

COMMONWEALTH OF AUSTRALIA

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Design Process: From Idea to Prototype

COMP3511/9511 Human Computer Interaction
Presented by Dr Cat Kutay

Slides adapted and modified from those by Dr Nadine Marcus and Dr Daniel Woo
Adapted from slides by Dr Daniel Woo

Aims

- Introduce an observation/evaluation technique - think aloud
- Step through the design process starting from an idea through to the step just prior to developing paper prototypes

Think Aloud

Think Aloud

- p195 Nielsen Usability Engineering
- p256, p286 Interaction Design 2011

Think Aloud

- Observation technique
- Users verbalise their thoughts continuously whilst interacting with a system
- Facilitator listens
- Notes are taken, audio possibly recorded

Think Aloud

- Gather a lot of user comments about the interaction
- People don't naturally speak all the time, so..
- Facilitator prompts the participant if they have stopped verbalising
 - "What are you thinking about now?"
 - "Describe what is on screen"

Observing

- System to test
- Facilitator + Diary
- Participant
- Note taker
- Recording equipment (NB: ethics, privacy)

Process

- Formal process involving participant consent (cover that in future weeks)
- Explain the objective
- Give the participant a task scenario
 - Describes a goal - but not explicit tasks
- Encourage to think aloud

Example

COMP3511 1442 **Lectures** Computing 1

Note: Please click on the name to see more details

Week	ID	Topic	Material
1	00	Overview	Slides1, Slides4
1	01	Introduction	Slides1, Slides4
1	02	Numbers In, Numbers Out	Slides1, Slides4
2	03	Making Choices	Slides1, Slides4
2	04	Loops	Slides1, Slides4
2	05	Functions	Slides1, Slides4

Moodle

COMP3511-COMP9511-Human Computer Interaction

Navigation

- My home
- Site home
- Site pages
- My profile
- Current course
- COMP3511-COMP9511-1447_12823
 - Participants
 - News and Assignments
 - Week 1: Introduction, Design and

News and Assignments

Forum

- News forum
- General Forum 4 unread posts
- User Interface Examples
- Assignment 1 Forum
- Assignment 2 Forum
- Course Outline 2014 in PDF document
- Sample Exam 188 H8 PDF document

Assignment 1 - COMP3511/COMP9511

- Assignment11 V1.4 241 H8 PDF document

Your progress: 0/100

Being a Designer

ability to listen

ask appropriate
questions

take notes

connect ideas, possibly
different ideas

see patterns

understand what people
do

understand your medium

Idea to Prototype

Ideas

- Already discussed idea generation and brainstorming
- Techniques are valuable at the beginning of a project to identify and seek out the "problem space" and the possibilities
- At the beginning of a design process there are many possible paths

Ideas

- As the project evolves, the team moves from the creative side to the business of building a specific product/service
- Various creative techniques will be employed throughout the design process

Target: Prototype

- Our first objective is to come up with a set of paper prototypes that represent the screens that will be presented to the user
- There are several steps before we reach this stage

Protoyping

- A cheaper way of answering design questions regarding whether a design will succeed or fail
- The design team may not know the answers to all the questions - build a prototype and assess the outcome
- It isn't the final system so it may not perform exactly like the final product

Prototype

- In a movie, a storyboard is a form of prototype of the final movie
- There are various forms of prototyping used in pre-production to understand what is possible

Principles

“design is practical
and creative

p412, Preece

ultimate intent to
develop a product that
helps users achieve their
goals”

