



# **Interactive Multimedia Applications User Experience Design: Model**

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## Pen Based Interaction

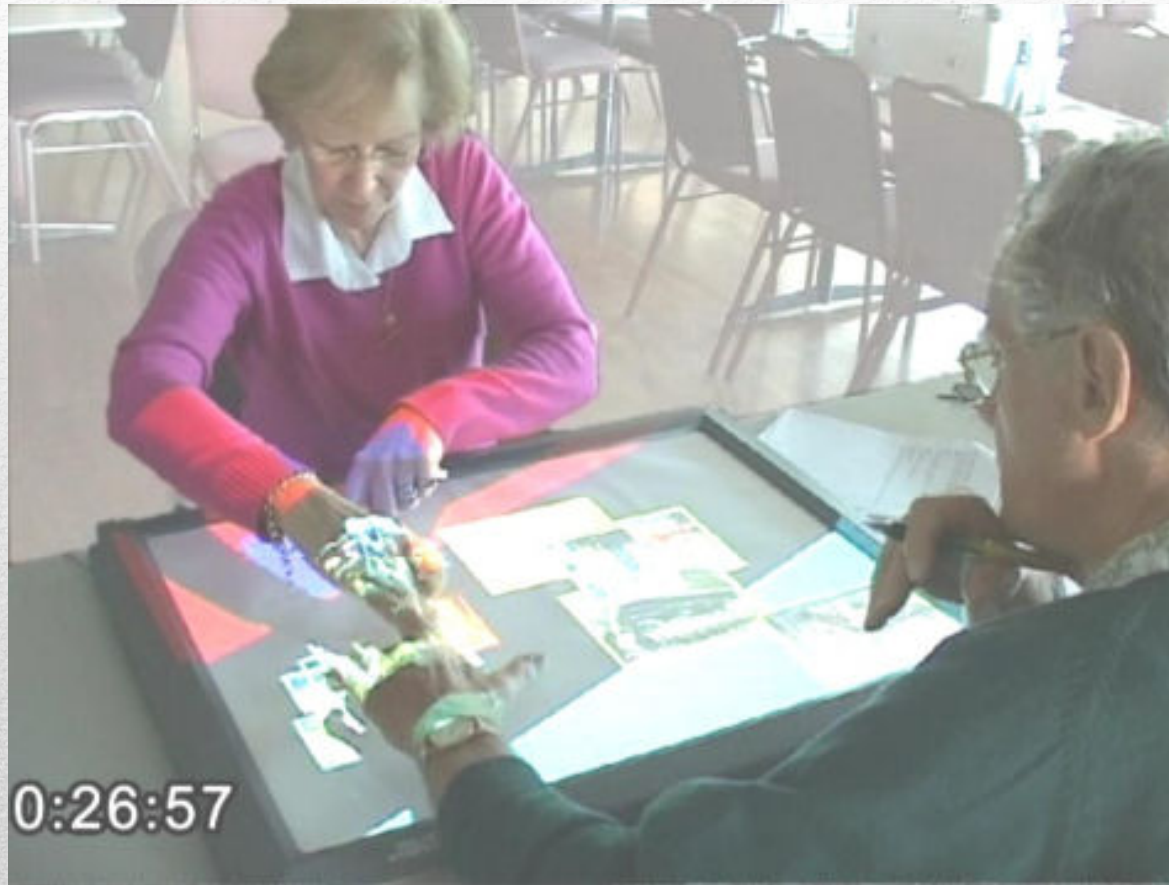




## Natural Interaction (Kinect - Sensor 3D)

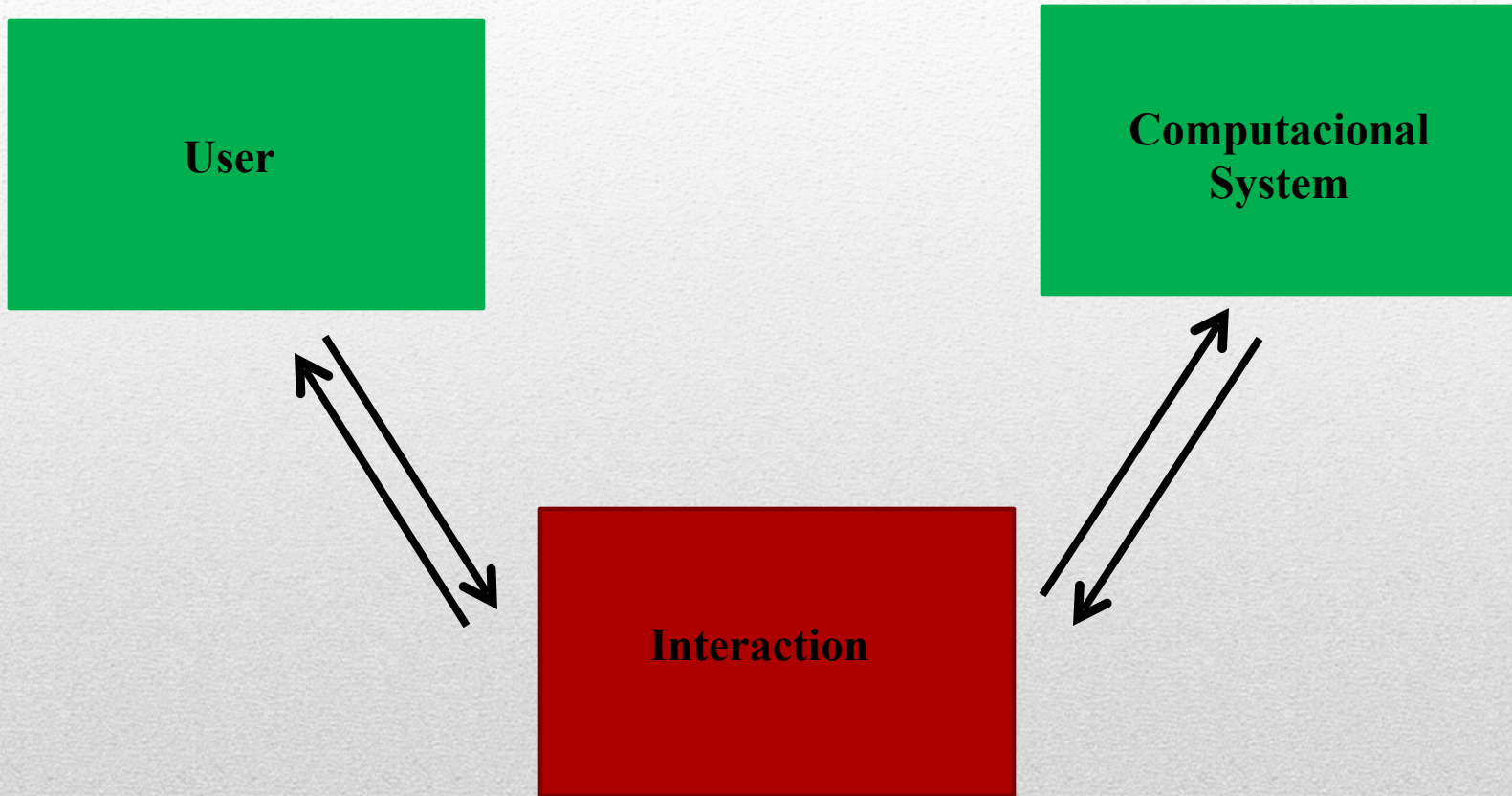


