DDR

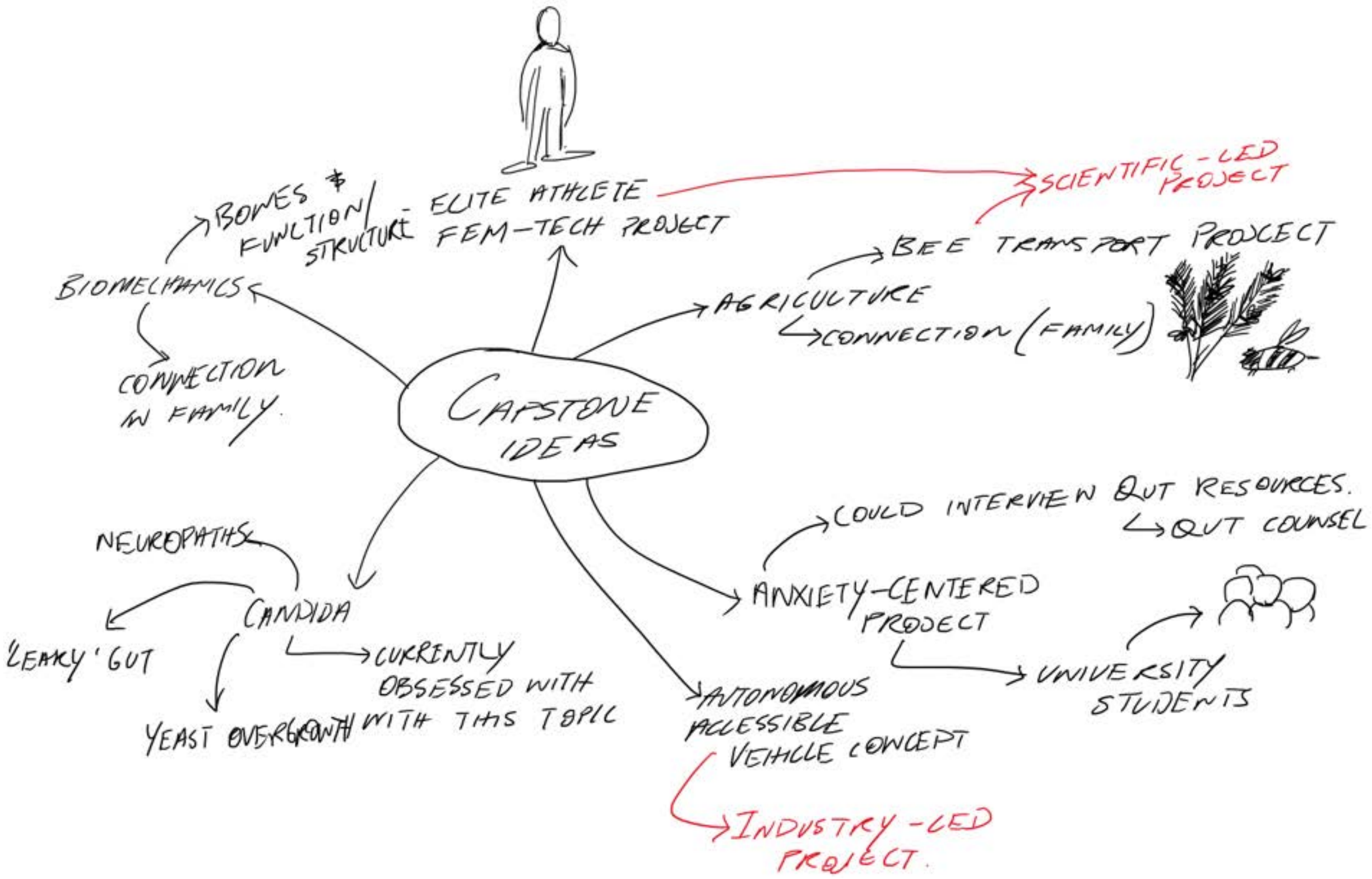
DESIGN DEVELOPMENT RECORD

DNB311_23e2 | ID STUDIO 7: CAPSTONE

Milli Mehari Abraha | N10599185

TUTOR (Robert Geddes)

DESIGN DEVELOPMENT – WK 8



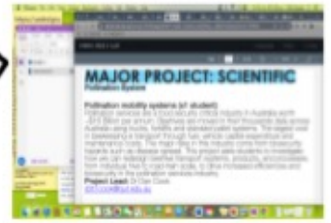
REPORT – Project selection

On this page I research possible ideas for project.
I explore the context people and technology of potential ideas.

Lecture notes:
Topic ideas:

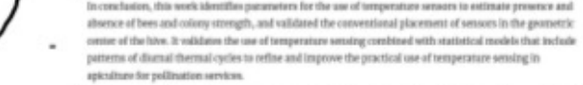
- Old DNB311 topic last year was aged care system.
- Agriculture - bee transport
- **Anxiety and mental health - I could explore and ask qut students/ and fee counsellors.**
- Accessible Autonomous vehicle concept
- **Elite athlete performance (have history in wearable designs)**
- Biomechanics - or the biomedical research project based on sister's expertise.
- Key- shot can be used for rendering
- Anxiety mental health…. And driving. Driving for disability.

Pollination mobility system:



https://academic.oup.com/jee/article/115/3/715/6581873

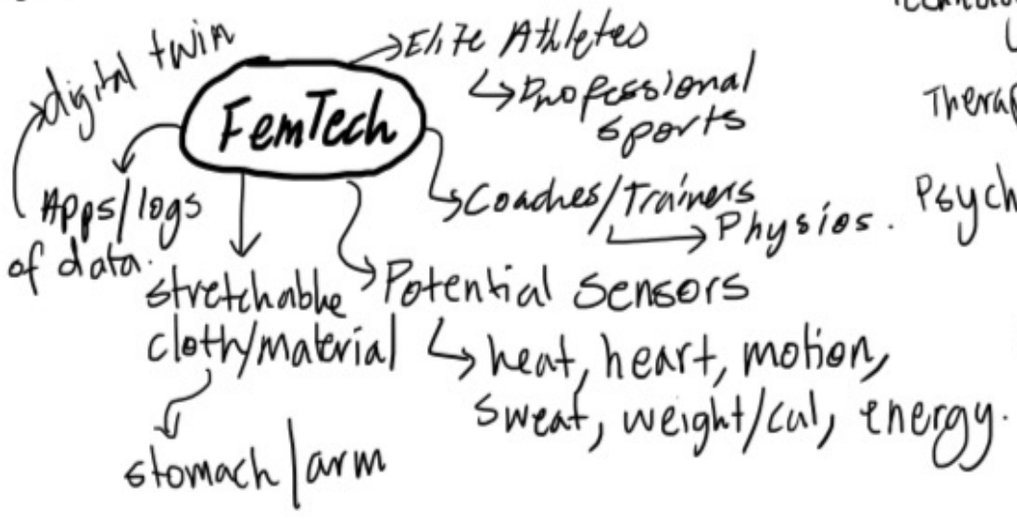
- Based on paper, they can use temperature senses to estimate the presence or absence of bees in a hive.


In conclusion, this work identifies parameters for the use of temperature sensors to estimate presence and absence of bees and colony strength, and validated the conventional placement of sensors in the geometric centre of the hive. It validates the use of temperature sensing combined with statistical models that include patterns of diurnal thermal cycles to refine and improve the practical use of temperature sensing in apiculture for pollination services.

- The project is asking for a student to redesign the transport system - including products, and a process that protects and limits the risk to biosecurity hazards.
- The transport system: Hive (farm) - road slash / train….
- Containers ad

Menstrual Cycle FemTech for elite students.

- Menstrual cycle and the process and cause.
- All sports? Generic female training and information related to their research activities
- Existing biometrics and indicators of female athletes
- The only issue is I don't have history in sport performance or contacts.



Designing with technology for empathy building :

MB https://research.qut.edu.au/designlab/projects/designing-with-technology-for-empathy-building/ MB

Anxiety in students… however I don't have contacts in the mental health sections…. Could contact QUT professionals.

- Monitoring anxiety for university students with disorders
- QUT mental health
- Mental health and food. - yeast/and chemicals in sugar that effect emotion.
- Stress and links to health and food conditions.

Existing products:

MB

- https://cedu.news.niu.edu/2018/10/30/researchers-study-wearable-technology-to-help-students-with-anxiety-disorders/
- The Empatica E4, which tracks heart rate, heart rate variability, motion/activity, electrodermal activity and skin temperature, was also used to measure students' anxiety under a variety of circumstances.
- Wearable technology that gives simple response to user based on heart parameters/characters.
- https://www.wareable.com/health-and-wellbeing/stress-monitoring-wearables-explained-7969
- Could add emerging technologies to the wearable product.
- Wearable technology can detect when user is in elevated stress but, it doesn't know the case… and the user needs to understand and identify the cause themselves.

Most existing products:

- Apps and small portable gadgets that monitor your breathing

Using Technology to create behaviour change:

- https://www.bluezones.com/2017/11/technology-can-help-reduce-anxiety-and-stress-too/

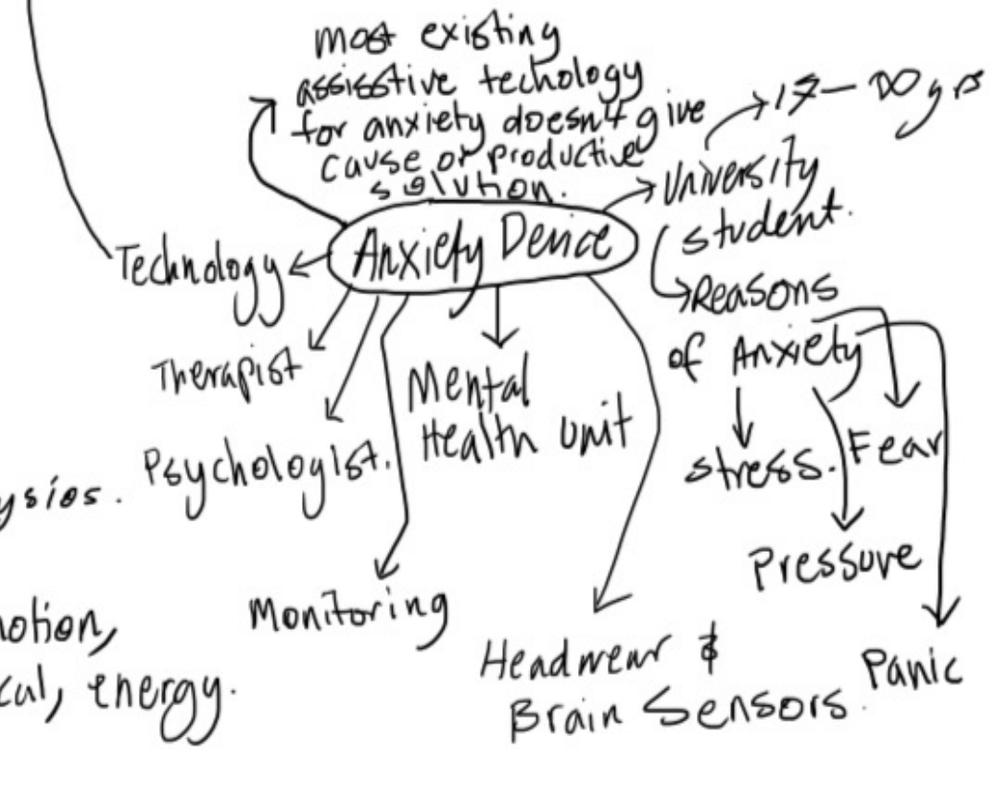
Muse: Uses audio and brain-sensing headband to provide real-time solutions/ feedback to help with a mediation project.

- Quite a forward and noticeable headband.

Psious: A virtual reality solution to help treat phobias and anxiety disorders. - VR headset.
Look at emerging technologies… digital twin, apps and AI… like real-time solution.

- Controlling and changing the environment.

Email about the Femtech area. - they will guide me on my journey.



REPORT – Project selection

LECTURE NOTES:

- Enforce sustainability
- Diversity
- Inclusivity
- Disability
- Design process - iterative
- Qualitative research
- Quantitative research - numbers, variables, statistical, focused towards numbers and statistics.
- Mixed methods.
- Qualitive analysis has the reality constructed by the people of that time, bias from researcher and bias.
- Qual - context bound and accurate and reliable through verification.
- Qual - location creates limits to research findings, research and limits don't necessarily apply to other parts of the world.
- Qual - ask about focusing on Australia.
- Research Question: Exploring...
- Have graphic projects and reports. - make sure to make the report graphical in nature.
- Observations can be online and youtube videos.
- Semi-structure interviews.
- Be prepared for the data you are collecting. Text or audio... possibly images.
- Method triangulation... Interview, talk aloud, observe, survey

Participants for each method:

- Interview, 1 - 3 participants
- Survey, 5 - 10 participants
- Observation, 1 - 3 (depending on the length).
- Specific age groups or broad public.

- 15 - 20 academic articles
- 20 survey responses
- 11 interviews responses
- Send thank you emails, be respectful and send emails beforehand

MB

POTENTIAL IDEA 1: EXPLORING CONSTRUCTIVE AND BENEFITIAL ANXIETY AND MENTAL HEALTH MONITOR AMOUNGST UNIVERSITY STUDENT.

QUT WELLBEING APP:

- https://qutvirtual4.qut.edu.au/group/student/health-and-wellbeing/qut-wellbeing-app

QUT COUNSELLING AND WELLBEING:

- https://qutvirtual4.qut.edu.au/group/student/health-and-wellbeing/counselling-and-mental-wellbeing

QUT Mental Health Support:

- https://www.medical-centre.qut.edu.au/home/featured/mental-health

Digital Technology in the treatment of anxiety:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7006989/#:~:text=Recent%20findings.%2Dworld%E2%80%90%20settings%20is%20unclear.

- To help with the treatment of anxiety through emerging technology, vr seems probable.
- There is now substantial clinical research demonstrating the efficacy of internet-delivered cognitive behavioural therapy in the treatment of anxiety. However, the ability of these interventions for engaging patients in "real-world" settings is unclear.
- Recently smartphone apps are popular as an delivery of intervention.

VR exercise for anxiety and depression:

- https://www.mdpi.com/2077-0383/7/3/42
- https://mental.jmir.org/2021/9/e29681
- VR is said to help

Existing technology that assists with stress and anxiety:

- https://at3center.net/2018/05/23/at-for-managing-anxiety/
- Apps, soothe-your-space devices
- Wearables or winding down
- Fidget freely

MB

POTENTIAL IDEA 2: HANDHELD DEVICE FOR MANUAL SCANNING IN PODIATRY PRACTICE

In our funded CRC-P project with company i-Orthotics (Design-led digitised supply chain of smart orthotics for Regional Australia), we are working with biomedical scientists to produce an accurate hand-held scanning technology for podiatrists who prescribe orthotic devices.
The challenge of this project is that it needs to serve remote and regional health service providers, where there is no specialised practitioners in orthotics and patients need to wait for more than 6 weeks for a consultation with a fly-in specialist to prescribe their custom orthotics.
Scanning technology of the human body is common place now, but not so much the type of scanning requiring accuracy of data for the manufacturing of orthotics. While our team is working on the scanning technology itself, we need a hand-held device to ensure that any lay person can use the manual technology in the correct manner, and as a result, obtain an accurate scanning of the foot.

In this project you would be guided and mentored by myself (Industrial Design researcher) and the biomedical team working on the scanning technology. Our most recent industry delivery contains the data that you would need for the design development of the hand-held device.

I am cc copying Dr Rafael Gomez in this email, as this is a new project I am proposing.

Please let me and Rafael know if this project is of your interest, so that I can organise a zoom meeting for us to chat about the project and your individual goals for this capstone unit.

MB

Meeting:

- Lortholcs
- 6 weeks to get to
- Podiatrists and manufacturers in the region
- 3 year project
- Learning project
- Scanning feet varies person to person
- The scanning hopes to work
- They
- Full weight bearing, semi and no weight - how much pressure you put on the foot
- This captures different data, this makes it harder for the podiatrists and this makes it harder for the foot and client.
- CHALLENGE? How to make it easy to use for anyone, the hand held object.
- Existing scanners, analysis and different interfaces between the foot and digital scan, manual scanners to inform product design.
- Manufacturing perspective, podiatrists, professor in podiatrists ... biomedical scientists... Says surveys they don't need. Analysis for medical technology and existing technology
- Research in design and human centered design.... Because it is a human centered design
- Discuss with lecturer and come up with a project plan...
- Identify the questions for each part of the project. And send to prof.

MB

What are orthotic devices:
https://orthoinfo.aaos.org/en/treatment/orthotics/

- Devices or products that help with common complaints of the foot or ankle.

Uses

Conditions that connects to orthotic devices:

- Flatfoot
- Foot deformities
- Unsupported ankles and foot.
- Tendinitis
- Rheumatoid arthritis - heel of ankle
- Ankle sprains
- Pressure and foot/ankle stress

Orthotic devices

- Wedge insert
- Ankle foot brace
- Heal flare
- Heel cushions
- Custom orthoses

Other things:

- Orthotic devices can work depending on cost and additional training and exercising program.

TECHNOLOGY

- Now, computerized foot analysis is often used to develop orthoses that more accurately reflect the dynamics of your gait. - Instead of plaster moulds in the past.

Start to look at users and how to investigate what I should explore in the design. The system and what and how the data is used. Look at podiatrists and points of exploration.

Questions and topics to explore:

- Does technology help or worsen anxiety?
- Scanning technology at qut.

Existing Scanning Technology:
https://www.hmpglobalearningnetwork.com/site/podiatry/scanning-technology-and-orthotic-casting-what-you-should-know

- Plaster casting v 3D Scanning

MB

Friday (4th Aug):
Begin RP: ccp
1. Begin literature review, search:
• Academic articles, industry reports on your topic
• Categorise key themes identified in literature
• Keep a rigorous record of your literature identified
2. Explore existing concepts and ideas (benchmarking)
• What currently exists in this space?
• Are there current solutions that are performing poorly?
• Is there a novel design opportunity that hasn't been explored?
• Keep a good record (images, source, etc) of what you find in DDR
• You should begin sketching from day one. Ideate, gather inspiration, build mood boards, etc.
• Begin DDR and design process right now!

Project plan:
Feedback advice from Mike...
Ask podiatrists ask about what

- Ask about how the whole system works, potential 3 printing, how do they operate things, position for foot and how does the system works. Can I come up with a better solution for foot scanning... ask about the problems, can you make a system that removes error
- Ask about observational research would be beneficial and think talk survey would be good.
- Questions should centre around the system and finding error
- Podiatrists , manufactures,

Ask about research methods.... Zoom interview... types of questions and observational work.
Do system research learn from id6 ... stakeholder, context, technology.
Begin research ceatwork.

