

1. Who are the project users (both generally and specific users who have agreed to help you in the project) and what user problems or opportunities is your project trying to address? Please provide approximately one page of detail on what you have learned about these users and their problem(s) that shapes your project.

Our target users are medical students who take notes on a tablet. The specific users who have agreed to help us include med students at the University of Minnesota, as well as a practicing pharmacist who has been in the workforce for roughly five years. We are trying to address the difficulties of note taking and retention of college course material. During one of our classes, Professor Konstan described the general lecture class structure as “information being transferred from the mind of the professor to the notes of a student, when it should ideally be from the mind of the professor to the mind of the student.” Hand-written notes are more effective than typed/digital notes, because writing out the content allows the brain to better digest the information that’s being processed.

However, that isn’t always achievable during lecture because the speed at which the professor speaks is often much faster than a student can realistically hand write their notes. Handwriting also benefits users in being able to write out complex diagrams or images, which allows them to gain a deeper understanding than they would copying and pasting images digitally. However, students often end up using digital notes despite their shortcomings because of the convenience and ease of use they provide. Our goal is to create a digital note taking system that allows for the detailed and organized structure of handwritten notes, while still providing the convenience and ease of use of digital notes.

Our specific users are medical students because of the wide range of informational content they need to understand in order to succeed in their courses. They need to know very minute details about interconnected systems – for example, anatomy students must know both the layout of the digestive tract, as well as the structure of each individual organ. Our interviewees presented a number of problems with their current and/or previous note taking style. These problems include struggling with high level organization of notes, as well as sectioning off larger pieces of notes into smaller ones. Our interviewees also expressed an interest in the prospect of better handling of images inside documents, citing Google docs’ handling of images as the comparison example.

2. **Include at least two persona descriptions and at least two detailed task descriptions that encapsulate what you've learned from your users. If the users carry out the tasks using existing tools, then also include scenario descriptions for how they accomplish those tasks today.**

Persona 1 : Carlos is a 25 year-old Mexican-American pre-med student who is studying to become a Pharmacist. At his age, he makes sure to take school very seriously, putting it at a high priority. Most of his time is spent either working or attending courses, so he puts value to his note taking methods. His first language is Spanish, so when he attends lectures he makes sure to take down quick notes on the key points of the lecture in English on a Word document on his laptop. Then when he goes home, he sits down and rewatches the lectures while hand writing out more detailed information in Spanish in order to better retain all the concepts mentioned. This allows him to keep up in lectures while also learning all the in-depth information he needs.

Scenario description:

Carlos is attending his fifth BIOL 2531 lecture during the fall semester, ready to take down his notes. He brings out his laptop and pulls up Microsoft Word and creates a new document, and takes down key points that were discussed during lecture. He doesn't care about the specific details yet. Using his laptop helps with being able to keep up with the professor's pace. Later in the evening, he sets aside some time to go over the lecture's recording. While rewatching the lecture, he uses a pen and his notebook to rewrite everything and solidify what was lectured. This helps him retain the important information while also making sure he did not miss anything from before. After all, they do say that you remember things better when you physically write them out.

Persona 2 : Bill is a Kinesiology major in his sophomore year of college. He was a football player in high school, so he spends his free time watching the NFL and college football instead of studying, mentally checking out the moment he leaves his lecture. Unfortunately, this inevitably leads to him cramming the night before his unit tests. Once every two weeks, he throws together a study guide on the most recent chapters as quickly as possible, then stays up all night memorizing as many facts and definitions as he can. The next morning, he'll come to class, take the quiz, and promptly forget most of what he learned the night before.

Scenario description:

It's Sunday night and Bill has finally begun studying for his Kinesiology unit 3 exam tomorrow. The professor recently released the study guide on Canvas, so Bill opens it up and uses it as a basis for his notes. He opens Google Docs on his laptop, and creates a new document. He doesn't bother putting it in a folder; he won't have to study this information again until midterms. He copies down the definitions of different nervous system cells from his textbook, sorting them into categories based on which part of the nervous system they're found in. Below these categories, he writes assorted information about neurons. He pastes diagrams of these cells at the bottom of the page, so they don't take up too much space. While the notes don't look too pretty, he doesn't see the point of spending the extra time to add bullet points.

- 3. What is the competitive space and context of the project? What are other tools that attempt to address the same need (and what is inadequate about them that leads you to believe you can do better)? What are other tools your project needs to work together with? (one page or less)**

There are a variety of digital note taking apps used on a multitude of different devices. However, these apps rarely utilize the digital format to create a more effective note taking tool. Tablet applications like Notability offer an effective simulation of pen-and-paper notes. Yet, aside from a few extra useful features (like moving text around or pasting pictures), the application offers no organizational tools beyond sorting notes into folders. Computer-based alternatives like Google Docs have their own set of problems, with images affecting formatting. To us, this is a missed opportunity that we seek to fill.

