

Syllabus for ISE 2

By DRK

Module 1

Module 4.1,4.2

By SB

Module 5.2 and module 6.1

By KG

Module 3, excluding topics : Extracting Interaction Design requirements (ch5), and Constructing design-information Models(Ch 6)

Ch means chapters from textbook1 authors Rex Harrison, Pardha Pyla

Chapter 3 . Chapter 4(**only topic 4.5**) also understanding of process is needed so **Revise Process concept (ie Chapter 2)**

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Module 1.1(DRK)

History of user interface designing

UI design goals

Module 1.2 : Introduction to UI & UX Design(DRK)

Chp 1 : Introduction(Rex Harton)

What is UX?

- User Experience(UX) can be explained as a person's perceptions and responses resulting from the use or anticipated use of a product, system or service.
- User experience is how you feel about every interaction you have with what's in front of you in the moment you're using it.
- It is not about if something can be done, rather it is about what is felt while doing something.

Ubiquitous Interaction

- Despite advances in technology we still need the basic computing i.e. we still need basic desktops, laptops, GUI, etc. Even in future we will be needing basic building blocks of computing.
- The concept of computing is changing. Computer systems are being worn by people in wearable devices. Embedded systems are used in appliances, furniture, vehicles, roads, etc.
- Sometimes people are interacting with computing systems but do not think of it as computing. For eg: People use computing systems in vehicles & even GPS but still don't think of it as computing. But it is just evolved way of interacting with computing systems.

Emerging Desire of Usability

- In the past, the systems were focused just on improving the work being done, despite its poor usability.

- Poor usability was instead used as an excuse of provided as security barrier from uninitiated outsiders.
- But as the computing as improved and a lot of options are being provided to users, they tend to find the service that is the most usable apart from being the most efficient.
- Modern users give a lot of importance to design.
- They tend to choose alternatives just because they think the design is very poor which was not the case earlier.
- To be precise, poor designs were being tolerated for effective systems earlier but not in this modern era.

From usability to user experience

- Traditional usability can be explained as how efficient, effective and satisfying can the human-computer interaction be to the user.
- General characteristics of usability are use, productivity, learnability, efficiency, effectiveness, retainability, user satisfaction, etc.
- There are certain misconceptions about usability such as being called “dummy proofing” and being considered as equivalent to “user equivalent”.
- More of engineering focus is being deployed on user performance which is known as user experience.
- User satisfaction is not just the emotional impact but considered as a much broad spectrum & the response to user satisfaction is also very different from people these days.
- A good user experience does not necessarily mean high tech or cool8
- User Experience is totally felt by the users internally.
- It is simply the effect or effects felt by the user as a result of interaction with any system.
- User experience can never be designed, it can only be experienced.

Difference between UI and UX

(<https://blog.prototypr.io/ux-vs-ui-similarity-differences-837775584cd8>)

- UX designers tend to focus on creating a product that solves a problem, while UI designers work on the design patterns and micro-details of the product.
- UX designers think extensively about how best to make a product easy to use, while UI designers think extensively about how best to make a product delightful and enjoyable to use
- UX design can be used for both tangible and intangible products, while UI design tends to be limited to digital interfaces.
- UX is what we, as users, experience, while UI is what we see while using a product.
- UX design generally comes before UI design in an ideal design process.

Module 1.3 Introduction to UI & UX design(DRK)

Need of Business Case

- It is only thought of as an added extension to the system which is optional.
- Often positive responses about products or services are considered as no complaints about user experience which is not correct.
- There is also a misunderstanding that training can replace user experience. It is thought that user experience can be achieved by making users well versed with the system.

Roots of Usability

- It is actually not confirmed when computer usability came into picture.
- It was preceded by the usability of non-computer machines in industrial designs & human factors.
- Various fields have contributed towards user experience such as industrial & systems engineering, psychology, cognitive sciences, computer science, software engineering ,etc.

Module 4 The UX design Process: Information Architecture, Interaction design and prototyping

Module 4.1 Design Thinking, Ideation, and Sketching

Chp 7 : Design Thinking, Ideation, and Sketching(Rex Harton)(pg 251)

DESIGN PARADIGMS

1. Engineering and human factors: deconstruct work with the objective of designing the machine for optimum human performance
2. Cognitive science: the theory of what is happening in the human mind during and with

respect to interaction by treating human minds as information processors.

3. The phenomenological paradigm (they call it the phenomenological matrix): emphasis in interaction is about making meaning (more on this later).

DESIGN THINKING

Def: Design thinking is a mind-set in which the product concept and design for emotional impact and the user experience are dominant. It is an approach to creating a product to evoke a user experience that includes emotional impact, aesthetics, and social- and value-oriented interaction. As a design paradigm, design thinking is an immersive, integrative, and market-oriented eclectic blend of art, craft, science and invention.

- Designers are called upon to create a new vision, taking customers and users to a profound and satisfying user experience.
- Design thinking is immersive; everything is about design. Design thinking is integrative; you pull many different inputs, inspiration, and ideas together to focus on a design problem. Design thinking is human centered, requiring a thorough understanding of the needs, especially the emotional needs, of human users.

