CPSC 344 Project Part I: Paper Prototyping and Design Weeks 08, 09 and 10

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In the last 6 weeks of the course (Part I and Part 2, each 3 weeks), you will do a larger project that focuses on *design*. As you begin, imagine you are part of a larger team redesigning a system. You have completed the pre-design phase to understand the problem, and are ready to move forward with requirements (adding new functionality, and/or usability/user experience, as user research dictates) to begin designing and evaluating early prototypes.

Part I has weekly in-workshop design reviews, and a final set of deliverables:

W08 Checkpoint Design Review [group] – Propose direction + conceptual models. Specify your topic interface, develop task examples and requirements that your design will support, and develop draft conceptual models for your design.

W09 Checkpoint Design Review [subgroup] – Create a paper prototype. Break into subgroups and create paper prototypes based on the team's conceptual model(s).

W10 Deliverables and Design Review [group] – Perform cognitive walkthroughs and propose Part II plan. Conduct cognitive walkthroughs on your team's prototypes to identify which approaches work best, and identify major issues with the interactions. Present your work to date in a report and video. In workshop, propose a direction for part II.

Checkpoints, Reports and Planning

The **checkpoints** are intended to keep you on track with the project timeline and give you regular feedback. In workshop you will present your plans and/or evidence of your work on the project to date to your TA, and it will be "checked off" according to a few specific marking criteria.

Part I and Part II deliverables (due at 3rd and 6th weeks) will be marked in more detail, and include elements that you have worked on or revised over the full period.

→ *Review the entire 3-week assignment carefully before you start*: *plan your time.*

Team Formation

You will complete the 6-week project (Parts I/II) with **the same team**. Your input on team mates has been requested via survey; staff will post team composition to website/private.

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PART I - OUTLINE OF STEPS

All steps are GROUP unless SUBGROUPS is specified.

Step 1: Select a topic

Choose ONE topic system and ONE topic interface that you will design, from a provided list (on Courseweb/Deliverables). To choose a different focus, discuss with course staff.

Step 2: [Re-] Develop task examples

Develop at least 2 task examples that illustrate the tasks and stakeholders (needs and characteristics) that you feel are most important for your interface to support.

You may use and/or modify any of the task examples provided in the accompanying ProjectTopics doc, and/or any that your team created for MiniProject W06.

Your task examples need to provide you with solid support for your prototype design and evaluation throughout the project. You will be NOT be assessed on their originality.

Step 3: Develop requirements

From your task examples and previous knowledge, generate a short list (3-5) of requirements for the **new/improved functionality** that your interface will support.

Note: The Project Topics document includes a list of existing (already-supported) functional requirements for each topic system. Step 3 requirements are *in addition* to these – do not restate unless they must be revised in view of new functionality your interface will support.

Your goal is to specify the direction your solution will take – many are possible! Consider both functional and usability/user experience requirements, and be **specific to your topic**.

Step 4: Conceptual Design (Brainstorm Alternatives and Conceptual Models)

Brainstorm alternative design approaches to support your task examples (e.g. types of computational assistance, form factor, etc.). Find alternatives that are as different as possible. Then develop and roughly sketch out at least two contrasting draft **conceptual models**.

"Draft" means: not perfect or comprehensive; but advanced enough to help you understand and decide between alternatives. In developing your alternatives, consider:

- useful design *metaphors* and analogies you could employ
- concepts e.g., objects, actions you can do to them; user roles; attributes of both.
- relationships among concepts; and mappings from concepts to the actual task
- interaction types and interface types

This is a **crucial step**! The conceptual model will be the **bones** of your design(s). If you skimp here, you will struggle when you prototype (e.g., put muscle and skin on the bones).