## Multi-touch Interaction

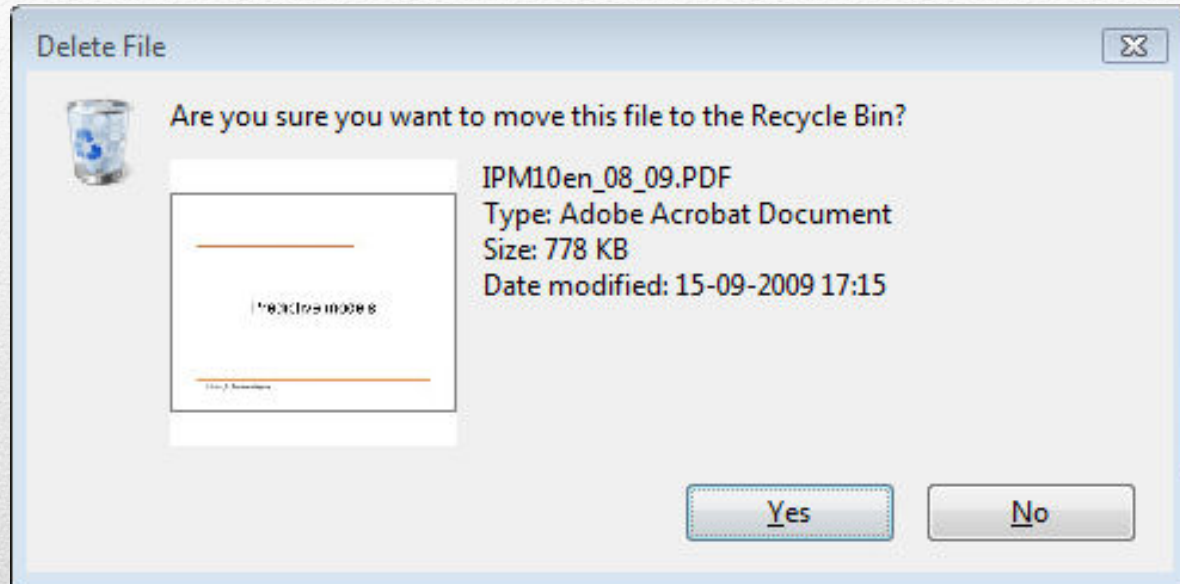




## Interactive System



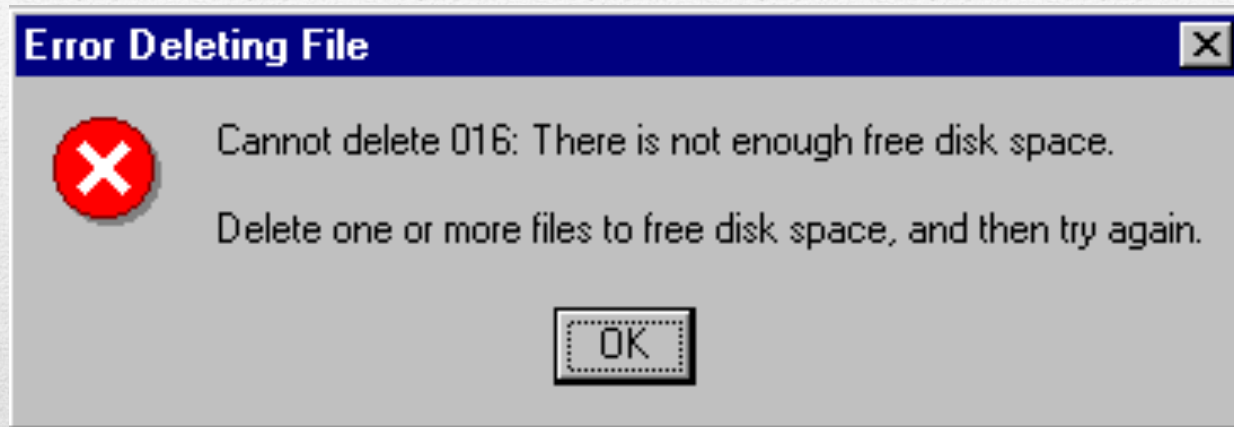
## Interaction Design, Why?