REPORT – Project Research

Summary:
I was given the opportunity to do a project in orthotics and manual scanning using new technology. I have too main ideas :

- EXPLORING CONSTRUCTIVE AND BENEFITIAL ANXIETY AND MENTAL HEALTH MONITOR AMOUNGST UNIVERSITY STUDENT.
- HANDHELD DEVICE FOR MANUAL SCANNING IN PODIATRY PRACTICE

REPORT – Relevant links

WEEK 2 Links: academic sources for lit

Potential IDEA 2
•https://orthoinfo.aaos.org/en/treatment/orthotics/
Orthotics - 2008
•https://journals.sagepub.com/doi/full/10.1080/03093640802113006
Orthotics and prosthetics in rehabilitation
•https://books.google.com.au/books?hl=en&lr=&id=MszsAwAAQBAJ&oi=fnd&pg=PP1&dq=orthotics+&ots=UvuYViV7Ir&sig=GYMcx1txcore80TKs5ANb1F-xVU#v=onepage&q=orthotics&f=false
Chapter 1 - Orthotics and Prosthetics in Rehabilitation: Multidisciplinary Approach
•https://www.sciencedirect.com/science/article/pii/B9780323609135000015
•AND CHAPTER 8 - foot orthoses

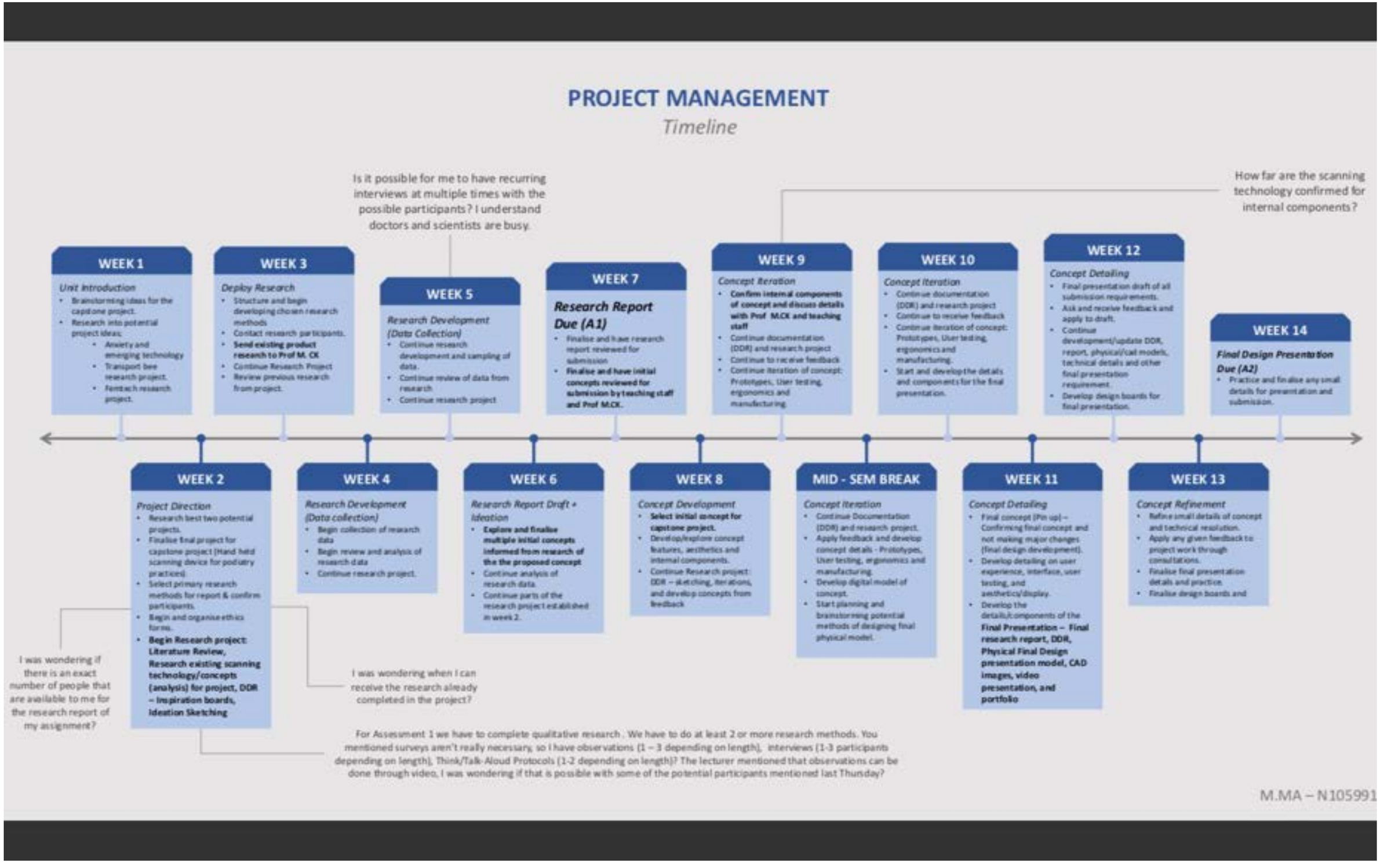
Introduction to orthotics - 2014
•https://ebookcentral.proquest.com/lib/qut/reader.action?docID=2072272
Orthotics - 2011
•https://www.sciencedirect.com/science/article/pii/S1878764910001543

The use of a low cost 3D scanning and printing tool in the manufacture of custom-made foot orthoses: a preliminary study - 2014
•https://bmcresnotes.biomedcentral.com/articles/10.1186/1756-0500-7-443

CUSTOMIZED FOOT ORTHOSIS MANUFACTURED WITH 3D PRINTERS - 2012
https://www.researchgate.net/profile/Selman-Hizal/publication/260686174_CUSTOMIZED_FOOT_ORTHOSIS_MANUFACTURED_WITH_3D_PRINTERS/links/00b4953201ed3d4311000000/CUSTOMIZED-FOOT-ORTHOSIS-MANUFACTURED-WITH-3D-PRINTERS.pdf

Potential IDEA 1
•https://www.medical-centre.qut.edu.au/home/featured/mental-health - QUT Support page
QUT WELLBEEING APP:
•https://qutvirtual4.qut.edu.au/group/student/health-and-wellbeing/qut-wellbeing-app
QUT COUNSELLING AND WELLBEING:
•https://qutvirtual4.qut.edu.au/group/student/health-and-wellbeing/counselling-and-mental-wellbeing
Digital Technology in the treatment of anxiety:
•https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7006989/#:~:text=Recent%20Findings,%2Dworld%E2%80%9D%20settings%20is%20unclear
Wearable technology for anxiety and uni students
•https://cedu.news.niu.edu/2018/10/30/researchers-study-wearable-technology-to-help-students-with-anxiety-disorders/

REPORT – Project Management



REPORT – Project Research (PAC)

Week 2 Catchup - RESEARCH

Monday, August 7, 2023 8:51 PM

Further research in orthotics and foot scanning.

Orthotics and Manual Scanning
About Orthotics
https://orthoinfo.aaos.org/en/treatment/orthotics/

- Orthotic devices like these are frequently used to treat various conditions of the foot and ankle. They are often very effective in relieving common complaints.

https://www.sciencedirect.com/science/article/pii/S1878764910001543

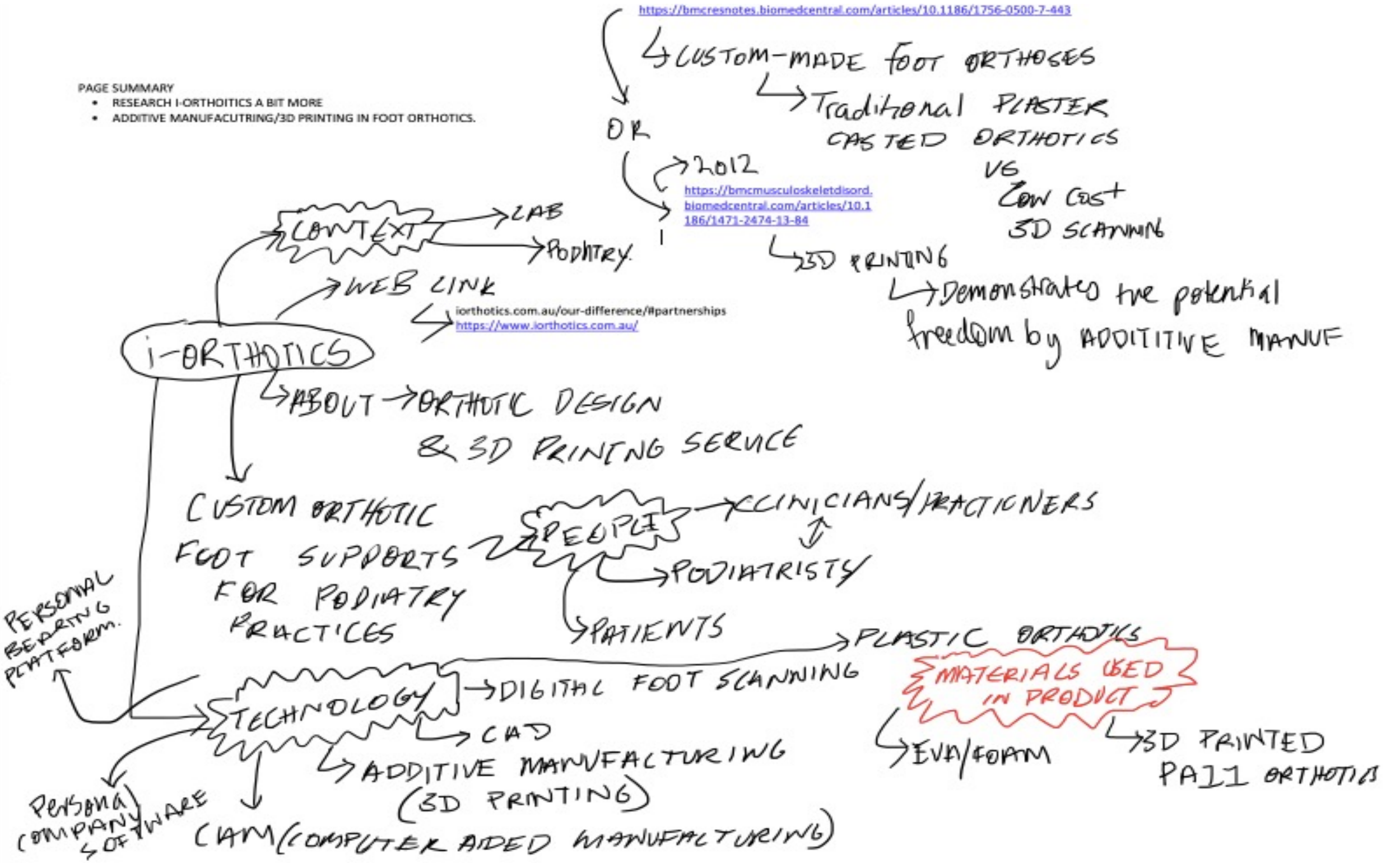
- Is the use of synthetic or mechanical devices in order to stabilize, heal, or prevent injury and deformity to weak joints or bones
- Common conditions include calluses, hallux valgus and other toe deformities. In addition, a number of comorbid conditions also have a direct impact on foot health and/or function: rheumatoid arthritis, peripheral vascular disease, diabetes

https://research.qut.edu.au/designlab/projects/designed-led-advanced-manufacturing-of-smart-orthotics/

https://www.iorthotics.com.au/how-to-capture-the-perfect-3d-foot-scan/

REPORT – Project Research (PAC)

PAGE SUMMARY
- RESEARCH I-ORTHOITICS A BIT MORE
- ADDITIVE MANUFACUTRING/3D PRINTING IN FOOT ORTHOTICS.



PROJECT INTRODUCTION – Existing products (3d scanners)

MOST PRODUCTS ARE VARIATIONS OF 3D SCANNING.

https://all3dp.com/1/best-3d-scanner-diy-handheld-app-software/

RESEARCH ABOUT 3D PRINTING PROCESS.

EXISTING PRODUCT ANALYSIS:

PRODUCT	DESCRIPTION	COMPONENTS	Aesthetics	Dimensions	COST	CUSTOMER REVIEWS	SOURCES
	Structure sensor is an IPAD/Tablet extension that attaches to the camera of the device. By Occipital inc	Tech - Structured light Multi-purpose camera attachment Ipad/tablet Requires additional software the manufacturer provides is called Structure SDK Wireless	Small and rounded structure Filleted ends.	109 × 18 × 24 mm 0.07 kg	From $599	Innovative 3D sensing platform. Can serve as a 3D scanner. Good opportunity for software developers to create related apps. Compact. Seamlessly integrates with iPad. Best for software developers and early adopters. Few apps are currently available for this device.	https://www.footwork.com.au/new-portable-3d-foot-scanner/ https://www.aniwaa.com/product/3d-scanners/occipital-structure-sensor-pro/ https://www.pcmag.com/reviews/occipital-structure-sensor
	A small portable 3D Scanner that can fit in your hand. By Orthotech Laboratory	0.4mm of accuracy 3D non-weight bearing scans Software USB Ports	Silver rectangular prism	150g	N/a	N/A	https://orthotech.com.au/3d-scanners/orthotech-3d-mini/
	Einscan Pro 2X Plus 3D scanner that is used professionally for healthcare, education, design art, VR and engineering.	3D Scan Real-time data Foot Analysis Report Software Multiple parts like calibration board, phone screen mount, usb input	Dark grey Closed Handle Single hand use		$8,500	Scans well, Very versatile, have to pay for the features needed, reasonably priced, straightforward software Takes up a lot of power on computer, meshing software can miss, struggles with dark or detailed surfaces.	https://www.einscan.com/handheld-3d-scanner/foot-station-pack/ https://all3dp.com/1/shining-3d-einscan-pro-2x-plus-3d-scanner-review-specs-price/
	Hand-held structured-light 3D scanner is the ideal choice for making quick, textured, and accurate 3D models of medium-sized objects such as a human. By Artec 3d	Tech - Structure light Accuracy - up to 0.1 mm Fast capturing speed 16 fps High 3D resolution 0.2 mm Texture resolution 1.3 Mpx Requires artec studio - software HD Scanning USB CABLE/ Power Supply - standing parts Target-free tracking Hybrid geometry and color based	Closed handle. Single-hand use White and grey Smooth and glossy finish.	0.9 kg 262 × 158 × 63 mm	$19,800	Bestselling handheld 3D scanner on the market Expensive Clunky design and tiring to hold Limited to object that are bigger then 10 cm Good software Can scan tricky surfaces	https://www.artec3d.com/portable-3d-scanners/artec-eva https://all3dp.com/1/artec-eva-3d-scanner-price/
	Peel 3 3D scanner is a product a part of a series of updates. Redesigned from peel 2 3d. Provides a professional - grade s3 scanning solution for high - fidelity objects, digital archiving, human anatomy, orthotics and prosthetics, converts handmade objects to digital.	Tech - Structured light, LCD Screen - touch screen, Cad Software, A foam insert as a light-duty carrying case, Power supply, usb cable, Accuracy - 0.250 mm/m, up to 0.1 mm (0.003 in/ft, up to 0.004 in)	multi-grip triangulated handle	304 x 150 x 79 mm (12 x 5.9 x 3.2 in) 950 g (2.1 lb)	$8,490 USD	Simpler design Easy to learn Portable	https://peel-3d.com/products/peel-3/ https://ultimate3dprintingstore.com/products/peel-3-3d-scanner?off=2
	Shining 3D Einstar Affordable hand-held 3D scanner suitable for outdoor scanning, human body, material adaptability	Structured light, Accuracy - up to 0.1 mm, Equipped with 5 Infrared VCSEL Projectors, 2 Stereo Depth Cameras and 1 RGB Camera, Software - Einstar, Additional features - Calibration boards, case, User interfaces - LED indicators, Buttons, Suitable scanning - outdoor, human. Einstar 3D scanner, USB cable, Power adapter, Power cable, Calibration board, Quick start guide, Reflective markers (500x)	No handle Lightweight	220x46x55 mm 500g	$959.00 600g	Good Build quality, Good software, Good value considering price, Great scanning for a handheld device 3d scanner, Practical carrying case, Unsuitable for smaller objects, Low capture detail, Not ergonomically designed well, Demanding system requirements, Noisy fan	https://www.einstar.com/

KEY FINDINGS:
Most of the existing 3D scanners that are used to scan foot or the human body are designed to heavy/large and used with one hand. Currently the method is 3D scanning --> 3D Imaging ---> Private Software ---> 3D Printing.

They tend to be heavy and seem tiring for use, due to the weight and the internal components.

Most scanners are limited interface on the product and are operated through USB Cable by software in the PC/tablet.

Most scanners scan and operate moderately well in terms of accuracy.

Most have good accompany software and other accessories like ... power supply, case, USB cord.

Most aren't colourful or expressive in the aesthetic, the colours tend to be neutral and have geometric design/smooth design shape.

The more popular products tend to be more expensive and favour the vertical/cylindric design.

Most require the subject to sit very still, or have a separate standing platform for the foot.

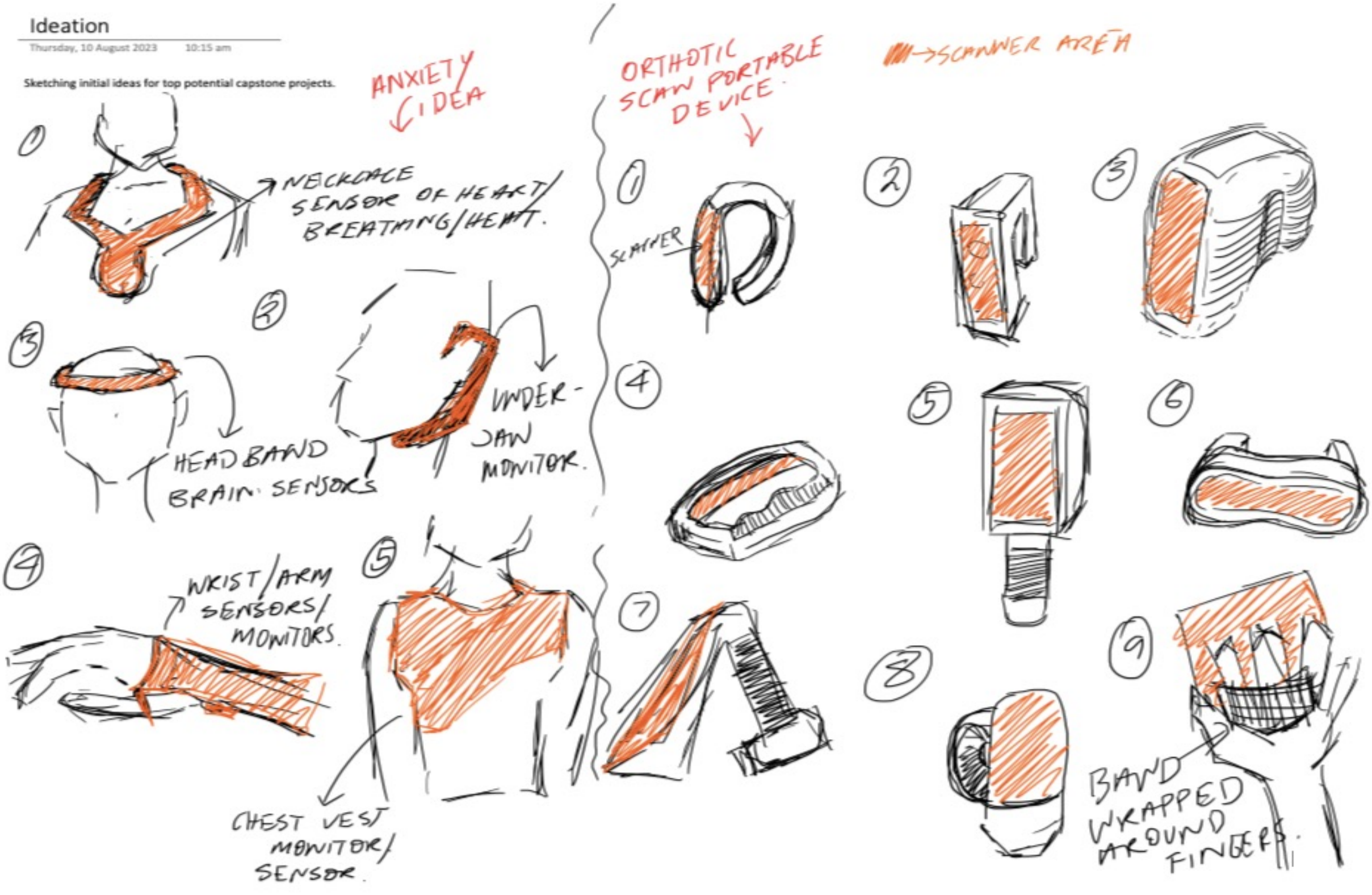
Most of the Technology used for human anatomy scanning is STRUCTURED LIGHT - AS IT ISN'T HARMFUL.

