Task Analysis and Requirements Activities

Human Computer Interaction
CSCI 4620U| SOFE 4850U | CSCI 5540G
Dr. Christopher Collins

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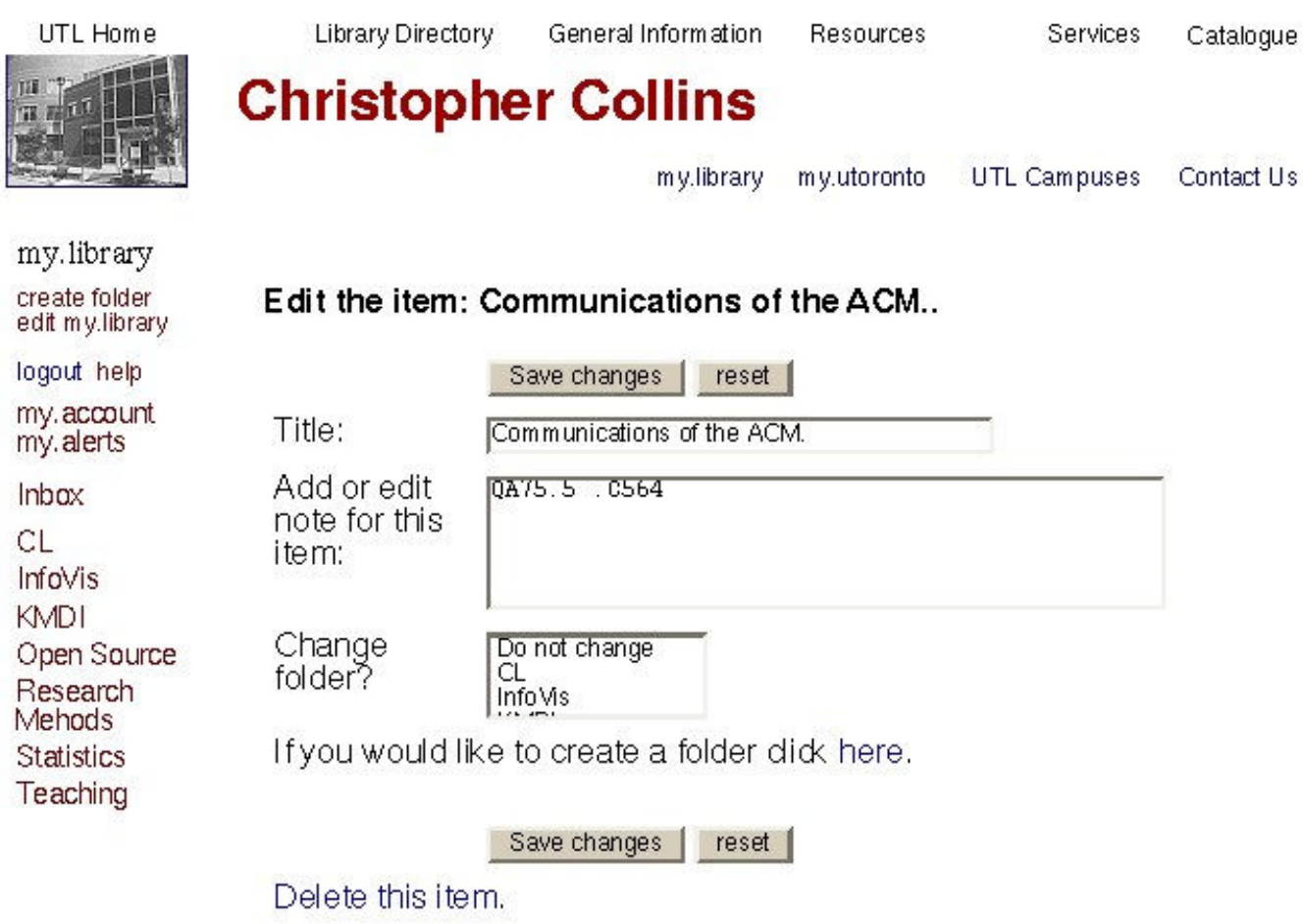
UOIT Open House

- Seeking volunteers (CS Students)
- 10:30-2:30, Saturday Nov 1
- Meet prospective students, talk about your experiences (favourite courses, research experiences, co-op experiences)
- Email ken.pu@uoit.ca if you are available

