1. Different Design Approaches

► System-centred design
  - What can be built easily on this platform?
  - What can I create from the available tools?
  - What do I (programmer) find interesting to do?

► Task-centred design
  - Structured around specific tasks the user will want to accomplish with the system being developed.
  - Able to get users but not throughout the process.
  - Tasks are chosen early in the design effort to:
    - Raise issues about the design
    - Aid in making design decisions
    - Evaluate the design as it is developed

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1.1. Task Centered Design

► Phase 1: Identification
  - Identify specific users
  - Articulate example realistic tasks

► Phase 2: Requirements
  - Decide which of these tasks and users the design will support

► Phase 3: Design
  - Base design representation and dialog sequences on these tasks

► Phase 4: Walkthrough Evaluations
  - Using your design, walk through these tasks to test the proposed interface

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1.2. Phase 1: Identification

► Get in touch with real people who will be potential users of your system
► Spend time with them discussing how the system might fit in, observe them
► Learn about the user’s tasks
  - Articulate concrete, detailed examples of tasks they perform or want to perform that your system should support
  - Ask users to verify

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1.2. Phase 1: Identification

► Good task examples
  1. Are very specific
    - Say exactly what the user wants to do
    - Specify actual inputs and outputs
    - Do not assume anything
    - Can be used to compare different design alternatives in a fair way
  2. Are real
    - Illustrate functionality in user’s real work context
    - Reflect user’s real task interest and needs
1.2. Phase 1: Identification

► Good task examples
3. Describes a complete job
   ▪ not just a list of simple things the system should do!
   ▪ does more than present a sub-goal independent of other sub-goals
   ▪ forces designer to consider how interface features will work together
   ▪ contrasts how information input and output is carried through the dialog
     ► where does information come from?
     ► where does it go?
     ► what has to happen next?

1.2. Phase 1: Identification

► Good task examples
4. Are evaluated by users
   ▪ Have gone through user's omissions, corrections, clarifications and suggestions
5. As a set, identifies a broad coverage of users and task types
   ▪ the typical 'expected' user = typical routine tasks
   ▪ the occasional but important user = infrequent but important tasks
   ▪ the unusual user or user with special need = unexpected or specialized tasks

1.3. Phase 2: Requirements

► Which user types will be addressed by the interface?
  ▪ designs can rarely handle everyone so
  ▪ why are particular users included / excluded?
► Which (sub-) tasks will be addressed by the interface?
  ▪ designs can rarely handle all tasks so
  ▪ requirements listed in terms of how they address tasks (must, should, could)
  ▪ discussion includes why items are in those categories

1.4. Phase 3: Design as Scenarios

► Develop designs around how well they fit users and specific tasks
► Use tasks to
  ▪ get specific about possible designs
  ▪ consider how design features work together to help a person accomplish real work
  ▪ consider the real world contexts of real users
► Reconsider how a design scenario handles each task
  ▪ what the user would do and see in each step of using the system to perform a task

1.5. Phase 4: Walkthrough Evaluation

► Good for debugging an interface
► Process:
  1 Select one of the task scenarios
  2 For each user's step/action in the task:
     ▪ Does the story represent all possible actions a user will do?
     ▪ Can you rely on user's expected knowledge and training about system?
     ▪ If the answer of any of the above is no:
       ► then you've located a problem in the interface
       ► once a problem is identified, assume it has been repaired
       ► go to the next step in the task

1.5. Walkthrough evaluation

Task example 1:
Fred, a regular in the store, wants to buy two bags, pays cash, and wants them delivered to his home next week.
2.1 ISO 13407 – Human-centred design process

2.1 User-Centered Design

Up side of UCD
- users are excellent at reacting/commenting
- users bring in important "folk" knowledge of use context
  - knowledge may be otherwise inaccessible to design team
- greater buy-in for the system often results

Down side of UCD
- hard to get a good pool of users (cost, reluctance)
- users are not expert designers
  - don’t expect them to come up with design ideas from scratch
- the user is not always right
  - don’t expect them to know what they want

2.1 Traditional design sequence

2.2 Star method of UCD

Components:
- Requirements - finding out what people need from the system
- Evaluation - checking that you’ve got it right
- Conceptual design - creating the overall idea for the new system
- Physical design - filling in the details of what the new system will be like and how it will work
- Prototyping and envisionment - bringing ideas to life

Features of star method:
- Evaluation is central to everything
- Activities can happen in ‘non-orderly’ manner