W08 CHECKPOINT (Steps 1-4): by now,

Completed: Steps 1-4. **Design review:** present topic, guiding requirements, task examples, and evidence of conceptual design progress. *See the W08 Design Review, below, for details.*

Step 5: Develop two paper prototypes (SUB-GROUPS)

In this step, your group must develop TWO paper (low fidelity) prototypes that demonstrate how an interface could support your task examples and requirements. Each paper prototype must be developed and submitted by a sub-group of 2-3 team members.

The purpose of these prototypes is to compare design alternatives via "walkthrough" evaluations, and to form a collective template for a medium-fidelity prototype in Part II.

With your entire group, first brainstorm the *questions you currently have* that your prototypes could help you answer, and what you would like to learn by prototyping. Then, identify how you will answer these questions via *choices of prototyping coverage and focus*: who will prototype what?

Coverage by each prototype can vary according to the following constraints:

- *Prototype two different interfaces:* EITHER two variants for one conceptual model; OR, if you aren't sure which model is better, one interface for each model to help you decide.
- *All together*: the group's prototypes should support all of your <u>key task examples</u>. A given prototype need only support one task example (but can support more).
- *All together*: the group's prototypes should cover the <u>core views</u> that illustrate how the interface will work. Emphasize elements central to your tasks and requirements.
- *Subgroups should coordinate loosely.* Your goal is to generate diverse alternatives and perspectives. Thus, beware of either management extreme: "divide and conquer" (everyone prototypes completely different elements), *or* centrally controlling what each person does. Allow overlap and freedom, while communicating and inspiring each other.

Scope: When deciding how far to take your prototypes –

- Consider what this prototype is to be used for. Do no more, no less than needed.
- Only if the scope is small should the prototype be comprehensive. Instead, make visible or interactive the subset of functionality that is crucial to your tasks and requirements.
- It does not need to capture every little detail, but should capture the details that will dominate the experience of using it.
- Illustrate in principle how the user will view and interact. Prettiness and completeness could be a liability (participants respond to wrong things; inefficient for designer).

W09 CHECKPOINT (Step 5): by now, Completed: Step 5. Design review: present paper prototypes (*W09 design review for details*).

Step 6: Cognitive Walkthrough (CW)

Perform cognitive walkthroughs (CW) on BOTH Step 5 prototypes, using the task example(s) that each prototype was constructed to support. Post-CW, you will decide on one or a complementary set as your Part II design focus.

- Who does the CWs? Each CW should employ at least one designer and one other 'expert evaluator' (team member / classmate). Balance usefulness of involving all team members (note taking, and to support discussion) with its cost in logistics and time.
- **How**: See textbook / class notes. The designer(s) must provide direction about action sequences for the task. Take care not to bias other evaluators in answering CW questions.

Step 7: Set the focus for Part II – Evaluation goals and prototyping plan

In Part II, you'll build and evaluate a medium-fi prototype. To plan strategically:

- i) Set direction of next iteration: Based on your CW results, which conceptual design(s) and paper prototype(s) were most effective? Which (or combination) should go forward?
- ii) Set Part II prototype evaluation goals: Generate a list of usability and UX goal(s) based on the requirements and task examples your interface must support. Prioritize based on (a) importance, and (b) your ability to test them in 344 context.

From these, choose 1-2 goals to focus on, and **translate into 2-3 evaluation questions** to answer with a usability study on your Part II medium-fidelity prototype.

iii) Make a Part II medium fidelity prototyping plan: Set scope, approach, and platform.

All teams will build **one functional prototype,** to support a usability study to evaluate your design: that is, to find points of usability "friction" in the implementation.

- (a) Scope: Except for a quite simple interface, you don't need to implement everything.
 - Horizontal, vertical or both? Which regions of whole interface will you cover?
- (b) Strategic Approach planning questions to consider at this point include:
 - How **interactive** and **functional** does it need to be? What must it be able to do?
 - How important is **appearance**?
 - Does the **data** need to be real? Is it easier/acceptable to **fake it for now?**
 - Does it need to **run by itself**? What can be Wizard-of-Oz'ed, i.e. simulated with a low-tech, scripted not coded approach? Will this be informative at less effort?