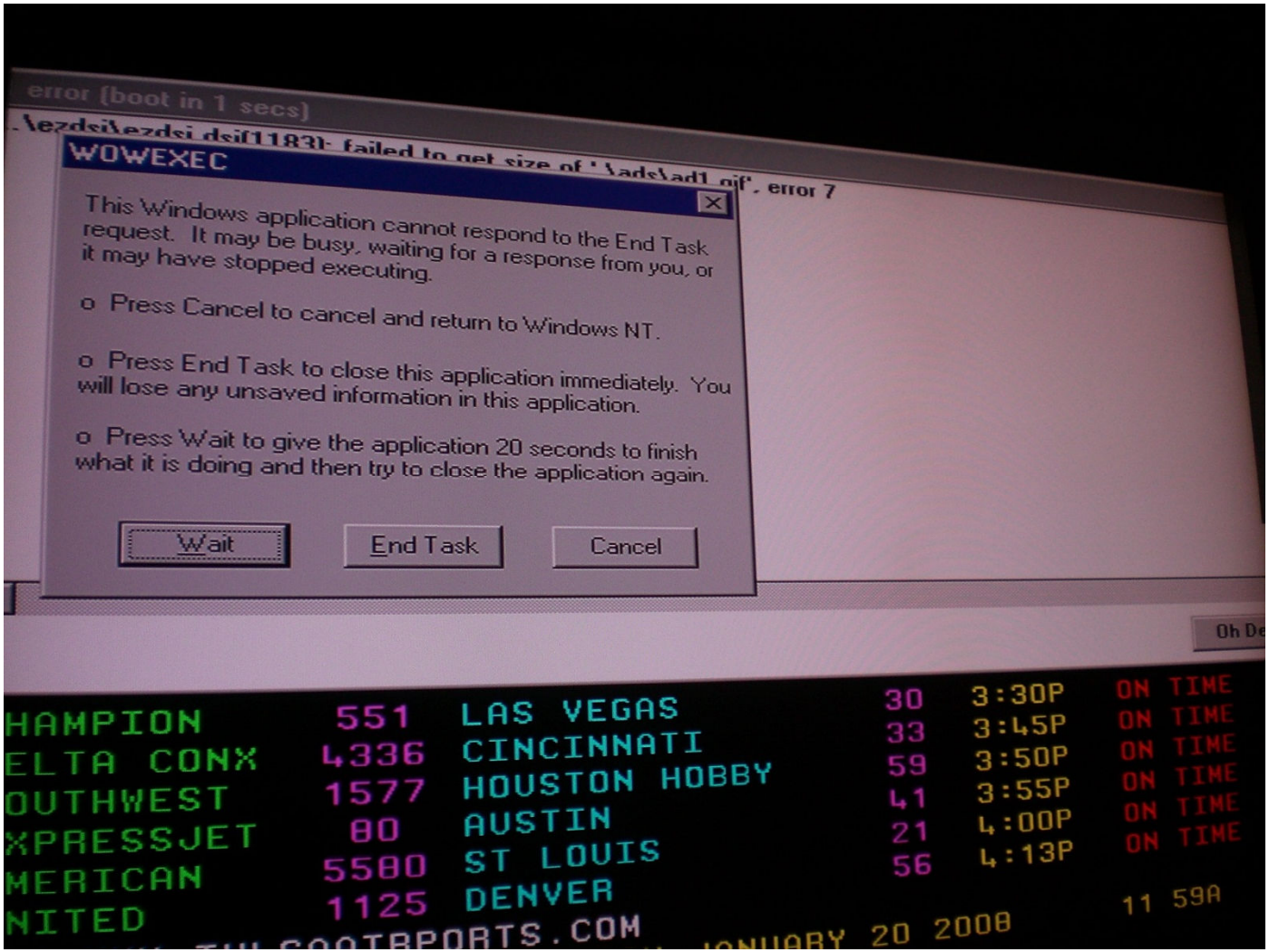
Neilson's Usability Heuristics

- Visibility of system status
- Match between system and the real world
- User control and freedom
- Consistency and Standards
- Help users recognize, diagnose, and recover from errors
- Error prevention
- Recognition rather than recall
- Flexibility and efficiency of use
- Aesthetic and minimalist design
- Help and documentation

U of Toronto “MyLibrary”



Errors at Airports

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Last Time

- Scenarios
  - Stories
  - Conceptual
  - Concrete
  - Use Cases
- Task Analysis
  - What we learn: people, work, technology
  - Hierarchical Task Analysis & Graphical HTA
- Styles of Interaction

Techniques for Design

REQUIREMENTS (REVIEW)

Requirements Categories

- stakeholder needs
- environmental requirements
- functional requirements
- technical requirements, and
- usability requirements