2.2 Re-decorating your room

Requirements - I need a space to work in. I want to get rid of some clutter. I want the room to be lighter, fresher, cleaner...
Conceptual design - need to create an area for working in; need to build a cupboard to store things in; paint the walls a lighter color.
Physical design - a partition up in that corner; that cupboard I saw in Ikea could be used to store things in my flat; I am going to paint the walls ‘apple-white’
Environment - look at this model room in this magazine; here’s a sketch of my ideas for a cupboard; you know the colour of Rod’s bedroom...
Evaluate - that partition would be too expensive, that cupboard would get in the way; light-colored wall would get dirty very quickly...
2.3. Requirements: Why
► To understand what we are going to be doing
► We build systems for others, not for ourselves
► Requirements definition: the stage where failure occurs most commonly
► Getting requirements right is crucial
► Understanding problem space
  ▪ Are there problems with the existing product or way people do things?
  ▪ Why do you think there are problems?
  ▪ How do you think your proposed design ideas might overcome these?
  ▪ How will the proposed design extend or change current products or ways of doing things?

2.3. Requirements: Development costs

2.3. Requirements
Functional:
► Historically requirements
► Features, functions that the system can/cannot do

Non-functional
► "The other issues" (quality, accessibility, evolvability, flexibility, etc.)
► Constraints
► Cost, aesthetics, etc.
► Usability requirements

2.3. Typical Real-World Constraints
► Elapsed time to market
► Cost/effort to design and implement
► Size/footprint/weight/power/price
► Computer power/memory (related to cost and power)
► Consistency with overall product line
► Backward compatibility
► Differentiation from competitive products

2.3. NF Requirements
► Accessibility = ensuring that people with special needs are not at a disadvantage.
► Usability = quality of the interaction in terms of parameters such as time taken to perform tasks, number of errors made and the time to become a competent user.
► Acceptability = fitness for purpose in the context of use. It also covers personal preferences that contribute to users ‘taking to’ an artefact, or not.
► Engagement = designing for great, exciting and riveting experiences.

2.3. NF Requirement: Usability
► Basic ideas: humans are emotional, are not interested in putting a lot of effort into, and generally prefer things that are easy to do vs. those that are hard to do. (McQuillen, 2003).
► ISO 9241 defines usability to consist of three components:
  ▪ effectiveness: the accuracy and completeness with which specified users can achieve specified goals in particular environments
  ▪ efficiency: the resources expended in relation to the accuracy and completeness of goals achieved
  ▪ satisfaction: the comfort and acceptability of the work system to its users and other people affected by its use.
2.3. Requirements: Steps

1. Gather data
   - Interviews, observation, ethnographic study, surveys/questionnaires, documentation, immersion, contextual inquiry, etc
2. Organize data
   - Notes, cards, affinity diagrams, recording, brainstorming, computer tools
3. Represent data
   - Lists, outlines, matrices
   - Scenarios, personas, storyboards, use cases

2.3.1. Requirement gathering: steps

1. General questions/specifications
2. Selecting relevant site(s) and subjects
3. Collection of relevant data
4. Interpretation of data
5. Conceptual and theoretical work
6. Writing up findings/formal specs

5b. Collection of further data
5a. Tighter questions/specifications

2.3.1 Requirements: Gather

► Competitive analysis → good and bad ideas
► Investigate: Activities and Artifacts (not just artifacts)
► Study related processes and objects in the environment that people may use
   - Office environment - papers, whiteboards, ...
   - Phone calling - phone book, note pad, dial, ...
► Focus on observable behaviors
   - What are the practices, methods, steps, objects, ..., used?
► Learn what users do, why they do it, how they do it, when and where they do it, with what tools or people they do it

Interviews

► Structured interview
  - Replicable but may lack richness
  - Questions with a set of pre-defined answers
  - Order and wording are important
  - Surveys
► Open Qualitative interviews
  - Qualitative analysis
  - Questions are used to start conversations with informants
  - Unstructured - are not directed by a script. Rich but not replicable
  - Semi-structured - guided by a script but interesting issues can be explored in more depth. Can provide a good balance between richness and replicability

Interview Guide

► A brief list of memory prompts of areas to be covered
► A more structured list of issues to be addressed or questions to be asked
► A list of themes and probing questions
► Preparing interview guide:
  - Prepare enough number of questions
  - Put checkbox in case you need to deviate to follow user lead
  - Check whether the topics cover all of your research questions
  - Use language that is comprehensible and relevant to the people you are interviewing
  - Record `fact sheet' information → general (age, gender, etc.) and specific (position in company, Internet exp, etc.) to contextualize people's answers