OPPORTUNITIES:
There is an opportunity to design an organic/a more expressive design.

There is an opportunity to explore various handles and methods of holding the device.

Explore multiple opportunities in potential interfaces (TOUCH LCD SCREENS, BUTTON, SWITCHES, SIGNS).

DESIGN DEVELOPMENT – WK 8



REPORT – Research investigation

METHODOLOGY

- I AM ENQUIRING INTO THE PROBLEMS OF THE CURRENT AND SUCCESSFUL/POOR HAND-HELD FOOT SCANNERS IN THE PODIATRY INDUSTRY
- I WILL CONDUCT MULITPLE INTERVIEWS AND THINK/TALK PROTOCOL OR OBSERVATIONS TO PEOPLE PROVIDED THROUGH THE CONNECTION OF PROF. MCK
- THE PARTICIPANTS FOR THE RESEARCH PROCESS ARE... PODIATRAISTS, MANUFACTURISTS - I.. ORTHOTICS, AND SCIENTISTS INVOLVED IN THE PROJECT
- I'LL MOST LIKELY DO THE INTERVIEWS OVER ZOOM, AND HOPEFULLY DO IT OVER MULTIPLE INSTANCES.
- I HAVE TO EMAIL MARIANELLA AND MAKE SURE TO GET THE INTERVIEWS NEXT WEEK.
- PROF. MARIANELLA... MENTIONED SURVEY'S AREN'T NECESSARY

METHODS:

- INTERVIEW: 1 - 3 PARTICIPANTS DEPENDING ON LENGTH..... PODIATRIST
- OBSERVATION CAN HAPPEN OVER VIDEO:

WHAT YOU NEED TO DO

You are required to provide the following information to participants

- Need to provide accurate and consistent information about your project/experiment and **what participants will be required to do**
- Inform them that information is to be used for the **purpose of research in this subject only and for design ideation**
- Their **responses / involvement will not impact their relationship with QUT** in any way
- Their **involvement is voluntary, and they are free to withdraw from study at any time** without question
- **Ask if they understand** the above information and have them **agree in written form** (sign and date, email, something in writing)

Ask Marianela of research material... like survey material?

INTERVIEW QUESTIONS: Semi -Structured

Questions in blue are additional questions based on responses.
Parts in red are the reasoning of the question.
Ask To record the interviews/ observation or think/talk protocol

THINK/TALK PROTOCOL <---- OR ----> OBSERVATION OVER VIDEO

In a think/talk protocol, the expert describes the process whilst performing the process of using a Scanner and observations are also take with images and audio/video.

- Step 1: How do you start the process.
- Step 2: Where does the patient sit
- Step 3: What is the user doing?

I am currently unsure what people would be a part of the observation or think/talk protocol process?
Online videos can be used as observations (methods).
Would it possible for me to observe the process and asking questions.

FOR PODIATRISTS:

- WHAT ARE THE CURRENT FOOT SCANNERS DO YOU USE IN YOUR PRACTICE AT THE MOMENT?
  - Do you currently like your scanner, that you are using.
  - Is that are popular scanner in the podiatry practice for scanning feet?
  - How do you hold it? One hand or two in the process?
  - Do you only have one scanner? How many have you used in the past?
- CAN YOU USE THE SAME SCANNER FOR ALL CONDITIONS YOU CAN PROVIDE FOR?
- HOW LONG IS THE PROCESS OF SCANNING THE FOOT? - To see if the process of scanning is tiring due to weight.
  - How does it feel when holding it? - Ergonomics
  - What is the required distance and angle do you need to be from the object to get your ideal scan?
  - Does the foot need to be on a standing platform? Why?
- WHAT ARE THE OTHER FEATURES NEEDED IN YOUR SCANNING PROCESS.
  - Like, standing platform, tablet, wires connected to the pc.
  - In the process is the scanner attached to the
- WHERE DO YOU KEEP IT IN YOUR PRACTICE?
  - Does it take up space?
  - Is it able to store or move around in the space?
- DO YOU TAKE THE SCANNER OUTSIDE THE PRACTICE.
  - Is it easy to travel with and store?
- WHAT FEATURES OF THE SCANNERS DO YOU LIKE?
  - Why do you like this part?
- WHAT ASPECTS OF THE SCANNER DO YOU DISLIKE?
  - Why do you dislike this part?
- IS THERE ANYTHING ELSE ABOUT THE FOOT SCANNER WOULD YOU LIKE TO ADD?

FOR BIOMEDICAL PROJECT PARTNERS:

- WHAT IS THE CURRENT TECHNOLOGY EXPLORED AND DEVELOPED IN THE PROJECT?
  - What are the main components of the technology? - structured light, 3D laser?

FOR MANUFACTURISTS:

- WHAT ARE THE CURRENT FOOT SCANNING TECHNOLOGY/ PRODUCTS ARE YOU WORKING WITH AT THE MOMENT?
  - Are these a popular products in the industry?

TUTOR FEEDBACK
Smart devices... with attachment ... look products as attachment... ask what the scanners need to do?
Scale of the foot... ask about additional footer and holder for plate for scale.

Ask about if the person has to show movement instead of static scan.. animation of movement foot.
Multiple scanners... ask what the possibility for scanners. Are there particularly scanners for... is there are range for feet size to scan.
Can you scan the inside the shoe? --- to help with issues

Ask about what type of scanning technology - infrared and what to include in product.

Are there specific issues or problems with remote use... ask about delivery and ask about if it personal device or care nurse/gp.
Can multiple people, what is the expected frequency and sustainability. Environment use?

Look at dental and other scanners... That are particularly small.

REPORT – Project update

PAGE SUMMARY:

- Outline and explain my understanding of the project that Prof. Chamorro-Koc has presented to me.
- Demonstrate my goals/aims and direction for the semester so she understands my timeline and deliverables.
- Other Information and tasks to show converse and discuss with Marianella about.
- Meeting notes where we discuss information on this page.

PROJECT OUTLINE:

The purpose of the project is to design a concept for a hand-held device that houses the new scanning technology being developed in the main project. The aim is to allow the technology to be used in regional and remote areas by regional **healthcare providers** without podiatry specialists' immediate need or wait time. Through a hand-held device, manual technology can be used for accurate results to develop orthotics for people in need.

GOALS, AIMS AND EXPECTATIONS:

- I aim to conduct qualitative research on the topic to investigate the
- I aim to interview up to 3 people for my primary research and to use that research to explore the best avenues for my concepts.
- I aim to conduct an observation to explore the ideal process and storyboard on the function and ability of the proposed device.
- I aim to use primary and secondary research to write and report that includes a literature review, qualitative research, research analysis, and initial concept sketches.
- I aim to develop the initial conceptual designs into a potential final concept for end of year presentation and get information on the possible internal components and necessary features and parts.
- I aim to design a final concept for the project I will present at the end of the semester. The final concept will include computer-generated designs, documentation of the whole design process (DDR), technical sketches, presentation material, a final research report and a physical model.

PROJECT MANAGEMENT TIMELINE:

I also suggest meeting once a week, maybe every Thursday, for project updates over

Meeting notes:

- most to be able to be used for lay people, nurses or carers… people without training
- They use different techniques…. Of developing orthotic devices. Not necessarily do the technologies take accurate foot moulds. It depends on how the pressure is applied, which changes the mould and conditions for the foot. How can we ensure that any scan we create makes the scan accurate? Investigate the product to look at what the body is scanning. Haptic technology… look at distance and the proposed motion of the design.

- **RE-d0 timeline…**
- Re-do Questions.
  - Meeting with Marianela
  - I have to meet next week.
  - Wednesday noon and afternoon.
  - Short paragraph into my project, what I am investigating, and deliverables.
  - Three people, scientists and podiatrists
  - Ask about and show questions….. ask about the legitimacy of the observation and if I am hitting the requirements for personal research.

Look at trying to implement the accuracy of motion scanning.

RESEARCH APPROACH:

My two main methods:

- **Interview**
  - Up to **2 participants** to interview and asked about the new technology being developed and how the proposed device will be used.
  - Potential Questions: 15 – 25 minute interviews:
    - What is the current technology explored and developed in the project? How much can you tell me?
    - What is the aim of the project and its purpose?
    - What are the accessories and potentially additional parts/features to the device?
    - I am exploring existing scanners and emerging technologies in the orthotics industry.
    - **I can also ask about the potential opportunity for personalisation.**
    - **I can also ask about the limitations of the technology.**
    - **I can also ask about all the potential users and stakeholders involved in the device.**
- **Observation**
  - Observation can inform the type of environment/context of the proposed device and the process for human use.
  - A video that functions similarly to the new technology and how it is intended to be used.
  - OR a simple mock-up/conceptual storyboard that shows how the intended design concept will be used (process, context,
  - Notes, audio, video or images to be used for research analysis.

Hello Mentors,

My name is Milli Mehari Abraha, and I am a student a part of the Industrial Design Capstone Unit. The unit requires me to conduct qualitative research for my report, which will inform my design creativity. I have to interview at least 2 in-depth interviews, and a structured observation.

For other students in the unit, the research part of the report is used to find the problem and opportunity for potential different products in a particular broad topic area they are investigating. However, I was lucky enough to get a device for my topic already. Thus, my research will primarily focus on the technology developed in the main project and scanning process. Prof Marianella Chamorro-Koc has already given me information on the project's development. However, for the sake of my assignment, I have to ask similar questions. I have to conduct interviews for at least 15 minutes and observation for at least 15 minutes. I aim to have the observation being a short mock-up demonstration of the technology's functionality. After the research report is due in week 7, I have to confirm the internal parts of my conceptual design. So I might have to ask a few weeks later about the components of the technology in more detail.

I have consent/participation forms with additional information about your contribution to the project that requires signing. When conducting my research, I also need to take notes, record audio, and take images and maybe videos. I also have an image consent sheet with information that also needs signing.

PROJECT– Project management update

NEW PROJECT MANAGEMENT

Timeline

FINISHED WEEKS

UNFINISHED WEEKS

WEDNESDAY
Conduct interview and observation on the same day at KG.

WEEK 1

Unit Introduction
- Brainstorming ideas for the capstone project.
- Research into potential project ideas;
  - Anxiety and emerging technology
  - Transport bee research project.
  - Femtech research project.

WEEK 2

Project Direction
- Research best two potential projects.
- Finalise final project for capstone project (Hand held scanning device for podiatry practices).
- Select primary research methods for report & confirm participants.
- Begin and organise ethics forms.
- **Begin Research project: Literature Review, Research existing scanning technology/concepts (analysis) for project, DDR – Inspiration boards, Ideation Sketching**

WEEK 3

Deploy Research
- Structure and begin developing chosen research methods
- Contact research participants.
- **Send existing product research to Prof M. CK**
- Continue Research Project
- Review previous research from project.

WEEK 4

Research Development (Data collection)
- Finalise questions and preparation for interview and observation next week.
- Get feedback from Prof. M.CK and tutors on questions and research direction for report.
- Continue research project.
- How the

WEEK 5

Research Development (Data Collection)
- Deploy and conduct interviews.
- Review and analyse data from interviews and observation, using analyse techniques.
- Get halfway with research report and have draft for literature review and graphics for week 6

WEEK 6

Research Report Draft + Ideation
- **Explore and finalise multiple initial concepts informed from research of the the proposed concept**
- **Send concept drafts to Prof. M.CK**
- Continue and finalise research data.
- Continue parts of the research project established in week 2.

WEEK 7

Research Report Due (A1)
- Finalise and have research report reviewed for submission at the end of the week
- **Finalise and have initial concepts reviewed for submission by teaching staff and Prof M.CK.**

WEEK 8

Concept Development
- **Select initial concept for capstone project.**
- Develop/explore concept features, aesthetics and internal components.
- Continue Research project: DDR – sketching, iterations, and develop concepts from feedback

WEEK 9

Concept Iteration
- **Confirm internal components of concept and discuss details with Prof M.CK and teaching staff**
- Continue documentation (DDR) and research project
- Continue to receive feedback
- Continue iteration of concept: Prototypes, User testing, ergonomics and manufacturing.

MID - SEM BREAK

Concept Iteration
- Continue Documentation (DDR) and research project.
- Apply feedback and develop concept details - Prototypes, User testing, ergonomics and manufacturing.
- Develop digital model of concept.
- Start planning and brainstorming potential methods of designing final physical model.

WEEK 10

Concept Iteration
- Continue documentation (DDR) and research project
- Continue to receive feedback
- Continue iteration of concept: Prototypes, User testing, ergonomics and manufacturing.
- Start and develop the details and components for the final presentation.

WEEK 11

Concept Detailing
- Final concept (Pin up) – Confirming final concept and not making major changes (final design development).
- Develop detailing on user experience, interface, user testing, and aesthetics/display.
- Develop the details/components of the **Final Presentation – Final research report, DDR, Physical Final Design presentation model, CAD images, video presentation, and portfolio**

WEEK 12

Concept Detailing
- Final presentation draft of all submission requirements.
- Ask and receive feedback and apply to draft.
- Continue development/update DDR, report, physical/cad models, technical details and other final presentation requirement.
- Develop design boards for final presentation.

WEEK 13

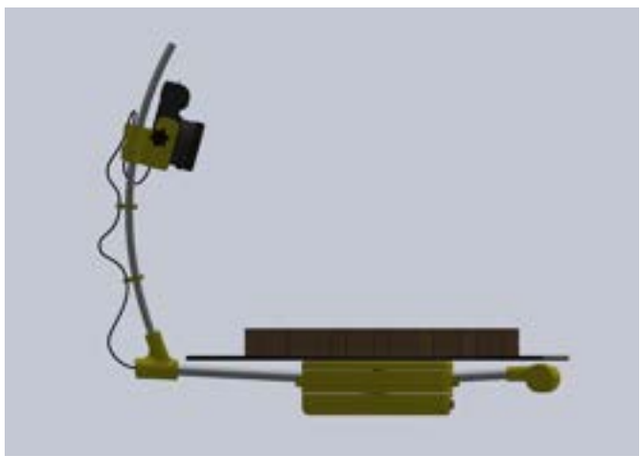
Concept Refinement
- Refine small details of concept and technical resolution.
- Apply any given feedback to project work through consultations.
- Finalise final presentation details and practice.
- Finalise design boards and

WEEK 14

Final Design Presentation Due (A2)
- Practice and finalise any small details for presentation and submission.

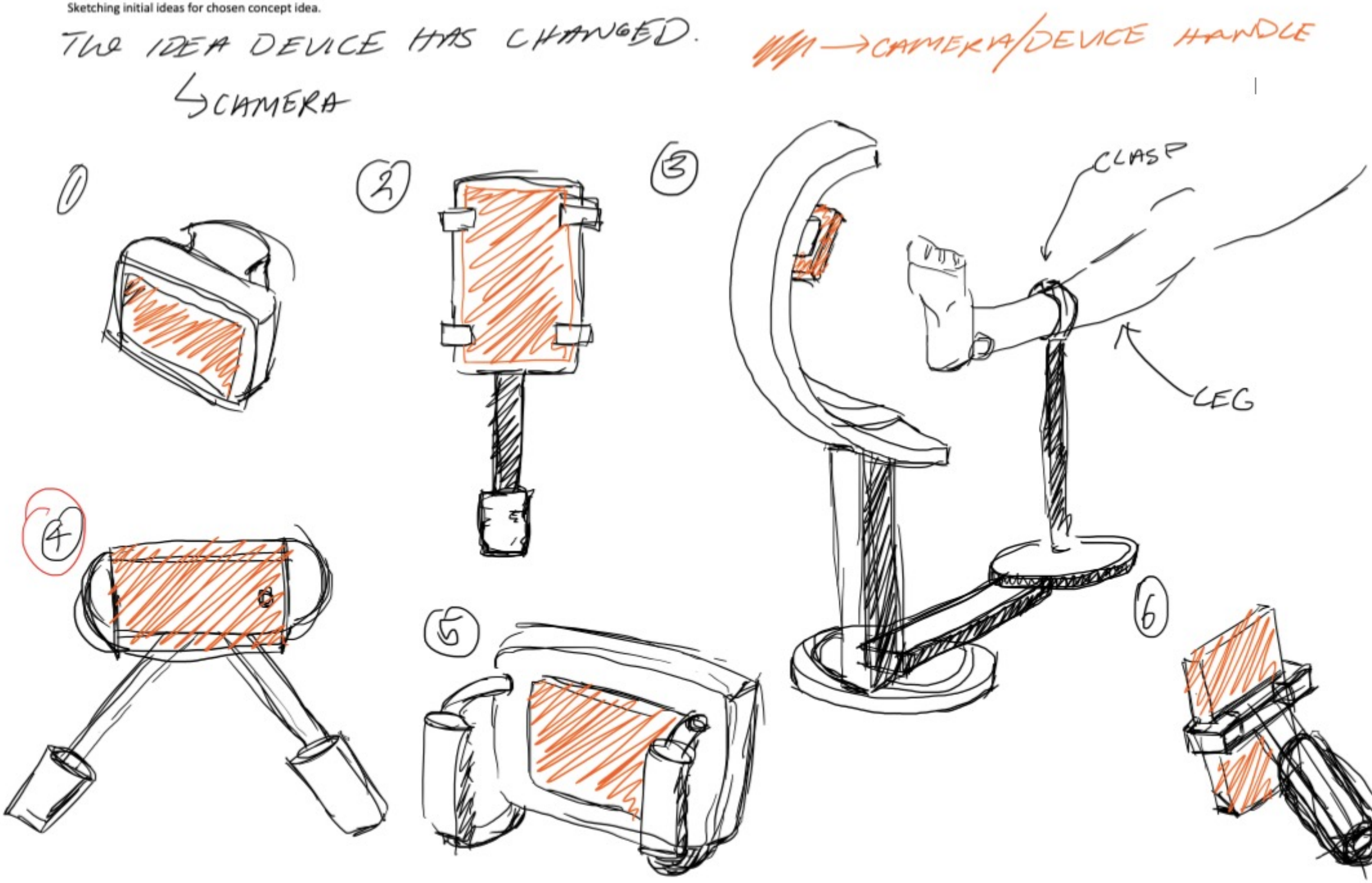
M.MA – N10599185

DESIGN DEVELOPMENT – Existing rigs used in for photogrammetry



DESIGN DEVELOPMENT – Ideation

Sketching initial ideas for chosen concept idea.



REPORT– Project update

RESEARCH STRUCTURE - PLAN
RESEARCH QUESTIONS: EXPLORING NEW SCANNING TECHNOLOGY BEING DEVELOPED FOR ORTHOTIC DEVICES IN REGIONAL AND REMOTE AREAS.