Eg: Apple iPod Touch

The device has superb usability; its soft buttons have precise and predictable labels. The physical device itself has a marvelous design with great emotional impact. The packaging, gift-wrapping, and engraving appeal to a personal and social Desirability. "Made by Apple"; it says, "Designed by Apple!" "You buy it for what it can do, but you love it because it is so cool." Apple's

DESIGN PERSPECTIVES

1. Ecological Perspective:

It is about how the system or product is used in its context and how the system or product interacts or communicates with its environment in the process. System infrastructure plays an important role in the ecological perspective because the infrastructure of a system, the other systems and devices with which it interacts in the world, is a major part of its ecology.

2. Interaction Perspective:

The interaction design perspective is about how users operate the system or product. It is a task and intention view, where user and system come together. It is where users look at displays and manipulate controls, doing sensory, cognitive, and physical actions.

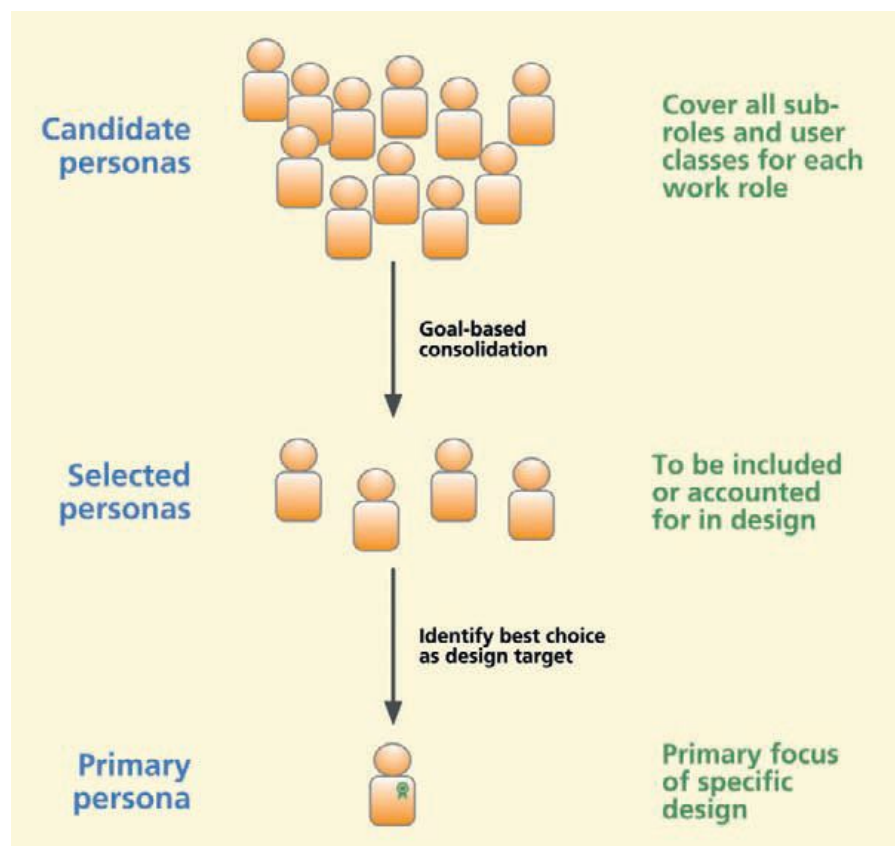
3. Emotional Perspective:

The emotional design perspective is about emotional impact and value-sensitive

aspects of design. It is about social and cultural implications, as well as the aesthetics and joy of use. A product is not just a product; it is an experience

USER PERSONAS

- A persona represents a specific person in a specific work role and sub-role, with specific user class characteristics.
- As Cooper (2004) put it, personas can help end feature debates. What if the user wants to do X? Can we afford to include X? Can we afford to not include X? How about putting it in the next version? With personas, you get something more like this: “Sorry, but Noah will not need feature X.” Then someone says “But someone might.” To which you reply, “Perhaps, but we are designing for Noah, not ‘someone.’”



- Characteristics of Effective Personas, Make your personas rich, relevant, believable, specific, and precise. Make your personas “sticky”

IDEATION

Def: Ideation is an active, creative, exploratory, highly iterative, fast-moving collaborative group process for forming ideas for design. With a focus on brainstorming, ideation is applied design thinking.

A] Essential Concepts

- Iterate to explore
- Idea creation vs. critiquing: Idea creation is about the generation of new ideas and throwing them out for discussion and inspiration. Critiquing is review and judgment.

