
CSC 2002S: MOBILE DESIGN & DEVELOPMENT

Melissa Densmore – Second Semester 2021

INTRODUCTION

Your assignment is to design a digital mobile solution that will address the problem statement below. A3 (Phase 1, due 17 Sept, weighted 40/100) is the first step towards this goal – gaining empathy for potential users through interviews and analyzing the results. Based on these results and principles covered in lectures, in A4 (Phase 2, due 8 Oct, weighted 60/100) you will prototype a digital solution and justify the design.

A3 is to be done individually, and A4 may be done individually or in pairs. At the top of each page of your assignment please indicate your names (both names for students working in pairs). If you are working in pairs only one person should submit the assignment.

To help you plan and prepare, both assignments are being released and described in this document.

This assignment is based in part on “[The Wallet Project](#),” a resource created by the Hasso Plattner Institute of Design at Stanford.

PROBLEM STATEMENT

*Design a digital tool help young kids learn to read
analog and digital clocks.*

Telling time is a key life skill, and a core part of the [South African Mathematics curriculum during the foundation phase \(Gr1-3\)](#). We will use the Grade 2 curriculum as a starting point for learning goals:

- Tell 12-hour time in hours, half hours and quarter hours
- Use clocks to calculate elapsed time in hours, and half hours
- On analog and digital clocks

A5 (PHASE 1) GAINING EMPATHY

Marks – 40 points

The goal of this assignment is for you to explore user-centered design by gaining empathy for potential users of your design. For this assignment you will interview three potential users - anyone who reads books to young children. From there you will analyze the interviews by building an empathy map and ideate by making some quick sketches. You will also provide peer feedback on sketches done by your classmates.

Lecture MDD01E gives an overview of the assignments. You will also find Lecture MDD01D on Empathy especially useful as you do this assignment.

I. INTERVIEW (20 POINTS)

Keep interviews fairly short, aim for about 15-20 minutes each. Do maintain social distance – interviews via call or chat are fine, but make sure to establish rapport with the interviewee before you start asking questions.

Participants can be anyone who has a perspective on learning to tell time – typically foundation phase teachers, parents with children 6-10y, and 7-10yr old kids. They should be people with experience with children, and preferably with mobile device experience. Try to find people that may provide different perspectives. If you interview anyone under 18, please secure the permission of a parent or guardian first.

The questions that follow are intended to help guide your interview. You may have to adjust the questions based on who you have interviewed. You may find that answers (especially typed in chat) are a bit short. If that happens, “dig deeper” and invite them to tell you more. If they share something unexpected, ask “why?”

Interview Guide

1. Tell me about your experiences teaching your children how to read a clock.
Potential follow up questions. What do they struggle the most with? Do they have homework related to this topic? Are they excited to learn?
2. Do you ever use your phone or another device as a teaching aid?
 - a. *If yes:* What apps do you use? What is it like? What works and doesn't?
 - b. *If no:* Why not? *Dig deeper.*
3. How do you feel about the idea of a digital tool to support learning to tell time? Why?
4. What might be some good ways to approach this?
5. Are there any constraints or wishes we should think about when designing a solution?
6. What features would you want to see? Why?

You will submit transcripts or detailed notes of each interview, but make sure to remove/redact any personal information (e.g. names, phone numbers). In addition, write a

short paragraph summarizing how you recruited each participant, provide a bit of demographic background on your participants, and discuss any potential biases of your selection (i.e. who is or is not represented).

II. AFFINITY SORTING (5 POINTS)

Once you have completed the interviews, you should do an affinity sort on the insights from each user. You can do this with paper stickies and take a photo (make sure it is legible) or use an online virtual sticky service such as Jamboard (jamboard.google.com), Stormboard, Miro, or even just squares in PowerPoint. Submit a photo or screenshot of the stickies.

III. EMPATHY MAP (5 POINTS)

Based on the affinity sorting, build an empathy map for your interviewees. Submit a photo or screenshot of the empathy map.

IV. IDEATE (5 POINTS + 5 POINTS FOR PROVIDING PEER FEEDBACK)

Based on your results, take a stand with a point of view. Completing this statement:

Parents/learners need a way to _____ because (or “but” or “surprisingly...”)
user's need

insight

Sketch at least 5 radical ways to meet your users' needs. They do not need to be perfect – merely to capture your ideas! Try not to spend more than 5-10 minutes doing these sketches – go for volume! You can use words to help clarify or capture your ideas – the goal is to brainstorm many ideas. You will also submit this as a separate assignment. Peers will be asked to give you constructive feedback on the sketches.

You are not being marked on the quality of the sketches, just the quantity. Your score for this section will be 1 point for each unique sketch provided plus five points based on the quality of feedback provided to your peers. You are expected to provide feedback on three other submissions.