Based on these answers, choose a subset of *aspects* of the chosen scope you should prototype at this time. Avoid simultaneously implementing aspects that make the mockup hard to build - e.g., both physical/shape and dynamic graphics - unless it's easy, or important. Aim for the greatest insight at least effort. Less is good!

(c) **Platform:** Propose the prototyping tools you will use. You should choose based on your group's skills/comfort level, and the requirements for the prototype. The methods introduced in the pre-readings or in class (Axure, HTML, PowerPoint) are recommended. If you wish to use different a tool/language, discuss with your TA.

W10 REPORT & DESIGN REVIEW (Steps 6-7):

Completed: 6-7. **Report**: Submit details of your work to date and a paper prototype video. **Design review (Step 7): Submit a plan (slides)** for Part II of the project. *See the W10 Deliverables for details.*

W08 CHECKPOINT DESIGN REVIEW: Direction & Conceptual Models (Steps 1-4)

Type: In-workshop design review

Length: **5 minutes** to present to TA; plus additional time for discussion and TA questions *Handin:* Group hand-in of slides for informal presentation, at time identified on dashboard

Checkpoint Design Review Components

This checkpoint's goal is to ensure you are on the right track. You will **hand in a summary presentation; then briefly walk your TA** through the requirements and task examples that will guide your project, and summarize your conceptual design progress. Your requirements, task examples and conceptual model(s) should be finalized enough to support you in starting to prototype, but may still evolve through the project. You will submit them in the W10 report.

Design Review Format

Coverage and timing: In your brief presentation, you need to cover all required points (below) in a brief time, so plan what and how you will convey your:

- project topic
- requirements
- task examples
- conceptual designs

Discussion: Your last slide should have questions on which you specifically want feedback. One of them should be to ask your TA for his/her general feedback and advice. Prioritize your discussion points to ensure you get the feedback you need.

Required materials

Have evidence you've created the above items. Use whatever combination of *slides, images and diagrams, point form or paragraph notes, drawings on the white board, etc.* is effective. Leverage documentation your team is already producing (and/or will use in the final report). You won't be able to cover everything in detail, but on request, be able to produce any work you list as completed.

Marking Scheme

[Tentative rubric at end of this document] Your *individual* checkpoint mark will be affected by your participation in the design review and demonstrated ability to describe personal contributions to the project. As a *group*, you will be evaluated equally on:

- *Definition elements* (topic, proposed task examples and requirements for the new functionalities the new interface will support) are of *appropriate scope and detail* to support design and prototyping steps.
- *Conceptual design progress is adequate.* Appropriate *breadth* of alternative approaches has been considered.
- Overall quality is high: project effort, maturity, depth, thoughtfulness, creativity, etc; presentation organization, correctness, completeness, understandability.

W09 CHECKPOINT DESIGN REVIEW: Paper Prototyping (Step 5)

Type: In-workshop design review

Length: **5 minutes** to present to TA; plus additional time for discussion and TA questions *Handin:* Group hand-in of slides for informal presentation, at time identified on dashboard

Checkpoint Design Review Components

By now, your low-fidelity prototypes should be in a form suitable for performing a cognitive walkthrough to evaluate a task example. In the checkpoint, you'll describe your prototyping approach, and briefly walk your TA through your subgroups' prototypes.

Design Review Format

Coverage and timing: In your brief presentation, cover:

- The rationale for how you divided your prototyping efforts between subgroups; what did you want to learn with each prototype?
- The overall approach/major design direction taken with each prototypes.
- A demonstration (prototype walkthrough) of the task(s) the prototype supports and what prototype consists of (e.g., screens, paper elements, etc.).

Discussion: Your last slide should have questions on which you specifically want feedback. Prioritize discussion points to ensure you get the feedback you need.