- **Interview**
  - Up to **2** to interviews and ask about the new technology being developed and how the proposed device will be used.
  - The parts in orange are the additional questions that I could ask based on responses
  - The parts in red are my reasoning for the questions.
  - Introduction: I will introduce myself and ask about their demographics/experience in the topic, just for research recording and report. Make sure to inform the participant about how I am recording the information and taking notes.
  - Potential Questions: 25 - 30 minute interviews
    - Why did you choose to explore this particular area to improve technology? To greater understand the importance of the design and necessity for improvement in the new technology.
      - IF - not said. Ask if they have had experience with previous methods for orthotic devices, and why the aim of the technology changes.
      - Who are the intended audience for this technology and proposed product. To explore who is using the product and why they chose this as a focus.
    - What is the current technology explored and developed in the project? How much can you tell me? To greater understand the technology being developed and how far it has come?
      - Are they any parts of the project in the technology that haven't been developed, or you hope to further develop.
    - I was informed on the importance of getting accuracy in scanning process for orthotic devices. What inaccuracies are you trying to eliminate with your new technology? To greater understand if I have to find the more practical ways through scanning to minimise the error in accuracy. Or if there are certain aspects of the technology that adhere this. Like through motion of the user.
    - Are there any additional parts or experimental accessories that would work with technology. To understand what I could add to the design/concept to best support the technology being developed.
      - Is there any indication for additional software that will help with the process?
      - Platforms, with markers?
      - Post production consultation? Can it store the data/scans.
      - I-orthotics
      - Interfaces?
      - How portable is it, does it need to wired or attached to an external device?
    - What are the limitations of the technology? To better understand the limitations of the potential concept.
      - Is there a designated distance for the device with the feet.
      - What is demographic for the technology? Do you expect all types of people to be accommodated by the technology? - Does it accommodate children, elderly, adult, disabilities.
      - Thus it accommodates all sizes.
    - There are different methods of scanning for different conditions that require different orthotic devices. Do you intend to adhere to all the various conditions? To understand if their limitations in what it can scan?
      - If not, what is excluded, or what conditions can the technology focus on?
    - Is there any opportunity for personalisation for the device?
    - Where do you intend the product to be used?
      - Indoors?
      - Health Practices?
    - What is the intended in the life-span or sustainability of the device. Sustainability life span?
      - How is the technology intended to be powered?
    - Is there anything else about the project you would like to add?
- **Observation**
  - 15 - 20 minutes.
  - The observation will happen at the lab where they can simulate how the product will be used.
  - Observation can inform the type environment/context of the proposed device and the process for human use.
  - A video that is a similar function to the new technology and how it is intended to be used.
  - OR a simple mock-up/conceptual storyboard that shows how the intended design concept will be used (process, context,
  - Notes, audio, video or images, to be used for research analysis.

MEETING WITH MARIANELLA CHAMORRO-KOC:

- **Interview**
  - Is with two scientists, that I can ask about questions.
  - The observation will be at the lab where they will demonstrate the technology and simulate how the product will be used.

OTHER NOTES:

ASK ABOUT AS THE ASPECS OF THE TECHNOLOGY, HOW FAR SHOULD IT GO, LOOK AT HOW PEOPLE USE IT AND HOW FAR IS IT GOING TO GO …. IS THEIR OPPORTUNITY FOR THE TECHNOLOGY TO BE EXPLORED.

METHODOLOGY:

RESEARCH QUESTIONS:

EXPLORING THE NEW TECHNOLOGY FOR

SEMI- STRUCUTRE INTERVIEWS

ASK ABOUT DEMOGRAPHICS, ASK ABOUT THEIR EXPEREINCE

CREATE AN INTRODUCTION PIECE.. ABOUT ME…. AND BUILD A RAPPORT BE NICE.

MAKE SURE TO TAKE NOTES AND RECORD AUDIO.

GIVE PROMTP SIF NECESSARY

DON'T TALK A LOT AND LET THEM SPEAK. ALLOW FOR BEAKS AND ACCOMODATION.

IF FOCUS GROUPS, ALLOW EACH PERSON TO TALK.

TRANSCRIBE AUDIO.TECHNOLOGY

DRAGON ANYWHERE,

STRUCTURED OBSERVATION -
ARCHIVAL OBSERVATION… ASK IF THEY HAVE I CAN LOOK AT.

PUBLIC CULTURAL/ARCHIVAL TEXTS.

REPORT– Lit review

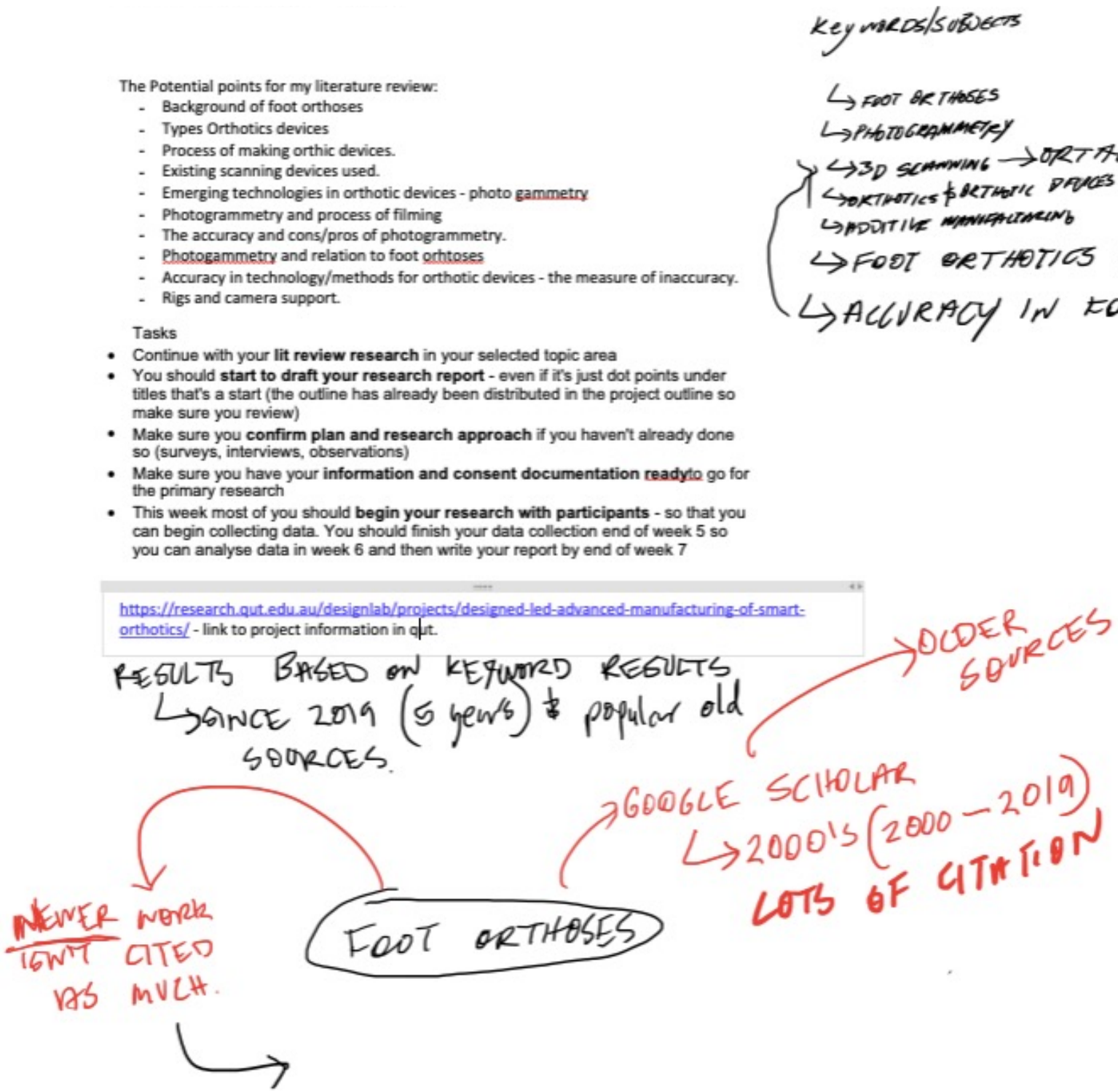
The Potential points for my literature review:

- Background of foot orthoses
- Types Orthotics devices
- Process of making orthic devices.
- Existing scanning devices used.
- Emerging technologies in orthotic devices - photo gammetry
- Photogrammetry and process of filming
- The accuracy and cons/pros of photogrammetry.
- Photogammetry and relation to foot orhtoses
- Accuracy in technology/methods for orthotic devices - the measure of inaccuracy.
- Rigs and camera support.

Tasks

- Continue with your **lit review research** in your selected topic area
- You should **start to draft your research report** - even if it's just dot points under titles that's a start (the outline has already been distributed in the project outline so make sure you review)
- Make sure you **confirm plan and research approach** if you haven't already done so (surveys, interviews, observations)
- Make sure you have your **information and consent documentation ready**to go for the primary research
- This week most of you should **begin your research with participants** - so that you can begin collecting data. You should finish your data collection end of week 5 so you can analyse data in week 6 and then write your report by end of week 7

https://research.qut.edu.au/designlab/projects/designed-led-advanced-manufacturing-of-smart-orthotics/ - link to project information in qut.



PAGE SUMMARY:

- I WAS ABLE TO HAVE A SHORT ZOOM MEETING WITH MEMBERS APRAT OF THE PROJECT WITH PROF. M.C-K.
- I FOUND THAT I HAD THE PROJECT PRODUCT AND DRIECTION WRONG. AND THAT I AM NOT DESIGNING THE DEVICE THAT HOUSES THE TECHNOLOGY BUT THE ATTACHMENT THAT WOULD HOLD THE DEVICE.
- THE SCIENTISTS EXPLAIN THEIR PART IN THE PROJECT AND PHOTOGAMMETRY(THE TECHNOLOGY USED FOR PEOPLE).
- PROJECT UPDATE PARAGRAPH - SHOWING MY UNDERSTANDING OF THE PROJECT.
- OUTLINE TARGET AUDIENCE AND STAKEHOLDERS POSSIBLY INVOLVED IN THE PROJECT.

NOTES:

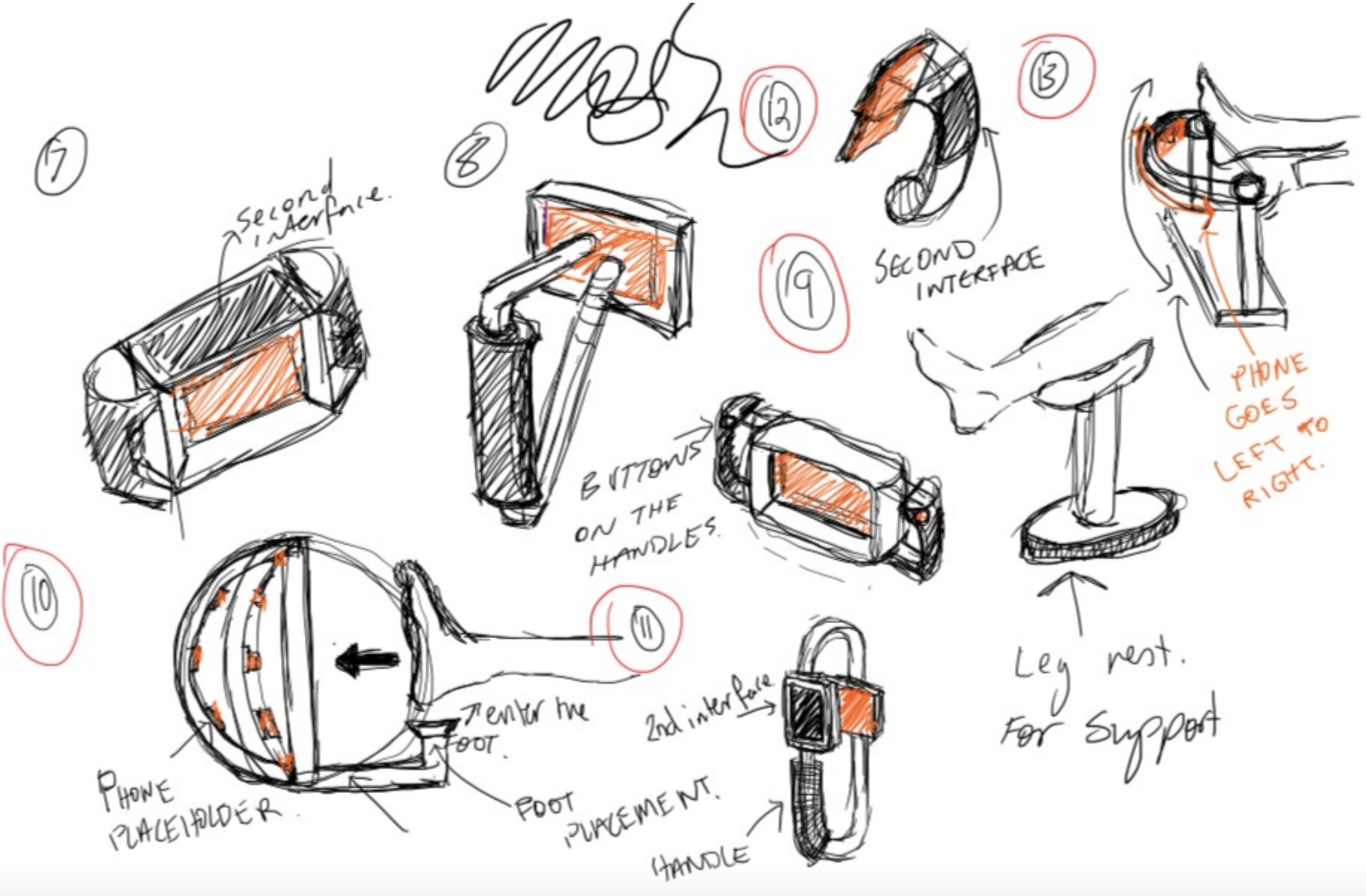
- Phd and post scholar, has orthotic history
- Another member has history
- **Photogametry** - needs a rig for high resolution models. Now they need to use phones. We don't need that resolution for photo orthoses what is achieveable with the phone and is sufficent for our services. It is very challenging when you ask people to follow protocol. Can take a low amount of photos in a rig that people stand on. The sitting position that the people sits on the bed, on the edge and foot is raised 90 degree on rig. Artec scanner, this is a problem with photogamery. The rig elements that can facilitate, I need to take find different ways to minimise error and. Design an attachment to the camera, fridays... 1:30 Wednesday... 11am.

PROJECT OUTLINE:

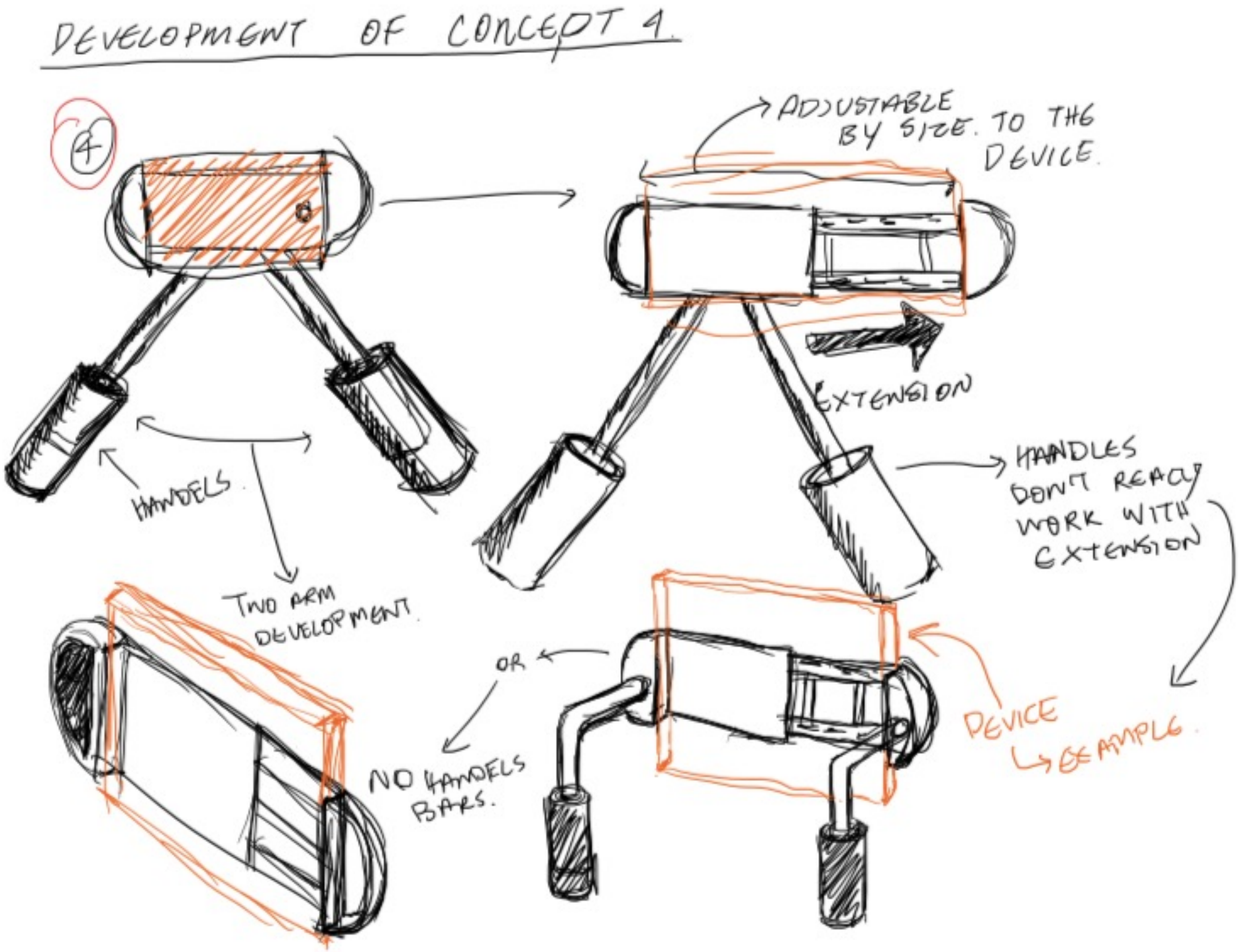
The purpose of the project is to explore digital modelling for remote and regional areas for orthotic purposes. The aim is to design ideation for an assistive structure that helps with the manual process of 3D digital modelling of feet for people in areas without immediate access to podiatry specialists.

