

DEPARTMENT OF COMPUTER SCIENCE  
UNIVERSITY OF TORONTO at MISSISSAUGA

CSC 318S

**THE DESIGN OF INTERACTIVE COMPUTATIONAL MEDIA**

Assignment 3  
**DESIGN AND PROTOTYPING FOR DESIGN PROJECT**

HANDED OUT: Tuesday, February 11, 4 p.m.

**Assignment 3a** DUE BACK IN via **email to TA**: Thursday, February 27, 4 p.m.

WORTH IN MARKING SCHEME: 3 points

**Assignment 3b** DUE BACK IN in **2 paper copies to BA7214**: Tuesday, March 18, 4 p.m.

WORTH IN MARKING SCHEME: 12 points

**THE PURPOSE AND TASK OF THIS ASSIGNMENT**

The purpose of this assignment is to give you experience in developing and prototyping a concept for a solution to the design problem. In doing so you will:

- carry out *conceptual design*, specifying the system concept, metaphor, and interaction style of your solution, and *activity design*, specifying functionality;
- augment it with *information* and *interaction design*, which specify the look (appearance) and feel (interactivity) of your solution; and
- embody the refined concept in **one or more prototypes** illustrating your solution.

Prototypes have to possess sufficient fidelity to allow usefulness and usability evaluations to be carried out in Assignment 4.

In other words, your task is to envision, specify, develop, explore, and prototype a concept for a solution for the design problem. Exploration will include soliciting feedback and reactions to at least one interim stage from individuals not on your design team, minimally students on other design teams, but ideally potential users.

Your team will then document your understanding of these issues in a thorough and thoughtful report (circa 20-30 pages, double-spaced). Your report should address the following issues (this list may suggest an outline for your report):

1. Conceptual design, including a description of the system concept, and how it arises out of the requirements analysis and scenarios from your Assignment 2
2. Functionality to be included in your system.
3. Scenarios and sketches describing how the envisioned system is to be used (activity design) and how it is to appear (information design)
4. Reactions of individuals not on your team, ideally potential users, to the scenarios and sketches
5. Claims analysis about the scenarios and sketches
6. A very brief statement of design implications from these reactions
7. A description of one or two key examples of interaction design
8. A very brief statement of key points helpful in understanding **one or more** prototypes

1. The conceptual design describes the purpose and key ideas for your envisioned system, and how it responds to:

- the problem you are trying to solve
- the results of the requirements analysis
- the needs of various stakeholders
- negative claims about features of current practice, such as those in your “problem scenarios”

You should describe clearly the metaphor(s) through which users are to understand the system, and the interaction style of your proposed solution.

2. Specify the functionality proposed for your system. List proposed capabilities and describe them in sufficient detail to be clear to individuals not on your design team.

3. Prepare at least two scenarios describing the life of your target users and other stakeholders as they use the envisioned system. The scenarios should make use of what you have learned in your requirements analysis, and should illustrate the most important functionality envisioned for the system. Your scenarios can be expressed in text, but they must also be augmented with visual sketches that illustrate how the system is to appear to users. Hence your scenarios and sketches should illustrate **both** functionality and appearance. In other words, you will be combining the Activity Design and Information Design phases from the text.

Note: Scenarios are often expressed as text augmented by sketches. Alternatively, they can be expressed as visual images augmented by text annotations, as, for example, in a *storyboard*. (A storyboard is a sequence of visual images with text annotations that represents successive stages in a process, animation, or video.) Graphical scenarios can also be created and presented as videos, but this is not recommended given the time available.

Finally, for concepts that involve novel hardware, such as mobile devices with special size, weight, or form factors, sketches or even physical models of proposed devices would be helpful.

4. Solicit reactions of at least two (ideally, somewhat knowledgeable) individuals to the system functionality and appearance. These individuals should not be on the design team, although they may be members on the class who are on different design teams. Much better would be reactions from potential users. Functionality should be judged in terms of its usefulness in dealing with the problem defined by the Requirements Analysis, and its perceived appropriateness for your target users. Ensure that you do not put answers into the mouths of your informants. The reactions should be summarized in an appropriate way. Including quotes may also be helpful.

5. Describe at least two features arising in the scenarios. The features encapsulate design issues involving your users and the other stakeholders that arose in developing the scenarios. Each design issue should be analyzed by a small set of claims, both “pro” and “con”, that assert what is good (+) or bad (-) about these features.

6. Summarize the implications for your design that you can draw from these reactions from knowledgeable individuals and from these claims analyses.

7. Think through, design, and present one or two examples of key interaction sequences, in other words, what users will have to do in order to accomplish tasks with your envisioned system. Justify any significant design decisions.

8. Design and create one or more prototypes to embody and portray the system you envision. Justify any significant design decisions.

## PROTOTYPES

Webster's Third New International Dictionary defines "prototype" as follows:

"1a(1): an original on which a thing is modeled... b: an individual that exhibits the essential features of a later individual or species... c: an individual, quality, or complex that exemplifies or serves as a standard of the essential features of a group or type..."