Stakeholder Needs

- Characteristics the user must possess (e.g. must know how to use a web browser)
  - Start from what users do, how they do it (field studies)
- High level needs
  - recall Maslow's Hierarchy
  - May need satisfaction, comfort, reliability, social connections, safety

Environmental Requirements

- Context of use
- Physical environment
- Social environment
  - e.g. requires login by three people who are friends
- Organizational environment
  - e.g. requires a professor and a student
  - e.g. requires approval of the manager to be activated

Functional Requirements

- What the new system is to do in general terms
- What specific capabilities are therefore required

Technical Requirements

- Technical requirements, constraints, assumptions
  - Price, size, weight, etc.
  - Compatibility with other technologies, adherence to standards
  - Data requirements

Usability Requirements

- Ease of learning
- Ease of use
- Protection against “errors”
- Specific heuristics which are important

Note: List *specifics* for the project/technology

Evaluating Requirements

- Measures of success
  - Absolute, objective, quantifiable, measurable,
    - "Productivity" improvement of 10% within 1 year
    - Error-free performance in 1 hour without use of manual
  - Subjective
    - Satisfaction expressed by 95% of operators after 6 months
  - Relative to current method, e.g., alternative or no technology

Evaluating Requirements

- Priorities, tradeoffs, & constraints
  - High-end vs. low-end
    - in functionality and price
  - General-purpose vs. special-purpose
  - Ease of use and ease of learning
  - Power and simplicity
  - High-speed and error-free performance

DESIGN ACTIVITIES

Topic Brainstorming

- What problems do you have as students?

Topic Brainstorming

- Commute planning
- Stress management
- Communication and contact with distant family
- Time management
- Tracking learning goals
- Working with groups

Activity One: Persona

- In groups of three, develop a persona which describes a member of a primary stakeholder group for computer-based solutions to assist *commute planning.*
- Post your persona to Blackboard discussion *Design Activities*

Activity Two: Scenario

- Using your persona, write a *story scenario* about a task related to commute planning.
- Post your scenario as a reply to your persona posting

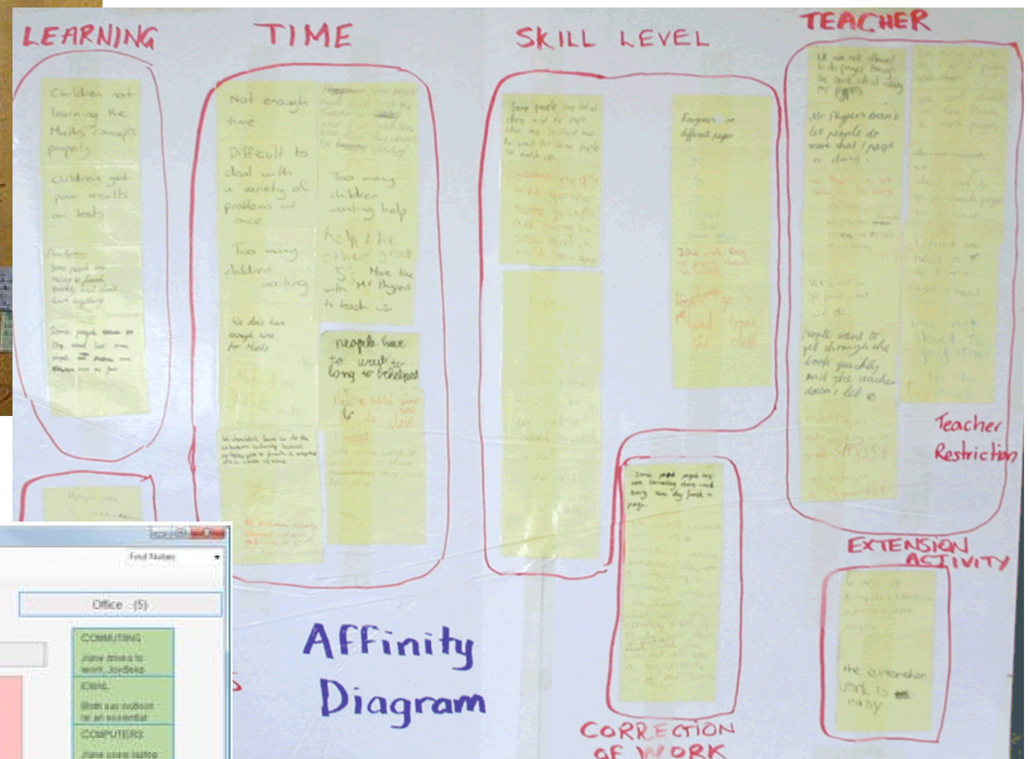
http://www.usabilitynet.org/tools/affinity.htm