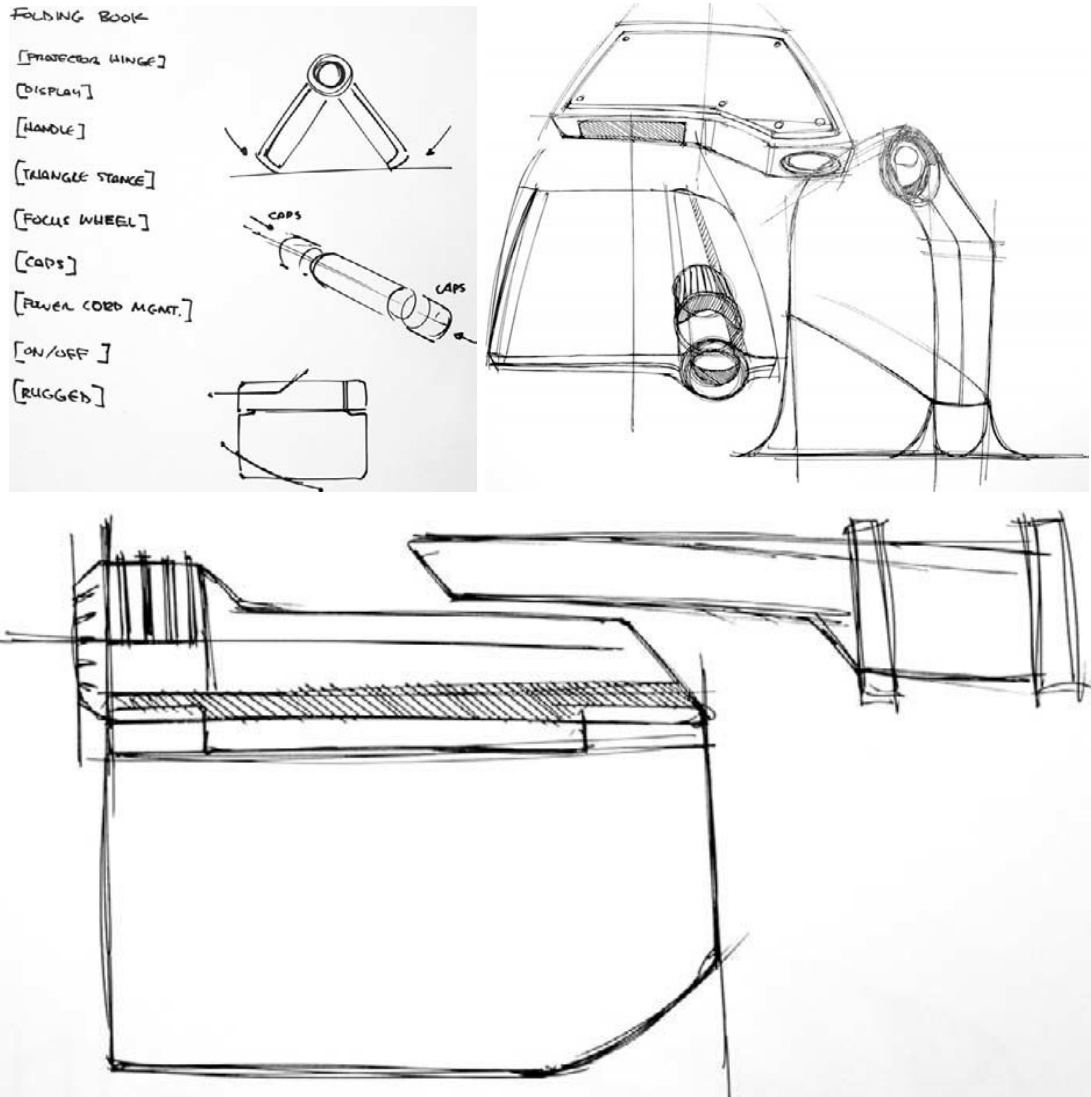
B] Doing Ideation

- Set up work spaces: Establish a place for design collaboration
- Assemble a team: Try to include people with a breadth of knowledge and skills, cross disciplinary people who have experience in more than one discipline or area. Include customer representatives and representative users
- Use ideation bin ideas to get started: An ideation input bin is an unconstrained and loosely organized place to gather all the work activity notes and other ideas for sparking and inspiring design. You should also include emotional impact factors in your ideation inputs.
- Brainstorm:
 1. The initial overview discussion establishes background and parameters and agreement on goals of the design exercise.
 2. Next, divide up the team into pairs or small sub-teams and go to breakout groups to create and develop ideas
 3. Use sketches (imperative, not optional) annotated with short phrases to produce quick half-minute representations of ideas

SKETCHING

Def: Sketching is the rapid creation of free-hand drawings expressing preliminary design ideas, focusing on concepts rather than details. Multiple sketches of multiple design ideas are an essential part of ideation. A sketch is a conversation between the sketcher or designer and the artifact.

- Sketches are not the same as prototypes: Sketches are for exploring the possibilities for creating a design. Sketching is designing, whereas prototyping in the usual sense is implementation to build a concrete design representation for testing.
- Most ideas are conveyed more effectively with a sketch than with words
- Sketches are quick and inexpensive to create; they do not inhibit early exploration
- Sketches are disposable; there is no real investment in the sketch itself
- Sketches are timely; they can be made just-in-time, done in-the-moment, provided when needed