REPOT– Observation photos

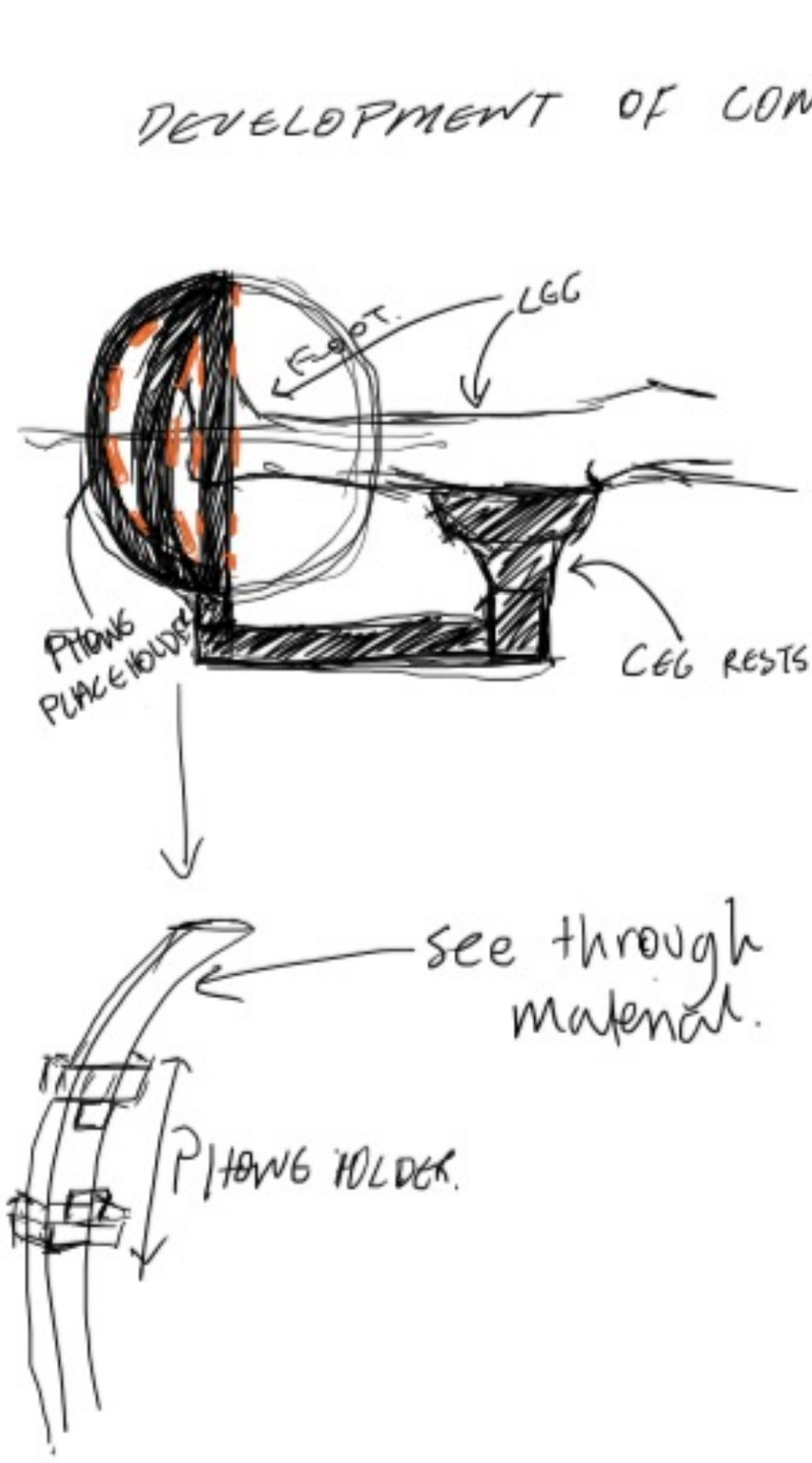
DESIGN DEVELOPMENT – Ideation

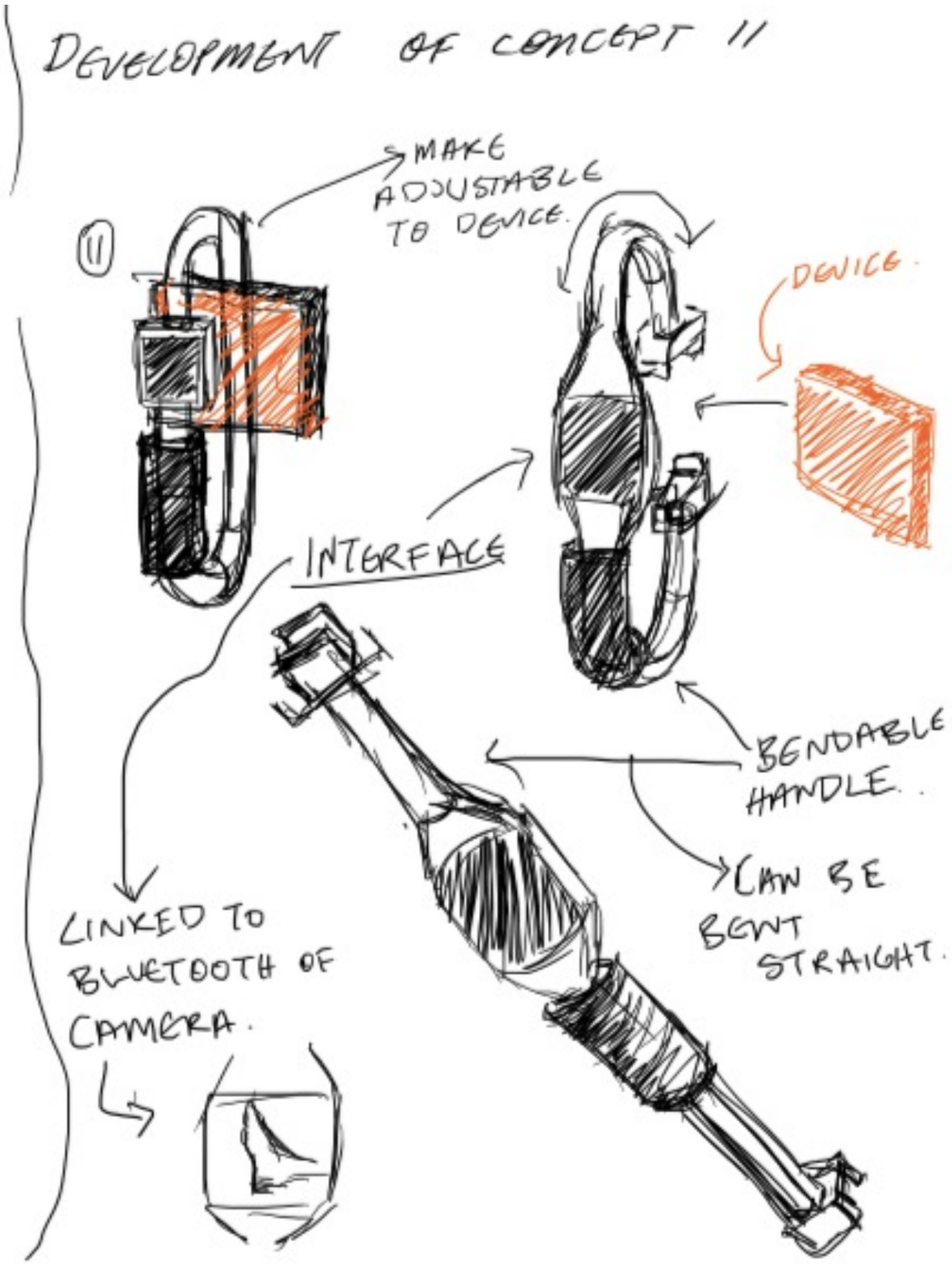


DESIGN DEVELOPMENT – chosen concepts

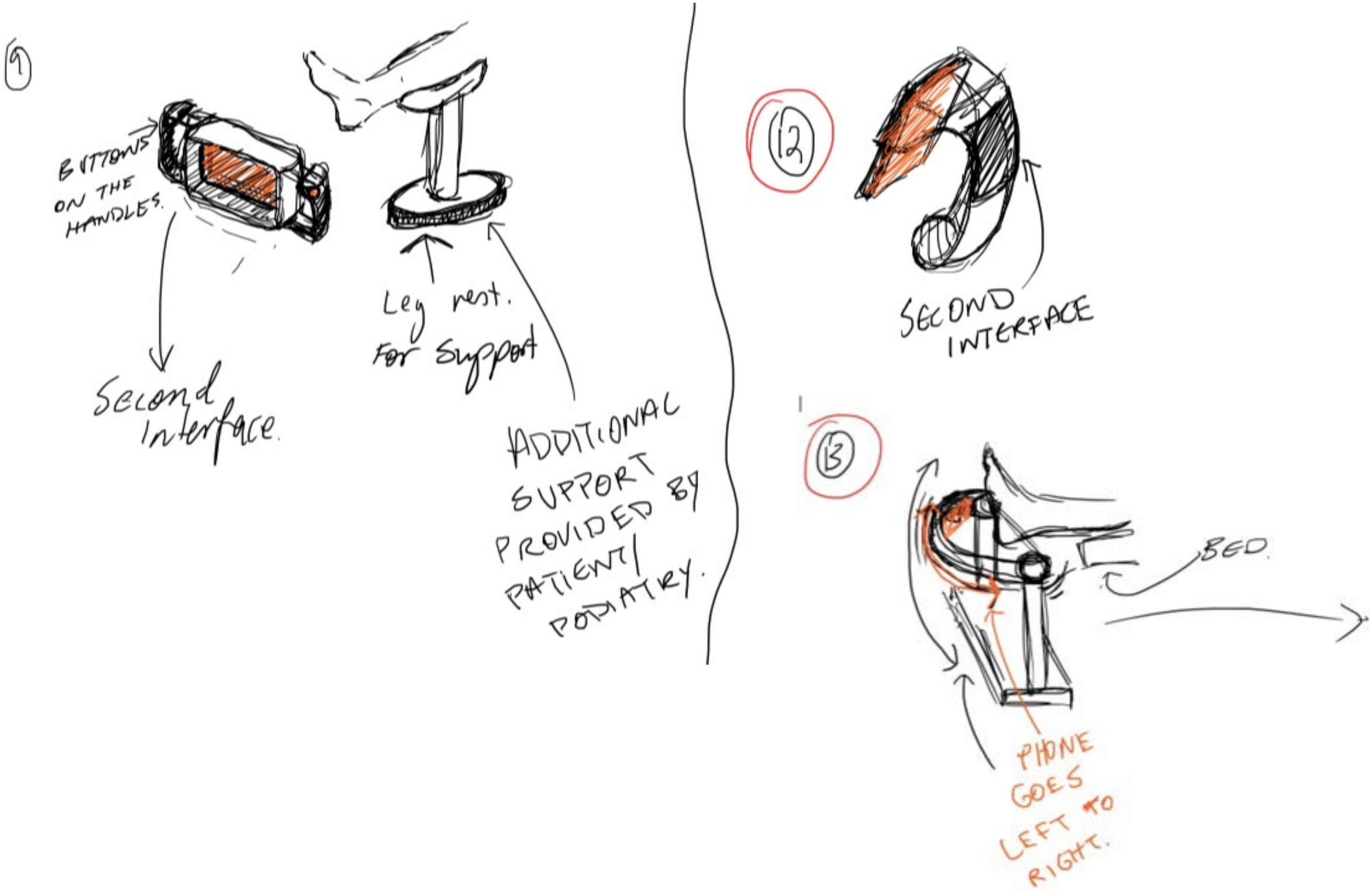


DESIGN DEVELOPMENT – chosen concepts

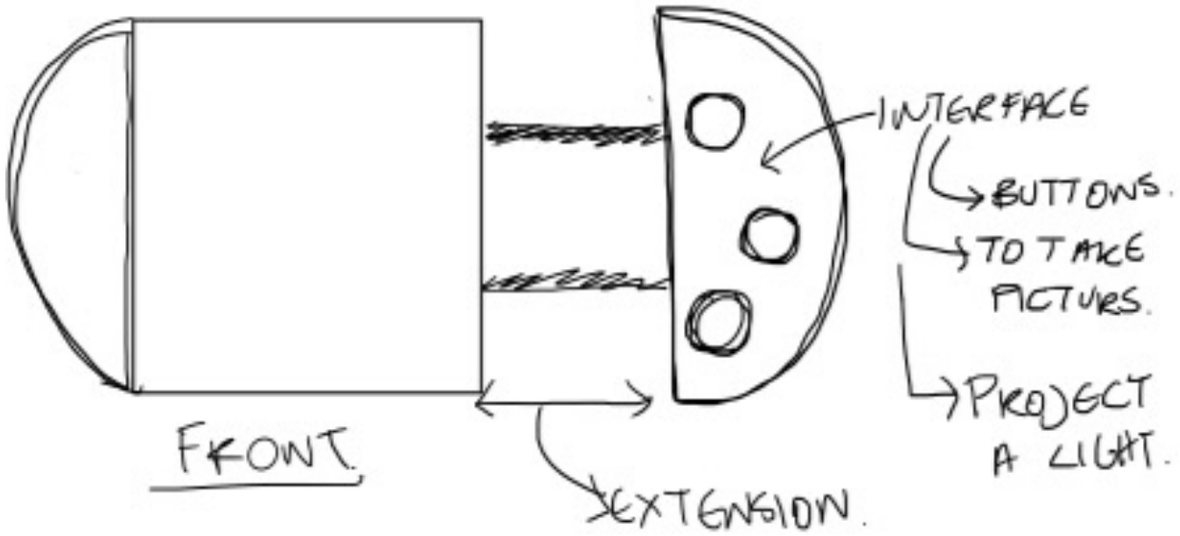


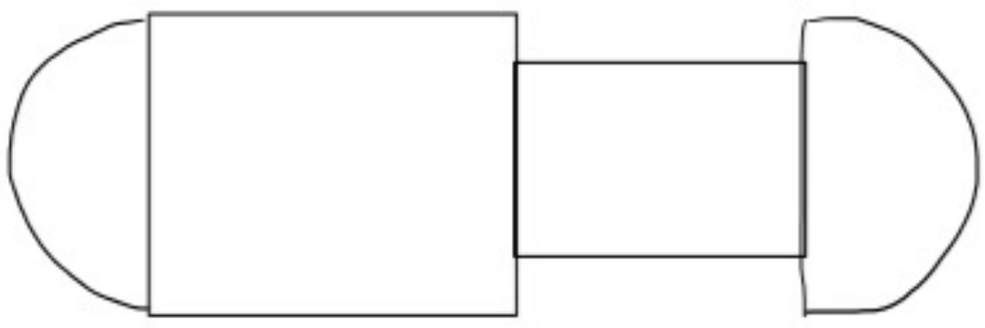


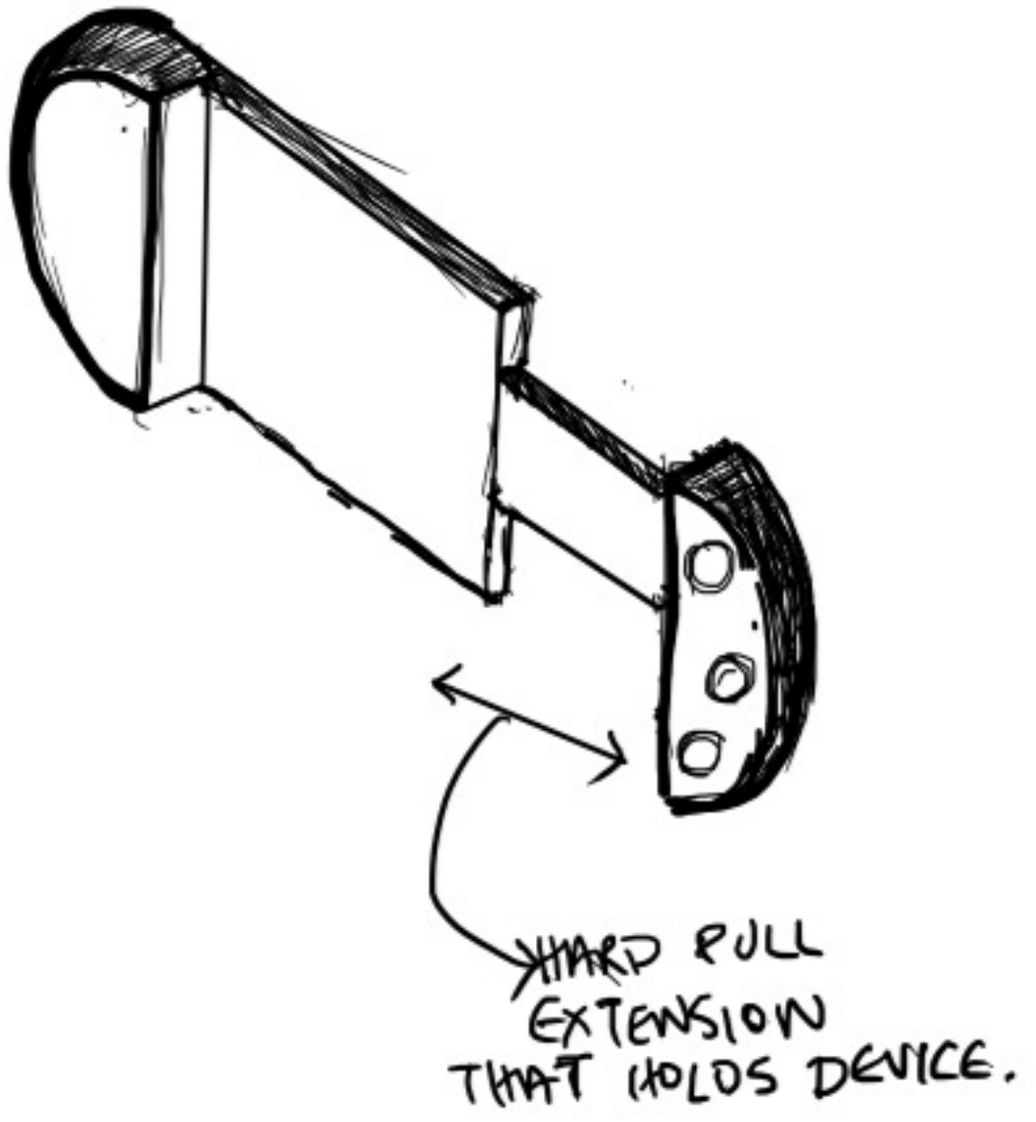
DESIGN DEVELOPMENT – chosen concepts



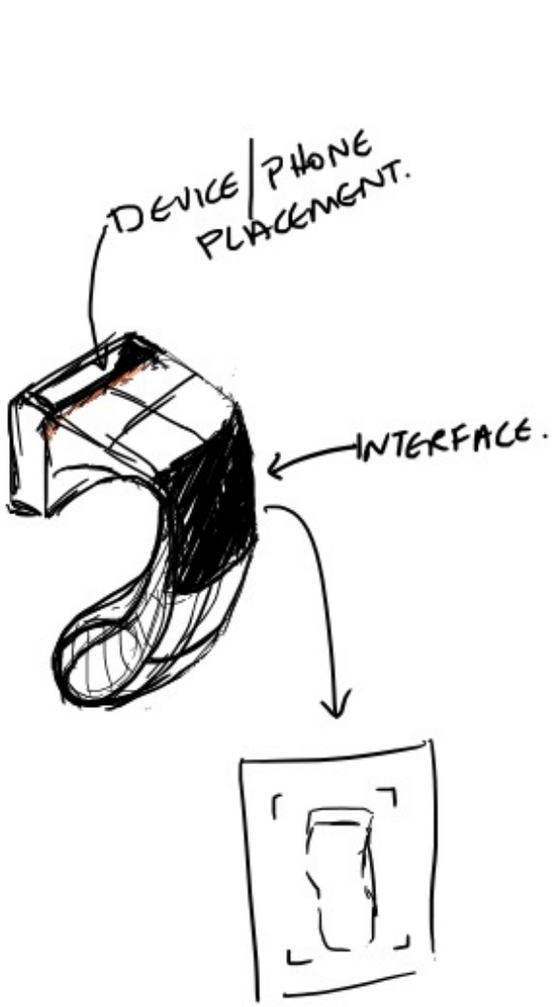
DESIGN DEVELOPMENT – chosen concepts

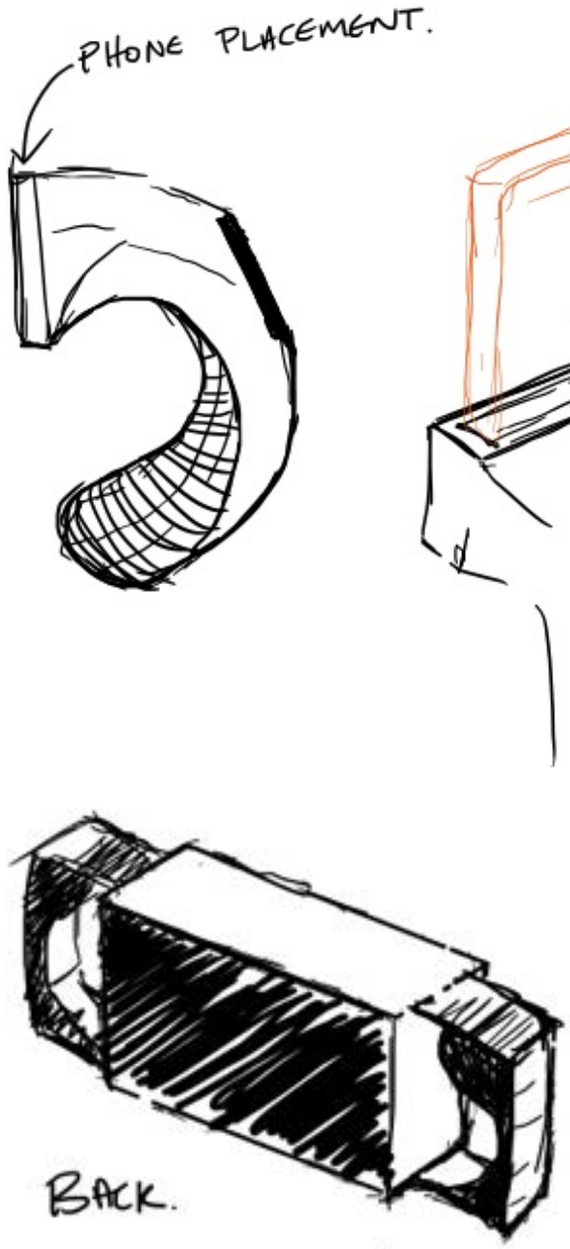


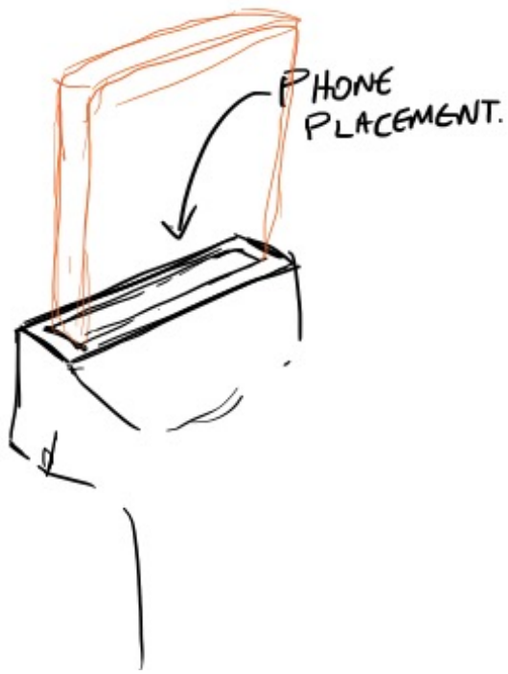


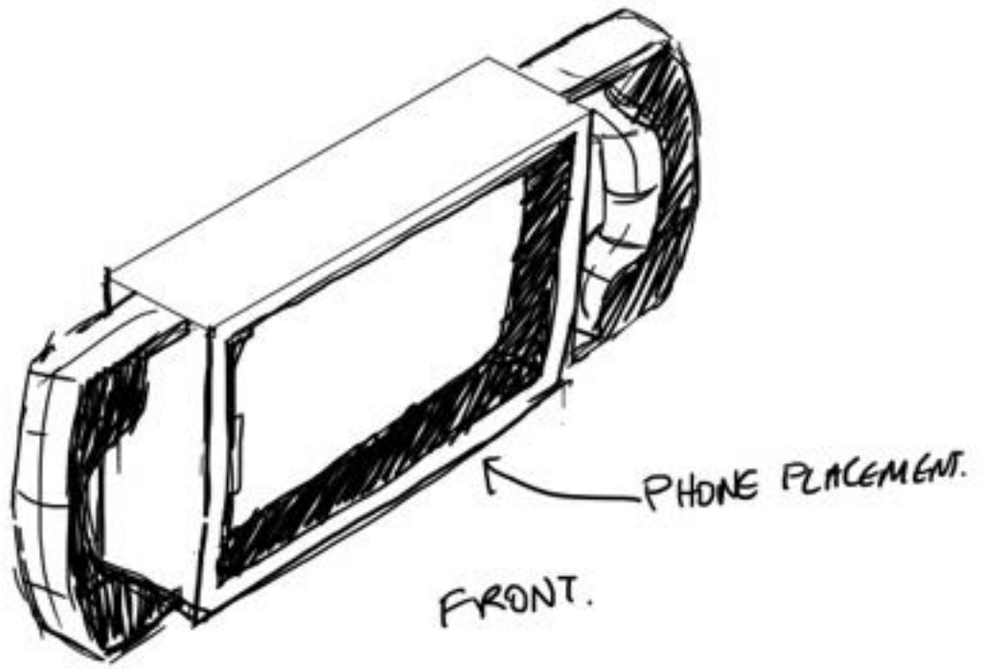


DESIGN DEVELOPMENT – chosen concepts

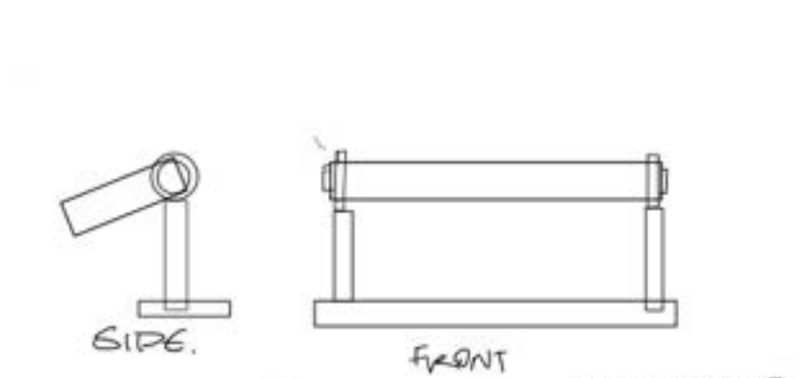


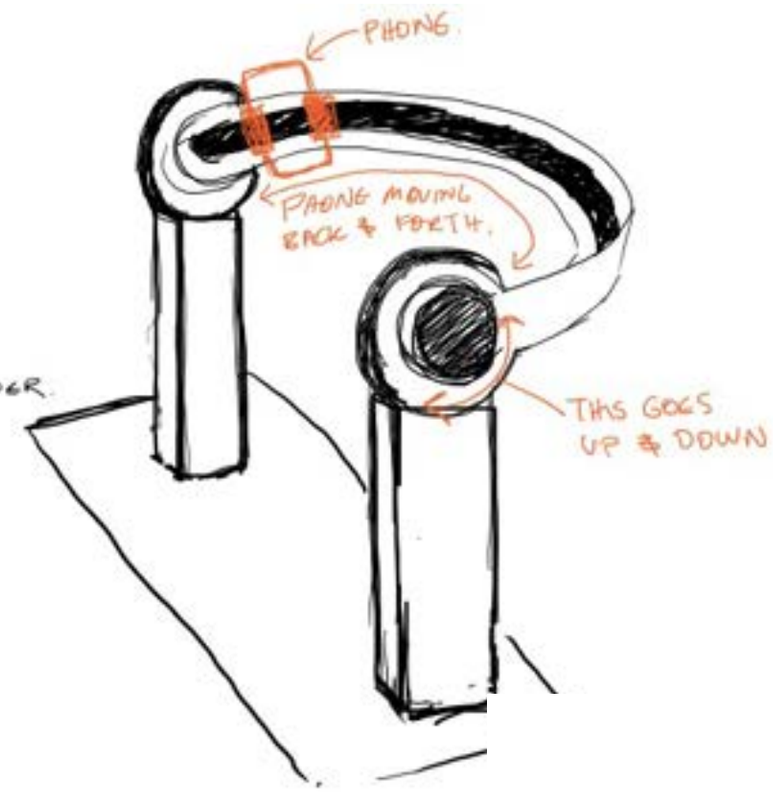


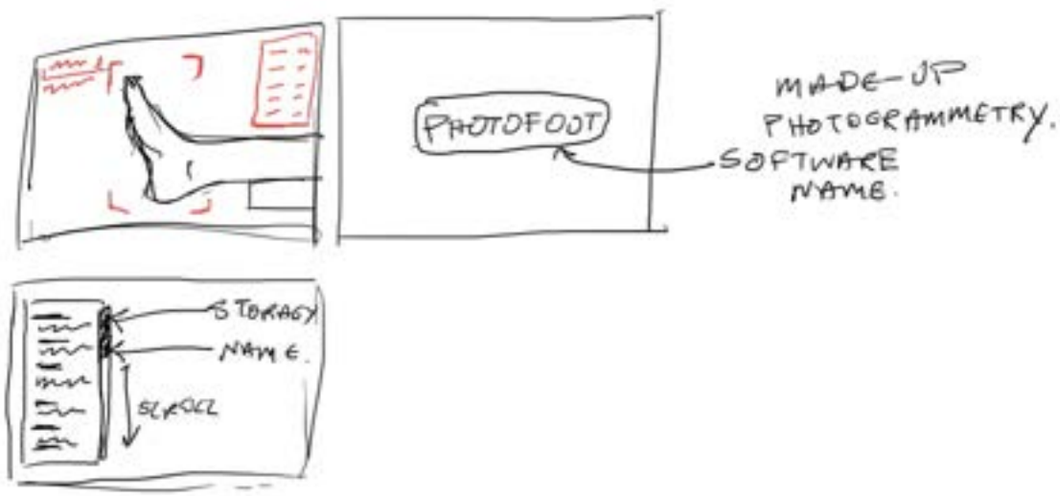


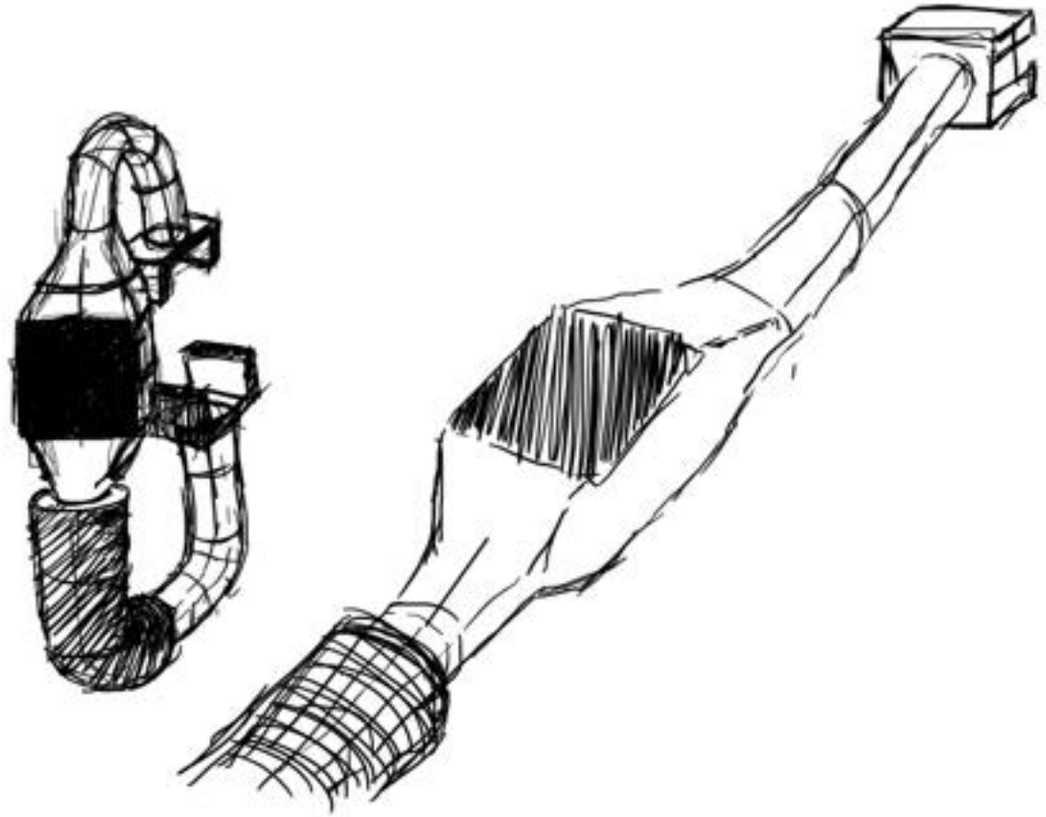


DESIGN DEVELOPMENT – chosen concepts









DESIGN DEVELOPMENT – Report and Initial Concepts

Concept 3

Concept 5

Concept 4

Concept 1

Concept 2

DESIGN DEVELOPMENT – Lecture Notes

DNB311 Week 7 Development.

LECTURE NOTES.

- UCD. → without the need of specialised or adaption.
  - → accessible by all people.
  - → physical
  - → Guidlines → AS → STAADARDS AUSTRALIA.
    - → ISO
    - → LINKS LECTURE SLIDES.
  - → INSTRUCTIONS.

↓

BODY SIZE + FUNCTION

- → FINGER, HAND, ARM FUNCTION. → WEIGHT.
- → VISION
- → HEARING + SPEECH.
- → MOBILITY

FINISH NOTES

To Do

- ☐ Target user needs (in context)
- ☐ UCD
- ☐ ITGRATE & REFINE.
  - ☐ → DOWNLOAD SOCID WORKS
  - ☐ ERGONOMICS.
    - → Prototypes
    - → fit Anthropo data.
    - → Feedback. → ASK Project scientist.

ANTHROPOMETRIC DATA

RELEVANT.

- → Feet size → PATIENT.
- → HAND → GRIP → USER. → FUNCTIONAL GRIP → REACH.
- → BUTTON FINGER → BUTTON & SCREEN SIZE. → USER.
- → EYE VISION → SAFE DISTANCE FROM SCREEN. → USER.
- → Posture. → USER & PATIENT.
- → sitting

Pg 12. → 5. THE MEASURE OF MAN & WOMAN.
→ TILLEY & HENRY DREYFUSS. 1993.

Week 8 LECTURE NOTES..

1. Valuable → It is able to provide users with remote access to treatment.
2. INNOVATIVE → Sustainable → a device the engages users in long term connection WITH HEALTHCARE.
   - → AFFORDABILITY?
   - CHEAPER & MORE ACCESSIBLE OPTION OF SELF SERVING PHOTO GRAMMETRY.
3. PURPOSEFUL → PROVIDE REMOTE ACCESS & ALLOWS USERS TO SAVE ON ENERGY, MONEY & TIME.
4. FUNCTIONAL. → PORTABLE. 5. USABLE.
   - → TAKES PICTURES IN A CONTROLLED AREA FOR QUALITY.
   - → YES PORTABLE.
6. ENJOYABLE.
   - → MIGHT BE A GOOD EXPERIENCE.
7. MANUFACTURABLE.
   - → YES, HANDHELD
   - → LARGE) AROUND FOOT.
8. DETAILED.
   - → NOT YET.
9. PRESENTABLE.

DESIGN DEVELOPMENT – Lecture Notes

LECTURE NOTES.