There exist digital note taking apps that offer the user tools to better organize their notes. Unfortunately, these tools are often too complex to be useful in a school setting. Obsidian, for example, offers the users ways to map out different note pages and link related concepts. Evernote has an advanced tagging system, geared primarily towards personal use and planning. While these programs are certainly useful, they are not intuitive. All these advanced note apps come with their own learning curve. This curve acts as a barrier of entry; students do not wish to invest their limited time into learning how to use a note-taking program, especially when simpler ones exist.

Still, it is clear that students prefer to have some sort of organizational structure when taking notes. Even when using pen-and-paper, students will often use color, bullet points, and drawings to map out related concepts. The benefits and drawbacks of using pen-and-paper are rather self-explanatory: writing has been shown to improve memorization, but is less convenient than using a computer or tablet. While the benefits are difficult to translate to an application, a new application may be worth using if it can improve where pen-and-paper is lacking. Ultimately, digital note taking is little more than a pen-and-paper note sheet on a computer screen. For classes with complex & interrelated concepts, like anatomy or biology, this leaves a lot to be desired. While sorting digital pages into folders and notebooks may help organize notes, a program designed to connect related concepts within the page could be a great asset to students.

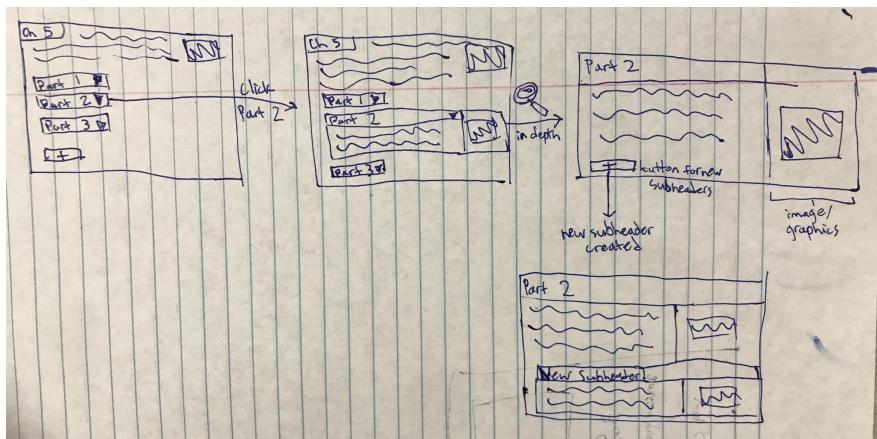
4. **What is your strategic advantage in taking on this project? What do you know that others don't? What special skills, access, or insights do you have that will let you succeed? In other words, why is this something that hasn't been done before, but that you'll be able to succeed in? (one page or less)**

There are many apps that exist already in the market for taking notes. However, our main focus in building this app is our audience, and we begin by understanding their unique requirements and how our app can fulfill them. Our app will bring convenience to the users, and that is the most prominent thing that they look for today. One of the key advantages of our design is that we have focused on specific users and design an app based on their needs. Usually other note taking apps don't focus on one specific field or their target audience is wide, and try to satisfy their needs. Other apps try to have more users, so their app has many features which makes users confused, and users can't find features that they need for taking notes. However our app is focused on medical students in the university of Minnesota and our audience is limited and we want to create an app based on their needs, and the way they would like to sort their notes and take notes. We interviewed and talked with medical students and asked them about their experience with other note taking apps, and how those note taking apps would be better, and it makes it their favorite, and satisfies all their need for talking notes. We have analyzed those interviews and our data, and based on them, we will create a better app that satisfies the user's needs.