<table>
<thead>
<tr>
<th>Qualitative interviewing</th>
<th>Structured interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>much less structured</td>
<td>structured for reliability and validity of measurement of key concepts</td>
</tr>
<tr>
<td>greater interest in the interviewee's point of view</td>
<td>interview reflects the researcher’s concerns</td>
</tr>
<tr>
<td>‘rambling’ is often encouraged</td>
<td>rambling regarded as a nuisance and discouraged</td>
</tr>
<tr>
<td>interviewers can depart significantly from any schedule or guide</td>
<td>any departure compromises the standardization of the interview process</td>
</tr>
<tr>
<td>flexible, responding to the direction interviewees take the interview</td>
<td>typically inflexible, because of the need to standardize</td>
</tr>
<tr>
<td>researcher wants rich, detailed answers</td>
<td>interview supposed to generate answers that can be coded and processed quickly</td>
</tr>
<tr>
<td>the interviewee may be interviewed 1+</td>
<td>unless longitudinal study, the person will be interviewed 1x</td>
</tr>
</tbody>
</table>
Interview Questions
1. Introducing questions: `Please tell me about when your interest in X first began?`; `Have you ever . . .?`; `Why did you do . . .?`.
2. Follow-up/probing questions: getting the interviewee to elaborate his/her answer, such as `Could you say some more about that?`; `What do you mean by that . . .?`; `Can you give me an example...?`
3. Specifying questions: `What did you do then?`; `How did you open that new Web page?`
4. Direct questions: `Do you find it easy to use the system?`; `Are you happy with the amount of help the documentation provide?`
5. Structuring questions: `I would now like to move on to a different topic`.

Interview Questions
6. Indirect questions: `What do most people around here think of that user interface?`, perhaps followed up by `Is that the way you feel too?`, in order to get at the individual's own view.
7. Interpreting questions: `Do you mean that the way you write an email has changed since you use that system?`; `Is it fair to say that what you are suggesting is that you don't mind switching to this new system but you would not recommend it to other colleagues?`
8. Silence (not a question but important): allow pauses to signal that you want to give the interviewee the opportunity to reflect and amplify an answer.

Quality of an Interviewer
1. Knowledgeable: thoroughly familiar with the focus of the interview (use pilot interviews)
2. Structured: gives purpose for interview; rounds it off; asks whether interviewee has questions.
3. Clear: asks simple, easy, short questions; no jargon.
4. Gentle: lets people finish; gives them time to think; tolerates pauses.
5. Sensitive: listens attentively to what is said and how it is said; is empathetic in dealing with the interviewee.
6. Open: responds to what is important to interviewee and is flexible.

Quality of an Interviewer
7. Remembering: relates what is said to what has previously been said.
8. Interpreting: clarifies and extends meanings of interviewees' statements, but without imposing meaning on them.
9. Balanced: does not talk too much, which may make the interviewee passive, and does not talk too little, which may result in the interviewee feeling he or she is not talking along the right lines.
10. Ethically sensitive: is sensitive to the ethical dimension of interviewing, ensuring the interviewee appreciates what the research is about, its purposes, and that his or her answers will be treated confidentially.

Before and After
► Find:
  • a quiet, private space in which to conduct an interview uninterrupted
► Be careful of:
  • agreeing to interview someone in their own office
  • frequent telephone calls or interruptions
► Spend some time:
  • getting hold of a good tape recorder and microphone
  • checking the room prior to the interview
  • doing a speech recording to test acoustics and carefully positioning the furniture
► Immediately after the interview, note:
  • how the interview went
  • the setting (busy/quiet, many/few other people in the vicinity, disruptions)
  • forgotten topics or good questions for future

Focus Group
► A group discussion/interview to access memories, feelings and perceptions concerning a specific focused topic
► Typically 7-10 people – small enough for everyone to have the opportunity to share insights; large enough to provide diversity of perceptions.
► Moderated by a trained, neutral interviewer (i.e., moderator, facilitator), who asks questions, listens, keeps the conversation on track, and makes sure everyone has a chance to speak
► Must be held in a comfortable, permissive, non-threatening environment
► Three focus groups are considered to be the minimum for a quality study
Ethnographic Observation
► A research process used in the scientific study of human interactions in social settings (ethno = culture, graphy)
► Used extensively in anthropology
► **Purpose** – to describe and explain a facet or segment of group social life
► **Hypotheses and questions** – begin as a broad statement about the purpose of the research, then are allowed to emerge more specifically as data are amassed.
► **Data** - verbal descriptions of people, interactions, settings, objects and phenomena within the context being studied
► **Data Sources** – the people, settings, and relevant objects being observed
► **Data Collection** – done by the researcher through observation combined with interview
► **Data treatment and analysis** – presentation of verbal descriptions and/or logical analysis of information to discover salient patterns and themes