FINISHING WK 7 lecture Notes.

D UCD.

- PHYSICAL
- PSYCHOLOGICAL → EXTERNAL STRESS/ANXIETY
- EMOTIONAL.
- ENVIRONMENT.
  - LIGHTING. → CONSIDER IMPLEMENTING LIGHTING.
  - TEMPERATURE.
  - NOISY ENVIRONMENT. → EMERGENCY.
  - DISABILITIES → CONSIDER ABILITY & AGE OF USER.

UCD REQUIREMENTS:

- BODY SIZE & FUNCTION.
  - OBJECT VS HUMAN.
  - FORCE + STRENGTH → TWISTING OR INSERTING.
- FINGER, HAND, ARM
  - DEXTERITY.
  - GRIP + HOLD.
  - CARRYING LIMITS.
- VISION
  - STRING
  - SPACING OF INFO → INCORPORATE APP THAT COULD HELP WITH INSTRUCTIONS.
  - PROPER LABELLING
  - VISUAL FIELD + CONTEXT

ASSESSMENT Objectives or Requirements.

A). ~~Format~~ Final Research Report. → HARD COPY.

- Clean up Graphics → ? DON-T KNOW WHAT TO HAPPEN.
- CAN I ADD GRAPHICS

B) DESIGN DEVELOPMENT RECORD (DDR)

- SKETCHES
- PHOTOGRAPHS
- DOCUMENTATION
- DETAILS.
- DRAWINGS.
- RENDERINGS.
- PROTOTYPES PHOTOS
- MODEL PHOTOS → PROGRESS. → PHOTOS
- ENGINEERING & TECHNICAL DRAWING & DOCUMENTATION.
- MANUFACTURING & BUSINESS CASE CONSIDERATIONS.

C) PHYSICAL FINAL DESIGN MODEL.

D) CAD IMAGES. → DDR.

E) VIDEO FOR DESIGN IN CONTEXT → 2–3 min.

F) PORTFOLIO. → A2 & A2. Dig & Physical.

DESIGN DEVELOPMENT – Lecture Notes

LECTURE ~~WE~~ NOTES.

↳ USER EXPERIENCE.

NOT A FOCUS ↳ Expecience Design.

↳ Experience focused (user expectations)

↳ Time (longitudeinal)

↳ Contex (~~reete~~ relevance)

enjoyment?

DOES IT PROVIDE ENJOYMENT.

Familiarity?

DOES IT GIVE A CHALLENGE.

NO, OPPOSITE ~~ASPECTS~~ I DON'T WANT IT TO BE CHALLENGING.

Challenge?

novelty?

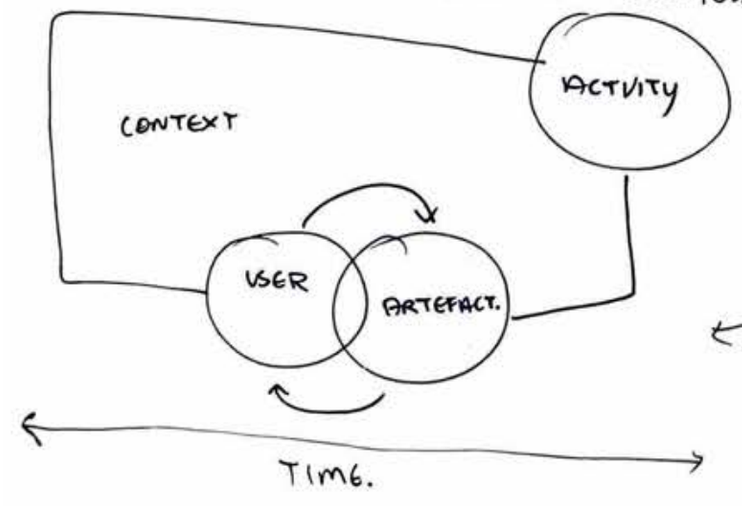
IT WILL HAVE SOME NOVELTY.

SENTIMENTAL?

SURPRISE?

TRADITIONAL

USER-PRODUCT INTERACTION IN CONTEXT.



ASPECTS

5 PRINCIPLES OF INTERACTION FOR PRODUCT DESIGN.

→ AFFORDANCES → Properties of devices & capability of agent using the product.

→ Signifiers.

→ Mappings.

→ Feedback.

→ Conceptual models.

Conceptual model

↳ how certain things can be done with a product.

communicaton on device

↳ CABLES

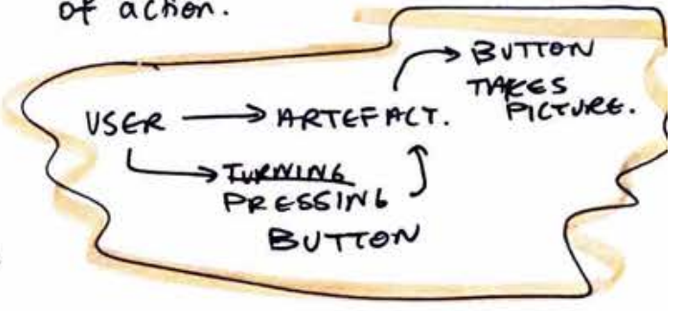
↳ SIGNS ON INTERFACE.

INSTRUCTIONS

DISTINCTIVE/OR TRADITIONAL FEATURES.

Feedback

↳ ACTIONS & COMMUNICATION of action.



10 INTERACTION DESIGN GUIDLENES.

1. EXPECTATION → USER EXPECTATON.
2. CONSISTENT DESIGN
   ↳ maintain
3. FUNCTIONALITY → FOLLOW FUNCTIONAL MINIMALISM
4. COGNITION
5. ENGAGEMENT.
6. USER-CONTROL
7. PERCEIVABILITY
8. LEARNABILITY
9. ERROR HANDLING.
10. AFFORDABILITY.

FINISH
Week 8
lecture Notes.

DESIGN DEVELOPMENT – Lecture Notes

→ALARM + NOISES.
↳INCORPORATE
↳BEEP TEST.
↳ALARM WHEN
TO TAKE THE
PICTURES.

↳MOBILITY
↳MOVEMENT → MOVING AROUND
THE FEET.
↳MOVING + TRASPORTATION.
↳BOXING & ASSEMBLAGE.