p412, Preece

chaos to order

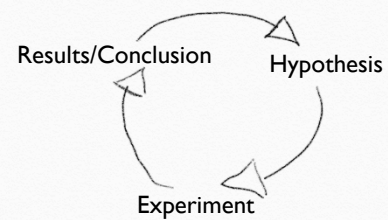
idea to product

user centred

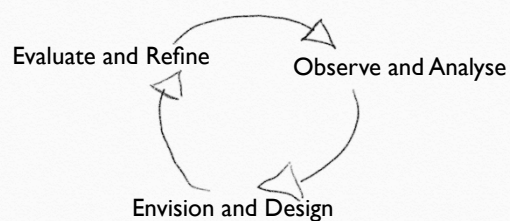
questionnaire,
interviews,
interpret

iterative

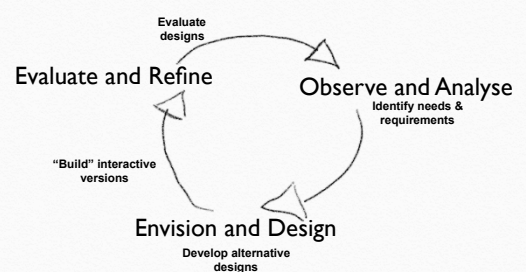
scientific method

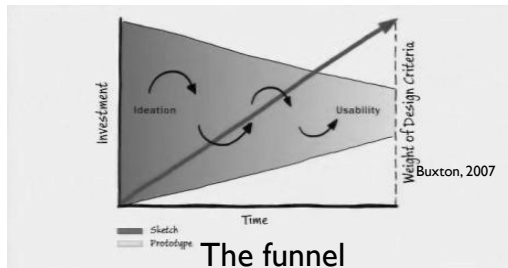


design method



design method





“the best way to get a good idea is to get lots of ideas”

Linus Pauling, Preece p417

People

Who is involved in the project?

People

- Direct Users
- Indirect Users
- Stakeholders

Indirect Users

- those who manage direct users
- those who receive output from the product
- those who make purchasing decisions

Stakeholders

- Product Marketing Lead
- Technical Lead
- Executives
- Sales
- Brand Steward
- Subject Matter Expert
- Quality Assurance Manager
- Support/ maintenance/ training staff
- Professional Services
- Community

Goodwin 2009

Who are the stakeholders?



Design Team

- Interaction Designer
 - Generates, then synthesizes ideas
- Visual Designer
- Industrial Designer
- Team Lead

Goodwin 2009

Understanding Users

It's not guess work

Research User Needs

Data Gathering

Method

- The approach you take to understand user needs will depend on whether you are creating a new product, enhancing an existing one, rethinking a existing one
- You may have obvious access to the target audience and stakeholder, but in some cases you may not

Data Gathering

- Talking to people
 - Interview (ID 7.4)
 - Structured / unstructured
 - Focus group (ID 7.4.4)

Interview Process

- There are ways to run the interview process (covered later)
- Being prepared beforehand is very important
- Remember that you are capturing data so you need methods to record the data

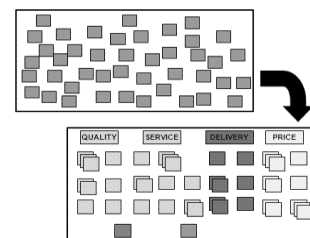
Questionnaire

- Developing a set of questions to ask users and stakeholders
- How many people will you talk to?
- Is there a need to analyse the data? Should the questions be quantitative?
- See ID 7.5

Analysis

- You will gather both qualitative and quantitative data from the interview process
- Find patterns and use methods to group the data (consider affinity diagramming)
- Look for trends, consider statistics (if there are enough responses)

Affinity Diagram



Affinity Diagramming

- The affinity diagram organizes a large number of ideas into their natural relationships - looking for common themes and patterns
- Use after a brainstorming exercise
- Or when analyzing verbal data, such as survey results
- Often used as a group technique using post-it notes

See ID p 286

Data Gathering 7.3

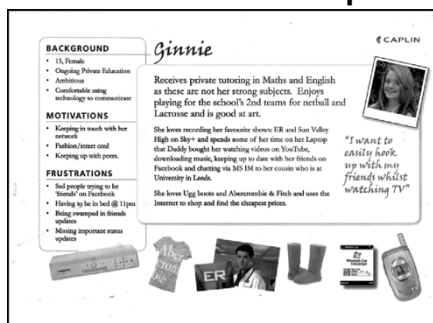
- Questionnaires
- Interviews
- Focus Groups and Workshops
- Naturalistic Observation
- Studying Documentation

Developing Scenarios

- From your analysis you might see trends
- From these "groupings" you can start to write narrative (context scenarios) based on the findings of the interviews
- Cooper (About Face) calls these archetype people used in design "personas" - they are based on research not guess work
- Cooper also uses the term goal-directed scenarios

Scenarios

Persona example



Context Scenarios

- A day in the life of a user
- Narrative form, story
- Explains goals and needs
- Not technology specific
 - Don't talk about clicking specific buttons or using a specific technology
 - No system behaviour

Context Scenario

- Demographic / Age
- Gender
- First Name
- Photo (stock photo)
- Describe their goals, what are they aiming to achieve
- Describe their feelings

Context Scenario

- High level description of the tasks that they are currently performing
- Don't be specific about interface details – not 'they press the button labelled ...'
- "Sequence of information exchange, actions and results" (Goodwin)
- User focussed not system focussed

Context Scenario

- "Context scenarios should be compelling: they need to engage the imagination and help people see the possibilities, not bog them down in detail"
- Goodwin p318

sample activity/context scenario

- Sam has recently been hired as a Senior Consultants in the firm, and just returned from speaking at a conference. His presentation was very successful and several people gave him their business cards and requested more information about the consulting firm.

