Immersive Search Project

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Stage 2 : Generate

1. **Existing Prototypes and Product Lists**

Anmol:

1. Acer Windows MR

The Acer Windows MR is a mixed reality headset developed by Acer. It has 6 degrees of freedom positional tracking - forward/back, up/down, left/right, pitch, yaw, roll. The AH101 is outfitted with a 2.9 x 2-inch LCD panel that provides 1440 x 1440 resolution for each eye and a 100-degree field of view. it provides 360° video/image experience. In order to fully immerse the user it uses hardware frame interpolation to play videos.

2: Vuzix M300

The Vuzix M300 is a pair of professional augmented reality smart glasses made by Vuzix, a manufacturer based in the US. These provide 64 GB internal memory, 16 MP Camera sensor, 2 GB Ram, Power LED Display. These smart glasses are suitable for enterprise operations (industrial, medical, retail, manufacturing, and logistics applications). and adapt to complex working environments, warehouses and construction sites.

Jash :

1. HoloLens

The HoloLens is a head-mounted display unit connected to an adjustable, cushioned inner headband, which can tilt HoloLens up and down, as well as forward and backward. To wear the unit, the user fits the HoloLens on their head, using an adjustment wheel at the back of the headband to secure it around the crown, supporting and distributing the weight of the unit equally for comfort, before tilting the visor towards the front of the eyes.

2. SOLOS Smart Glasses

SOLOS Smart glasses are usually used by athletes. It is slight, light weight and has a comfortable design. SOLOS brings newly expanded running capabilities, offering enhanced software to facilitate running

metrics such as elapsed time, speed, power, pace, cadence, heart rate and more. Athletes can leverage wearable sensors to measure their performance, set targets and use the SOLOS platform to track progress. It puts one or two fields of data in front of your right eye, connects to your sensors (and phone) via the application, and can play music from your phone on mini speakers behind your ears.

Shreya :

1. HTC Vive

   The **HTC Vive** is a virtual reality headset developed by HTC and Valve. The headset uses "room scale" tracking technology, allowing the user to move in 3D space and use motion-tracked handheld controllers to interact with the environment.

2. Google Glasses

   Glass Enterprise Edition 2 is a wearable device that helps businesses improve the quality of their output, and help their employees work smarter, faster and safer. It provides hands-on workers and professionals with glanceable, voice-activated assistance that is designed to be worn all day with its comfortable, lightweight profile.

Vishwa :

1. Oculus Rift

   The Rift uses a pair of screens that displays two images side by side, one for each eye. A set of lenses is placed on top of the panels, focusing and reshaping the picture for each eye, and creating a stereoscopic 3D image. The goggles have embedded sensors that monitor the wearer's head motions and adjust the image accordingly. The end result is the sensation that you are looking around a 3D world.

2. Epson Moverio BT-300

   The Epson Moverio BT- 300 uses a significantly sharper 720p HD resolution OLED display and packs a 5-megapixel front-facing camera. It's also powered by an Intel Atom quad core processor, with Android covering the software bases.

Sameer:

1. React-360

   React 360 is an innovative framework that is designed to create 3D and VR experiences with familiar tools. Built on the top of React, a popular JS library, it enables developers to create appealing and immersive user interfaces that add interactivity to your website or application. The framework is created by Facebook and already has an active community of engineers, who strive to improve the technology with the help of extra tools, modules, and modifications.

2. A-Frame

A-frame. It is a web framework that allows creating games, apps and various scenes in virtual reality. It uses WebVR API to connect your web browser with a particular headset, which serves as a transition component between a user and software. This instrument comes in handy for a specialist dealing with web VR projects. It also may serve as a platform for the development of web apps, sites, landing pages, games, etc. The framework is written from scratch using WebGL. It is primarily based on the Three.js library.

Nidhi:

1. Everysight Raptor

   AR smart glasses designs for cycling have become very popular, and the Everysight Raptor is a highly regarded AR device. In addition, these smart glasses offer a range of great features such as long battery life, high-quality front camera, and a host of connectivity options such as GPS, GLONASS, Bluetooth, Wi-Fi, and ANT+. The additional options like the Everysight controller round out a great AR smart glass.

2. ThirdEye Gen X2

   ThirdEye Gen X2 are augmented reality smart glasses which are compatible with AR and VR applications. Intended for professional and educational uses, these AR smart glasses can share the user's point of view with a remote person via video communication and live audio for remote assistance. They boast an excellent battery life of 8 hours, but the user can also switch to external batteries.

Cheng:

1. Google Daydream

   Daydream is a virtual reality (VR) platform which was developed by Google, primarily for use with a headset into which a smartphone is inserted. It is available for select phones running the Android mobile operating system.

2. VR library Demo

   This is a demo of a VR library I found on YouTube. It's pretty rough and simple, but it shows the possibility that we can use VR to find books and article

2. **Ideas for what we could make (one per team member) :**

Anmol:

One of the issues mentioned was that the filter criterion is not good enough as the results shown are less relevant and the fact that the webpage is not very interactive.

- First, the user can decide what environment to work in. The choices could be an office environment, a library environment or any other outdoor or indoor environment. So, if the user picks an office setup, they can have a virtual experience of sitting inside a big office room and have all the files kept on the desk.
- When a case file is opened, the user can choose to have a 360-degree field of view.
- Also, the AR/VR can have an assistant which guides the user through the cases files and can give a brief description of case files in the search results and a detailed one once a case file is opened.
- Considering the search results, What we could do is when the filter criteria is applied, we can also ask for a list of keywords and find cases that are most relevant and consist of the keywords and also the frequency of the keywords to be taken into consideration and when the results are displayed they are sorted in the descending order of the keyword's frequency.
- Also, the keywords can be given in a decreasing order of importance and based on the results can be displayed.
- So, when the filters are applied, the keywords are also put up and the results that are shown satisfy all the filters and have a higher frequency of the keywords put.
- Also, considering an interactive webpage, we can have gesture-based scrolling, navigation and zooming and a voice assistant. We can also have a popover when the user is scrolling through the results and while hovering on a case, its details pop up.

Jash:

- My idea is a combination of both AR and VR.
- The user enters into a room wearing a VR headset wherein he feels like he's in a traditional library.
- Now, we use AR to let the user find the relevant case document.
- The usage of AR would be similar to the Pokemon Go game where the user would walk in the room to find the required case documents.
- The number of documents required for a case are too many.
- So the user will read one document and he finds any useful information, he could save that in the form of a sticky note and then save that information in the virtual room. The sticky note would be present on a virtual wall and hover around the user.
- Subsequent important information would similarly float/hover around the user so that the user at all times can see important information.
- This will help him in joining the dots quickly as lawyers might get confused with too much information.
- This will help in legal search as lawyers have a huge stack of documents where in they have find to a needle in a hay.
- This will ease the process as search would be made efficient and faster.

Vishwa:

- As mentioned by Jennifer in our first meeting, the goal here is to make the searching process for legal professionals by incorporation of AR/VR immersive.
- Traditionally, the users have to do the task of going to the library and skimming through a lot of library sections to search for relevant documents, followed by choosing and saving the relevant files physically. Even a website is not as well preferred by users as a library. I believe that one reason for users to not prefer websites would be that it is not as comprehensive and as easy to access as documents in a library.
- However, using AR/VR we could augment the benefits of the library search process with that of the website. Exploiting the functionality of hand gestures and head movements we could allow the user to have a very interactive and easy search experience.
- Through AR/VR we could make the search more immersive and the ability to review selected documents later could me more convenient, giving the user the feel of a traditional library.
- Through hand gestures, the user could select relevant documents from this virtual library wherein documents would be stacked according to case genres, as in a real library.
- The selected documents would create a mini library for the user allowing the user to be in his own reading room with his/her own relevant documents pertaining to one particular case.
- Each document from the users own mini library could be brought to full view with the help of hand gestures. Unwanted documents could be removed from the user's reading room through hand gestures. Documents from the mini library could also be moved and arranged priority wise using hand gestures.
- Through head movements the user could then star or save particular documents.
- The starred documents would be displayed in the mini library with a different color.
- The documents chosen to be saved would be saved at locations pertaining to the case the user is searching for on the user's desktop.

Idea: Documents could be moved and searched for using hand gestures. Actions on documents could be performed through head movements.

