

# CHAPTER 4:

## Design



*Designing the User Interface:  
Strategies for Effective Human-Computer Interaction*

*Sixth Edition*

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# Design

## Topics

1. Introduction
2. Organizational Support for Design
3. The Design Process
4. Design Frameworks
5. Design Methods
6. Design Tools, Practices, and Patterns
7. Social Impact Analysis
8. Legal Issues

# Organizational Support for Design

- Design is inherently creative and unpredictable. Interactive system designers must blend knowledge of technical feasibility with a mystical esthetic sense of what attracts users.
- Some companies are beginning to employ chief design officers (CDOs), which may help to promote usability and design thinking at every level
- Return on Investment (ROI) business case for focusing on usability has been made powerfully and repeatedly

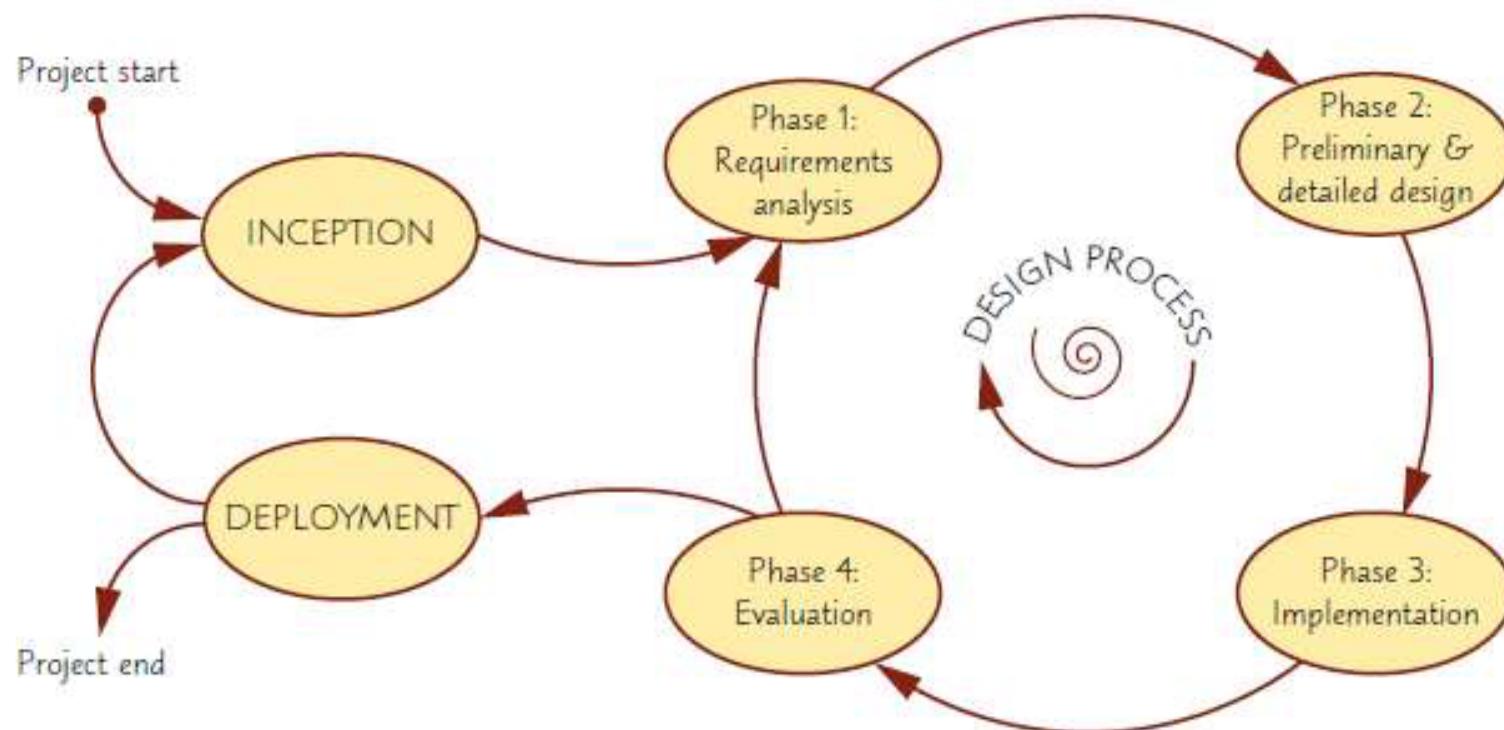
# Organizational Support for Design (concluded)