- Before sending the information, he wants to see if the company has had any other contact with any of these people, so he could be sure to send the appropriate information. Starting with the first card, he looks in their newly deployed Customer Relationship Management system to see if the person is already there (entered by another person in the office). Even if that person is not in the database, he would like to know whether anyone else from the person's company is there.

- Sam makes sure to enter those people who were not already in the database. In doing so, he makes sure that he flags the fact that he met them at this particular conference, so the marketing manager can follow-up with a letter in a month's time...

why use activity/context scenarios?

- Provides a snapshot of the critical points of user interaction
- Keeps context in which the tasks are carried out
 - by including other elements such as phone calls, forms, interruptions...
- Helps to get into the 'user's shoes'
- Provides a means to envisage workflow

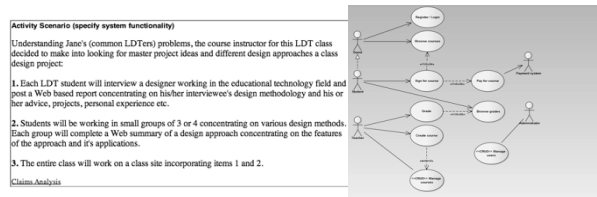
activity scenarios in the design process

- Analysis
 - envisage a series of activities based on knowledge of user environment, user requirements, common practices & workflow
- Design
 - provide context for brainstorming leading to mock-ups and prototypes
- Evaluation
 - baseline against which to compare results

comparison of scenario techniques

- Use case scenarios - include users' goals, but emphasises the user-computer interaction
- Activity scenarios - who, what, when, why, where from the user's perspective... concrete narratives focusing on specific activities

Activity scenario / Use Case



the problem with use case scenarios

- Not a substitute for user-centered design when written before users have been involved
- Pre-supposes a particular design, limiting the way that the application can work to support users

Templates

- Aspects of narrative to consider:
 - Persona – who
 - Action (user) – what
 - Sequence – when
 - User goals – why
 - Context – where

Activity

Diagrammatic Techniques to Model Tasks

Tasks and Workflow

- People perform tasks that are made up of subtasks
- People make decisions as part of the workflow
- Some workflows are followed others not, depending on certain factors

Existing Processes

- It will be easier to model/document existing processes using these techniques since the structures will be inherent in the activities

Task Analysis 10.7

about.com

Task Analysis

- Task descriptions are often used to envision new systems or devices
- Task analysis is used mainly to investigate an existing situation
- Try to understand purpose of what people currently doing

Task Analysis

- It is important not to focus on superficial activities
 - What are people trying to achieve?
 - Why are they trying to achieve it?
 - How are they going about it?
- Many techniques, the most popular is Hierarchical Task Analysis (HTA)

Hierarchical Task Analysis

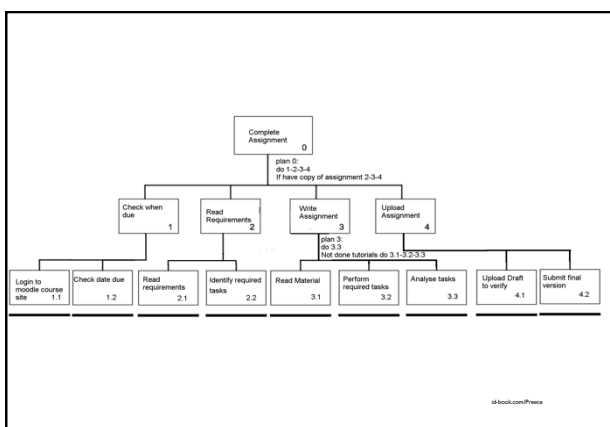
- Involves breaking a task down into subtasks, then sub-sub-tasks and so on. These are grouped as plans which specify how the tasks might be performed in practice
- HTA focuses on physical and observable actions, and includes looking at actions not related to software or an interaction device