MORE ABOUT PHENOMENOLOGY

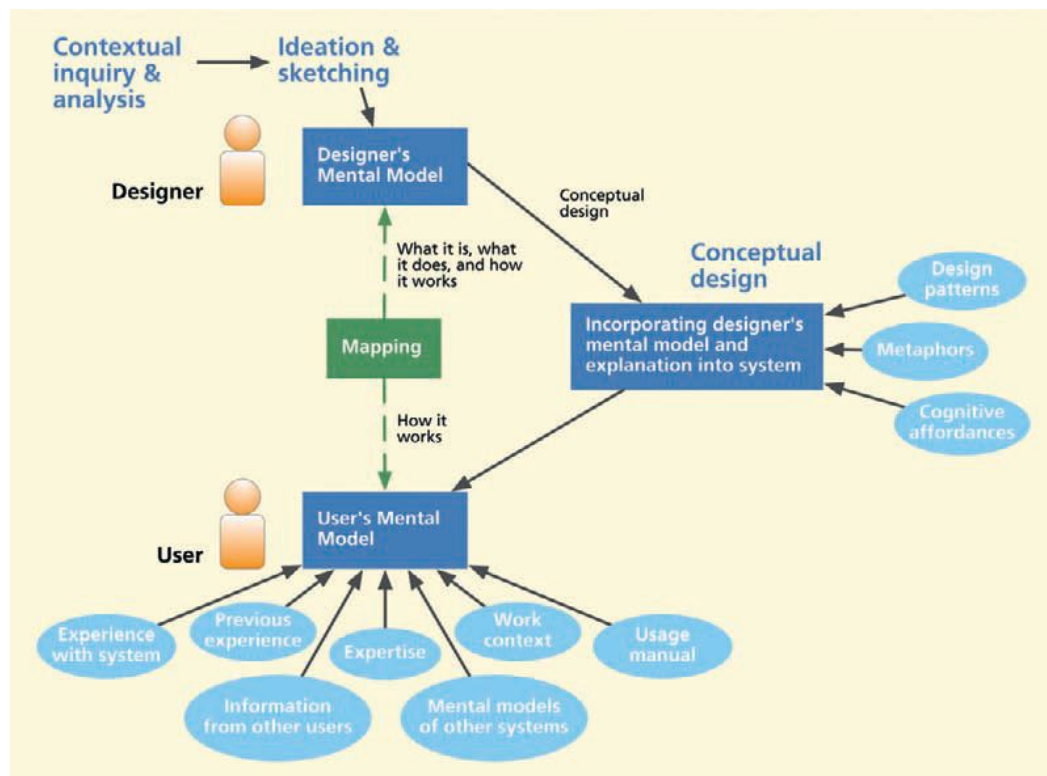
- Phenomenology is the philosophical examination of the foundations of experience and action. It is about phenomena, things that happen and can be observed. But it is not about logical deduction or conscious reflection on observations of phenomena; it is about individual interpretation and intuitive understanding of human experience.
- A key characteristic of phenomenological concepts is that the product or system that is the target of design or evaluation is present in the user's life, not just being used for something. That certainly rules out almost all desktop software, for example, but calls to mind favorite portable devices, such as the iPhone and iPod, that have become a part of our daily lives.

Module 4.2 Mental Models and Conceptual Design

Chp 8 Mental Models and Conceptual Design(Rex Harton)(pg no 299)

MENTAL MODELS

- Designer's Mental Model: the designer's mental model is the designer's conceptualization of the envisioned system—what the system is, how it is organized, what it does, and how it works.



- Designer's mental model in the ecological perspective: Describing what the system is, what it does, and how it works within its ecology
- Designer's mental model in the interaction perspective: Describing how users operate it
- Designer's mental model in the emotional perspective: Describing intended emotional impact
- User's Mental Model: A user's mental model is a conceptualization or internal explanation each user has built about how a particular system works.

CONCEPTUAL DESIGN

- A conceptual design is the part of an interaction design containing a theme, notion, or idea with the purpose of communicating a design vision about a system or product.
- Bring Designer's Mental Model to Life.
- Leverage Metaphors in Conceptual Design: What users already know about an existing system or existing phenomena can be adapted in learning how to use a new system.
- Example: use of a typewriter metaphor in a word processing system. New users who are familiar with the knowledge, such as margin setting and tab setting in the typewriter domain, will already know much of what they need to know to use these features in the word processing domain.
- Metaphors in the ecological perspective: iTunes as a mother ship for iPods, iPhones, and iPads
- Metaphors in the interaction perspective: A more modern example is the metaphor of reading a book on an iPad
- Metaphors in the emotional perspective:

####For Example: Conceptual Design for the Ticket Kiosk System(Refer Pg no, 312)####

STORYBOARDS

Def: A storyboard is a sequence of visual "frames" illustrating the interplay between a user and an envisioned system. A storyboard might be thought of as a "comic-book" style illustration of a scenario, with actors, screens, interaction, and dialogue showing sequences of flow from frame to frame.