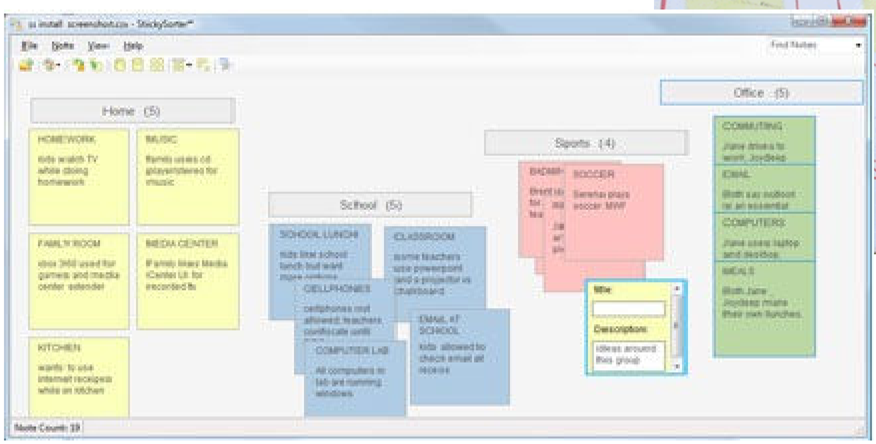
Design Process

AFFINITY DIAGRAMS

Affinity Diagrams

- Goal: organize our ideas related to the project – these are things we learned during contextual inquiry and research


LEARNING
TIME
SKILL LEVEL
TEACHER
Teacher Restriction
EXTENSION ACTIVITY
CORRECTION OF WORK
Affinity Diagram


Home (5)
HOMEWORK
MUSIC
FAMILY ROOM
MEDIA CENTER
KITCHEN
School (5)
SCHOOL LUNCH
CLASSROOM
CELLPHONES
COMPUTER LAB
EMAIL AT SCHOOL
Sports (4)
SOCCER
Office (5)
COMMUTING
EMAIL
COMPUTERS
MEALS

Affinity Diagrams

- Draw out common themes from a large amount of information
- Discover previously unseen connections between various ideas or information
- Brainstorm root causes and solutions to a problem

(Source: http://www.mindtools.com/pages/article/newTMC_86.htm)

Affinity Diagrams

- Used mostly for brainstorming, can be useful in any problem where:
  - The solution is not readily apparent
  - You want to reach a consensus or decision and have a lot of variables to consider, concepts to discuss, ideas to connect, or opinions to incorporate
  - There is a large volume of information to sort through

(Source: http://www.mindtools.com/pages/article/newTMC_86.htm)