FORMAT FOR REPORT

You will submit this assignment twice, once for tutor marking and once for peer feedback. Submit a single PDF or DOCX document with all of the above (including the Ideate section), making sure to clearly mark each section:

- I. Interviews
 - a. Transcript 1
 - b. Transcript 2
 - c. Transcript 3

- II. Affinity Sorting (paste readable image)
- III. Empathy Map (paste readable image)
- IV. Ideate (number the sketches)
 - a. Sketch 1
 - b. Sketch 2
 - c. Sketch 3
 - d. Sketch 4
 - e. Sketch 5

PEER MARKING (5 PTS)

You will be given three assignments to peer-mark. For each submission give written feedback (50-100 words each) on your likes and dislikes about the different sketches, which one is your favorite? Would you like to mix any of them up? What are some questions that you think arise in response to the interviews? Try to situate your feedback using concepts taught in this course.

In addition to the written feedback, give a score of 1-3 as follows:

- 0 – no submission, or interviews are too brief to be useful
- 1 – No sketches, only interviews
- 2 – Some sketches that convey at least one idea, not necessarily linked to interview data
- 3 – Several sketches effectively convey a variety of ideas that helped to inspire more ideas myself. Sketches clearly linked to interview data.

The tutor will mark your feedback (5 points) based on the number of submissions (up to 3) on which you have provided constructive feedback, with additional points for details and especially helpful feedback. The peer marks and feedback are for the next assignment and will not be incorporated into your final mark.

MARKING RUBRIC

Category	Marks	Guideline
Interviews: Notes	10	0 - no interviews documented 1-2 Only one interview documented, documentation may be unclear (1) 3-4 Only two interviews documented, documentation may be unclear (3) 5-6 At least three interviews documented but missing details (i.e. not all questions answered) and is difficult to read 7-8 At least three interviews documented, all details present, but difficult to read 9-10 High quality transcripts or detailed notes, clearly communicated

Interviews: Recruitment	5	<p>0 - no summary provided</p> <p>1 - overall description of participant demographics, but not clear how they were recruited</p> <p>2 - explanation of how participants recruited (e.g. I asked my roommate), uses the word "random" to refer to haphazard or convenience sampling</p> <p>3 - as above, discussion of potential biases present, but may have flaws or be incomplete</p> <p>4 - as above, and participants represent some variety of potential perspectives, acceptable discussion of potential biases</p> <p>5 - explanation of how participants recruited using research terms (e.g. snowball, convenience sampling), good discussion of potential biases, acknowledges limitations of the sample</p>
Interviews: Depth	5	<p>0 - interview seems to have been done as a simple survey, no follow-up on answers at all</p> <p>1-2 Some attempted follow-up evident, but answers are brief</p> <p>3-4 Clear attempt to engage deeper, frequent use of "why" or "tell me more", interviews clearly respectful of participants</p> <p>5 insightful interviews, clearly respectful of participants</p>
Affinity Sorting	5	<p>0 No affinity map</p> <p>1 Something attempted but isn't an affinity map</p> <p>2 Stickies present but no categories, or unreadable</p> <p>3 Stickies sorted into high-level categories, but seem a bit sparse (not many stickies or not many categories)</p> <p>4 Stickies clearly emerging from interviews and represents the data well, and sorted into helpful categories.</p> <p>5 As above. Categories should not be exactly the same as the interview questions</p>

Empathy Map	5	<p>0 No empathy map</p> <p>1 Something attempted but isn't identifiable as an empathy map</p> <p>2 Structure of empathy map adhered to, but it doesn't provide insight into a shared understanding of the user, or is very confusing</p> <p>3 Empathy map(s) which capture user insights</p> <p>4 Well documented and readable empathy map(s) which capture user insights in all categories (says, thinks, does feels)</p> <p>5 Insightful empathy map that has clear linkages to the affinity map/interviews</p>
Ideate: Sketches	5	<p>1 point per sketch of unique idea, up to 5 points</p> <p>Note it doesn't have to be a detailed sketch/prototype, or represent the whole interface, just capture an idea. We are aiming for quantity over quality at this stage.</p>
Ideate: Peer Feedback	5	<p>0 No peer feedback given, or feedback is denigrating or disrespectful</p> <p>1 One peer feedback given, with constructive feedback</p> <p>2 Two peer feedback given, with constructive feedback</p> <p>3 Three peer feedback given, with constructive feedback</p> <p>4 Three given, with detailed constructive feedback</p> <p>5 Three given, with insightful and especially helpful feedback</p>

A4 (PHASE 2) DESIGN A PROTOTYPE

Marks – 60 points

You need to design a prototype based on your results from Phase 1. You should start by listing three or more primary features for the system, explaining why you think those features are useful for addressing your revised problem statement. Do not just give your personal opinion - think about the social issues discussed in lectures, and design patterns you may have seen in similar apps. You may want to quote interviews or peer feedback where relevant. For the purposes of this assignment a feature is a significant piece of functionality encompassing a particular user goal, rather than individual buttons or settings.

Next, you need to design how the interface for this functionality will appear. To that end you need to create a prototype and annotate it with a rationale for your design; be prepared to explain why your design looks the way it does with reference to the design ideas in the lecture. Simply stating that you think your design looks nice does not constitute an acceptable rationale. The more (relevant) information you can give about why the interface looks and works the way it does, the more marks you will receive. Where relevant, reference specific design principles and sources using academic conventions for referencing¹.