## *Hall of Shame (I)*

- **Example 1**



- <http://hallofshame.gp.co.at/mdesign.htm>
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## *Hall of Shame (II)*

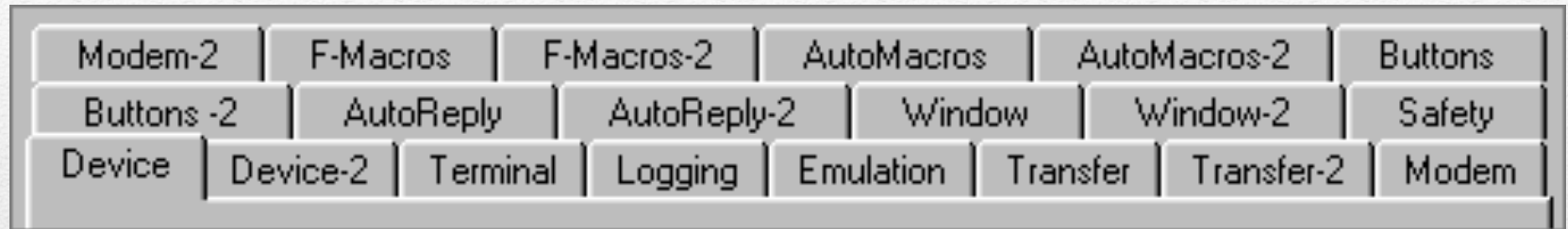
- Example 2

Modem-2	F-Macros	F-Macros-2	AutoMacros	AutoMacros-2	Buttons		
Buttons -2	AutoReply	AutoReply-2	Window	Window-2	Safety		
Device	Device-2	Terminal	Logging	Emulation	Transfer	Transfer-2	Modem



## *Hall of Shame (III)*

### ■ Example 2



### ■ Multi-row tab controls

- One of the worst interfaces
  - Selecting a tab causes a reorganization of the entire set of tabs
  - Different number of tabs per line also does not help
  - More than one tab for the same function
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## Human-Computer Interaction

- **Human-Computer Interaction**

- It is a study area that aims to improve the interaction between users and computer systems