- Hand-sketched pictures annotated with a few words
- All the work practice that is part of the task, not just interaction with the system, for example, include telephone conversations with agents or roles outside the system
- Sketches of devices and screens
- Any connections with system internals, for example, flow to and from a database
- Physical user actions, Cognitive user actions in "thought balloons"
- Extra-system activities, such as talking with a friend about what ticket to buy

####Example: Ticket Kiosk System Storyboard Sketches in the Ecological Perspective(Refer Pg np 318)####

DESIGN INFLUENCING USER BEHAVIOR

- “Slanty design is an approach that extends user-centered design by focusing on the things people should (and should not) be able to do with the product(s) behind the design.”
- In essence, it is about controlling user behavior through designs that attenuate usability from the individual user’s interaction perspective, making it difficult to do things not in the interest of other users or the enterprise in the ecological perspective, but still allowing the individual users to accomplish the necessary basic functionality and tasks.
- For example, a particular device might change reading habits. TheAmazon Kindle device, because of its mobility and connectedness, makes it possible for users to access and read their favorite books in many different environments

DESIGN FOR EMBODIED INTERACTION

- Embodied interaction refers to the ability to involve one’s physical body in interaction with technology in a natural way, such as by gestures.
- Dourish says that embodied interaction is about “how we understand the world, ourselves, and interaction comes from our location in a physical and social world of embodied factors.”

Example: Embodied and Tangible Interaction in a Parlor Game(refer pg no, 330)

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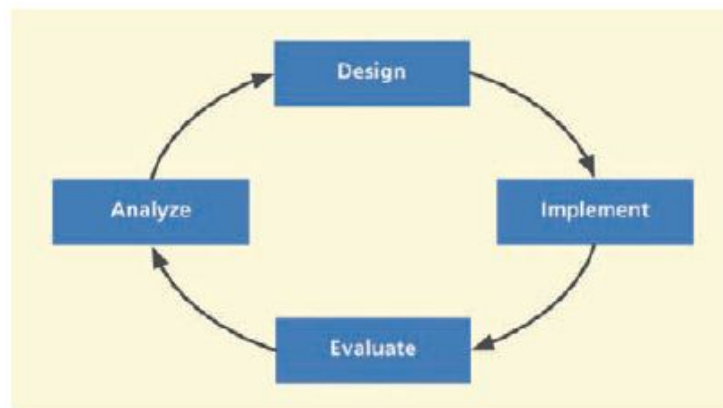
Module 2.1 The Wheel: The UX design lifecycle template(KG)

Chp 2: (Rex Harton)

- A lifecycle is a structured framework consisting of a series of stages and corresponding activities— such as analysis, design, implementation, and evaluation
- An iterative process is one in which all or part is repeated for the purpose of exploring, fixing, or refining a design or the work product of any other lifecycle activity.