You are encouraged to explore native android development or other mobile development frameworks (e.g. Flutter, React). However, for this assignment, you are not required to implement this as an android application – you may use any prototyping tool, such as Invision, POP, Fluid UI, or PowerPoint. Hand-drawn images are also acceptable but must be readable. You should justify and discuss the fidelity of the prototype.

For this assignment, you will submit a written report of up to 3500 words, containing:

- Overview of the solution architecture: Describe your problem statement, your target audience and any assumptions you have made. Then provide an overview of the solution and how it meets the needs of your target audience.
- Overview of the solution's interface, showing how the features you choose fit together in the overall solution.
- A list of features with an explanation for their inclusion
- An initial design for each feature. This will consist of a number of screenshots, with clear markings of how one transitions from one screen to the next. It may be easiest to have a diagram with numbered elements and refer to those numbers in the text. Be sure to show how errors or edge cases would be handled in your design. *Diagrams may be hand-drawn if desired but must be clear to the reader.*
- For each feature, justify the design; explain why it looks and works the way it does. Do not just state the name of relevant design principles, but make an argument for why others will appreciate your design.

¹ Do not reference lecture slides. It is sufficient to reference specific principles by name, but ideally you will make reference to primary sources (e.g. published ACM papers).

GRADING

OVERALL ARCHITECTURE: 5 MARKS

Give an overview of your target audience. Based on this, describe and give a rationale for an overall architecture for your digital solution. If it is a mobile app – will this be a web app or a native android app? Is a server required to interface with the app? If it is something different, how is it all put together? Discuss how your choices include or limit use of your solution by different populations. Will it work for bandwidth-constrained users? If you are still in the paper prototyping stage, propose an architecture and justify it.

Score	Description
Not complete (0)	No answer, or answer fails to give an overview.
Poor (1-2)	No rationale given, or architecture is incomplete or unclear.
Sufficient (3)	Good description of overall architecture. Brief rationale based primarily on developer constraints.
Good (4)	Good description of overall architecture. Brief rationale linked to target audience needs. Target audience and their requirements are clear.
Exemplary (5)	Strong discussion and targeting of the architecture to a target audience. The proposed solution is likely to be inclusive of a wide audience (e.g. accessible, bandwidth-friendly).

OVERALL DESIGN AND LAYOUT: 10 MARKS

Provide an overall design for your finished app, showing how all of your features will interact. Make sure this corresponds to your explanations with the rest of the assignment. You should discuss your target users and state any assumptions. Specifying the device(s) that the app would run on may be helpful too.

Score	Description
Not complete (0)	No layout section or screenshots provided
Poor (1-3)	Screenshots incomplete or screenshots provided but it is not clear how the different features and screens will interact.
Minimal (4-5)	Layout is specified but the features or designs do not mesh well together, or are confusing to the projected user.
Sufficient (6-7)	Interactions between features are clearly specified, with markings for how various features are invoked, and how different user interactions lead to changes in screen layout. Fidelity of the prototype discussed and justified.
Good (8-9)	All of the above, and the screenshots adhere to the appropriate platform design principles (probably android). Clear synthesis of the app overall (i.e. consistent fonts, buttons, etc).
Exemplary (10)	Strong discussion and targeting of the designs to a target audience, complete application specification, accounting also for application and user errors.

FEATURE RATIONALE AND DESIGN: 45 MARKS

Each feature is worth 15 marks. Up to 3 features will be marked. If you have added more than three features, you should clearly indicate which you want to be marked, or they may be selected at random.

- **Feature Rationale (5 marks):** Fully justify the features that you decided to include. Include details of any research or experience that lead you to choosing them with referencing.
- **Design (5 marks):** Document your screenshots, showing how to trigger transitions, and clearly showing the interface for your feature.
- **Design Rationale (5 marks):** Explain your design fully, linking it to the concepts and ideas that you were taught in class. Include in this the ways in which it conforms to the different standards and models, if appropriate. Every design decision should be motivated.

	Not Done (0)	Fair (1-2)	Good (3-4)	Excellent (5)
Feature Rationale	No feature specified, or feature is not significant.	Feature described adequately but not justified.	Feature justified.	Clearly articulated and cited rationale for feature.
Design Prototype	No design specified, or design unclear.	Prototype provided (of any fidelity) but transitions and where it fits in the existing app are unclear	Clearly depicted prototype including transitions, error handling and synthesis with current app	Innovative prototype, clearly articulated, leverages affordances and mappings in an intuitive way.
Design Rationale	Design not justified.	Justification is given but doesn't reference design principles or other concepts taught in class	Justification includes either an explanation of how it adheres to standards and models or it is linked to HCI and design concepts	Justification correctly references both appropriate standards and HCI design concepts.

For resources on academic report writing, please refer to Vula resources, and visit the [UCT Writing Centre website](#) for additional resources. Any images included should be clearly numbered and captioned. Please use the [ACM citation style and reference formats](#).