**Why Ethnography?**
► To define a problem when the problem is not clear
► To define a problem that is complex and embedded in multiple systems or sectors
► To identify participants when the participants, sectors, or stakeholders are not yet known or identified
► To clarify the range of settings where the problem or situation occurs at times when the settings are not fully identified, known, or understood
► To explore the factors associated with the problem in order to understand it
► But
  ▪ Possible bias on the part of the observer (which leads to validity concerns)
  ▪ Generalizability (how generalizable are the findings from a small, purposely selected group)

**Ethnography Process**
1. A question or concern is identified for study
2. A group to study is identified (typically small and purposively selected) → permission is asked
3. The researcher observes the group
   ▪ *Privileged observer* – just observes
   ▪ *Participant observer* – functions as part of the group
4. Researcher watches and listens attentively and records as much detail as possible (this is called **naturalistic observation**). Large amounts of notes are typically generated.
5. Repeat as long as necessary (a week or years).
6. The researcher analyzes the notes, identifies themes, looks for answers to questions, and makes logical inferences.

2.3.1 Ethnography Steps
► **1.1. Preparation**
  ▪ Familiarize yourself with the system and its context
  ▪ Set initial goals and prepare questions
  ▪ Gain access and permission to observe & interview
► **1.2. Field study**
  ▪ Establish rapport with users
  ▪ Observe/interview users in workplace and collect all information (actions, words, environment, other people, interruptions)
► **1.3. Analysis**
  ▪ Compile, analyze and interpret information
► **1.4. Reporting**
  Rose et al ’95

2.3.1 Contextual Inquiry

**Contextual Design**

**Contextual Inquiry principles**
► **Context:** go to the customers’ workplace and watch them do their own work.
  ▪ Allows the analyst to experience the rich detail of work rather than the impoverished account of a summary
► **Partnership:** discuss about their work and engage them in uncovering unarticulated aspects of work.
► **Interpretation:** develop a shared understanding with user about the aspects of work that matter.
  ▪ Sharing interpretations with users is an important test of our reasoning - and they may fine-tune/correct details
► **Focus:** direct the inquiry from a clear understanding of your own purpose.
  ▪ Focusing on things that are important/interesting
1. The designer introduces herself, presents the project focus, and asks authorization from the user to record the interview. (15 minutes)
2. The designer explains the methods of Contextual Inquiry. (3 minutes)
3. The user works, the designer observes, and as apprenticeship, makes annotations, diagrams, launches questions and analyzes effects. (one or two hours)
4. The designer confirms her notes with the user, giving him the chance to expand points or conclusions. (10 minutes)

**Contextual inquiry in a nutshell**
- Questionnaires
  - Can be administered to large populations
  - Paper, email and the web used for dissemination
  - Questions can be closed or open
  - Closed questions are easier to analyze, and may be done by computer
    - Dichotomous: offering two choices (yes/no)
    - Multiple choice: three or more
    - Likert Scale: balanced units ("scaled")
      - Odd # allows neutral stance
      - Even # forces choice → nobody is really neutral
      - Respondent chooses amount of agreement/disagreement (usually 5-10 choices)
  - [http://www.socialresearchmethods.net/kb/scallik.php](http://www.socialresearchmethods.net/kb/scallik.php)

**Questionnaire design**
- The impact of a question can be influenced by question order.
- Do you need different versions of the questionnaire for different populations?
- Provide clear instructions on how to complete the questionnaire.
- Strike a balance between using white space and keeping the questionnaire compact.
- Decide on whether phrases will all be positive, all negative or mixed.
- Some examples of HCI questionnaires:
  - [http://oldwww.acm.org/perlman/question.html](http://oldwww.acm.org/perlman/question.html)

**Encouraging a good response**
- Make sure purpose of study is clear
- Explain how anonymity is assured
- Ensure questionnaire is well designed
- Offer a short version for those who do not have time to complete a long questionnaire
- If mailed, include a stamped addressed envelope
- Follow-up with emails, phone calls, letters
- Provide an incentive
- 40% response rate is high, 20% is often acceptable