A UX process lifecycle template

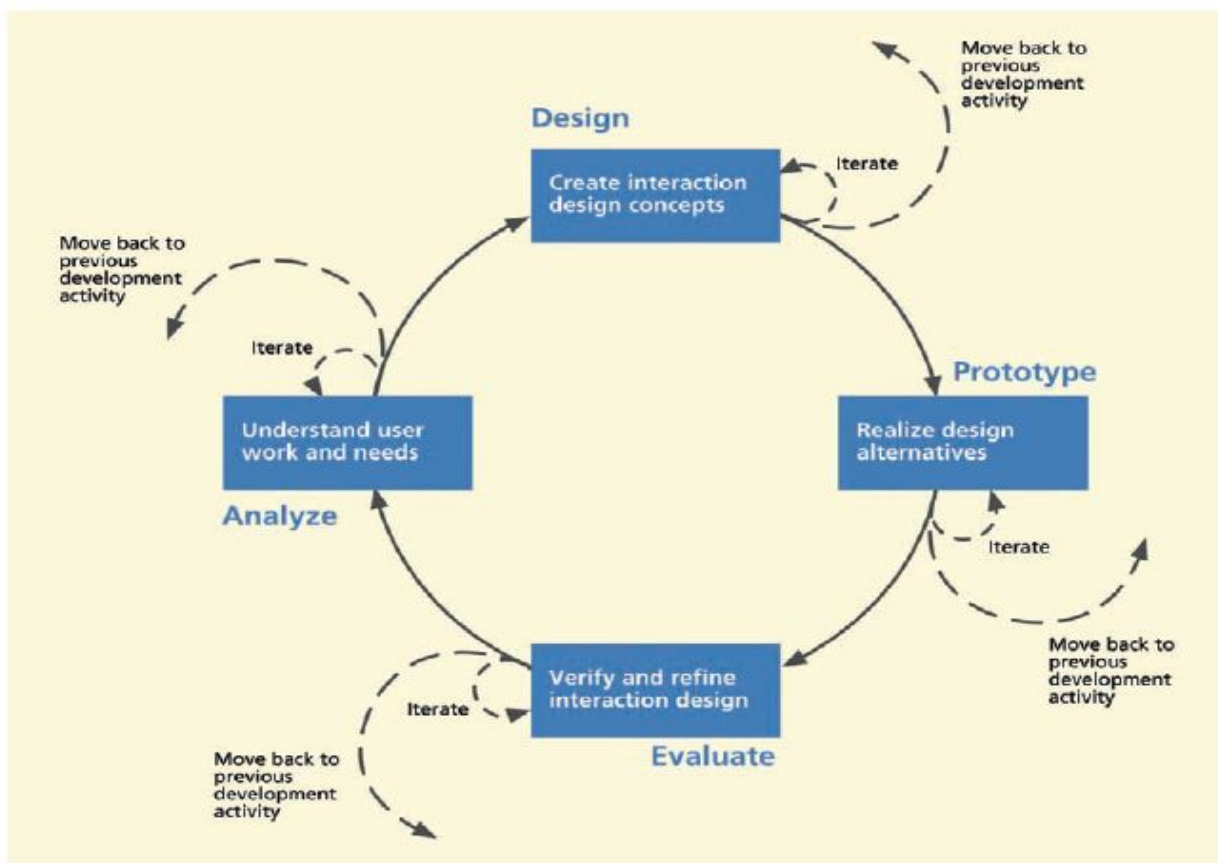
- Universal abstract activity cycle



- Analysis translates to understanding user work and needs.
- Design translates to creating conceptual design and determining interaction behavior and look and feel.
- Implementation translates to prototyping,

- Evaluation translates to ways to see if our design is on track to meet user needs and requirements.

- The Wheel



Analyze: Understanding the business domain, user work, and user needs

- Subactivities include contextual inquiry and contextual analysis for studying customer and user work practice in situ, from which we can infer user needs for a new system design.
- The requirements, if you choose to use them, are interaction design requirements, inputs driving the design process and helping to determine its features and the look, feel, and behavior of the interaction design. These requirements are used as a checklist to ensure that they are covered in the design, even before any UX evaluation.

Design: Creating conceptual design, interaction behavior, and look and feel

- sub-activities to support design are design ideation and sketching where the team does creative design thinking, brainstorming, and sketching of new design ideas.
- Design ideation leads to the representation of mental models, conceptual design, and design storyboards. Design production entails prototyping and iteration of the conceptual design, intermediate designs, and detailed designs

Prototype: Realizing design alternatives

- Prototyping is generally done in parallel to design process. As designs evolve in designers' minds, they produce various kinds of prototypes as external design representations. Eg, horizontal, vertical, T prototype
- Prototypes are made at many different levels of fidelity, including low fidelity (especially paper prototypes), medium fidelity, and high fidelity (programmed functional prototypes)

Evaluate: Verifying and refining the interaction design

- For evaluation to refine, you can employ rapid evaluation methods or fully rigorous methods
- This Evaluation is where we see if we achieved the UX targets and metrics to ensure that the design "meets usability and business goals"

Choosing a process instance for your project

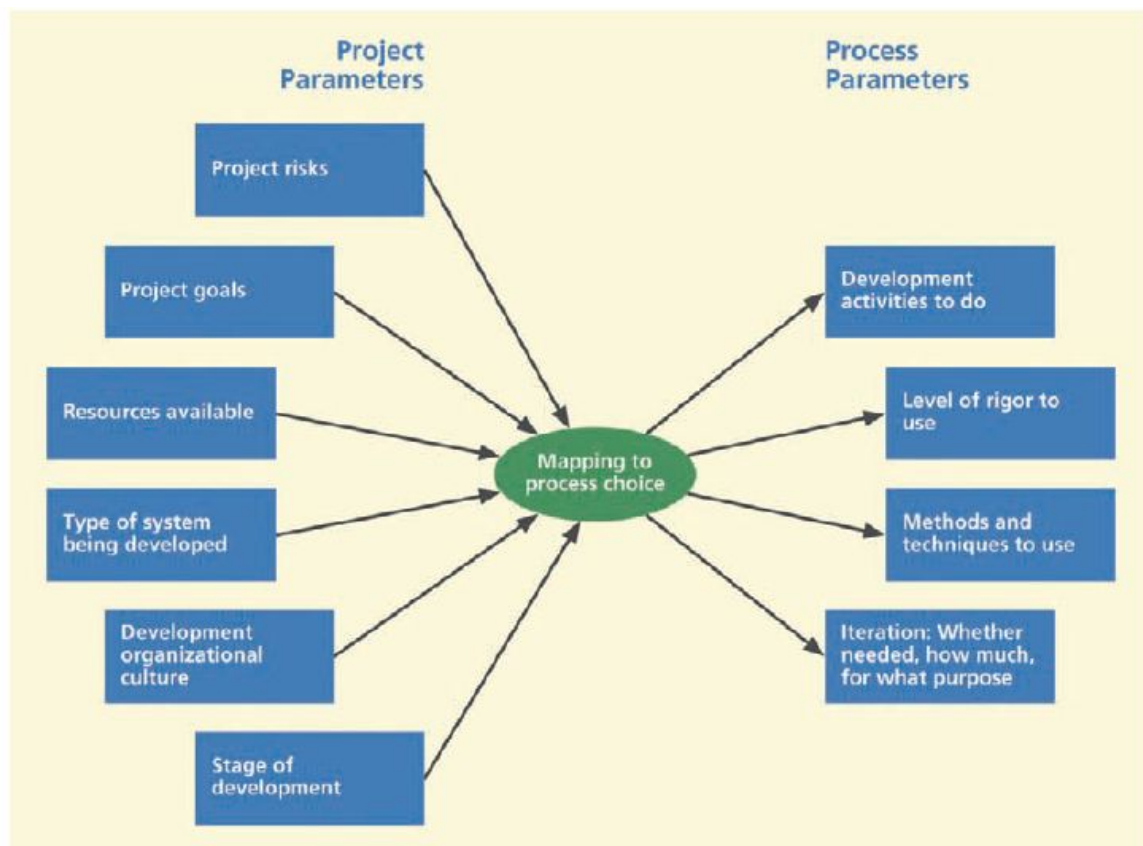
Project Parameters: Inputs to Process Choices