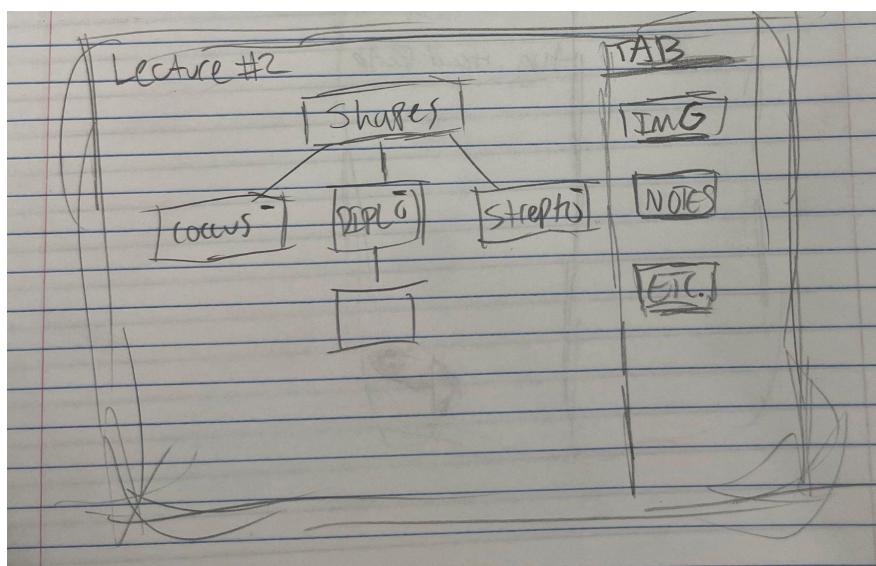
Also, we are building this app based on the design principles that have been provided to us through this course and try to implement all standards to design our app. We try to build our app based on the users' needs and our users' feedback is really critical and important for us to build this app more efficiently, unique and better than other apps. In order to design a better and different app, we will keep our App design simple. Sometimes the users of the application have certain goals in mind and if they find an obstacle in their way, they may get frustrated or spend more time than expected, losing their way in the meantime. Similarly, the unwanted features and functionalities of our mobile app will only lead them away from their goal.

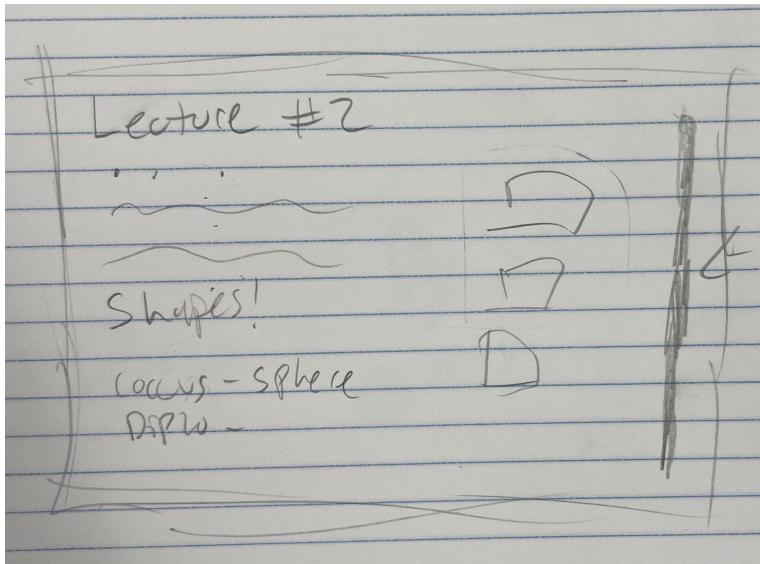
When students take notes from the lecture, they should be fast while taking it, otherwise they will forget it and they will lose the lecture, because lectures are going fast and there's no option to stop the lecture to find a feature in the app (like inserting an image) so the app should be really simple and user friendly so that the user can find everything fast and easy. We want to create a mobile experience that will make our users want to try our app and visit it again. In order for us to accomplish this, we're thinking of user goals while designing the mobile app. For instance, in our app users can build their own template based on their need and whatever they like which will make their taking note process easier, and easy to use for them. To create a template we'll use a wizard which would ask the user about the important tasks with what color they would like to show and how they would like to use shapes etc. In addition, our app will be free and we wouldn't charge users for subscription and using our app.

- 5. What are your initial approaches to the project? Include at least three different low-fidelity prototypes (these can be pictures of paper prototypes of the core functionality) with a quick description of how each idea attempts to address the core challenge of the project. Don't worry about auxiliary elements (such as sign-on, error handling), just focus on the main part of your application. (between 3 and 6 prototypes, brief descriptions of a paragraph or bullet list)**