**Online questionnaires**
- Advantages
  - Responses are usually received quickly
  - No copying and postage costs
  - Data can be collected in database (automatic formatting)
  - Time required for data analysis is reduced
  - Errors can be corrected easily
- Disadvantages
  - Sampling is problematic if population size is unknown
  - Difficult to prevent individuals from responding more than once
  - Population bias to people with Internet access

**Content analysis**
- We ran interviews/focus group discussions – what to do with the data?
- A technique used to study written material by breaking it into meaningful units, using carefully applied rules.
- Use objective and systematic coding to produce a quantitative description of the observed material.
  - Can analyze common myths
  - e.g., women are portrayed as inferior to men in the cowboy movies.
  - e.g., graffiti in toilets are heavy on pornographic comments
  - e.g., spam mails promise money
Content analysis seeks to avoid confirmation bias
- the tendency to look for information that confirms our beliefs and ignore information that disconfirms our belief
- Can be used to quantify concepts
- Can also be used in a qualitative way.
- What can be studied
  - Any written material
  - Audio/visual information
- Useful for 3 types of research
  - Problems involving a large volume of test
  - Research from afar or in the past
  - Revealing themes difficult to see with casual observation.

- Human vs. computer coders
  - Can often utilize computers
    - Internet searches
    - Automated text search
      - Great for extremely large sets of data
    - Personal judgment not part of the process
    - Cheaper and faster than humans
- Humans
  - Useful for coding complex concepts
  - More flexibility
  - Costs more time and money

Steps in content analysis
1. Define problem
2. Select the media that will be used
3. Derive coding categories
4. Sampling strategy – (every 10th page, every other sentence?)
5. Choose the coders: Humans vs. computer
   - Human is useful for coding complex concepts
   - Computer removes subjectivity
   - Human costs more time and money
   - Multiple coders and interrater reliability are a must
6. Code the material
   - In vivo codes vs. conceptual constructs
   - Established vs. your own codes
7. Analyze the data

Getting started
- What gets counted?
  - # certain words, # pictures, senders/receivers
- What is important for understanding themes?
  - Explicit themes
  - Number of times mentioned
  - Amount of space dedicated
- What is the coding unit of analysis?
  - Word vs. paragraph vs. themes
- What to analyze?
  - Frequency
  - Direction: Positive vs. negative; happy vs. sad
  - Intensity: Strength of message, minor vs. major issues
  - Space: Picture size, amount of time spent, etc.

Latent vs. manifest content
- Manifest – overt, visible material
  - How many of times a word appears
  - How many times someone is mentioned
  - Highly reliable coding
  - No judgment
- Latent content – symbolic content; semantic analysis
  - Ex. Level of violence
  - Requires judgment
  - Depends on coders prior knowledge, expectations, etc.
  - Often required – writers portray meaning indirectly
  - Lower reliability, increases with training
  - Allows for more flexibility

Coding approaches
- Common classes
  - used by virtually anyone in society, e.g. age, gender, mother, father, etc
  - essential in assessing whether certain demographic characteristics are related to patterns that arise from other coding
- Special classes
  - colloquial categories
  - includes jargon of various professions, e.g. petty crime vs. serious crime
- Theoretical classes
  - those that emerge in the course of analyzing the data
  - category labels generally borrowed from special classes
  - their substance is grounded in the data
  - not immediately knowable until observers spend considerable time with the content
Content analysis: an example
1. Identify problem
   ▪ Is American and Canadian television different at portraying crime?
2. Select media
   ▪ Television news programs
3. Derive coding categories (manifest & latent contents)
4. Sampling strategies: equal 100 30-min news in 4 areas (Detroit, Toledo, Toronto and Kitchener)

Manifest Content
► Type of crime
   ▪ Which crime was being reported on
   ▪ Kept 28 categories of crime, not necessarily mutually exclusive
► Local or national story
   ▪ Origin of study
► Length of story
   ▪ Used stopwatch to measure exact time spent reporting each study
► Stage of crime: Pre-arrest, Arrest, Court, Disposition
► Live footage?
► Firearm reported?
► Was it the lead story?