- risk tolerance
- project goals
- project resources
- type of system being designed
- development organizational culture
- stage of progress within project

Process Parameters: Outputs of Process Choices

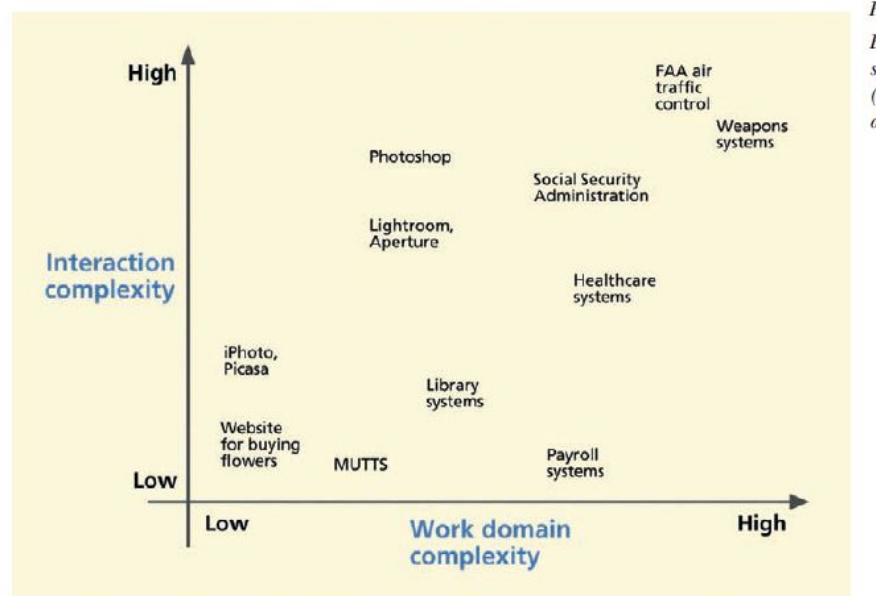
Choices also can be made from among a large variety of data collection techniques. Finally, an agile UX process is available as an alternative choice for the entire lifecycle process, a process in which you do a little of each activity at a time in a kind of spiral approach.

Mapping Project Parameters to Process Choices



The system complexity space

- Interaction complexity, represented on the vertical axis, is about the intricacy or elaborateness of user actions, including cognitive density, necessary to accomplish tasks with the system.
- Low interaction complexity usually corresponds to smaller tasks that are generally easy to do on the system, such as ordering flowers from a Website. High interaction complexity is usually associated with larger and more difficult tasks, often requiring special skills or training, such as manipulating a color image with Adobe Photoshop.
- On the horizontal axis in Figure 2-5 we show work domain complexity, which is about the degree of intricacy and the technical nature of the corresponding field of work
- Low work domain complexity means that the way the system works within its ecology is relatively simple. Examples of work domains with low complexity include that same Website for buying flowers and a simple calendar management application



