behaviour
  - Internal structure and behaviour
- End users are only concerned about external visibility, not the internals necessary to make it happen
- Make internal decisions based on external needs

How Do You Choose Among Alternative Designs?

- Let the users interact with prototypes of each alternative and discuss the pros and cons of each
- Select the alternative which is going to give the best quality interface

How Do You Integrate Design with Other Lifecycle Models?

- An ongoing question is
  - How do we integrate design with software development life cycle models?
- Current software lifecycle models are focusing on agile methods which
  - Involve users in the process
  - Do many iterations and get frequent user feedback
  - Test continually throughout the development process
- These ideas are in line with the requirements of interface design