Latent Content
► Reporting of motive
   ▪ Implied or confirmed
   ▪ Ex. Drug-related; gang-related
► emotive presentation: 3 categories
  1. Presentation of fear:
     ▪ Words were explicitly stated about fear, e.g., “be advised”; “on the run”
  2. Presentation of outrage or sympathy
     ▪ Explicit statements made by reporters or interviewees
     ▪ E.g., “tragedy”; “devastated”; “savage”; “horrifying”
  3. Sensationalism
     ▪ Involving famous people
     ▪ Comical stories
     ▪ Dramatic arrests
     ▪ Vivid descriptions – “bizarre”

Content Analysis: spam
► Type of crime
   ▪ Which crime was being reported on
   ▪ Kept 28 categories of crime, not necessarily mutually exclusive
► Local or national story
   ▪ Origin of study
► Length of story
   ▪ Used stopwatch to measure exact time spent reporting each study
► Stage of crime: Pre-arrest, Arrest, Court, Disposition
► Live footage?
► Firearm reported?
► Was it the lead story?

Distribution of Word-counts in <title>
► Spam more likely in pages with more words in title
Distribution of Visible-content

\[ \text{Visible Content} = \frac{\text{size (in bytes) of visible words}}{\text{size (in bytes) of the page}} \]

Spam Content Analysis
- size of the page
- static rank
- link depth
- number of dots/dashes/digits in hostname
- hostname length
- hostname domain
- number of words in the page
- number of words in the title
- fraction of anchor text
- average length of the words
- fraction of visible content
- fraction of top 100, 200, 500, 1000 words in the text
- fraction of text in top 100, 200, 500, 1000 words
- occurrence of strange words
- occurrence of the phrase “Privacy Policy”
- occurrence of the phrase “Privacy Statement”
- occurrence of the phrase “Customer Service”
- occurrence of the word “Disclaimer”
- occurrence of the word “Fax”
- occurrence of the word “Phone”
- occurrence of the word “Copyright”

Homework
- Evolutionary theory says women will offer (and men will seek) youth, looks, sex appeal while men will offer (and women will seek) age, status, security.
- Go to http://personals.yahoo.com/ and collect 25 from each category of ads.
- Code those ads on the # occurrence of these themes and indicate ads that show themes from opposite genders.
- Code other themes that emerge.

Grounded Theory
- Sociologists Glaser and Strauss’ study of dying in a California hospital.
- Found no real theory to test against this subject.
- Developed the methodology to give them a method of developing a social theory of dying in hospital using only existing data gathering methods.
- A “loose”, less structured method of developing and testing theory simultaneously.
- A system of describing society through abstract notions, rather like a play describes a fictional/documentary occurrence.
- A creative method of breaking away from highly structured analyses.

Core philosophical principles of Grounded Theory
- Data is data. Qualitative is as good as quantitative.
- Theories are man-made and evolve.
- All data and existing theories are equal. Even supporting studies in refereed journals have equality with data freshly collected in the field.
- All researchers’ experiences are valuable.
- Useful when
  - In an area where there is little or no theory in existence.
  - You disagree with existing theories.
  - You may not want to test existing hypothesis.
  - You may want to mix qualitative and quantitative data.
  - You may want to collect a broad range of data beyond more structured methods.

Forms of data and coding
- Usually involves qualitative data collection, particularly interviewing.
- Also tend to feature observations.
- Statistical information is usually regarded as secondary source data.
- Self reviews and field diaries are also used as data.
- Codes
  - Open coding. Identifies concepts and actors
  - Axial coding. Connecting the concepts and actors (plot)
  - Selective coding. Find the stories behind the connections between actors and their concepts (storyline)
Open coding:

SHAZIA: Yeah I’d rather have some, a few people that mean a lot to me than hundreds of people that I know so little about, that doesn’t, its not, you can’t even call it a friendship it’s just like an acquaintance [INT: yeah], but I don’t, I’m not really bothered about people that I’m just acquainted with and like just fellow students and stuff like that, I kind of push those kind of, cause I don’t like people knowing exactly what I’m feeling and thinking all of the time, so I think if I’ve got these few people around me that are close to me I can confide with them and that’s it, I don’t have to, yeah I don’t like other people knowing too much about me [INT: OK, OK], I don’t know if it’s because I don’t really like them or because I keep them away for a reason, but yeah, so only a few people close to me.

Quality not quantity in friends
How much you know about people
Acquaintances vs. friends
Not bothered with acquaintances
Don’t want people to know my thoughts
A few close confidants

Keeping people away

Selective Coding

Homework

► Download the excel file at [http://www.soe.ucsc.edu/classes/CMPE131/Winter10/homework.xls](http://www.soe.ucsc.edu/classes/CMPE131/Winter10/homework.xls)

► This file contains open-ended answers to an online survey on blind walkers

- Do grounded theory on the column that is assigned to your last name.