Shreya :

IDEA : Explore Library with AR interaction

- When a lawyer wants to find documents/files for a case, they visit a library and search for relevant documents. A more advance way is to sit with a computer and to search for relevant files on the website. But as Jennifer said, the lawyers find the library experience better.
- The solution proposed, is to allow users to explore library with AR interaction. AR can make the library more interactive which is a characteristic that is highly valued in today's concept of library spaces and commons.
- The lawyer must take a mobile/tabular device to the library/room where documents and files are stored. Then the lawyer must open the AR Application, show the surroundings and should mention key words. After the AR application scans the surrounding, it points to all the location of the searched files/documents.
- When the lawyer reaches the proximity of the file, the AR will point the exact location of the file. After which the lawyer can check the file out. If the lawyer does not feel like reading the file, he can just scan the cover and the application will give a summary as well as notes written by other lawyers which can help the lawyer decide whether the file/document is relevant or not to the case.
- If the lawyer feels like finding more relevant files to the file in hand, then lawyer can scan the file and find more relevant files.

- Also, the lawyer can find more information related to the file just on one scan and can get more information on the internet.
- Also, lawyer will get a list of subcategories in the shelf if the search is not appropriate.
- In this way, AR helps in enhancing physical surrounding with mobile devices. The system offers searching, locating and navigating with the intuitive digital interface on physical space. Just using a camera's scan of the surrounding, you are presented with additional information on your screen that doesn't exists in the screen that doesn't exist in the real-world popular examples of this include snapchat filters.

Sameer:

- One of the major problems with using an AR/VR device is typing with the help of a
- remote as it would be both time-consuming and not easy. In order to overcome that we
- could use the feature of audio recognition in order to make the search easier and
- comfortable.
- We can further add the feature of Virtual assistant(Librarian) to make the search
- easier and lively. In order to perform an operation, the user can use directly ask the
- Virtual assistant to perform it and they can just see the results.
- Hand Gestures such as tap, slide are something that can make search more feasible.
- The user can perform various hand movements so drag, drop or select files and even
- zoom them. By this, the user would feel like they have control over the device.
- Usually, lawyers like to take down notes from the documents. In such a case we can
- use the feature of wall display to move the field of view on to the wall and we can
- provide a note-taker on their screen so that they can take down the notes.
- When we do a search on a browser we would keep the relevant sites on new tabs. In
- the same way, we can provide the user with the flexibility to keep a document aside for
- later consideration if they feel its a bit relevant or first select all the relevant documents
- for the case, keep them aside and then go over them one by one.

Nidhi:

- The device can have a voice recognition feature, which will make the interaction process better and faster. It can be used to search and filter the results to get the best few relevant ones. It can also be used to take verbal notes while going through a case.
- The cases will be displayed in a way that it shows just enough details for a user to know what the case is about, like the cover page of a book.
- As the results will be displayed in 3D space, a user can efficiently use all the spaces for a better visual experience, like zooming in and out any case, sorting cases according to his/her preferences and separating the important ones from the group of results into empty space by simple drag and drop.
- After getting all the relevant case files, a user can either zoom in to read the details or can use a more suitable screen like a desktop where he/she can comfortably sit and study the case.

Cheng:

Library Search

Inspiration:

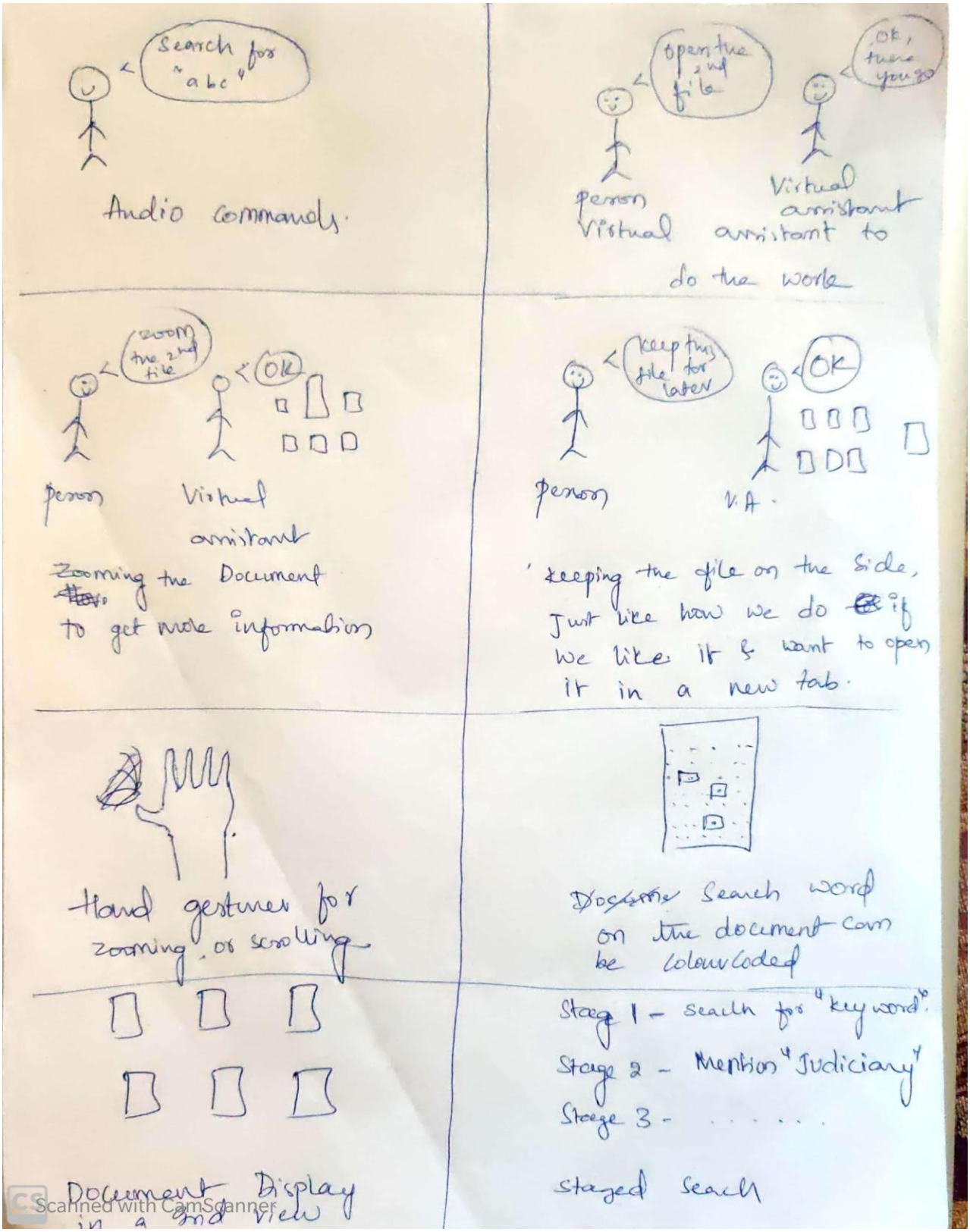
- In our first meeting, Jennifer mentioned how lawyers search for legal cases in the old days.
- They search in the library shelf by shelf, trying to find cases that are related to the one they are working on. And Jennifer also mentioned how they still love this “traditional” way and think this is more efficient.
- So, we are trying our best to provide our lawyers the same experience as they are still in the library.

Idea:

- Instead of wasting time walking in the library to find the right shelf and case, by using VR, we can bring each shelf to the user.
- Users can use scroll gestures like using a giant iPad to move “shelf” to themself.
- The shelves could be arranged by whatever order the user likes.
- On the right, we provide some options that users can toggle.
- On the left, users can drag the case they found that they are interested in to a “briefcase”, in which he/she can view a more detailed file late with a more suitable device instead of VR gadget.