Process

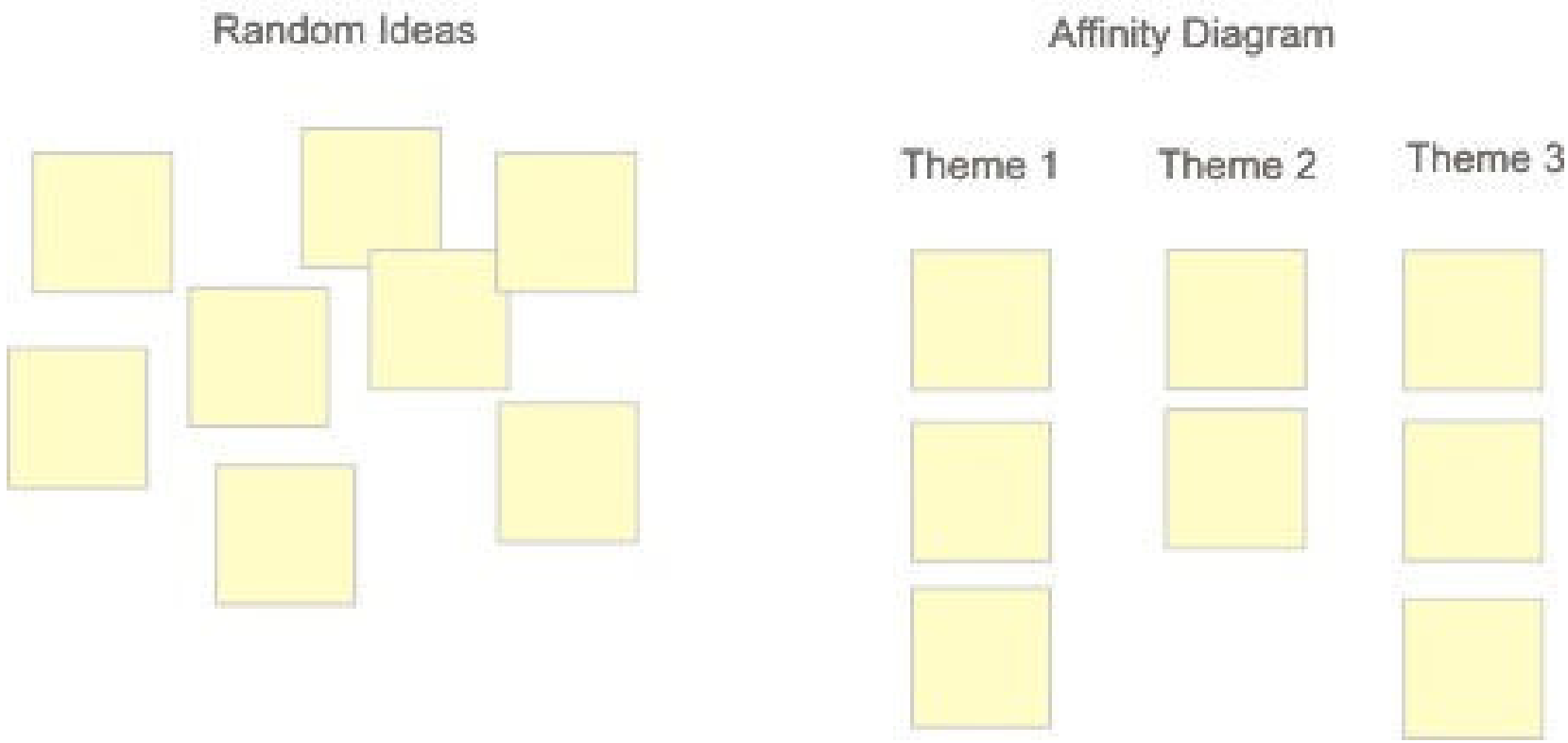
1. Write down the problem
2. Generate ideas
    1. Emphasize volume (more is better!)
    2. Suspend judgment
    3. Piggyback on other ideas

Process

1. Sort ideas into themes
    1. Which ideas are similar?
    2. Is this idea connected to the others?

Ideally, work in groups of 3-4 people and use a consensus model
Sort in silence to avoid bias
Groupings can be hierarchical

Figure 1



Process

4. Create consensus
    1. Discuss meanings of groupings
    2. Separate stand alone ideas
    3. Duplicate cards as needed
    4. Limit to 5-9 themes

Process

5. Names the Themes
    1. Create short 3-5 word descriptions
    2. Write on a card and place atop the group
    3. Create super-headers when needed
6. Connect themes with lines
7. Record the results
    1. Use a camera or write it down