► Report all of the open codes that you found

- Delete the columns not assigned to you, and write the open codes next to the relevant columns (can be 1 or more open codes per row)

► Draw the axial codes.

► Write an essay for the selective coding.

2.3.2. Requirements: Organize

► Affinity Diagram

- Write down each quote/observation on a slip of paper
- Put up on board
- Coalesce items that have affinity (similar things about an issue)
- Give names and colors to different groups
- Continue grouping subgroups indicate relationships
- A hierarchy will be formed

http://baran-systems.com/Products/Affinity%20Diagram%20for%20Excel/Image_concept/affinitydiagram.jpg

2.3.3. Req. Represent

- Personas
  - a set of stereotypical narratives of potential users of the system
- Scenarios
  - an informal narrative story, simple, ‘natural’, personal, not generalisable
- Use cases
  - assume interaction with a system
  - assume detailed understanding of the interaction
- Essential use cases
  - abstract away from the details
  - does not have the same assumptions as use cases
2.3.3. Req. Represent: Personas
► A model of key user attributes and goals
► Distilled from observing/interviewing real people
► Presented as a vivid, narrative description
► Of a single “person” who represents a user segment
► Used to guide the design of products, channels, and messaging
► Personas need to have goals (what they are trying to achieve w. the product), inclinations, capabilities.
► Personas represent behavior patterns, not job descriptions
► It is best to develop a few (not too many) concrete personas who have hard characteristics such as name, computer experience, etc
► Try to bring the character alive - perhaps include a picture or two

2.3.3 Reasons for Personas
► There is no such thing as an average user
► A compromise design pleases no-one
► The broader you aim, the more likely you miss the bulls-eye
► 50% of the people 50% happy doesn’t work: car: soccer mom, carpenter, dot-com exec
► “Every time you extend functionality to include another constituency, you put another speed bump of features and controls across every other user's road.”
► A targeted design can achieve
  ▪ 10% people 100% ecstatic
  ▪ Examples: pickup truck, paro

2.3.3 A family of AOL users
Al, 47, Software developer, visually impaired, wants fast connection
Mary, 45, architect, needs GB data transfers, novice Internet user
Charlotte, 16, Nursing student, chats for 2 hrs per day
Jane, 2, loves Sesame Street online games
Rufus, 10, dog, barks on every animations

2.3.3 Sample persona
Mary Jones, 45, architect for SCArC, an urban architecture company based in Santa Cruz
She took Computing and Internet class at Cabrillo College last Fall. When working at home, she normally starts working at 09:00, taking a break 12:00-14:00 to pick up the children, then go back to work until 18:00. Have to handover computer to Charlotte at 18:00 sharp. Most often her remote work involves discussing with clients over skype, sending sketches in jpg (typical size 1GB per file), and updating her office on the discussions.

2.3.4. Req: Represent: Scenarios
► Scenarios are stories about people undertaking activities using technologies in contexts
► Most often narrative but can be complemented with pictures
► Develop conceptual scenarios that cover the main activities that the technology has to support
  ▪ Pete logs onto the computer
► Develop concrete versions of these for specific designs of the technology
  ▪ Pete clicks on the key icon in the File toolbar

2.3.4 Example of a scenario
1. The user selects Add a Note from the menu. A new window appears.
2. From the list box at the top of the window she selects the name of the client.
3. A list of campaigns appears in the list box below, and she selects a particular campaign.
4. A list of adverts appears in the next list box, and she selects a specific advert.
5. She types a few paragraphs into a text box to describe her idea for the advert.
6. She fills the space on screen and a vertical scrollbar appears and the text in the text box scrolls up.
7. She enters her initials into a text box, and the system checks that she is allocated to work on that campaign.
8. The date and time are displayed by the system, and the Save button is enabled.
9. She clicks on the Save button and the word Saved appears in the status bar.
10. The text box, the text field for initials and the date and time are cleared.
2.3.5. Use Cases

► Interaction between a user (actor) and a given or assumed user interface
► Encompass a set of usage scenarios, bound to the same goal of the primary actor
► Organized into a Main Success Scenario and a set of Extensions
► Contain attributes such as goal, primary actor, precondition, level of abstraction
► Essential use case: A simplified, abstract, generalized use case defined in terms of user intentions and system responsibilities → no technological constraint