- **To Study and To Know**

- Users, tasks, and application context

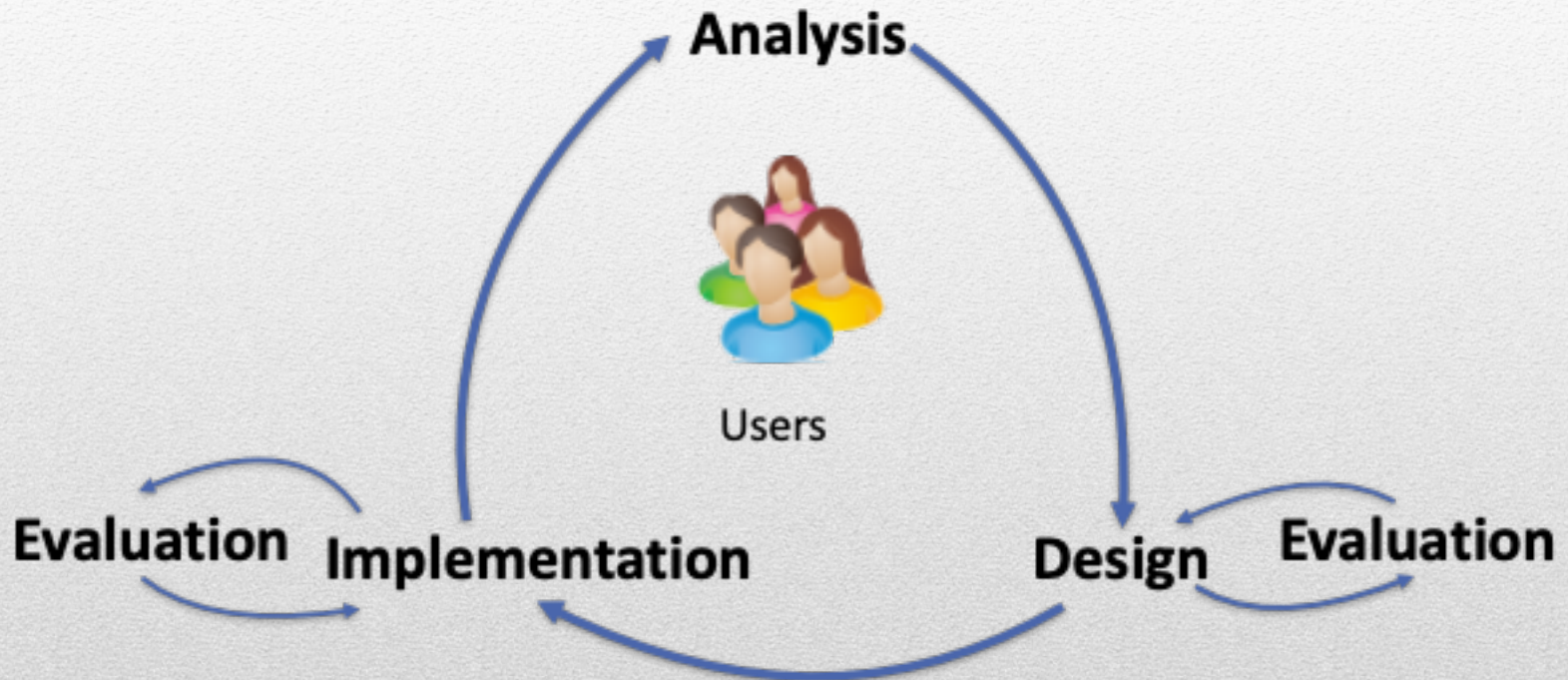
- **User-Centered Design (UCD)**

- It is the process of developing interactive computer systems in the context of user tasks
-

