INFO-440: Information System Design

Autumn 2003
B.S. Informatics
Information School
University of Washington

Theoretical and practical examination of the information systems design process. Techniques for assessing the need for technology, specifying the system design, and involving users in the design process are explored. Design methods include social impact statements, future scenarios, mock-ups, rapid prototyping, field-testing, heuristic evaluation. Prerequisite: CSE 373.

Course website & Listserv
http://courses.washington.edu/info440

info440a_au03@u.washington.edu
Registered students are subscribed automatically using their UW mail account.

Credit Hours
5 (3 lecture hours; 2 lab hours; 10 outside hours)

Meeting times
Lecture
Monday/Wednesday, 1:30-2:50; Mary Gates Hall 254

Lab
Thursday, 11:30-12:50; Mary Gates Hall 287

Instructor
David Hendry, Assistant Professor
330J Mary Gates Hall

Office hours: Monday, 3-4pm or by appointment

dhendry@u.washington.edu | http://faculty.washington.edu/dhendry
Tel: 206-616-2316

Teaching assistant
Meliha Yetisgen Yildiz, PhD Student
melihay@u.washington.edu

Student services
Mariko Navin, Student Services Administrator
470E Mary Gates Hall
mnavin@u.washington.edu
Tel: (206) 616-1197

Please note: If you have any concerns about the course or your TA, please see the TA about these concerns as soon as possible. If you are not comfortable talking with the TA or not satisfied with the response that you receive, you may contact the instructor of the course.

If you are still not satisfied with the response that you receive, you may contact Allyson Carlyle, the Associate Dean for Academics in 370 Mary Gates Hall, by phone at (206) 543-1887, or by e-mail at acarlyle@u.washington.edu. You may also contact the Graduate School at G-1 Communications Building, by phone at (206) 543-5900, or by e-mail at efeetham@u.washington.edu

For reference, these procedures are posted on the Information School bulletin board outside the Student Services Office in 470 Mary Gates Hall.
Overview

Effective information systems are not accidents. On the contrary, experience has shown that great design teams do certain things over and over again. Great teams study user activity as it really happens and examine the whole context of use throughout product development. Early in the process, great teams are not afraid to make mistakes and enthusiastically examine dozens of options before settling on an approach. Additionally, great teams continually improve their methods and shape organizational processes to support successful practice.

Most of all, great teams practice proven methods of design. For this reason, in this course you will investigate a wide range of design methods. A design method is a procedure or activity that leads toward a final solution. The output of a design method is a document, sketch, or model that then becomes the input to the next step in the development process. Design methods can be organized into three classes of activity:

- **Analysis.** What do people do? What are peoples' needs and wants? What are the current barriers and opportunities? How do cultural, social, and environmental factors influence behavior?
- **Synthesis.** What options exist for lowering barriers or innovating in new directions? How should the options be represented and judged? How should the interface behave? What should the interface actually look like? How will the interface enable better problem solving, improve productivity, and better mediate communication between people?
- **Evaluation.** How can design ideas be validated, user interface options tested, and existing systems examined with precision?

Textbooks and readings

The required textbook, which is available at the University Bookstore, is:


Occasionally, we will draw upon material from these books:


Occasionally, additional readings will be posted on the website.

Learning

**Aims**

The general aims of this course are to:

1. Develop an appreciation for the theory and sensibilities that underlie effective design practice
2. Develop skills in the use and application of approximately 20 different design methods
3. Improve individual and collaborative skills in design problem solving.

**Objectives**

On the successful completion of this course, you should be able to:

1. Gather useful information about users and activities through observation or systematic inquiry
2. Organize information about users into useful summaries with affinity diagrams and card sorting
3. Develop skills in inspecting artifacts and critically thinking about the use of artifacts
4. Develop skills in writing technical reports and preparing concise presentations
5. Represent and analyze trade-offs using claims analysis
6. Create descriptions of user needs with scenarios of use, task analyses, and social impact statements
7. Create a conceptual model for the user interface of a target system
8. Create specifications for the structure and flow through an information system (IA blueprints)
9. Demonstrate skills for low-fidelity prototyping
10. Conduct a heuristic evaluation of an existing system
11. Describe the roles for user interface standards and guidelines
12. Prompt users to think aloud
13. Plan and conduct a formative usability evaluation
14. Discuss Norman's model of human action and demonstrate how it can be used to identify problems with an information system
15. Be able to discuss the strengths and weaknesses of the following design processes: waterfall model, rapid prototyping, participatory design, and scenario-base design
16. Discuss the various roles in information system design, including visual designers, interactions designers, information architects, design ethnographers, project managers, and product managers
17. Analyze a design problem and propose a user-centered process, justifying the process and identifying the trade-offs.

The knowledge and skills you learn in this course will give you a foundation for more specialized learning in Interaction Design, Information Architecture, Usability Engineering, and User-Centered Project Management.

**Academic accommodations**

If you would like to request academic accommodations due to a disability, please contact Disabled Student Services, 448 Schmitz, (206) 543-8924 (V/TTY). If you have a letter from Disabled Student Services indicating you have a disability that requires academic accommodations, please present the letter to the instructor so we can discuss the accommodations you might need for this class.