HTA

- Start with a user goal which is examined and the main tasks for achieving it are identified
- Tasks are sub-divided into sub-tasks

Complete an assignment

- In order to complete an assignment
 - 1. check assignment due
 - 1.1 login to UNSW Moodle site
 - 1.2 Check due date
 - 2. read assignment requirements
 - 2.1 read requirements
 - 2.2 identify required tasks
 - 3. write assignment
 - 3.1 read text book chapters
 - 3.2 carry out tasks required
 - 3.3 analyse tasks
 - 4. upload assignment
 - 4.1 Upload early
 - 4.2 Final submit



HTA Plans

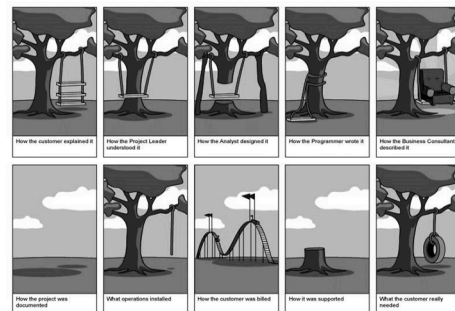
- plan 0: do 1-2-3-4. If have copy of assignment do 2-3-4.
- Plan 3: do 3.3. If not done work in tutorial do 3.1-3.2-3.3.

HTA limitations

- Doesn't scale well to really complex tasks
- Can't model parallel or overlapping tasks
- Can't model task interruptions

Flow charts can be used to model work

Requirements



Getting the requirements right is important

See id-book.com
see is-book.com

Requirements

- Functional
 - Specific behaviours or functions
 - What a system is meant to do
- Non-functional
 - Qualities of a system – usability, accessibility
 - How a system is meant to be
- Specific, non ambiguous
- Iterative
- Will be influenced by data gathering

Requirements

- Functional requirements
- Data requirements - type, persistence, amounts
- Environmental / Context of Use
- User Requirements
 - Ability, skill, novice, expert, frequency
- Usability requirements
 - Goals, metrics, user experience goals

Product Description Statement

30 words or less

Describe what the
product will do to meet
the users goals

Trilogy

- Components of a user interface can be broken down into three parts
- Information Design
- Interaction Design
- Visual Design

Information Design

- Stakeholders needs
- System dependencies
- Categories and organisation

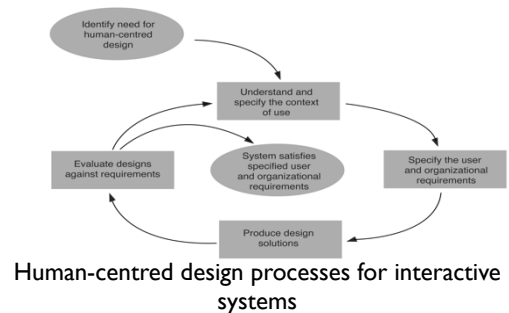
Interaction Design

- Use cases
- Activity scenarios
- Hierarchical task analysis

Visual Design

- Design principles
- Heuristics
- Accessibility

ISO 13407



So far

- Week 1
 - The language of usability evaluation and critique
- Week 2
 - Accessibility
 - Creative thinking

This week

- Week 3
 - People involved
 - Techniques to discover information about users
 - Data gathering for requirements
 - Consideration for information requirements

This Week

- And we haven't even started designing screens
- Interaction design is not about the visual look and feel of the user interface, it is much more

Next Week

- We'll continue on the design process
- ID Chapters 7,9,10,11 span this and next week

Assignment 1

Questions?

Assignment 1

- Due 1pm on Fri Week 5 (Aug 29) – submit well in advance as Moodle cannot handle 140 simultaneous submissions
- If submission is late, will be penalised
- 2MB file limit.
 - Graphics, sketches may need lower resolution to meet this constraint
- Note page limit and keep to it or will be penalised! (8 pages max for content plus 6 pages max appendices - sketches/tables)
- Choose 2 of given websites, OR 1 website and 1 mobile app (to be approved by your tutor).
- Our suggestion is to choose 1 mobile app and 1 website but they must be for different services.

Issues table

- Relate issues to design principles, heuristics, etc
- Relate finding to your issues raised.

Summary

- From ideas to prototype
- Think aloud protocol
- People involved – stakeholders
- Personas/ Scenarios
- Data Gathering
- Diagrammatic Techniques
- Requirements
- Product Description Statement