Required Materials

Bring your paper prototypes. For the rest of your presentation, use whatever combination of *slides, images and diagrams, point form or paragraph notes, drawings on the white board, etc.* is effective. The *slides* you hand in should include images / diagrams of your prototype progress as well as coverage of the items above.

Marking Scheme

[*Tentative rubric at end of this document*] Your *individual* checkpoint mark will be affected by your participation in the design review and demonstrated ability to describe personal contributions to the project. As a *group*, you will be evaluated on:

- *Prototyping rationale:* Brief description and justification of how prototyping efforts were divided, and what you wanted to learn.
- Brief overview of the prototypes: major design decisions, tasks they support, etc.
- Overall quality is high: project effort, maturity, depth, thoughtfulness, creativity, etc; presentation organization, correctness, completeness, understandability.

W10 DELIVERABLE: Prototyping Videos & Cognitive Walkthrough Report (Steps 5-6)

Type: Group assignment

Hand-in: Group hand-in, at time identified on dashboard (one per team, blending the work of both prototyping subgroups).

Deliverables

1) A report that covers (see template for report organization):

- Project direction, including requirements and guiding task examples
- Summary of low-fidelity prototyping rationale.
- Findings from cognitive walkthroughs of both paper prototypes.
- Requirements and task examples driving your design, with report of any revisions.

2) Two short videos, each documenting the paper prototype created by your subgroup.

Formatting and Submission

1) **Report**: follow general formatting and submission instructions on courseweb/Deliverables.

2) Videos: post online and submit a link to your video in Appendix A.2.

- Post your video to a website that supports streaming (e.g., YouTube or Vimeo). *Ensure your TA won't need to create an account to view them.*
- You may NOT change your video after the deadline. Evidence that you have done so will result in a mark of 0.

Marking Scheme

See tentative rubric at end of this document. In brief, marks will be based on quality of the design, and of the prototyped representation; project direction and subsequent design rationales; the cognitive walkthrough report's quality and sophistication of findings, and the overall presentation quality of the report.

Report Components

Project Direction (1-1.5 pgs; Steps 1-3)

- a) *Topic* (*Step 1*): Specify which topic and subtopics your group has chosen. (1-2 sentences).
- b) *Requirements (Step 3):* List the requirements (at least 3-5) for the new functionality that your interface will support (bullet list). Briefly justify these requirements.
- c) Task Examples (Step 2): Provide at least 2 task examples that describe the tasks and stakeholders that your interface will support

Paper Prototyping Rationale and Cognitive Walkthrough Report (1.5-2 pgs; Steps 4-6)

d) *Summary of Brainstorming and Conceptual Design (Step 4):* Briefly describe and illustrate (e.g., with hand-drawn sketches, computer-aided drawings, storyboards, diagrams, etc.) the conceptual model(s) that form the foundation of your design. You may include images or photos in the appendix a.1) and refer to them as necessary.

- e) *Paper Prototyping Rationale (Justification for Step 5):* Outline your team's overall prototyping approach (e.g., scope, coverage, etc.), and justify these decisions. Refer to video and/or images in Appendix A.2 and A.3 as necessary. <u>*Clearly identify subgroup members.*</u>
- f) Cognitive Walkthrough Findings (Step 6): Briefly describe the walkthroughs performed and task examples used, and summarize the good and bad that you found in your walkthroughs. Relate these findings to your prototype implementation and conceptual design.

Appendix A (No page limit)

A.1) Conceptual Models Images (Step 4): You should caption any images with brief descriptions.

A.2) *Paper Prototyping videos (Step 5):* More detail on videos is just below. For each prototype video, provide a link to the video.

A.3) Supplemental Paper Prototype Images (Step 5; Optional)

- Include images demonstrating additional features or aspects of your paper prototypes that are not well documented elsewhere, but that you feel are important for understanding the quality or rationale for your prototype.
- Any images included should be captioned, and should be chosen for a purpose (i.e. explain what they show that isn't documented elsewhere).