For additional information, see *Statements to Ensure Equal Opportunity and Reasonable Accommodation*, downloaded March 5, 2003, [http://www.washington.edu/admin/eoo/eoost.html](http://www.washington.edu/admin/eoo/eoost.html)

**Academic honesty**

Academic honesty is extremely important to the instructor, the Information School, and the University of Washington. Please review these Academic Honesty Guidelines, downloaded March 5, 2003, [http://depts.washington.edu/grading/issue1/honesty.htm](http://depts.washington.edu/grading/issue1/honesty.htm)

It is assumed that you have read the guidelines in their entirety, that you understand them, and that you follow them in all your work. If you have questions about these guidelines, you should ask the instructor.

**Assessment**

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Four design exercises</td>
<td>40%</td>
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<tr>
<td>Prototyping project</td>
<td>40%</td>
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<tr>
<td>Midterm exam</td>
<td>20%</td>
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**Assignments**

With the exception of A2, these are individual assignments:

- A1. Analyzing artifacts and use
- A2. Observing use, organizing facts, and deriving concepts
- A4. Evaluating systems: Tasks, actions & heuristics

Due

- A1. Wed, 8 Oct
- A2. Wed, 22 Oct
- A3. Wed, 12 Nov
- A4. Mon, 1 Dec

Unless otherwise stated, assignments are due at the beginning of class.
Prototyping project

The prototyping project is an individual project. You are urged, however, to collaborate with others in the class to generate and explore ideas. The labs will be specifically designed to enable this.

The deliverables for the prototyping project are as follows (See website for problem statement).

<table>
<thead>
<tr>
<th>Due</th>
<th>P1. Problem</th>
<th>16 Oct</th>
<th>5%</th>
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<tbody>
<tr>
<td></td>
<td>P2. User needs &amp; wants</td>
<td>30 Oct</td>
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<td></td>
<td>P3. Prototype I</td>
<td>13 Nov</td>
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<td>P4. Prototype II</td>
<td>26 Nov</td>
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<td>P5. User Experience Specification Participation</td>
<td>10 Dec</td>
<td>30%</td>
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Midterm

The midterm will assess your knowledge for the conceptual foundations for human-centered methods of information system design. The midterm will consist of short answer questions. Practice questions and solutions will be given periodically during the quarter.

Midterm exam Mon, 24 Nov, 1:30-2:50

Grading criteria

Work in this course will be graded to criteria. In other words, you won't be graded on a curve.

Each deliverable is designed to test your achievement against one or more of the learning objectives. Different assignments emphasize different learning objectives. Grades have the following meanings:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Performance Quality*</th>
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<tbody>
<tr>
<td>3.9 - 4.0</td>
<td>Superior performance in all aspects of the course with work exemplifying the highest quality. Unquestionably prepared for subsequent courses in field.</td>
</tr>
<tr>
<td>3.5 - 3.8</td>
<td>Superior performance in most aspects of the course; high quality work in the remainder. Unquestionably prepared for subsequent courses in field.</td>
</tr>
<tr>
<td>3.2 - 3.4</td>
<td>High quality performance in all or most aspects of the course. Very good chance of success in subsequent courses in field.</td>
</tr>
<tr>
<td>2.9 - 3.1</td>
<td>High quality performance in some of the course; satisfactory performance in the remainder. Good chance of success in subsequent courses in field.</td>
</tr>
<tr>
<td>2.5 - 2.8</td>
<td>Satisfactory performance in the course. Evidence of sufficient learning to succeed in subsequent courses in field.</td>
</tr>
<tr>
<td>2.2 - 2.4</td>
<td>Satisfactory performance in most of the course, with the remainder being somewhat substandard. Evidence of sufficient learning to succeed in subsequent courses in field with effort.</td>
</tr>
<tr>
<td>1.9 - 2.1</td>
<td>Evidence of some learning but generally marginal performance. Marginal chance of success in subsequent courses in field.</td>
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* Taken from Faculty Resource on Grading, downloaded March 5, 2003, http://depts.washington.edu/grading/practices/guidelin.htm
Standard cover sheet
To protect your privacy when exercises are returned and to facilitate communication, submitted work must have a cover sheet. The cover sheet must include the following information:

- Course name
- Quarter, program, department, and university
- Assignment name
- Your name and e-mail address
- A date
- A web site address (if relevant).

Staple the exercise pages to the cover sheet.

Formatting standards
Unless the Deliverable Guidelines state otherwise, please follow these standards:

<table>
<thead>
<tr>
<th>Property</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line spacing</td>
<td>1.5</td>
</tr>
<tr>
<td>Top margins</td>
<td>1&quot;</td>
</tr>
<tr>
<td>Left/right margins</td>
<td>1.25&quot;</td>
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<tr>
<td>Font</td>
<td>11-12 pt Serif</td>
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Note: You may use any appropriate font size and style for headings, figures, charts, etc.