Figure 3

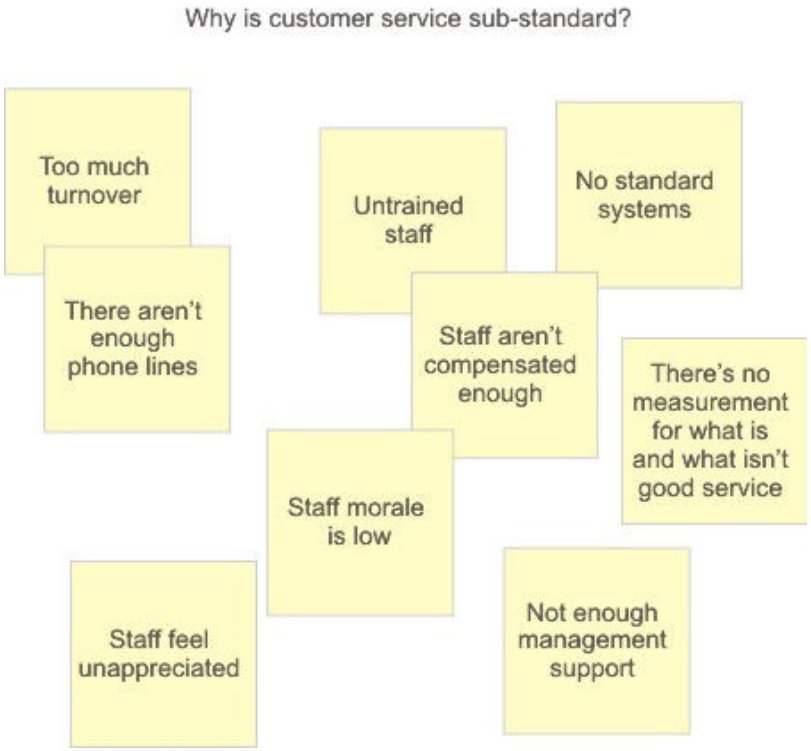
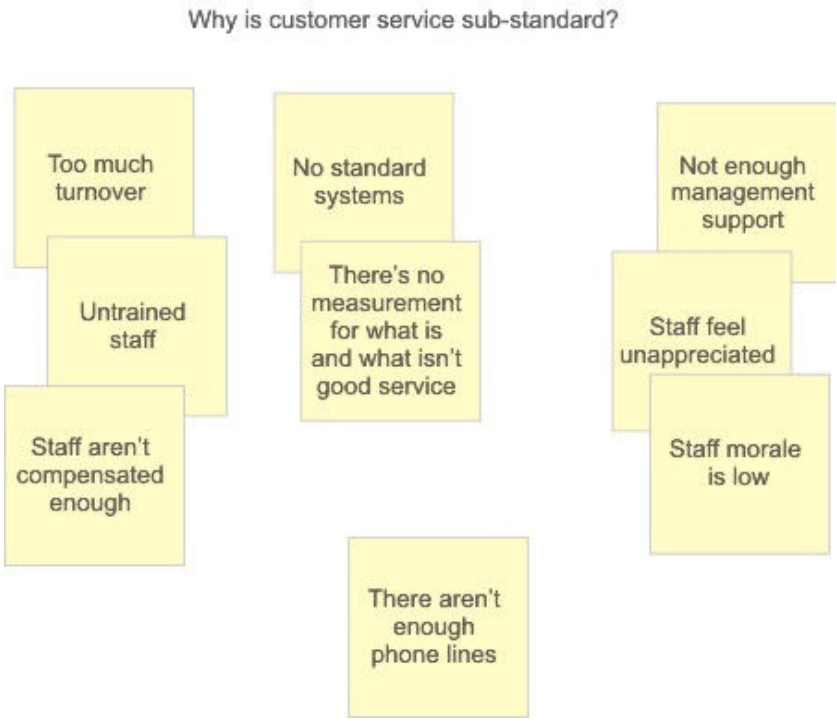


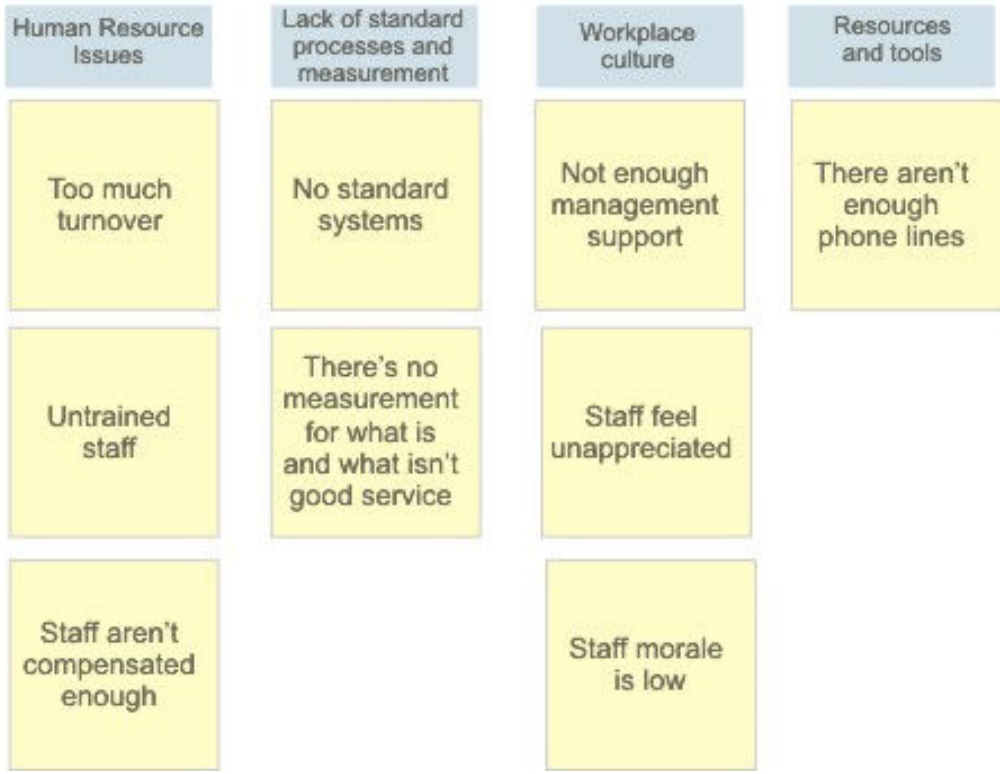
Figure 4



http://www.mindtools.com/pages/article/newTMC_86.htm

Figure 5

Why is customer service sub-standard?



http://www.mindtools.com/pages/article/newTMC_86.htm

Activity Three: Affinity Diagrams

- Split into N groups and follow the affinity diagram process for <our chosen problem>.