↳COGNITION
↳INFO OVERLOAD
↳INSTRUCTIONS.
↳PHYSICAL
OR APP.
↳FAMILIARITY IN SIGNS.

↳EXPERIENTIAL?

CONSDERATIONS FROM NEEKS LECTURES. ← FLASH FROM PHONES

→LIGHTING → BUILT IN LED.
→CONSDER AGE & ABILITY
→INSTRUCTIONS & PROPER LABELLING. → SUPPORTS FOR LEG.
→ADDITIONAL PARTS
→ACTIONS INVOLVED.
↳FORCE OR ACTIONS NEEDED BY USER TO INTERACT WITH DEVICE.

→EXPECTATION
→COGNITION
→CONSISTENT DESIGN
→FUNCTIONALITY
→ENGAGEMENT
→USER CONTROL
→PERCEIVABILITY
→LEARNABILITY
→ERROR HANDLING
→AFFORDABILITY.

→APP – INTERFACE → LINK TO THE ARTEFACT.
↳FIGMA FOR STORING PICTURES. →NOISES

→ENVIRONMENT.
→DURATION OF TAKING THE PICTURES.
→METHOD OF INSTRUCTIONS.

→EXPLORE IF EXPERIENCE IS ENJOYABLE.
↳EXPLORE DETAILS.
↳EXPLORE PRESENTATION.

→MOBILTY
↳INSTRUCTIONS
↳STEPS. → MOTION IN TAKING PICTURE.
↳TRANSPORT.

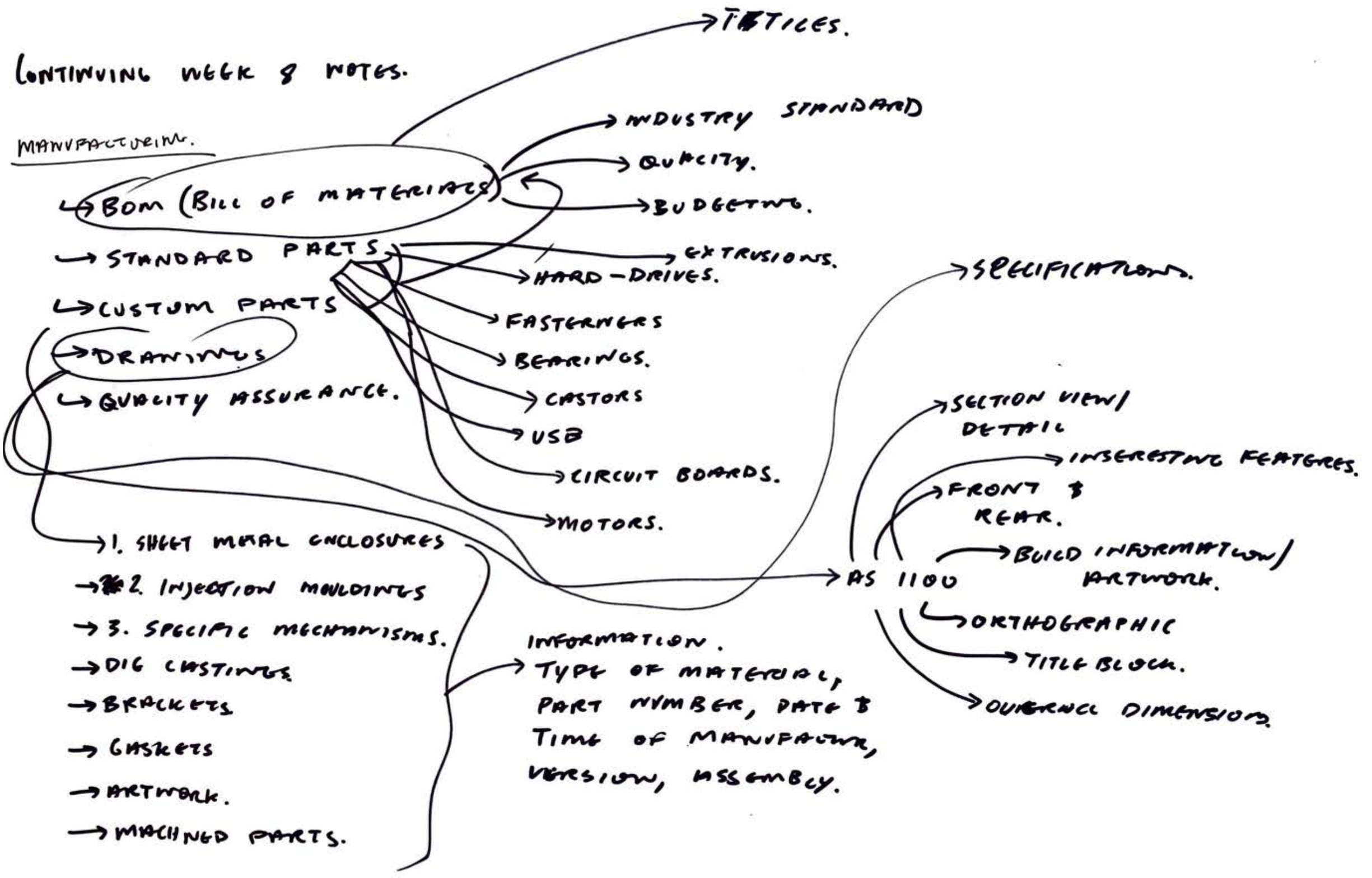
→BOM → STANDAR
→CUSTOM PARTS.

USER EXPERIENCE.
↳FAMILIARITY,
↳NOVELTY
↳SIMPLE & EASY ENJOYMENT.

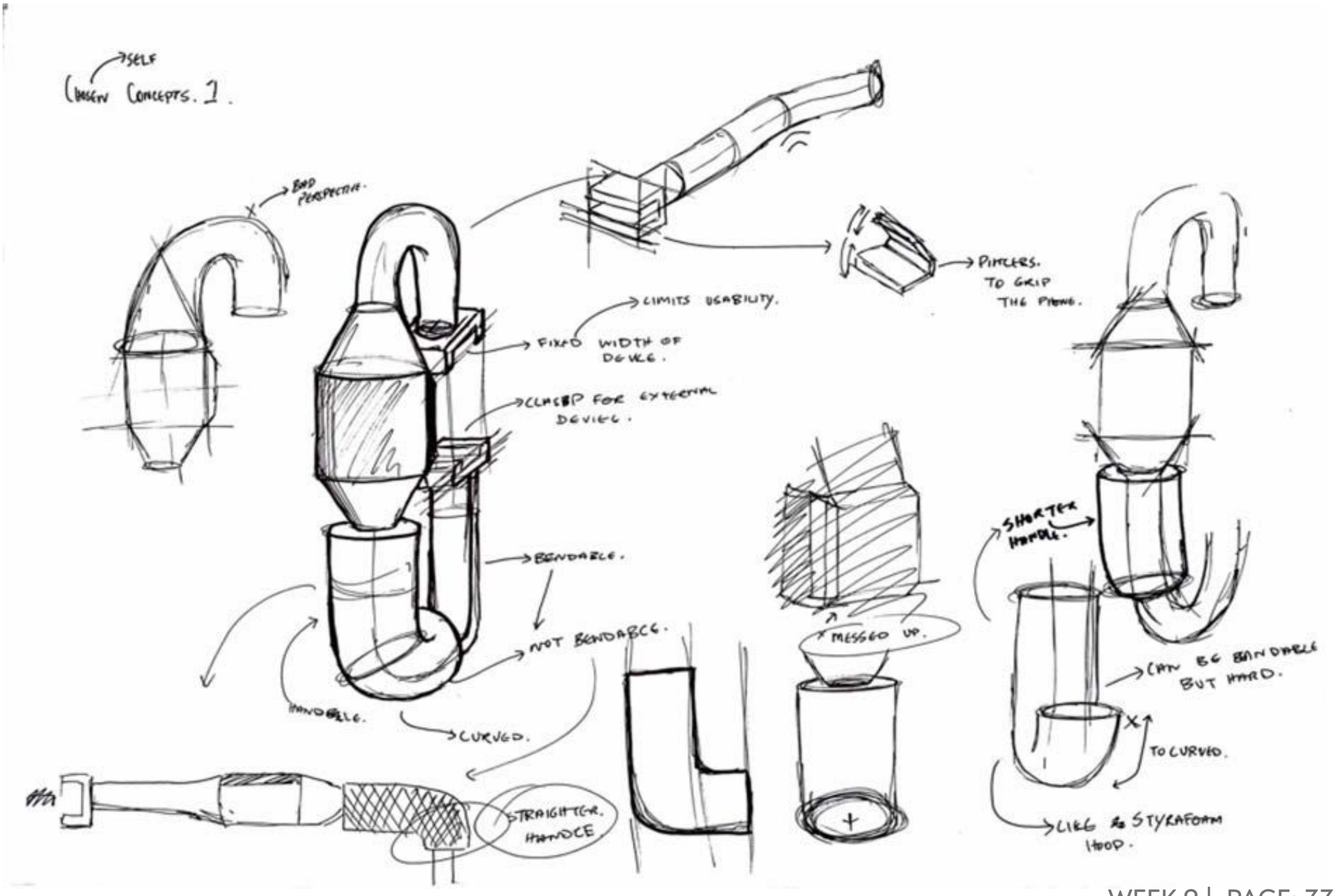
→TECHNICAL → DRAWINGS VIEWS
↳SPESIFICATIONS.
↳EXPLODED VIEW.

PRINCIPLES OF INTERACTION DESIGN. →MATERIALS.
→AFFORDANCES →SIGNIFIERS →MAPPINGS.
→FEEDBACK → CONCEPTUAL MODES.