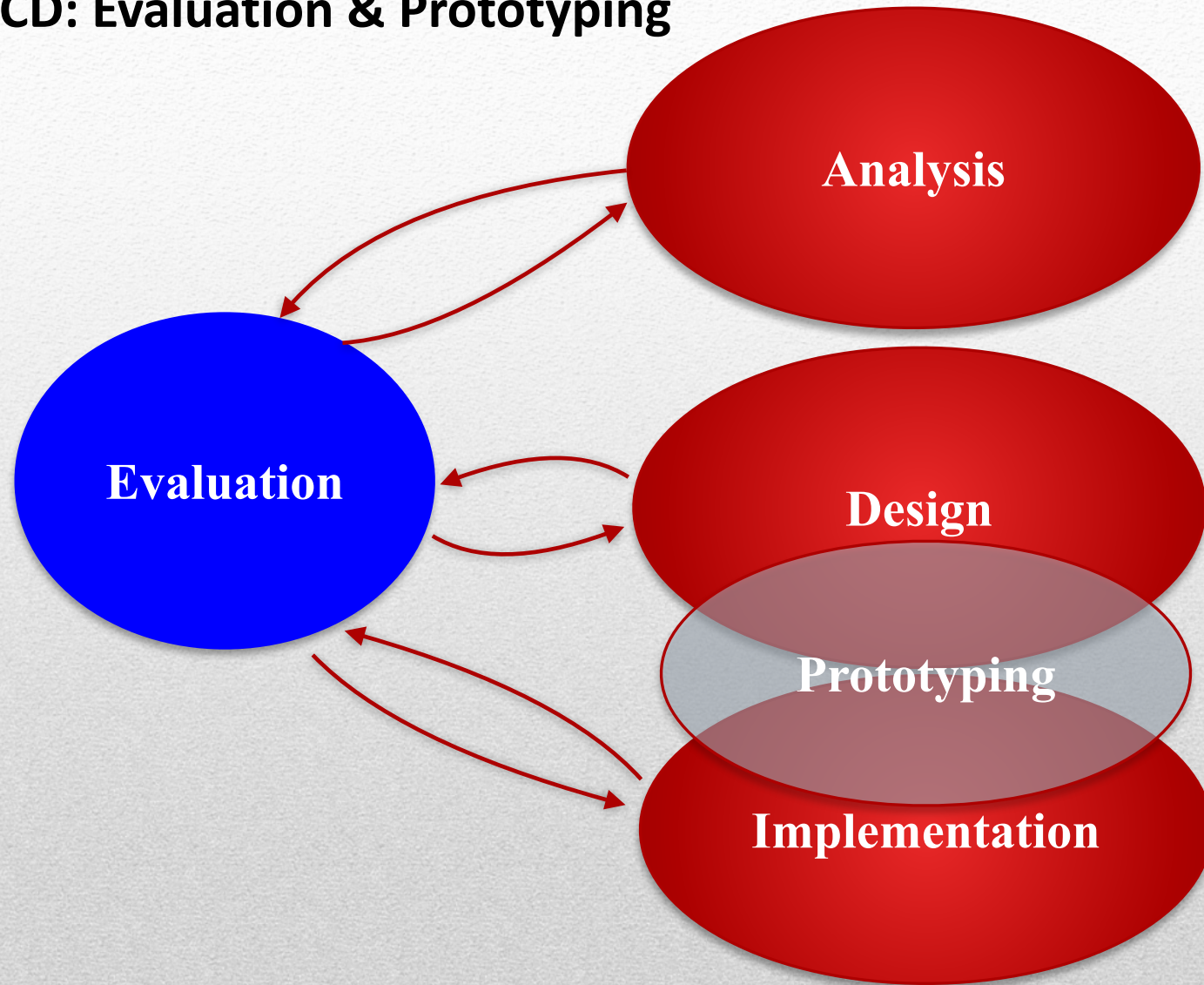


## User-Centered Design (DCU)

- Iterative Model



## UCD: Evaluation & Prototyping





## UCD – Relevant Activities

- **Analysis**
    - Identify user needs and define tasks
  - **Design**
    - Develop conceptual models and prototypes
  - **Implementation**
    - Build functional/computational prototypes
  - **Evaluation**
    - Evaluate ideas and prototypes
-

## UCD: Design Goals

- **Usability**
    - Optimize the interaction so that the interactive products are efficient and productive in the context of the tasks at work
  - **User Experience (UX)**
    - Improve the user satisfaction (experience)
-



## UCD: Usability Goals (I)

- **Effective to use (Effectiveness)**
  - **Efficient to use (Efficiency)**
  - **Safe to use (Safety or error tolerance)**
  - **Have a good utility (Utility)**
  - **Easy to learn how to use (Learnability)**
  - **Easy to remember how to use (Memorability)**
-

## UCD: Usability Goals (II)

- **Effectiveness**

- Measures the quality of the application in doing what it is supposed to do
- How it is measured?
  - Calculating the percentage of users who successfully completed the tasks





## UCD: Usability Goals (III)

- **Efficiently**
    - Measures how the application supports users in performing tasks
    - How it is measured?
      - Measuring the time needed to complete the task
-

## UCD: Usability Goals (IV)

- **Safety**

- Measures the safety that is given to the user when using the application
  - How many errors do users make, how severe are these errors, and how easily can they recover from the errors?
  - How it is measured?
    - Measuring the number of errors
-



## UCD: Usability Goals (IV)

- Utility
    - Measures the utility of the application
    - Satisfy the needs of users to carry out their tasks on a daily basis
    - How it is measured?
      - Measuring the number of satisfied users
-

## UCD: Usability Goals (V)

- **Learnability**

- Allow an inexperienced user to quickly perform tasks
  - How easy is it for users to accomplish basic tasks the first time they encounter the design?
  - How it is measured?
    - Computing the relation between the time spent by an inexperienced user and an experienced one performing the same task
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## UCD: Usability Goals (VI)

- **Memorability**

- Allow casual users to re-use the system without having to relearn how to use
- How it is measured?
  - Counting the number of errors committed by the user to perform the same task over time

## UCD: UX (Positive)

- **Satisfying, Enjoyable, Engaging, Pleasurable**
  - **Exciting, Entertaining, Helpful, Challenging**
  - **Motivating, Enhancing sociability, Supporting creativity**
  - **Cognitively stimulating, Fun, Provocative, Surprising**
  - **Rewarding, Emotionally fulfilling**
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## UCD: UX (Negative)

- Boring, Frustrating, Making one feel guilty, Annoying
  - Childish, Unpleasant, Patronizing, Making one feel stupid
  - Cutesy, Gimmicky
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## UCD: Design Goals (Examples) I

- **Mobile device that allows children to communicate with each other and play collaborative games**



## UCD: Design Goals (Examples) II

- **Mobile device that allows children to communicate with each other and play collaborative games**
    - Easy to learn to use, effective, efficient, enjoyable and entertaining
  - **Internet application that allows the general public to access your medical records through interactive television**
-