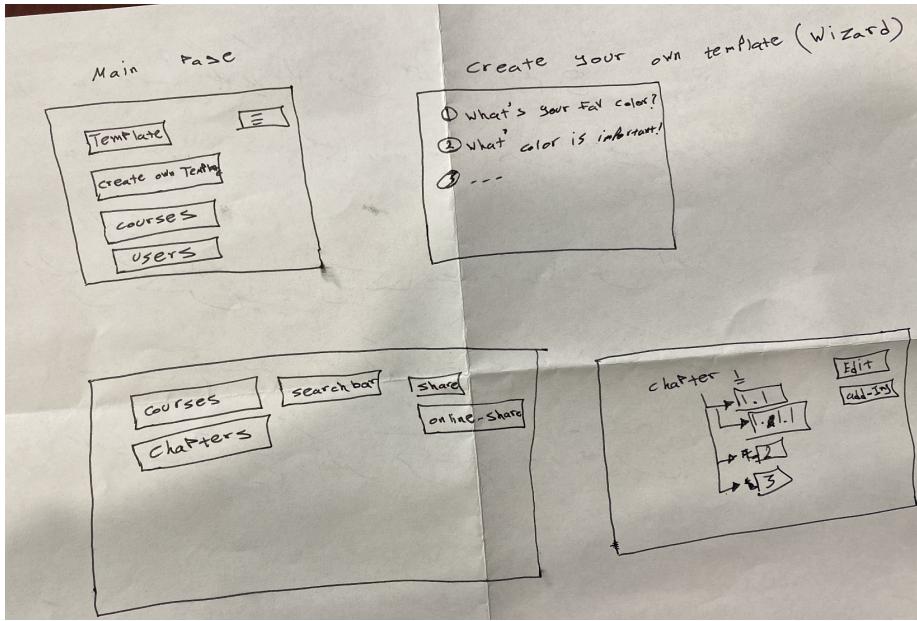


Here is an example of what a “note document” would possibly look like in our app. This document is dedicated to information from “Chapter 5” of a textbook, and includes a general text description and related image that summarize the content covered in the chapter. Beneath the general description are “subheadings,” drop down menus that contain more targeted/specific information from “Part 1” of the content in Chapter 5. Each subheading contains a general description of the topic, a designated area for images/media, and the option to add further subheadings for more specific info from that part of the chapter.





This is another example of our note-taking app. In this prototype, the user is met at the tree structure containing nodes of Lecture 2(1st image), where their notes are organized by a tree structure. Starting with Shapes, the tree goes down into further topics such as shapes like the Coccus, Diplo, or Strepto. This structure allows for links to be made from section to section, while also allowing the user to differentiate certain topics from one another. The sections can also be color-coded for better readability, and when the user clicks on one section, the right side-tab pops up. It displays folders for images, notes, or other files that the user wants to include. The second image is the user opening the notes section on the tab. When that is done, a notepad including all the information on the tree is displayed in order, with the tree's nodes being bolded headers. On the side of the notepad is thumbnails for images or sketches that the user can click on to enlarge. Overall this prototype allows for easy access to key points in the notes, while also giving the user an understanding of the connection between subjects and a clean format for storing/displaying images and taking down notes.



This is another example of our note-taking app. In this prototype, the user is met first on the main page, and it will show 5 dashboards to the user. First dashboard is about choosing a template, the second is about creating your own template, and the third dashboard is about courses which show a menu of the content like the main menu. Also the fourth dashboard is about users that shows different users. The second picture is shown when the user clicks on create my own template, and it will ask questions from the user, like what's your favorite color, and shape,etc. It will work like the turbotax example(Wizard) and with asking questions, the app will create a user's template. Third page contains a search bar where users can search for a document, share which user can share a document with another, share an online option where multiple users can work on one document at the same time, and courses tab to organize different courses, and check different courses that they have already created. Last picture shows how notes will sort in our app, which they will sort like a tree, and each child has a parent and a child can have a child, too.

6. Development plans (up to one page). Identify the platform you plan to use, elements that you expect to have to mock-up rather than fully implement, and the experience (or learning timetable) of team members related to that development platform and tools.

Our group has chosen the Android Studio development platform as our preferred environment, as its learning curve is manageable and aligns with both our previous programming experiences and end goals for the app. Our current plan is to use Matin's Android tablet for proof of concept and user testing, and potentially other Android devices leased from the university's reservable equipment page. Before deciding on this platform, we had briefly considered iOS and non-mobile operating systems, but ultimately decided they would introduce unnecessary complexity into our plan as we moved forward.

As far as digital elements of the app go, at this point in time it appears that we will not have to simulate many of the functions necessary for our idea. The app's main interface will be designed with simplicity in mind, both because this will make implementing our ideas easier, and because one of our major goals is to be far more user friendly than other note-taking apps like Obsidian. Our app's main structure will be to display notes in a series of box-like containers which can be expanded or contracted, which should be reasonably simple to create in Android Studio. However, there are a few app functions we may need to simulate. These may include syncing of notes over different devices, implementing translations, and automating citations. Translations may be a possibility if there is a free option in Google's translation API. If not, this functionality would most likely have to be simulated. In a similar vein, citations could be something of a challenge to implement properly, due to their unreliability. To simulate this functionality, we may be able to employ user sourced information to construct a "good enough" citation example for a proof of concept. Syncing of accounts and information across multiple devices would also most likely have to be simulated, as this may require an extensive back-end that would be out of scope for this class.

In terms of overall experience, our group has a solid grasp of C/C++ and Java, the main programming language competencies taught at the University of Minnesota. Additionally, a few of our members have experience outside of the classroom with personal projects, internships, and jobs that have provided experience with Python, JavaScript, SQL, and others. As we feel reasonably competent with Java, we anticipate our learning curve for Android Studio to be manageable.