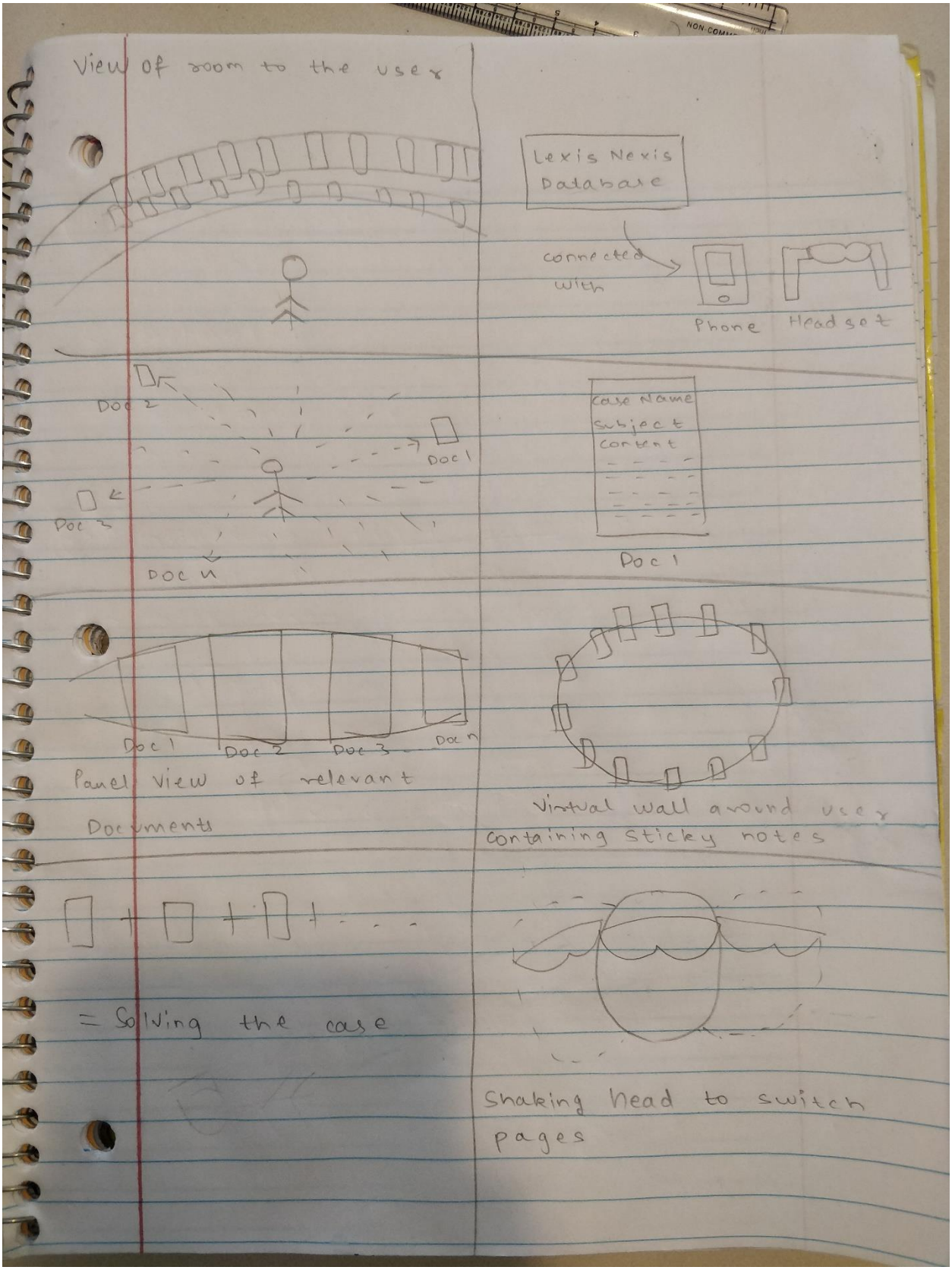
3. **Crazy eights (one per team member) :**

Sameer:

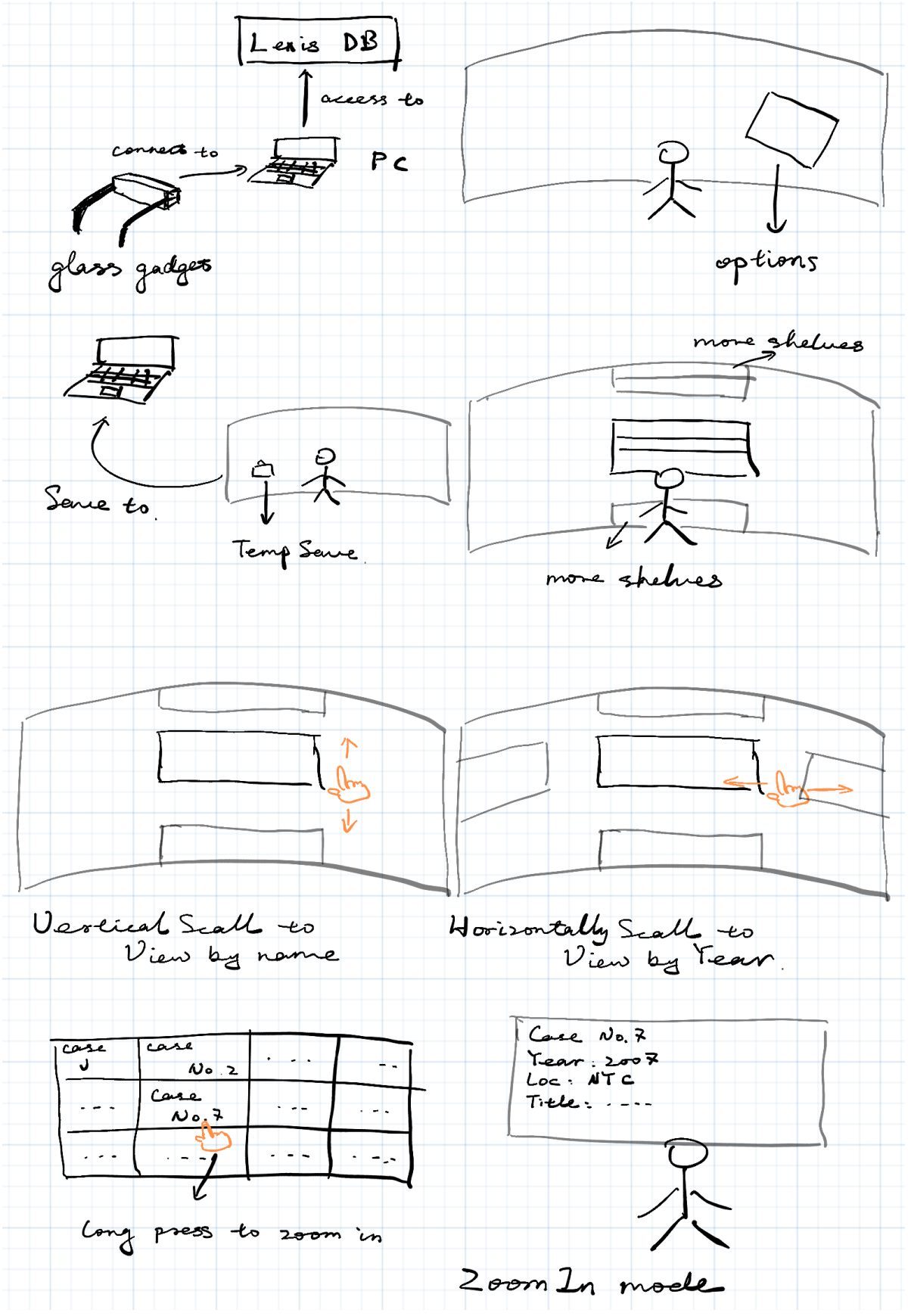


Stage 1 - search for "keyword"
Stage 2 - Mention "Judiciary"
Stage 3 - .....
staged search

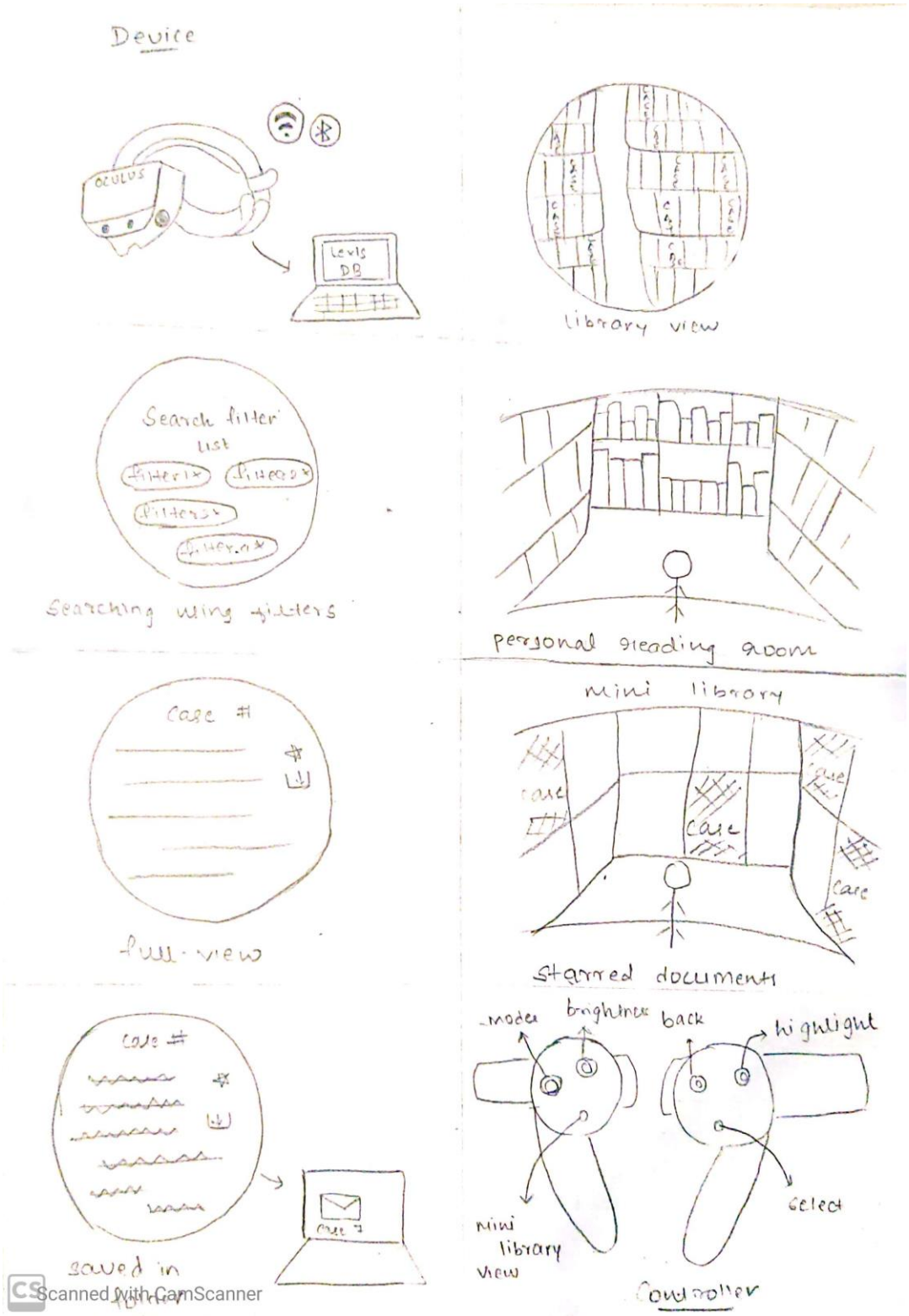
Jash:


View of room to the user
Lexis Nexis Database
connected with
Phone
Headset
Doc 2
Doc 1
Doc 3
Doc n
Case Name
Subject
Content
Doc 1
Doc 1
Doc 2
Doc 3
Doc n
Panel view of relevant Documents
Virtual wall around user containing sticky notes
= Solving the case
Shaking head to switch pages

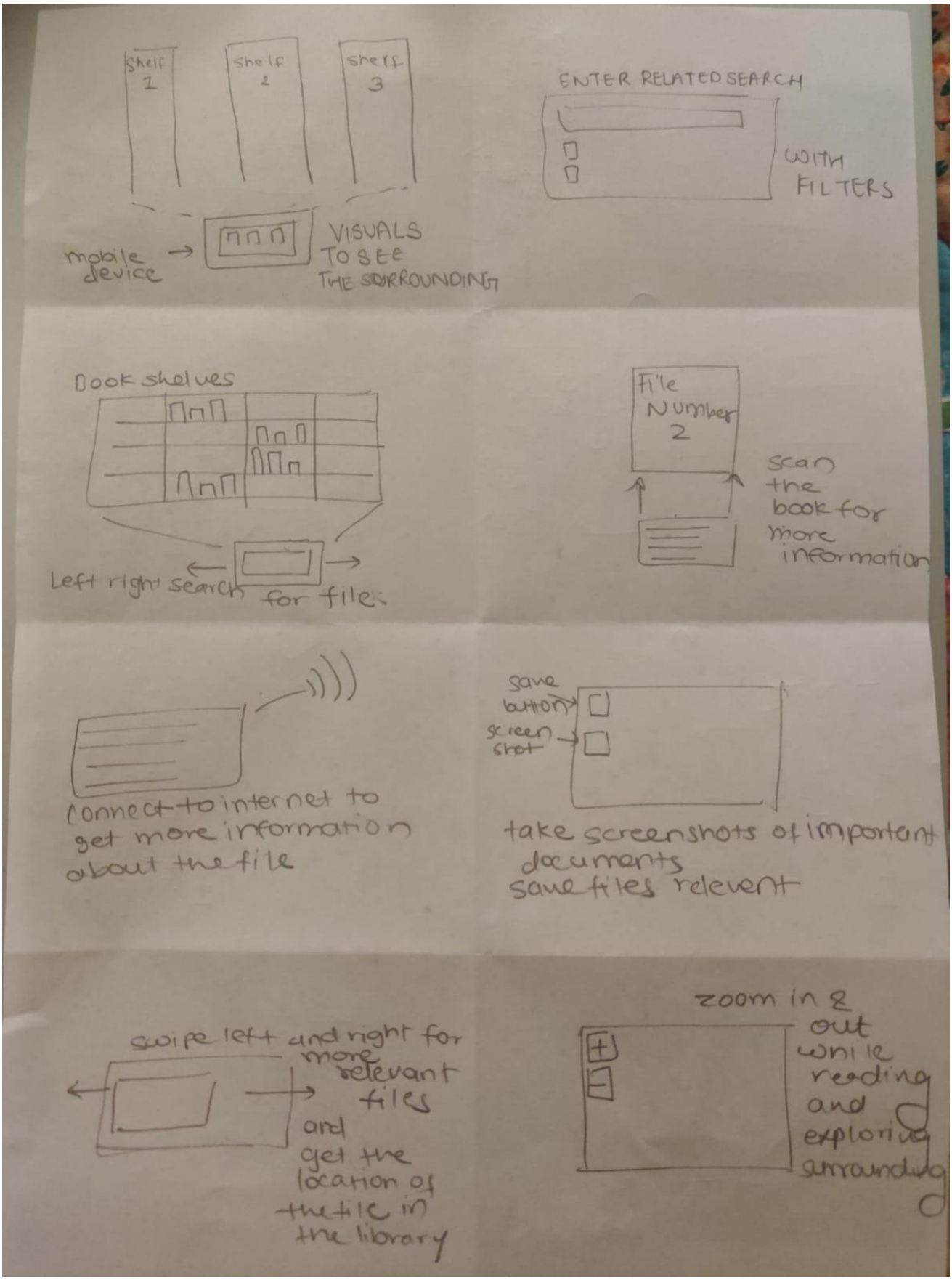
Cheng:


Lexis DB
access to
connect to
PC
glass gadget
options
Save to
Temp Save
more shelves
more shelves
Vertical Scall to
View by name
Horizontally Scall to
View by Year
case
No. 1
case
No. 2
case
No. 7
Long press to zoom in
Case No. 7
Year: 2007
Loc: NTC
Title:
Zoom In mode

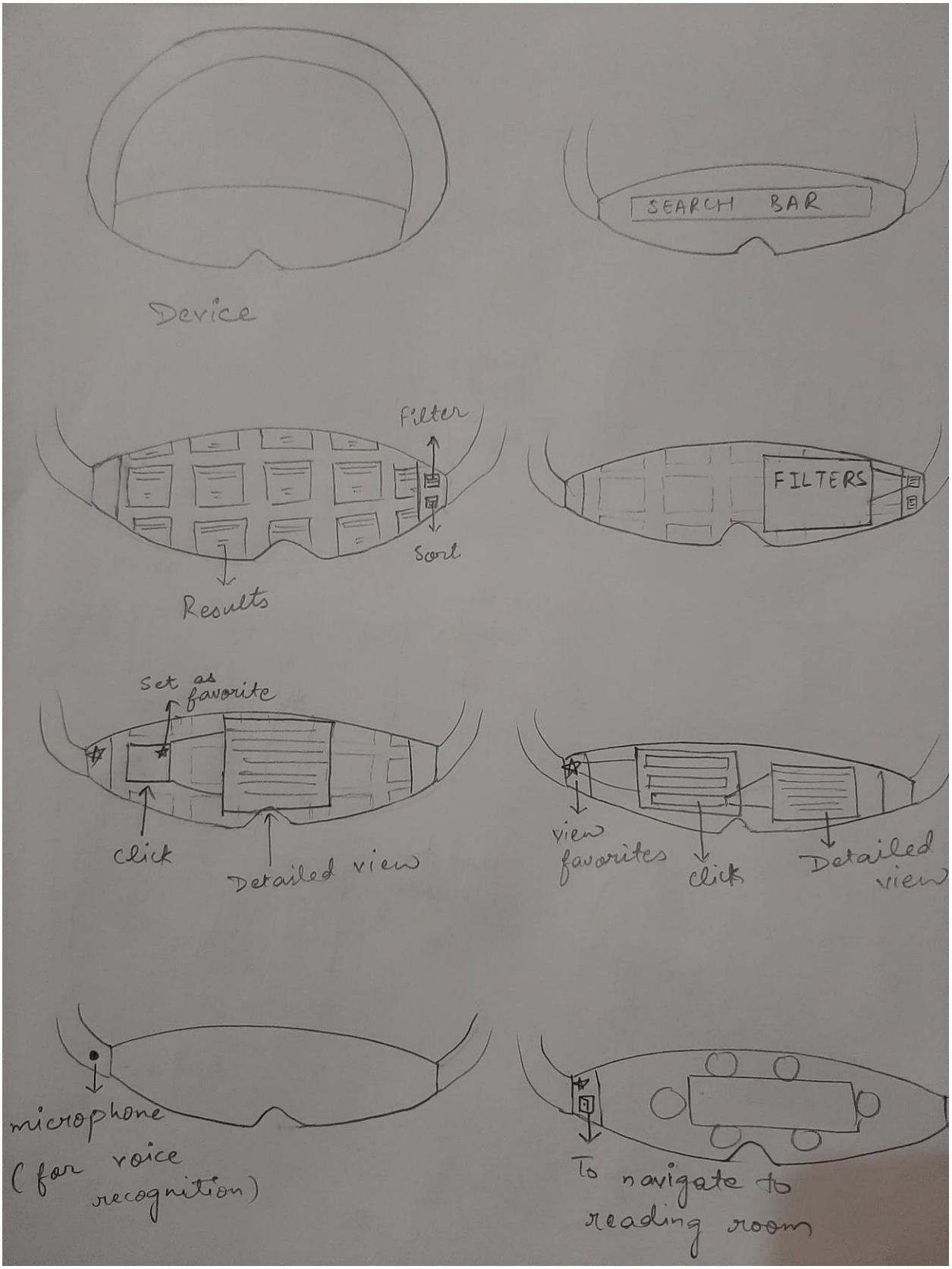
Vishwa:



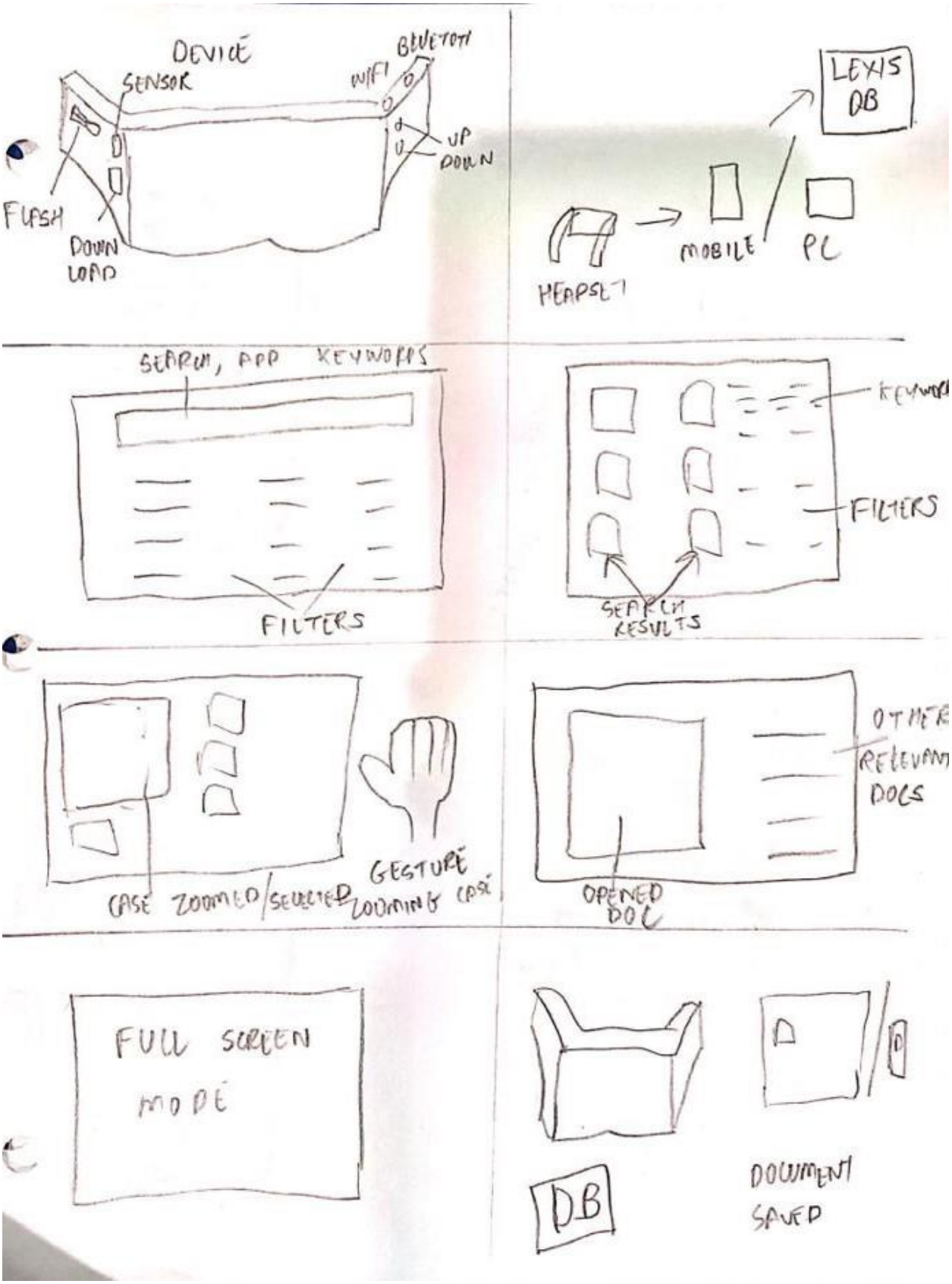
Shreya :


shelf 1
shelf 2
shelf 3
mobile device
VISUALS TO SEE THE SURROUNDING
ENTER RELATED SEARCH
WITH FILTERS
Book shelves
Left right search for files
File Number 2
scan the book for more information
connect to internet to get more information about the file
save button
screen shot
take screenshots of important documents save files relevent
swipe left and right for more relevant files and get the location of the file in the library
zoom in & out while reading and exploring surrounding

Nidhi:

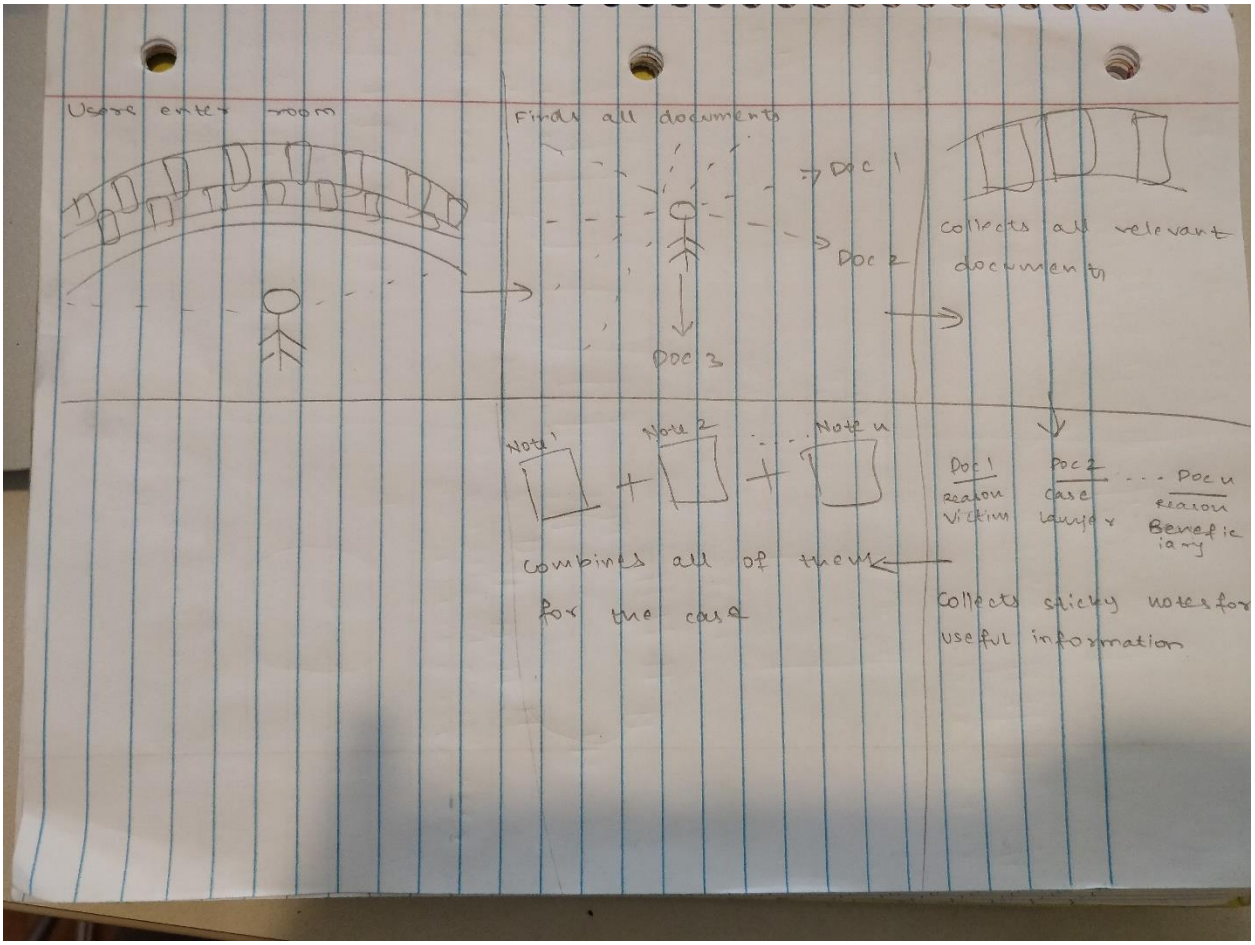

Device
SEARCH BAR
Filter
Sort
Results
FILTERS
Set as favorite
click
Detailed view
view favorites
click
Detailed view
microphone
(for voice recognition)
To navigate to reading room