Activity Four: Requirements

- Back in your original groups of three
- Brainstorm using your own experiences, choose an aspect of <our chosen problem> that is not well supported by technology
- Write a sentence about the problem as an introduction
- Imagine a technology solution to that problem (such a technology may already exist – that's ok!)

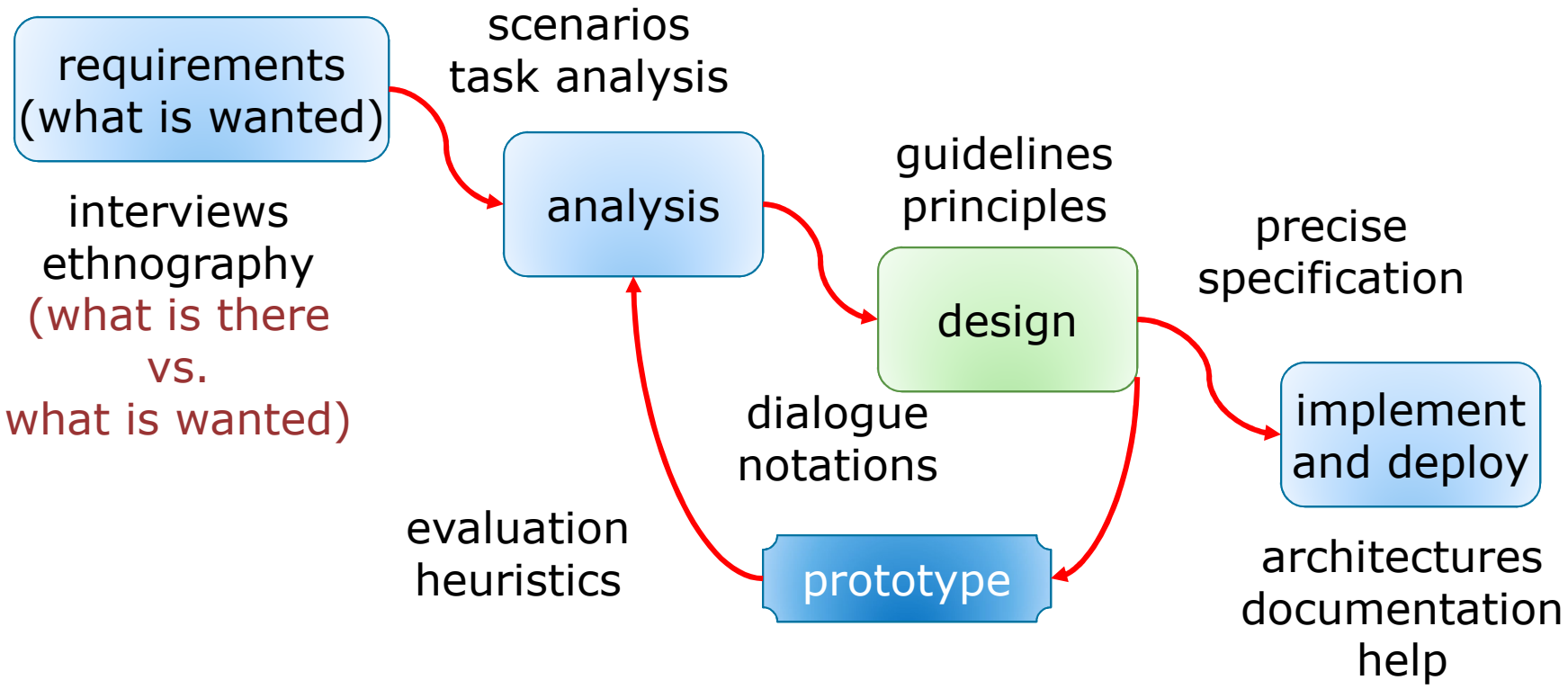
Activity Four: Step Two

- Write a list of requirements for a technology solution to this problem, under the categories we have discussed:
  - stakeholder needs
  - environmental requirements
  - functional requirements
  - technical requirements, and
  - usability requirements
- Post your requirements list to our discussion board as a reply to your other postings

Where are we now?