Video Component Requirements (2 videos – 1 per paper prototype)

Expected length per video: max length 3 minutes.

Each subgroup must create a short video documenting their paper prototype. The video needs to be understandable and clear enough to see the details of your prototype, and communicate the following information about your prototype:

- i. Briefly describe the purpose of the prototype and tasks that it supports.
- ii. Explain your overall approach/major design decisions and any known limitations.
- iii. Walkthrough the screens and actions required to complete the goal and task(s) described, providing as much explanation as needed to largely follow what you show on screen.

Resources for recording video

- Use any device to record your video. Cell phone or digital camera video are fine. This will be the most workable approach for nearly all teams.
- There are a limited number of video cameras available to borrow for 1-2 hour blocks. Arrange with your course TA at least 48 hours before you need to use it.

W10 DESIGN REVIEW: Part II Plan (Step 7)

Type: in Workshop design review

Length: **5 minutes** to present to TA; plus additional time for discussion and TA questions *Handin:* Group hand-in of slides for <u>formal presentation</u>, at time identified on dashboard

Design Review Components

In your design review following W10 report submission, your team will present your plan for the project Part II to your TA. You should also come with questions to elicit feedback from your TA. *Our goal is that by the end of this workshop*, you are in a position to start work on your medium fidelity prototype and your detailed Part II evaluation plan.

Format

This design review requires a slightly more formal TA presentation than in the checkpoints. You must cover all required points in the time provided; plan well. Walk your TA through your:

- **Direction for next iteration** (*Step 7i*): Outline the direction for the next design iteration based on your findings from the cognitive walkthrough. Which element(s) from your paper prototype and will your carry forward or change?
- **Part II Evaluation Goals** (*Step 7ii*): Outline the 2-3 questions (your evaluation goals) that you will evaluate with your medium fidelity prototype.
- **Part II Prototyping Plan** (*Step 7iii*): Describe your planned scope for the medium fidelity prototype you'll build.

Required Materials:

Your Part II plan, organized as a simple *slide presentation*. Aim for about 1, or max 2 slides per the three points listed above. You will NOT have time to cover everything in detail, *but you must be able to produce any work completed to your TA upon request*.

Marking Scheme

[Tentative rubric at end of this document] Your individual design review mark will be affected by your participation in the design review and demonstrated ability to describe personal contributions to the project. As a group, you will be evaluated equally on the following criteria:

- Outline of a *reasonable direction for Part II* based on what was learned in through the paper prototyping and cognitive walkthrough.
- 2-3 evaluation goals to be investigated with the medium fidelity prototype, and a reasonable *scope for that prototype* that makes sense with the goals.
- *Overall quality: project* effort, maturity, depth, thoughtfulness, creativity, etc; *presentation* organization, correctness, completeness, understandability.

W08 CHECKPOINT DESIGN REVIEW: Direction & Conceptual Models (Steps 1-4)

	LEVEL		MARK	WEIGHT
Design Review Presentation and Content			0	0.75
Gave brief, effective descriptions of project topic, proposed task examples and requirements for the new functionalities the new interface will support.		←		25.0%
Conceptual designs sufficiently complete and coherent to support design and prototyping steps.		~		25.0%
Provided evidence of conceptual design process, and demonstrated breadth of alternative approaches considered		←		25.0%
Overall Quality			0	0.1
Presentation as a whole showed organization, preparedness, coherence, cohesiveness, etc.		←		10.0%
	_			
Individual Participation	1 or 0		0	0.15
Participated in the design review (presenting, and/or engaging in effective discussion with TA). Upon request, was able to articulate appropriately scoped personal contributions to the team's work this week.		←		15.0%
Penalties and Bonuses				
Up to 5% deduction for issues with any of: presentation (grammar, misnamed files, unreasonable length, etc.); Timeliness.				
Bonus for creativity, originality, etc. up to 5%.				