## UCD: Design Goals (Examples) III

- **Mobile device that allows children to communicate with each other and play collaborative games**
    - Easy to learn to use, effective, efficient, fun and entertaining
  - **Internet application that allows the general public to access your medical records through interactive television**
    - Safe, easy to learn to use, easy to remember how to use, efficient and effective
  - **CAD system for architects and engineers**
-



## UCD: Design Goals (Examples) IV

- **Mobile device that allows children to communicate with each other and play collaborative games**
    - Easy to learn to use, effective, efficient, fun and entertaining
  - **Internet application that allows the general public to access your medical records through interactive television**
    - Safe, easy to learn to use, easy to remember how to use, efficient and effective
  - **CAD system for architects and engineers**
    - Easy to learn to use, safe, effective, efficient, helpful, pleasurable, supporting creativity
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# **User Centered Design (UCD) Analysis**

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## Analysis: Goals (I)

- **User Research**

- Analyze the users will use the application (User Analysis)
- Identify the user needs or real problems (Tasks Analysis)

- **Output**

- User characterization and list of user tasks
-

## Analysis: Goals (II)

- **Competitors Understanding**
    - Analyze similar products
  - **Business Understanding**
    - Including the Business strategy of the Company in the process
-



## Analysis: User Research (I)

### ■ Audience

- Defining groups of potential users of the application

### ■ Group

- Age group
  - Profession
  - Schooling
  - Technological knowledge
  - Physical features
  - Tools that use to do what the application will do
  - Experience using similar tools
  - Knowledge they have about the tasks to be performed in the new application
  - ...
-

## Analysis: User Research (II)

- **Task Analysis**

- Defining and describing the user tasks
- Tasks List
  - Tasks desired by the users
  - Relevant tasks available in similar applications
  - Tasks resulting from business strategy of the company

- **Output**

- Description of the relevant user tasks
-



## Task and User Analysis: Method (I)

- **Formal**

- Divide tasks into several steps. It is based on well-defined procedures

- **Informal**

- Based on a set of questions that help to understand the tasks that the user performs
-

## Task and User Analysis: Method (I)

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- **Informal**

- Based on a set of questions that help to understand the tasks that the user performs
-



## Task and User Analysis: Informal - 11 Questions (I)

- **Who will use the system?**
    - The answer should characterize users as much as possible
  - **What tasks are currently performed?**
    - It serves to identify the tasks that users perform now
    - **Redesign** - tasks that are performed in the current application
    - **New** - how are performed the tasks that the new application will allow to perform
-

### Task and User Analysis: Informal - 11 Questions (II)

- **What tasks are desirable?**
    - Identify the new tasks that users would like to have in the new system
  
  - **How are tasks learned?**
    - How users learn to perform tasks
    - What they need to know to perform tasks
-



### Task and User Analysis: Informal - 11 Questions (III)

- **Where are the tasks performed?**
    - Describe the physical, social and cultural environment that surrounds users
  
  - **What is the relation between the user and the information?**
    - Identify how personal data is stored and accessed
-

### Task and User Analysis: Informal - 11 Questions (IV)

- **What other instruments does the user have?**
    - When filling in the IRS, a calculator is needed to sum up the various values
  
  - **How do users communicate with each other?**
    - The identification of the communication mechanism can lead us to integrate communication functionality in the application
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### Task and User Analysis: Informal - 11 Questions (VI)

- **How often do tasks perform?**
    - Allows you to optimize the most frequent tasks
    - More frequent users know more about tasks, less frequently need more help
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### Task and User Analysis: Informal - 11 Questions (V)

- **What time restrictions are imposed?**
    - Identify how much time the user has to complete a task
    - Identify whether there is a temporal relationship between tasks
  
  - **What happens if something goes wrong?**
    - How users react to practical difficulties
-



## Task and User Analysis: Activities (I)

- **How to obtain information to define the users and the tasks?**
    - Watching users using other tools
    - Performing interviews
    - Analyzing similar tools
    - Analyzing the context where the application will be used
    - Analyzing studies on similar applications or problems
-

## Analysis: Activities (II)