Anmol:

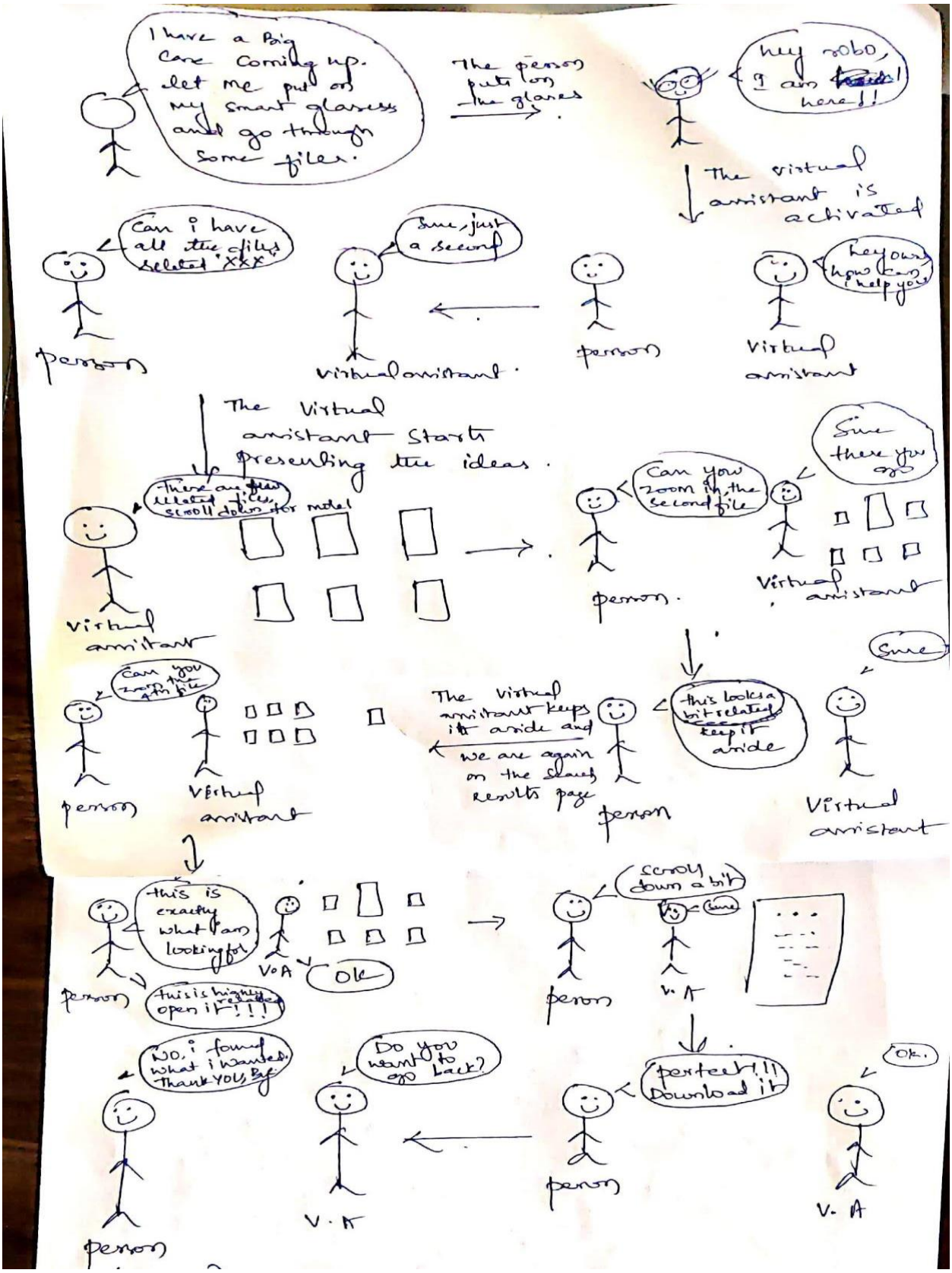

DEVICE
SENSOR
WIFI
BLUETOTH
UP
DOWN
FLASH
DOWN LOAD
LEXIS DB
MOBILE
PC
HEADSET
SEARCH, APP KEYWORDS
FILTERS
KEYWORDS
FILTERS
SEARCH RESULTS
CASE ZOOMED/SELECTED
GESTURE ZOOMING CASE
OTHER RELEVANT DOCS
OPENED DOC
FULL SCREEN MODE
DB
DOCUMENT SAVED

4. **Storyboard (one per team member) :**

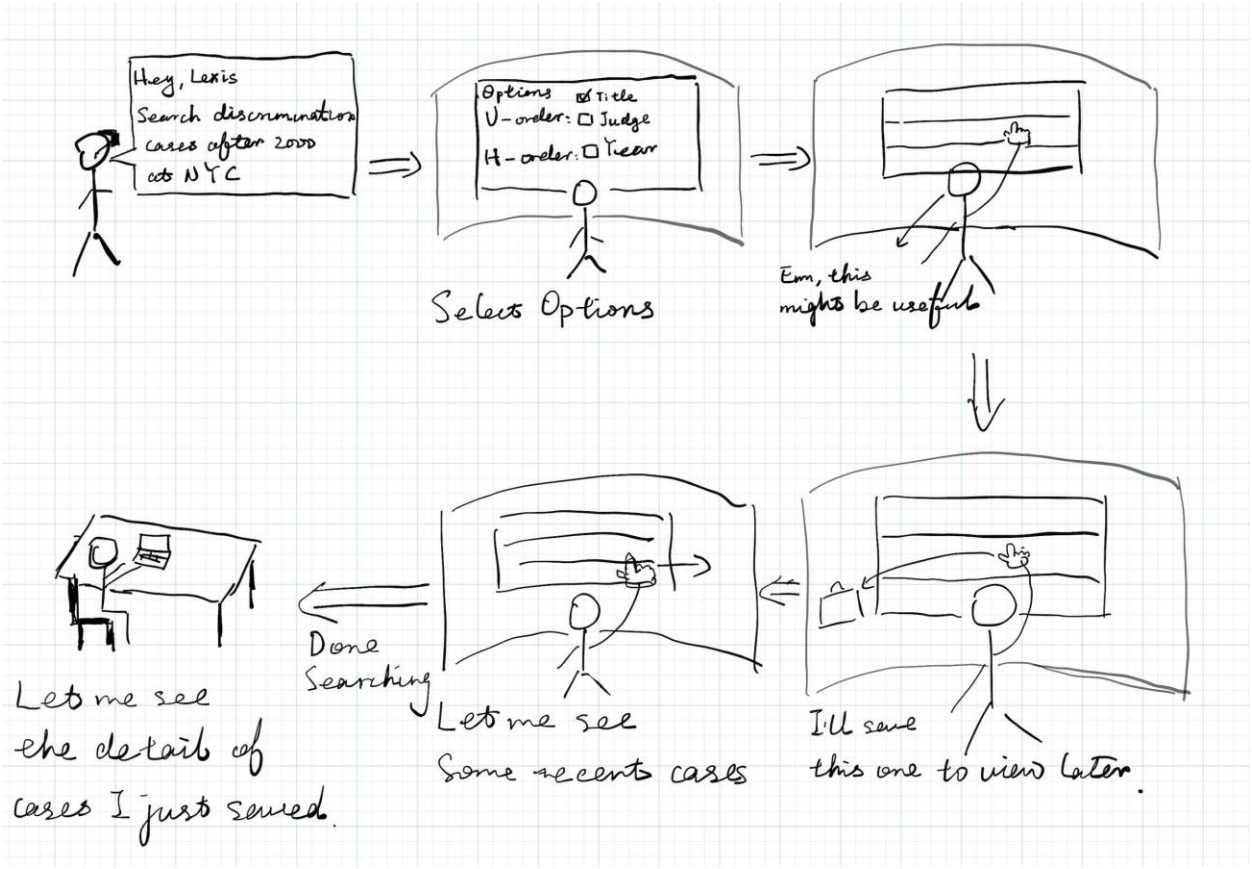
Jash:



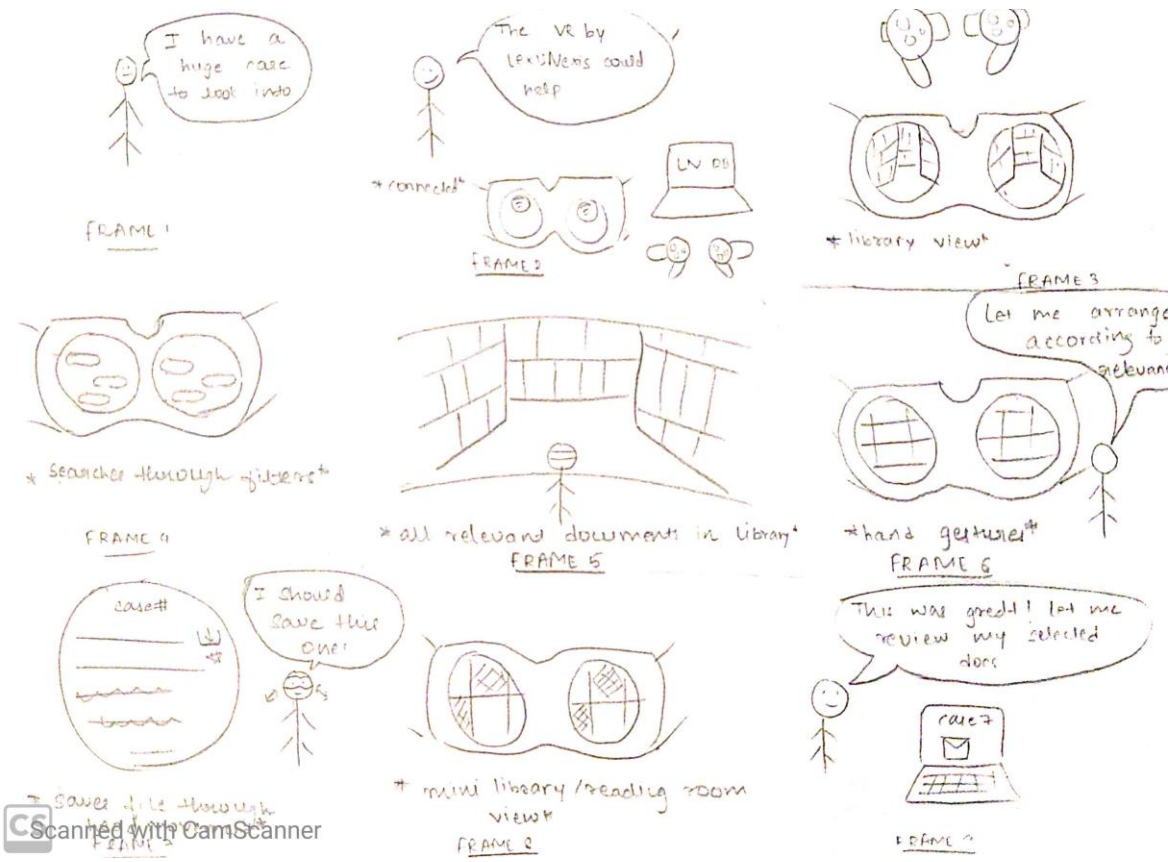
Sameer:


I have a Big Case Coming up. Let me put on my smart glasses and go through some files.
The person puts on the glasses.
hey robo, I am here!!
The virtual assistant is activated
Can I have all the files related 'XXX'
person
Sure, just a second
Virtual assistant.
person
Virtual assistant
hey dude how can I help you?
The Virtual assistant starts presenting the ideas.
There are few related files, scroll down for more!
Virtual assistant
person.
Can you zoom in the second file
Virtual assistant
Sure there you go
Can you zoom in this file
person
Virtual assistant
The virtual assistant keeps it aside and we are again on the shared results page
person
this looks a bit related keep it aside
Sure
Virtual assistant
this is exactly what I am looking for
person
this is highly related open it!!!
V.A
Ok
person
scroll down a bit
Sure
V. A
NO, I found what I wanted. Thank YOU, Bye
person
Do you want to go back?
V. A
perfect!!! Download it
person
Ok.
V. A

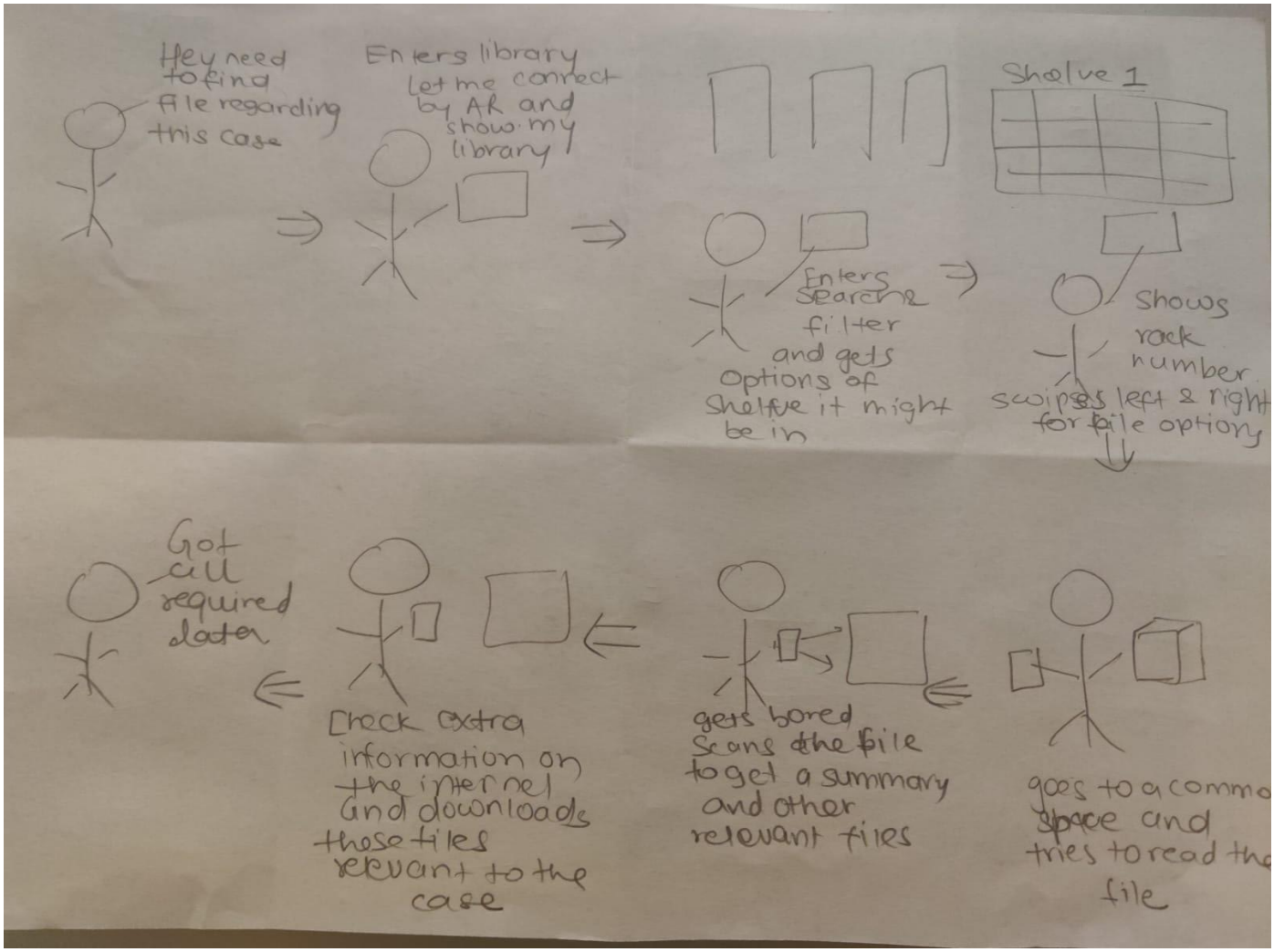
Cheng:


Hey, Lexis
Search discrimination cases after 2000 in NYC
Options ☒ Title
V-order: ☐ Judge
H-order: ☐ Year
Select Options
Emm, this might be useful
I'll save this one to view later.
Let me see some recents cases
Done Searching
Let me see the details of cases I just saved.