Prototypes should exhibit, exemplify, and make vivid and comprehensible the essential features of the system that is being designed, and of its style of user interface, i.e., its look and feel. A prototype should suggest what the application will do, what its essential characteristics are, what it will look like, and how it is to be used. It should ideally incorporate and illustrate a **tiny "critical mass"** subset of system functionality, in other words, its most essential functionality. You will be testing and evaluating your design and interface concepts in Assignment 4 and reviewing the suitability and viability of these concepts.

## PROTOTYPING

There are a variety of methods of prototyping. You should use a **combination** of methods that are appropriate and with which you can be maximally effective. These include:

- scenarios expressed in words
- sketches and storyboards
- physical models
- video sequences and animations
- interactive sequences expressed in computer prototyping media.

Physical models are particularly appropriate for concepts that involve novel hardware, such as mobile devices with special size, weight, or form factors. In all cases, it is **required** that a significant part of this work be done in a computer prototyping medium. We supply Macromedia Dreamweaver, Macromedia Flash, and Visual Basic for this purpose, but you may use a suitable alternative with the explicit permission of your TA. Most acceptable alternatives would likely allow your prototype to be viewable on the Web.

## PROTOTYPING TOOLS

The three environments mentioned above are available in the following location:

Gerstein Science Information Center

CDF-PC Lab, 2nd Floor

9 King's College Circle

< <http://www.cdf.toronto.edu/cdfpc/faq.html#GS1> >

The machines are now labelled "CSC318 SW" on the monitors.

Visual Basic Version 6.0 is also available on all CDF-PC machines, including those in the Bahen building (rooms 2200, 2240 & 3224). Please note the Bahen labs are closed to general use during the day (used for instructional purposes), but freely available evenings and weekends.

Further information about these three environments may be found in the prototyping tutorial document by Daniel Wigdor located on the course web site.

### **YOUR REPORT**

Although every report will be different, it seems likely that you can do a reasonable job of dealing with each issue as follows:

Issue 1: 3-4 pages  
Issue 2: 1-3 pages  
Issue 3: 5-7 pages  
Issue 4: 3-4 pages  
Issue 5: 2-3 pages  
Issue 6: 2-3 pages  
Issue 7: 2-3 pages  
Issue 8: 2-3 pages for each prototype  
Appendices (if appropriate)

### **KEEPING THIS ASSIGNMENT WITHIN BOUNDS**

If you spend more than 24-32 hours per person on this assignment, you are spending too much time. To achieve this goal, it is very important that all members of your group participate actively and collaborate in the work.

### **WHAT YOU SHOULD HAND IN**

You need to email an interim report dealing with issues 1, 2, and 3 to your TA by the due date for Assignment 3a. Your TA will then email you some feedback as quickly as possible.

For Assignment 3b, you need to hand in a diskette containing your prototype and a brief report **IN TWO COPIES**. If the files are too large to put on a diskette (see below), you need to explain in your report how to access the files. The report should deal with issues 1-8.

**The report must be typed and submitted on 8.5"X11" paper. Structure and organization, spelling, grammar, word usage, and document appearance will count for roughly 15% of your grade.** Sketches, diagrams, and tables should be used where appropriate to assist in conveying the concepts. **Papers submitted that are not written in minimally acceptable English will be returned for rework and resubmission.**

Each submission must include a title page with a meaningful title, your names, your student ID#s, your tutor's name, the course name and number, and the date. The second page should contain a very short one-paragraph executive summary of the document, a table of contents, and **a statement of who did what on this assignment.**

The CDF machines only have floppy drives, there are no cd burners, zip drives etc. Users have access to the same files from UNIX clients as they do from the PC clients, i.e. your home

directory on a UNIX client is the "H:\\" drive on a PC client. In other words, if you save to "H:\\" you will be fine.

Files can also be submitted from the PC clients (or home) through the web interface to submit at <https://www.cdf.toronto.edu/students/>. From a CDF unix client use the 'submit' command (see "man submit" for details). The submit system will accept file uploads of up to 100 megabytes. However, there are things that you need consider before submitting files larger than 10 megabytes:

- There is a time limit of 5 hours for all uploads. If your files don't make it across the Internet in that time, your upload will be terminated.
- If you are on a dial-up Internet connection, be aware of the usual transfer speed. For example, under ideal circumstances, it would take 7 hours to transmit a 100MB file over a 33.6K modem.
- If you are on a DSL or cable Internet connection, be aware that the uploads are never as fast as the down loads. On a typical DSL connection, the uploads are transmitted at a maximum speed of 56 kilobit per second, which means that it would take around 4 hours to up load a 100M file.

A few words about the diskette if you turn one in.

1. The name of the file representing your assignment should include 318 Assignment 3 and your project name, as well as an indication of what system it utilizes (e.g., Flash).
2. There must be a paper label stuck on your disk. On it you must **neatly print your project name, the course number, the assignment number, and your tutor's name.**
3. Even if you do this on another computer or with other software tools, you must ensure that your assignment runs on a DCS machine in CDF using its version of one of the software packages, or on its version of a Web browser, or on a Web browser available to your TA.

**IMPORTANT:** If you are going to do this on your own machine, which for many of you is going to be the best strategy, please try submitting an early version to your TA to ensure that everything is going to work.