Late policy
1. If you will miss the deadline, you should inform the instructor as soon as you can, indicating when you will submit the work. The instructor will try to accommodate your needs. You should use this clause only for extraordinary personal reasons.
2. It is at the instructor's discretion to accept late work or assign late penalties (see 1 above). For any late assignment, 10% will be taken off your work per day. After five days, your work will not be accepted.
3. Late work must be handed to the instructor or teaching assistant in person. You may also be able to hand work in at the front desk of the Information School and at student services but this cannot be guaranteed.

Work that is handed in late is penalized for two reasons. First, to be fair, all students should be given the same time limits. Second, if you spend too much time on one assignment, it is quite likely that you will have insufficient time to spend on subsequent assignments.

Re-grading policy
To have work re-graded, you must submit a Re-grade Request within five days of when your work was returned. The request must be a single page document printed on paper or sent by e-mail. It should contain the following information:

- Re-grade Request
- The information contained on the standard cover sheet
- An explanation for why you believe you deserve a higher grade.

The instructor, possibly in collaboration with the teaching assistant, will consider your request. If the instructor is convinced by your argument, your work will be re-graded. If not, the instructor will send you e-mail explaining why. No re-grades will be considered for late work.

Right to revise syllabus
Please note that the instructor may revise this syllabus.
Class schedule

Week 1, 29 Sept – 3 Oct, Introduction
Read  Rosson & Carroll, Chapter 1
      Norman, D. (1990). Chapter 1: The psychopathology of everyday things (pp. 1-33). Design of
      Everyday Things New York: Doubleday.
L1  Introduction
    Greetings! Overview of Syllabus
    Design vs. Science vs. Engineering; Design Competency; Design Methods
Lab  Creativity and Design

Week 2, 6 – 10 Oct, Requirements Analysis
Read  Rosson & Carroll, Chapter 2
      Kaufmann Publishers.
L3  Observing workplace activity
    Techniques for observing and interviewing people
    Design Method: Contextual Inquiry
L4  Techniques for analyzing and representing workplace data
    Techniques for analyzing and representing workplace data
    Design Method: Affinity diagrams and card sorting
Due: A1, Teams for A2, 8 Oct
Lab  Diane Quinn, Burke Museum, Introduction to Traveling Study Collections

Week 3, 13-17 Oct, Requirements Analysis
Read  Rosson & Carroll, Chapter 6
L5  Representing users and situations
    Design method: Scenarios & personas
    User types, individual differences
L6  Representing goals and tasks
    Design method: Task analysis
    Goals, tasks, and actions
Lab  Prototyping techniques
Due: P1, 16 Oct

Week 4, 20-24 Oct, Conceptual Design
Read  Rosson & Carroll, Chapter 3
      Green, T. R. G. and Benyon, D. (1996.) The skull beneath the skin: entity-relationship models of
      information artifacts. International Journal of Human-Computer Studies, 44(6) 801-828. [Note:
      This is a fairly difficult academic paper. Sections 4-5 are optional.]
L7  Creating conceptual models, Part I
    Design method: Conceptual models
L8  Creating conceptual models, Part II
    Metaphors & visual formalisms
Due: A2, 22 Oct
Lab  Diane Quinn, Burke, Q & A on traveling kits

Week 5, 27-31 Oct, Specifying systems
Read  Rosson & Carroll, Chapter 4
      Garrett, J. (2002). A visual vocabulary for describing information architecture and interaction
L9  Information architecture, Part I
Discipline overview
Blueprinting techniques: Sitemaps & flow

L10  **Information architecture, Part II**
Information scent
Navigation systems

Lab  **Prototyping techniques**
Due: P2, 30 Oct

**Week 6, 3-7 Nov, Specifying systems**
Read  Rosson & Carroll, Chapter 5
L11  **Interaction Design, Part I**
Interaction storyboards
L12  **Interaction Design, Part II**
Dialog design
Due: A3, 12 Nov

Lab  **Prototyping techniques**
Due: P3, 13 Nov

**Week 7, 10-14 Nov, Evaluation**
Read  Rosson & Carroll, Chapter 7
L13  **Analytic methods**
Design method: Heuristic evaluation
L14  **Empirical methods**
Design method: Usability evaluation
Think aloud
Develop procedure/experimental design for A4

Lab  **Project review & discussion**

**Week 8: 17-21 Nov, Evaluation**
No reading
L15  **Midterm**
L16  **More evaluation methods**
Methods: Logfile analysis & cognitive walkthroughs
Due: P4, 26 Nov

Lab  No lab – Thanksgiving Holiday

**Week 9: 24-28 Nov, Special Topics: You Decide**
Read  TBD
L17  TBD
Due: A4, 1 Dec
L18  TBD

Lab  Diane Quinn, Burke, Feedback on projects

**Week 10: 1-5 Dec: Special Topics**
Read  Class decides
L19  TBD
L20  TBD

Lab  **Project Review & Discussion**
**Week 10: 8-10 Dec**

**Read**  Rosson & Carroll, Chapter 10

**L1**  **How design really happens?**
Teamwork, communication, persuasion
Roles: visual & interaction designers, information architects, ethnographers, project managers,

**L2**  **Summary**
Methodologies; Review of design methods; The Design Way

**Due:** *User Experience Specification, 10 Dec*

**Goodbyes**

**Lab**  no lab