<table>
<thead>
<tr>
<th>User Intention</th>
<th>System Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student identifies himself</td>
<td>Verifies eligibility to enroll</td>
</tr>
<tr>
<td></td>
<td>Indicate available classes</td>
</tr>
<tr>
<td>Choose class</td>
<td>Validate schedule fit</td>
</tr>
<tr>
<td></td>
<td>Calculate fees</td>
</tr>
<tr>
<td>Confirm enrollment</td>
<td>Request confirmation</td>
</tr>
<tr>
<td></td>
<td>Enroll student in class</td>
</tr>
<tr>
<td></td>
<td>Add fees to student bill</td>
</tr>
<tr>
<td></td>
<td>Provide confirmation of enrollment</td>
</tr>
</tbody>
</table>

Use case for holiday planner

1. The system displays options for investigating visa and vaccination requirements.
2. The user chooses the option to find out about visa requirements.
3. The system prompts user for the name of the destination country.
4. The user enters the country’s name.
5. The system checks that the country is valid.
6. The system prompts the user for her nationality.
7. The user enters her nationality.
8. The system checks the visa requirements of the entered country for a passport holder of her nationality.
9. The system displays the visa requirements.
10. The system displays the option to print out the visa requirements.
11. The user chooses to print the requirements.

Alternative courses for holiday planner

Some alternative courses:

6. If the country name is invalid:
   6.1 The system displays an error message.
   6.2 The system returns to step 3.

8. If the nationality is invalid:
   8.1 The system displays an error message.
   8.2 The system returns to step 6.

9. If no information about visa requirements is found:
   9.1 The system displays a suitable message.
   9.2 The system returns to step 1.
2.4. Prototyping

How do we express early design ideas?
- Minimal development effort at this stage

Designs need to be visualized
- to help designers clarify their own ideas
- to enable users to evaluate them.

The medium needs to be appropriate for
- the stage of the process,
- the audience,
- the resources available and the questions that the prototype is helping to answer.

Usually designers create prototypes of increasing complexity

2.4. Prototyping Dimensions

1. Representation
   - How is the design depicted or represented?
   - Can be just textual description or can be visuals and diagrams

2. Scope
   - Is it just the interface (mock-up) or does it include some computational component?

3. Executability
   - Can the prototype be “run”?

4. Maturation
   - Revolutionary – Throw out old one
   - Evolutionary – Incorporate design changes
   - Incremental – Modular development

2.4.1 Low-fidelity prototypes

Paper-based prototypes
- a paper mock-up of the interface look, feel, functionality at the high level
- “quick and cheap” to prepare and modify
- For early feedback on conceptual design ideas

Issues
- Robustness – handled by many people
- Scope – focus on high level only
- Instructions – designer intervention when users evaluate it
- Flexibility – can users redesign it ‘on-the-fly’?

2.4.1 Low-fidelity prototypes

1. Sketches
   - drawing of the outward appearance of the intended system
   - hard to envision a dialog’s progression

2. Storyboarding
   - a series of key frames
   - originally from film; used to get the idea of a scene
   - snapshots of the interface at particular points in the interaction
   - users can evaluate quickly the direction the interface is heading
2.4.1 Storyboard of a computer based telephone

2.4.2 Prototyping: Wizard of Oz

Homework
- Create a storyboard of a library self service machine’s interface→ the system should provide the following functionalities (feel free to add more)
  - Checking where a book is located
  - Putting book on hold to be picked up in max 24 hr
  - Releasing book on hold
  - Checking out book
  - Returning book
  - Checking outstanding fine, disputing fine and paying fine
  - Checking when a certain book is due back or is on hold
  - Checking how many books I have in my possession and when they are all due
  - Checking how many books I can still borrow

2.4.3 High fidelity prototypes

Human simulates the system’s intelligence and interacts with user
- Uses real or mock interface
  - “Pay no attention to the man behind the curtain!”
- User uses computer as expected
- “Wizard” (sometimes hidden):
  - interprets subjects input according to an algorithm
  - has computer/screen behave in appropriate manner

Good for:
- adding simulated and complex vertical functionality
- testing futuristic ideas → think about real implementation, though

Prototyping with a computer
- simulate or animate some but not all features of the intended system to engage end users

Purpose
- provides a sophisticated but limited scenario to the user to try out
- provides a development path (from crude screens to functional system)
- can test more subtle design issues

Danger
- user’s reactions are about small things
- users reluctant to challenge / change the design
2.4.4 Limiting prototype functionality

► vertical prototypes
  - includes in-depth functionality for only a few selected features
  - common design ideas can be tested in depth

► horizontal prototypes
  - the entire surface interface with no underlying functionality
  - a simulation; no real work can be performed