STAGES OF DESIGN

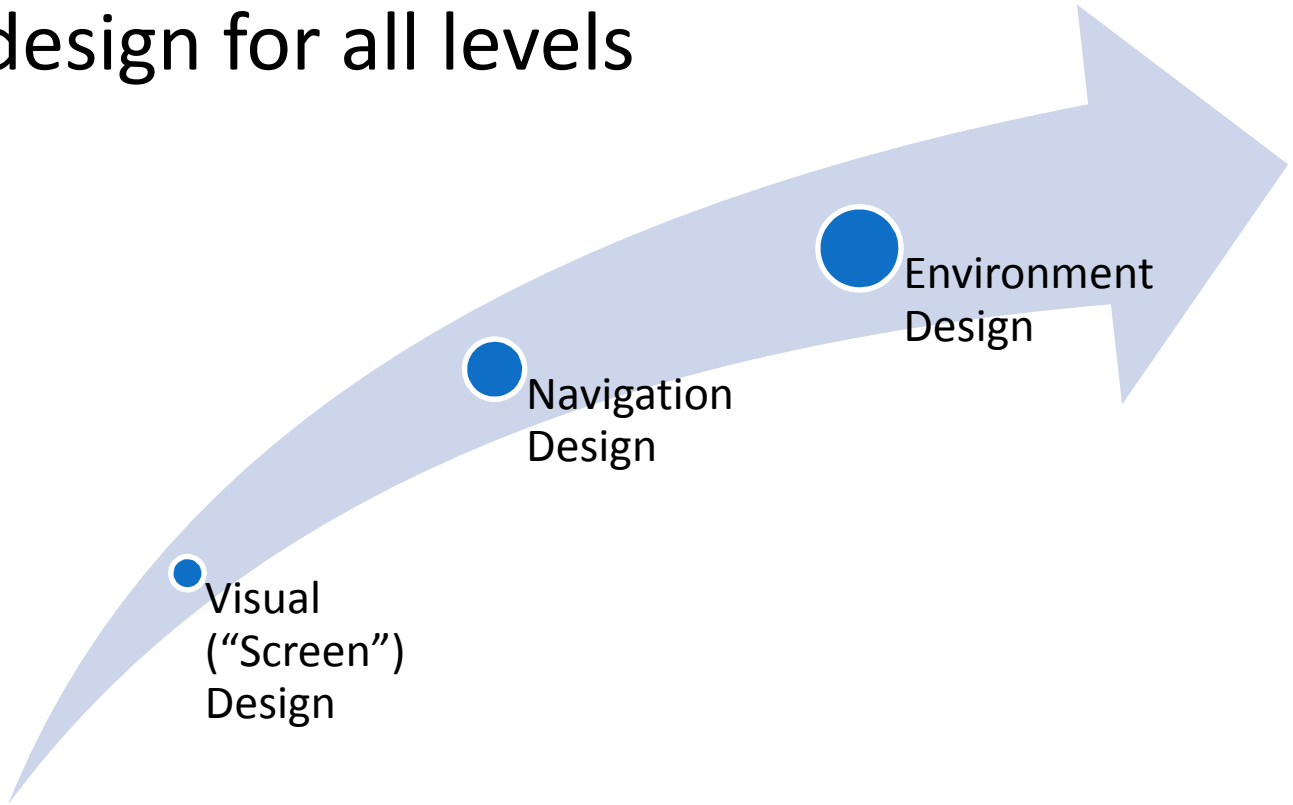
The Design Process



(Source: Dix, Finley, Abowd, Beale, *"Human-Computer Interaction")*

Design Stages

- There are different levels of interaction within any user interface – we have to ensure that we design for all levels



Project Part 3a:

- Conceptual Design
- Functionality (match with requirements!)
- Scenarios
- Interaction design
- Interface (“screen”) design

Summary

- Today we practiced creating personas, scenarios, and requirements
- We introduced Affinity Diagrams as a brainstorming activity

Your Action Items

- Group project part 3a is posted now
- New readings:
  - Chapter 7 (research methods - review)
  - Section 11.1-11.3 (task analysis - review)
  - Chapters 8 & 9 (envisionment & design - new)
  - Chapter 12 (visual aspects – new)
  - Sketching User Experiences Chapter 1

Ongoing Course Evaluation

- Please complete the Lecture 11 daily feedback form!