- *Usability engineering* has evolved into a recognized discipline with maturing practices and a growing set of standards
- Usability engineers and user-interface architects, sometimes called the user experience (UX) team are gaining experience in organizational change
- The Usability Experience Professionals Association (UXPA) holds annual meetings called the “World Usability Day”

# Design Process

- Rosson and Carroll (scenario-based) design characterization:
  - Design is a process, not a state
  - The design process is *nonhierarchical*
  - The process is *radically transformational*
  - Design intrinsically involves the *discovery of new goals*

# Design Process (continued)



An iterative design process would consist of four distinct phases

# Design Process: Phase 1 - Requirements Analysis

- Examples of requirements regarding system behavior for three distinct types of interactive systems: an e-commerce website, an ATM, and a mobile messaging app

## Functional requirements:

- **Website:** The website shall allow users to purchase items and shall provide other, related merchandise based on past visits and purchases.
- **ATM:** The system shall let users enter a PIN code as identification and shall ensure that the code matches the one on file.
- **Mobile app:** The app shall be able to send messages at all times, even when out of the service area (in which case they are saved for later sending).

## Non-functional requirements:

- **Website:** The website shall give users the ability to access their user account at all times, allowing them to view and modify name, mail address, e-mail address, phone, etc.
- **ATM:** The system shall permit the ATM customer 15 seconds to make a selection. The customer shall be warned that the session will be ended if no selection is made.
- **Mobile app:** Messages should send within 2 seconds, returning the user to the new message window (continuing in the background if necessary).

## User experience requirements:

- **Website:** The website shall always have a visible navigation menu in the same position on the screen.
- **ATM:** On-screen prompts and instructions shall be clear and accessible. The ATM should return the user's commands within half a second.
- **Mobile app:** The mobile app shall support customization such as color schemes, skins, and sounds.

# Design Process: Phase 2 – Preliminary and Detailed Design

- The design phase in turn consists of two stages:
  1. a preliminary stage, where the high-level design or architecture of the interactive system is derived
  2. a detailed stage, where the specifics of each interaction is planned out
- The preliminary stage is also called *architectural* or *conceptual design*
- Examples of suitable design methods include sketching, paper mockups, and high-fidelity prototypes
  - Can be clarified via tools, patterns, best practices

# Design Process: Phase 3 – Build and Implementation

- Where all the planning gets turned into actual, running code
  - The actual software and hardware engineering needed to achieve this are outside the scope of this book
  - Included in this text is software development platforms for interactive applications for mobile apps, the web and PC's
  - Make sure to evaluate tool capabilities, ease of use, ease to learn, cost, and performance
  - Tailor tool choices for the size of the job

# Design Process: Phase 4 – Evaluation

- Developers test and validate the system implementation to ensure that it conforms to the requirements and design set out earlier in the process
- Chapter 5 covers a range of suitable evaluation methods for this phase in depth

# Design Frameworks

- **User-centered design (UCD)**
  - Takes the needs, wants, and limitations of the actual end users into account during each phase of the design process
- **Participatory design (PD)**
  - Direct involvement of people in the collaborative design of the things and technologies they use
- **Agile interaction design**
  - Development methods for self-organizing, dynamic teams and that facilitate flexible, adaptive, and rapid development that is robust to changing requirements and needs

# Participatory Design

- Intergenerational and interdisciplinary design team from the University of Maryland's KidsTeam working on new human-computer interaction technologies using paper prototypes



# Agile Interaction Design

- Professor Jon Froehlich and his students working in the HCIL Hackerspace at University of Maryland, College Park