TOTAL:	0.0%	100%
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W09 CHECKPOINT DESIGN REVIEW: Paper Prototyping (Step 5)

		MARK	WEIGHT
		0	0.75
	←		25.0%
	~		25.0%
	←		25.0%
		0	0.1
	←		10.0%
1 or 0		0	0.15
	←		15.0%
1			
	1 or 0	← ← 1 or 0	← ← ← 0 ← 1 or 0 0

TOTAL: 0.0% 100%			
	TOTAL:	0.0%	100-70

W10 DELIVERABLE: Prototyping Videos & Cognitive Walkthrough Report (Steps 5-6)

	LEVEL	MARK	WEIGHT
Quality of Paper Prototype #1 + CW (sub-group)		0.0%	15%
Video of prototype describes prototype and tasks, explains major design decisions and limitation, and provides a clear walkthrough of major goals/tasks	-		5.0%
Creativity, resourcefulness, effectiveness, reuseable, apprioriateness for purpose, etc. as evident from video	←		5.0%
Usability of design (appears efficient, easy to use, memorable, etc.) as evident from video	←		5.0%
Quality of Paper Prototype #2 + CW (sub-group)		0.0%	15%
Video of prototype describes prototype and tasks, explains major design decisions and limitation, and provides a clear walkthrough of major goals/tasks	←		5.0%
Creativity, resourcefulness, effectiveness, reuseable, apprioriateness for purpose, etc. as evident from video	←		5.0%
Usability of design (appears efficient, easy to use, memorable, etc.) as evident from video	←		5.0%
		0.00/	200/
Project Direction Project Topic	←	0.0%	20%
Requirements, suitable for supporting project	← ←		3.0%
Task Examples, suitable for supporting project	<		3.0%
Brainstorming and Conceptual Design; effectively illustrates the conceptual model(s) that form foundation for later design	←		13.0%
Paper Prototyping and Cognitive Walkthrough Strategy		0.0%	35%
Paper Prototyping Rationale: makes clear overall approach and justification	<i>←</i>		15.0%
Cognitive Walkthrough Summary: outlines findings and conclusions that can be made	~		20.0%
Appendix		0.0%	5%
A.1 and A.2 presented and prepared correctly. If A.3 is included, prepared correctly and adds effectively to content in report.	<i>←</i>		5.0%
Overall Quality		0.0%	10%
Presentation as a whole showed organization, preparedness, coherence, cohesiveness, creativity, etc.	←		10.0%
Penalties			
Up to 5% deduction for issues with any of: Presentation (professionalism, etc.); Preparedness (e.g., evidence and materials available to show to TA); Timeliness.			
TOTAL:		0.0%	100%
IUIAL:		0.0%	100%

W10 DESIGN REVIEW: Part II Plan (Step 7)

	LEVEL		MARK	WEIGHT
Design Review Presentation and Content			0.0%	75%
Outlined a reasonable direction for Part II based on what was learned in through the paper prototyping and cognitive walkthrough.		←		25.0%
Presented 2-3 reasonable evaluation goals to be investigated with the medium fidelity prototype		←		25.0%
Presented a reasonable scope for the medium fidelity prototype that makes sense with the goals.		←		25.0%
			0.00/	100/
Overall Quality			0.0%	10%
Presentation as a whole showed organization, preparedness, coherence, cohesiveness, etc.		←		10.0%
Individual Participation	1 or 0		0.0%	15%
Participated in the design review (presenting, and/or engaging in effective discussion with TA). Upon request, was able to articulate appropriately scoped personal contributions to the team's work this week.		~		15.0%
Penalties and Bonuses				
Up to 5% deduction for issues with any of: presentation (grammar, misnamed files, unreasonable length, etc.); Timeliness.				
Bonus for creativity, originality, etc. up to 5%.				
TOTAL:			0.0%	100%

TOTAL:	0.0%	100%