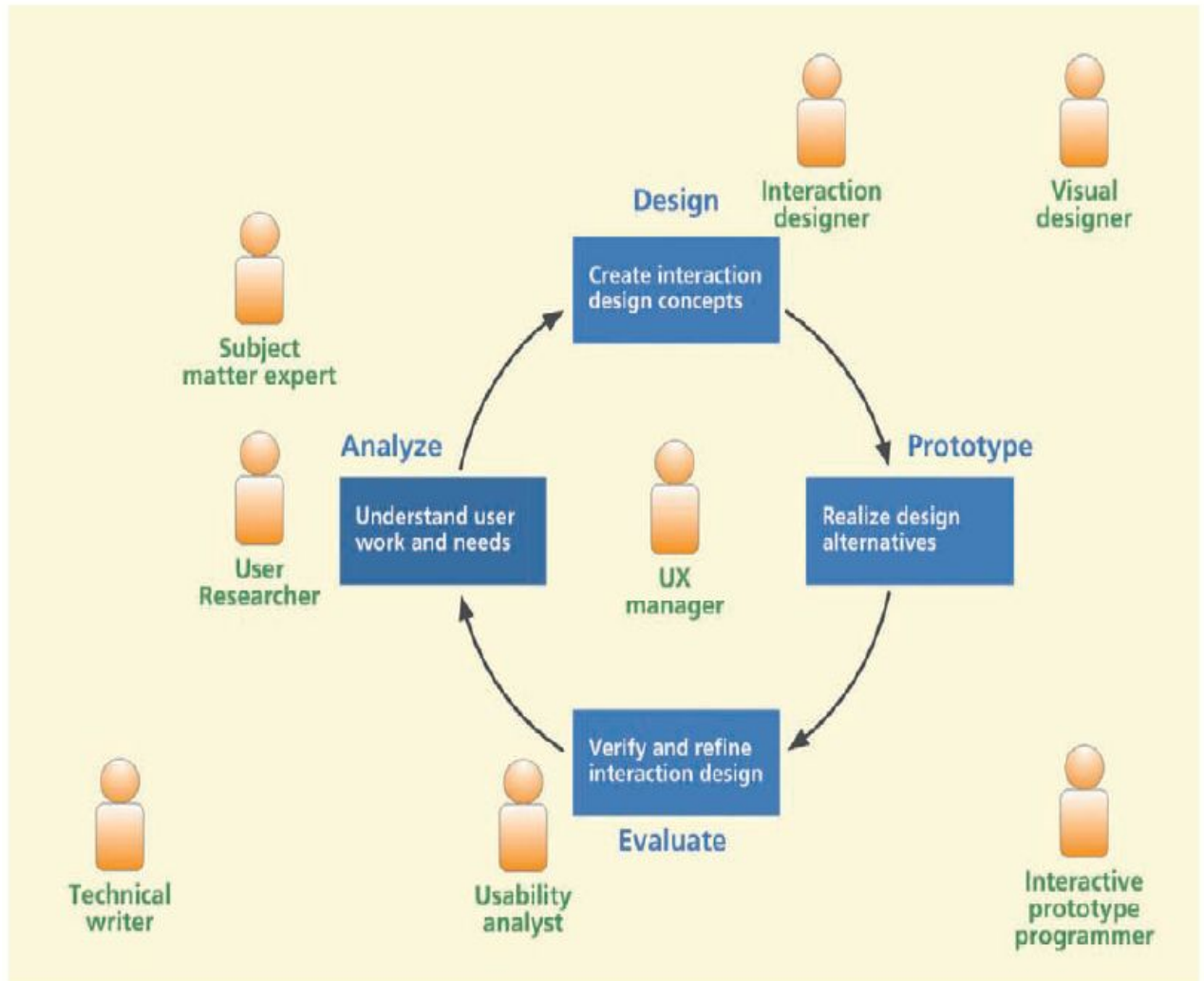
- Complex interaction, complex work domain
- Simple interaction, complex work domain
- Simple interaction, simple work domain
- Complex interaction, simple work domain

Module 2.2 :The Wheel: The UX design lifecycle template(KG)

Meet the UI team

- User researcher: involved with contextual inquiry and other work domain analysis activities.
- Users, user representatives, customers, and subject matter experts: used as information sources in contextual inquiry and throughout the lifecycle
- User interaction designer: involved with ideation and sketching, conceptual and detailed design, and low-fidelity prototyping activities
- UX analyst or evaluator: involved in planning and performing UX evaluations, analyzing UX problems, and suggesting redesign solutions.
- Visual/graphic designer: involved in designing look and feel and branding and helping interaction designers with visual aspects of designs.
- Technical writer: involved in documentation, help system design, and language aspects of interaction designs.”

- Interactive prototype programmer: involved in programming interactive high fidelity UX design prototypes.
- UX manager: someone with overall responsibility for the UX process.



SCOPE OF UX PRESENCE WITHIN THE TEAM

Importance and need of usability practitioner

More about UX lifecycles

Module 5.1 : UX Goals, Metrics and Targets(SB)

Ux metrics:

Setting target levels for UX metrics

Work Role: User Class	UX Goal	UX Measure	Measuring Instrument	UX Metric	Baseline Level	Target Level	Observed Results
Ticket buyer: Casual new user, for occasional personal use	Walk-up ease of use	Initial user performance	BT1: Buy special event ticket	Average time on task	3 min, as measured at the MUTTS ticket counter	2.5 min	
Ticket buyer: Casual new user, for occasional personal use	Walk-up ease of use for new user	Initial user performance	BT2: Buy movie ticket	Average number of errors	< 1	< 1	
Ticket buyer: Casual new user, for occasional personal use	Initial customer satisfaction	First impression	Questions Q1–Q10 in questionnaire XYZ	Average rating across users and across questions	7.5/10	8/10	
Ticket buyer: Frequent music patron	Accuracy	Experienced usage error rate	BT3: Buy concert ticket	Average number of errors	< 1	< 1	
Casual public ticket buyer	Walk-up ease of use for new user	Initial user performance	BT4: Buy Monster Truck Pull tickets	Average time on task	5 min (online system)	2.5 min	
Casual public ticket buyer	Walk-up ease of use for new user	Initial user performance	BT4: Buy Monster Truck Pull tickets	Average number of errors	< 1	< 1	
Casual public ticket buyer	Initial customer satisfaction	First impression	QUIS questions 4–7, 10, 13	Average rating across users and across questions	6/10	8/10	
Casual public ticket buyer	Walk-up ease of use for user with a little experience	Just post- initial performance	BT5: Buy <i>Almost Famous</i> movie tickets	Average time on task	5 min (including review)	2 min	
Casual public ticket buyer	Walk-up ease of use for user with a little experience	Just post- initial performance	BT6: Buy Ben Harper concert tickets	Average number of errors	< 1	< 1	

Module 5.2 : UX Evaluation Techniques

Module 6.1 : UX Design guidelines