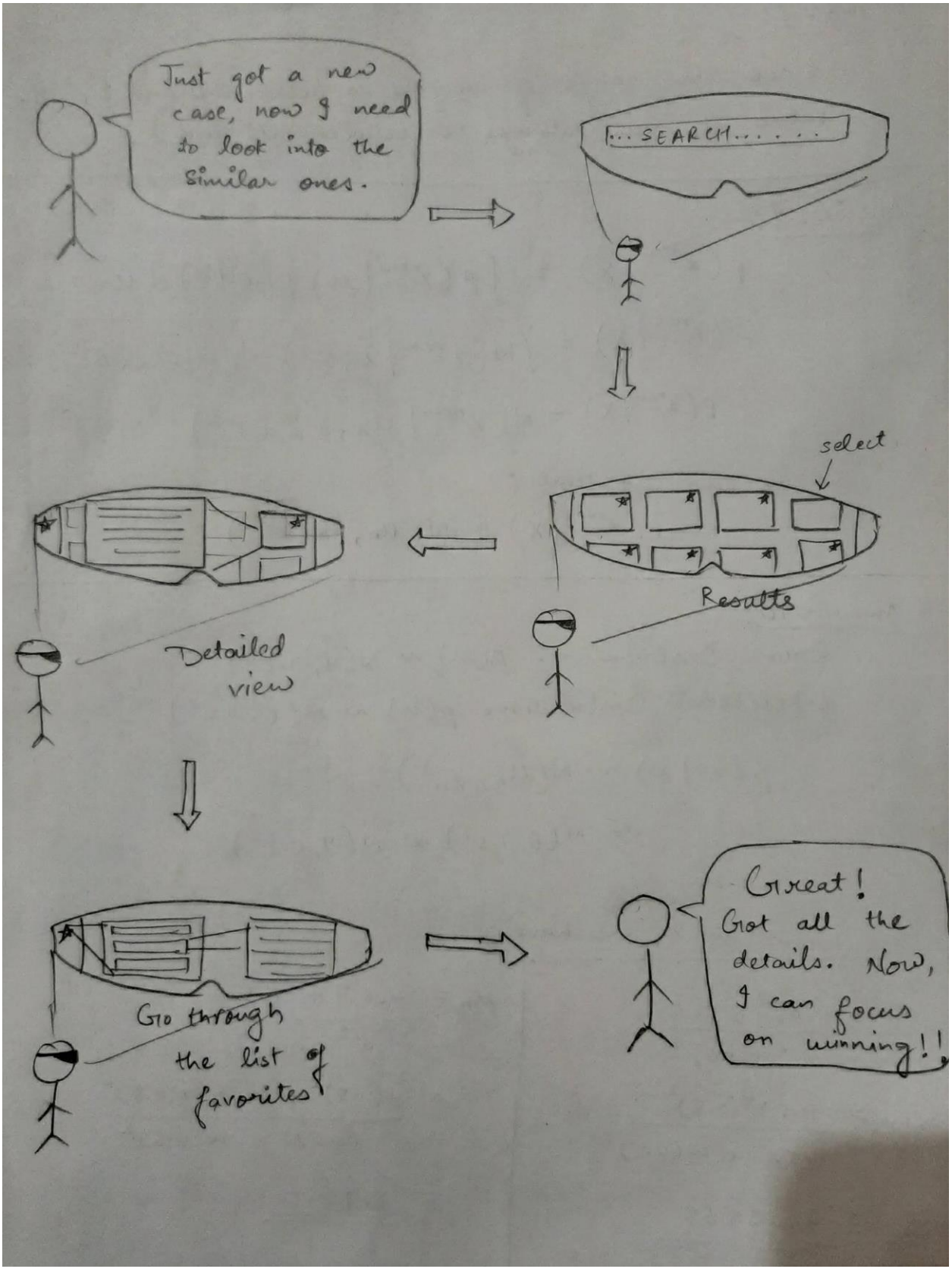
Vishwa:



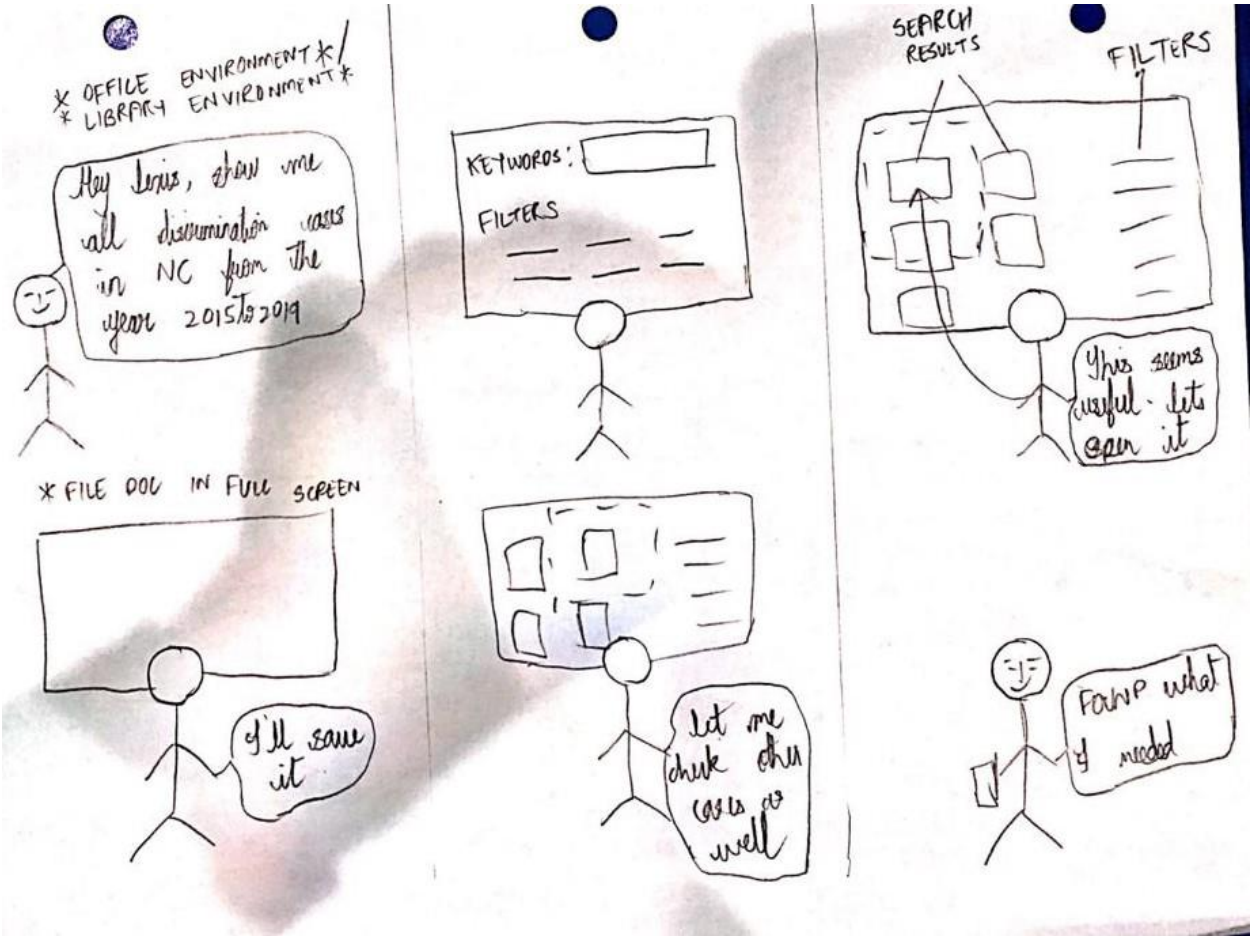
Shreya :


They need to find file regarding this case
Enters library Let me connect by AR and show my library
Shelve 1
Enters Searches filter and gets options of Shelfve it might be in
Shows rack number swipes left & right for file options
Got all required data
Check extra information on the internet and downloads these files relevant to the case
gets bored Scans the file to get a summary and other relevant files
goes to a comm space and tries to read the file

Nidhi:


Just got a new case, now I need to look into the similar ones.
...SEARCH.....
select
Results
Detailed view
Go through the list of favorites
Great! Got all the details. Now, I can focus on winning!!

Anmol:


* OFFICE ENVIRONMENT *
* LIBRARY ENVIRONMENT *
Hey Siri, show me all discrimination cases in NC from the year 2015 to 2019
* FILE DOC IN FULL SCREEN
I'll save it
KEYWORDS:
FILTERS
Let me check other cases as well
SEARCH RESULTS
FILTERS
This seems useful. Lets open it
Found what I needed