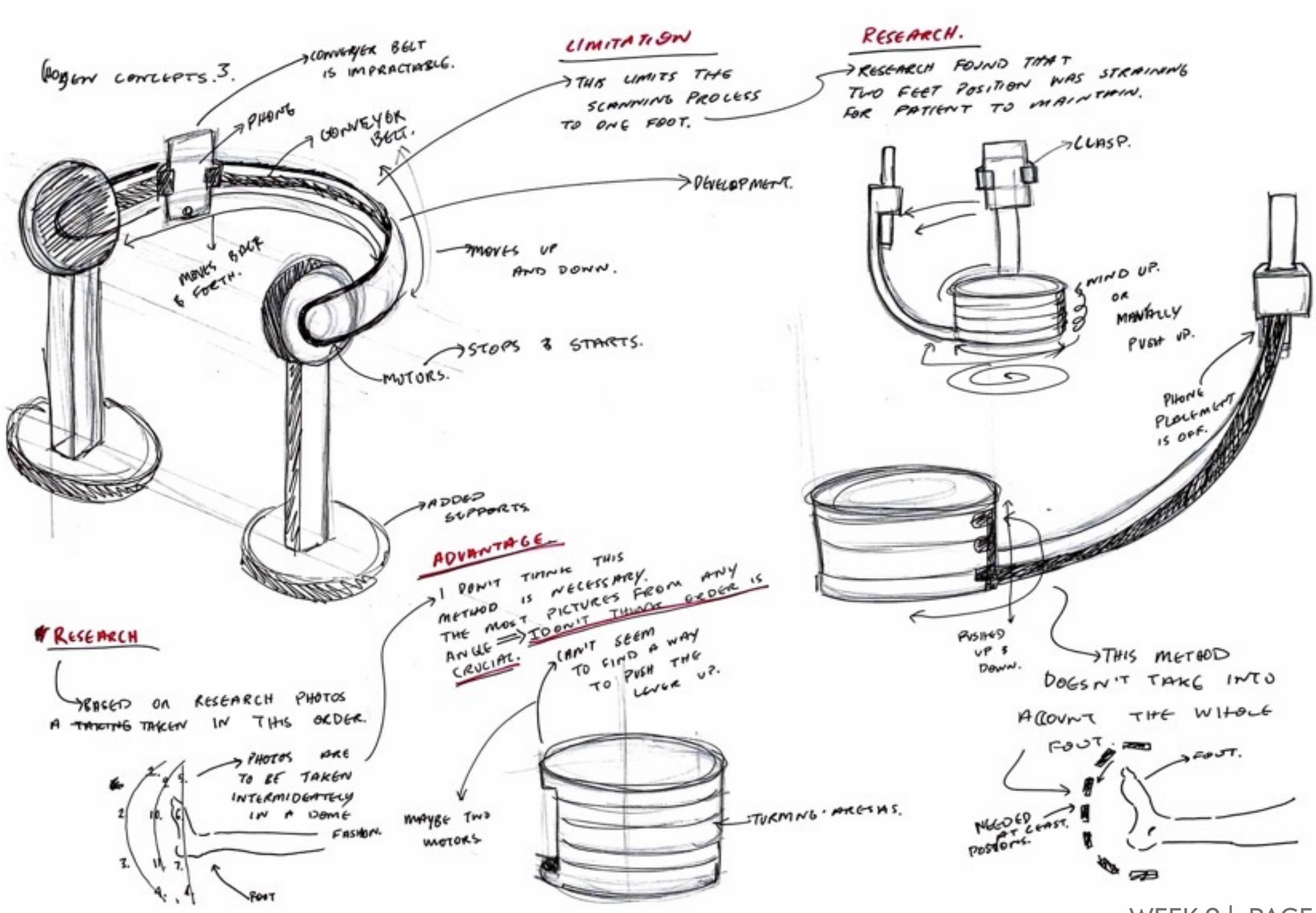
DESIGN DEVELOPMENT – Lecture Notes



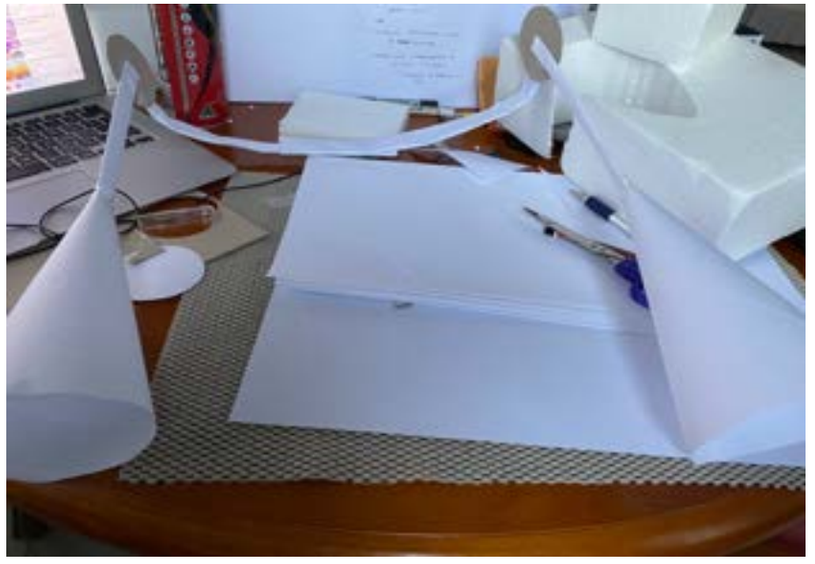
DESIGN DEVELOPMENT – Concept 1

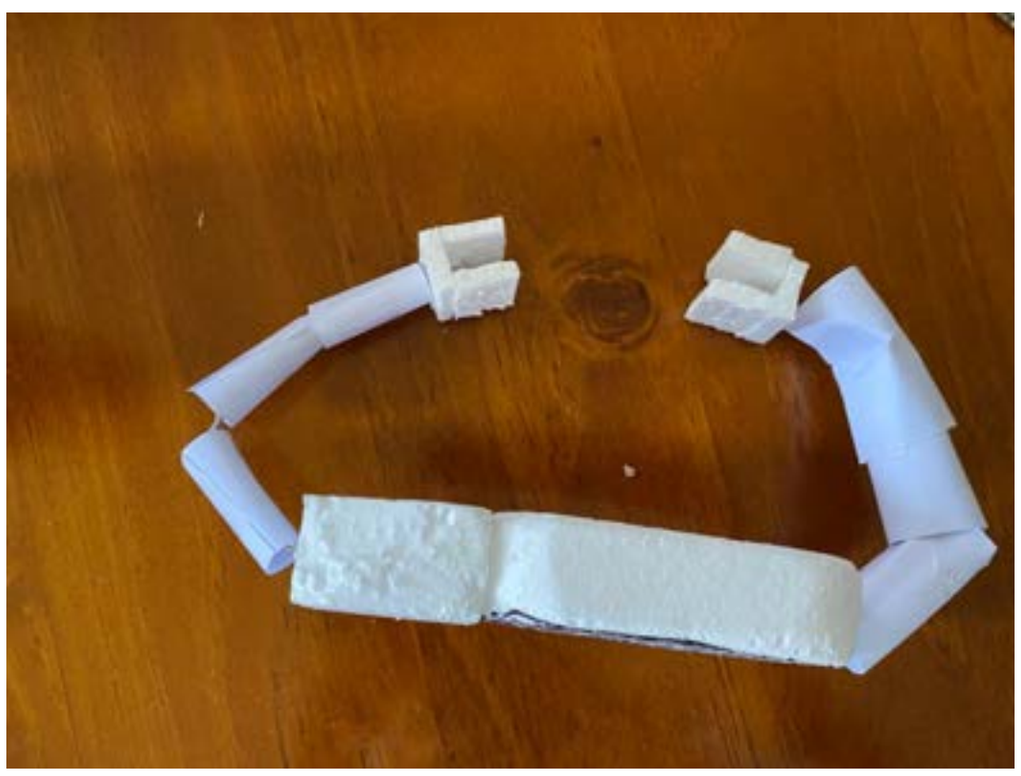


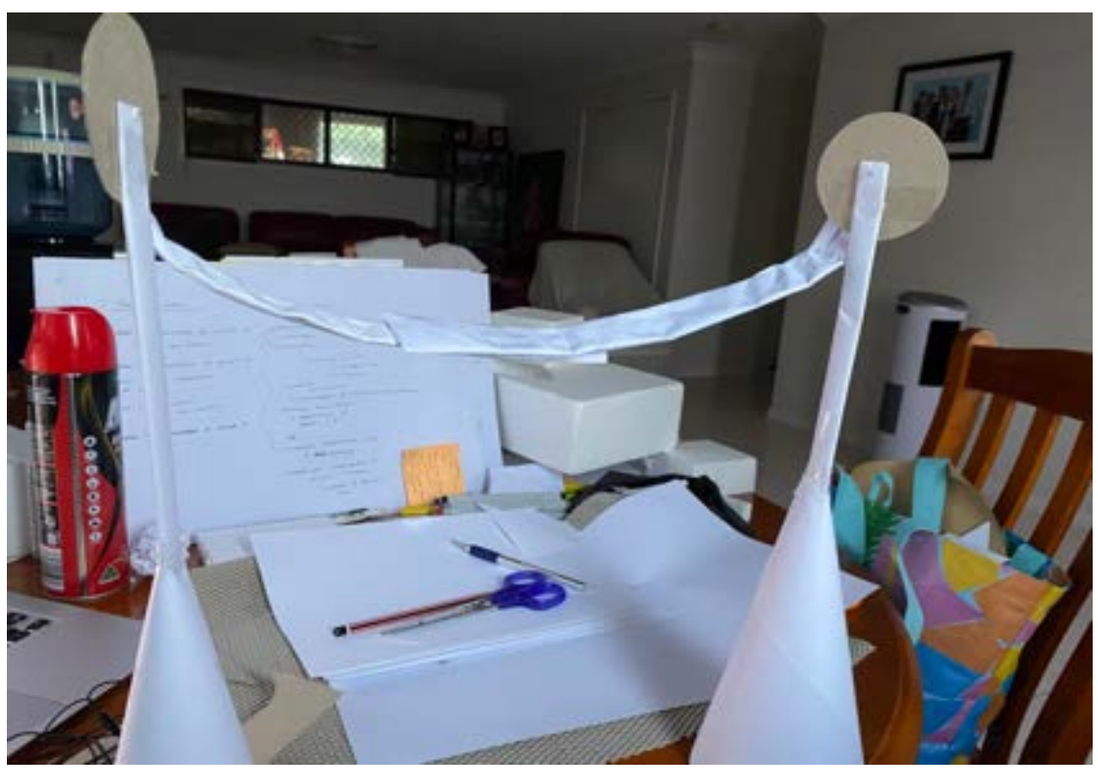
DESIGN DEVELOPMENT – Concept 3



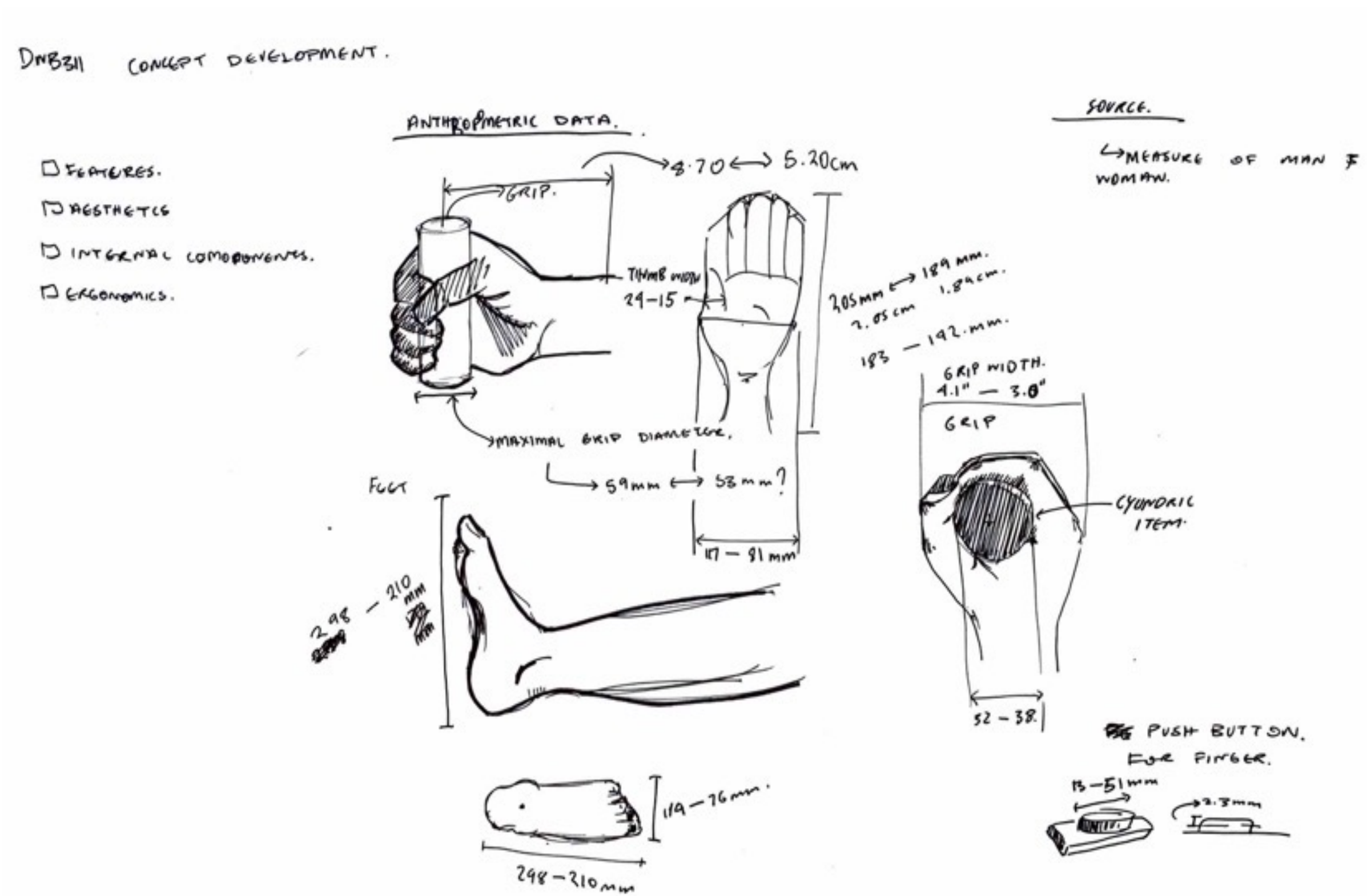
DESIGN DEVELOPMENT – WK 8 - 9



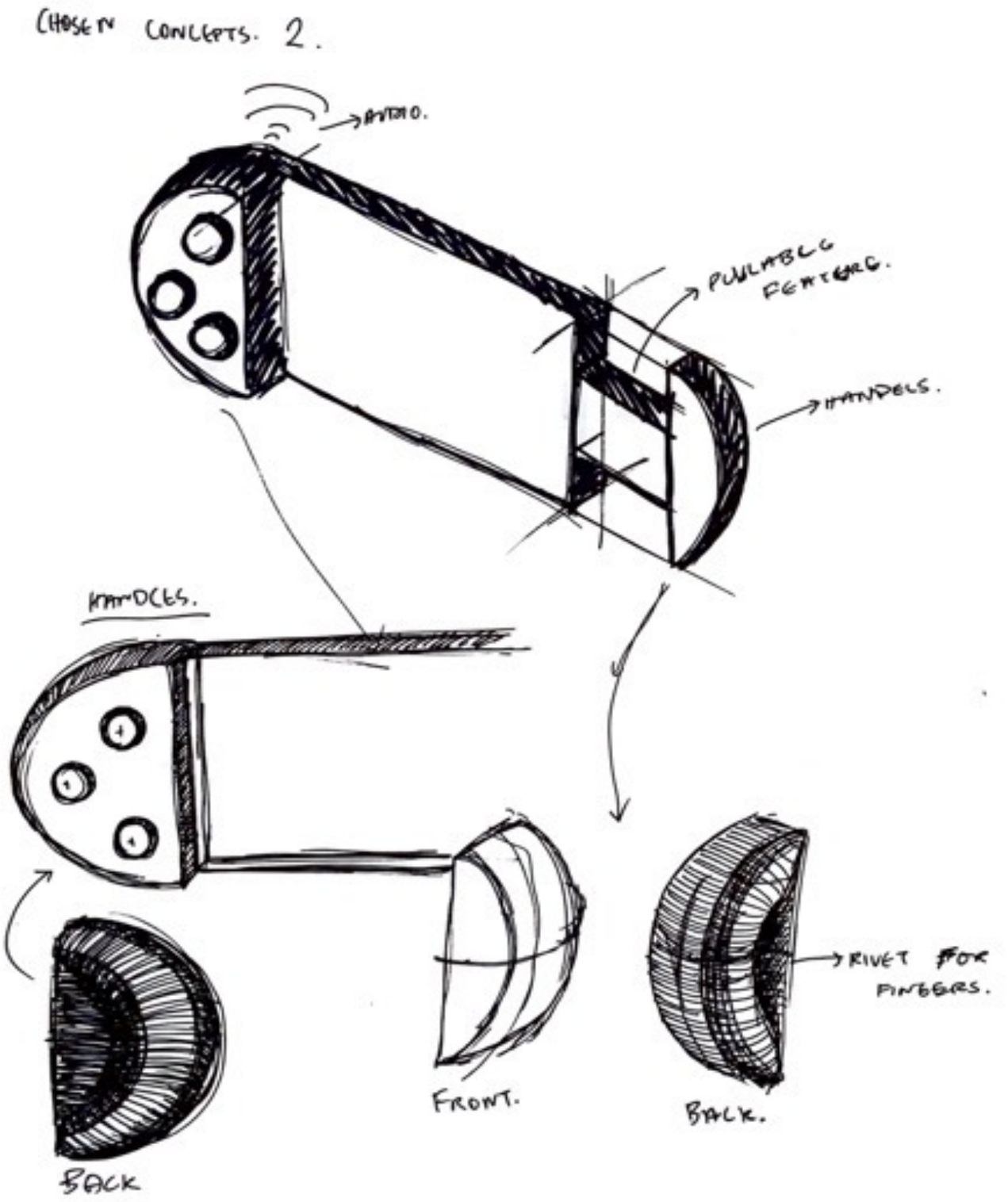




DESIGN DEVELOPMENT – Anthropmetrics



DESIGN DEVELOPMENT – Concept 2



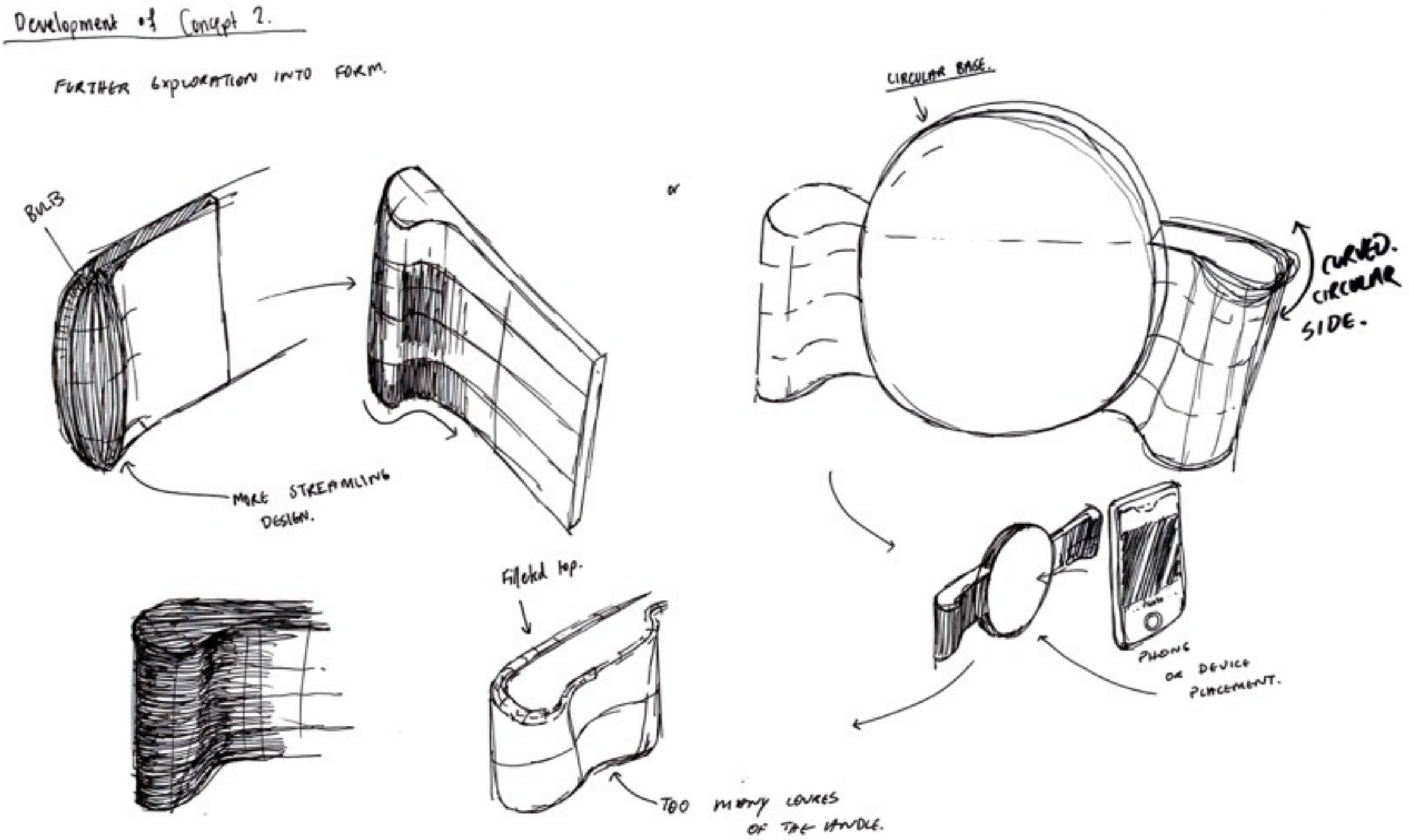
NOTES. → FEEDBACK

→ INCORPORATE 2 CONCEPTS TOGETHER.

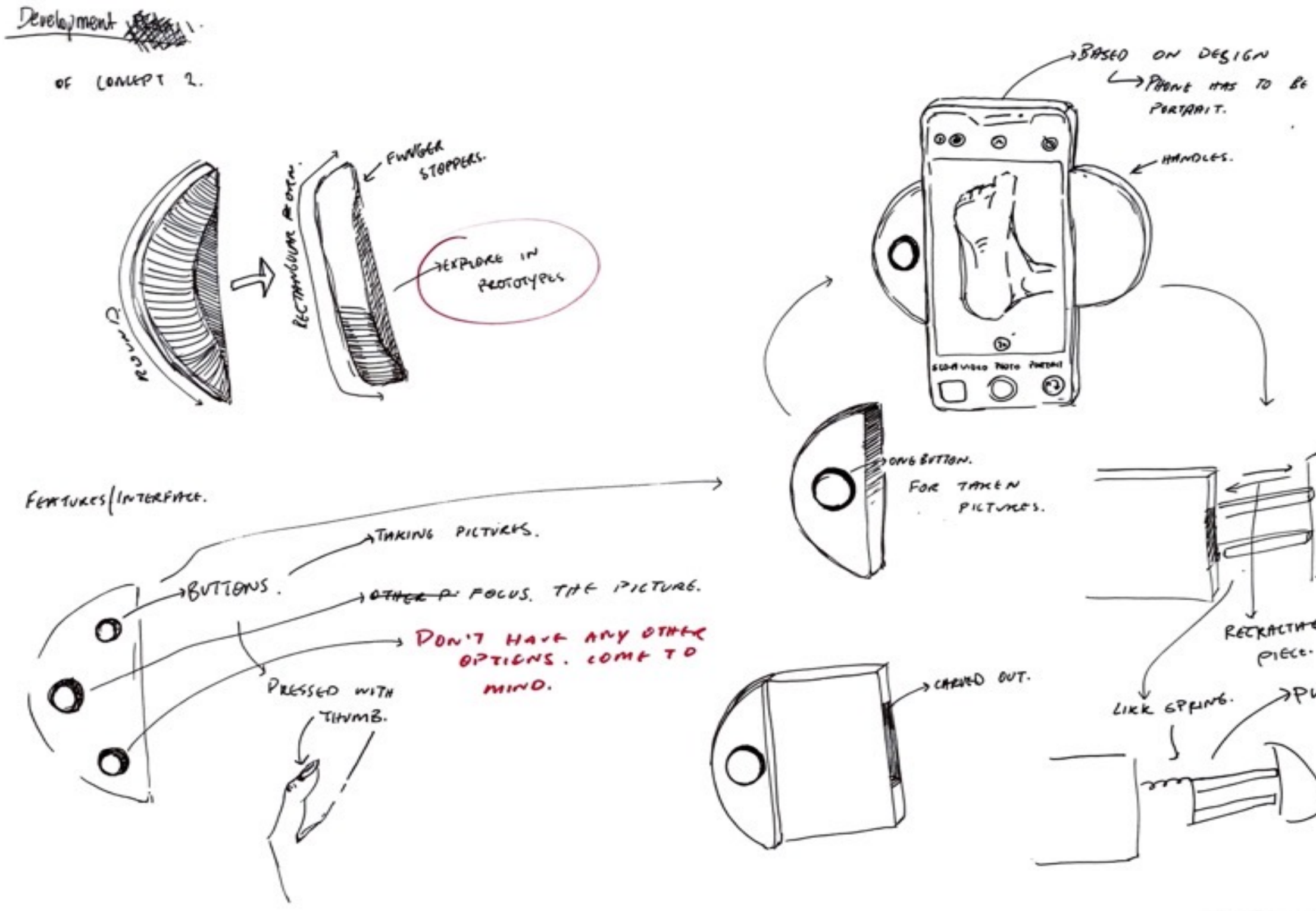
ATTEMPT AT PROTOTYPES

→ IMAGES.

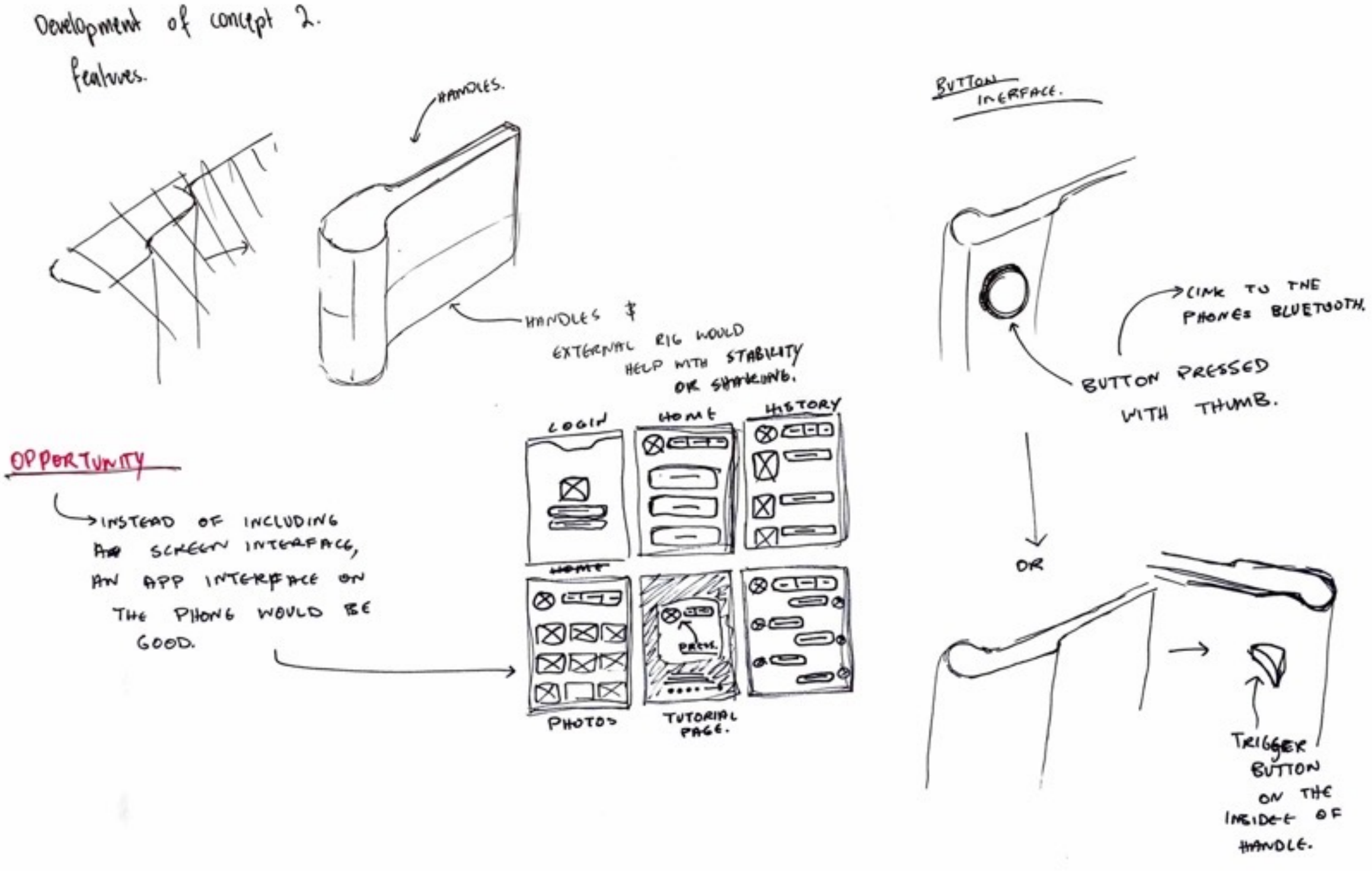
DESIGN DEVELOPMENT – Concept 2 – form



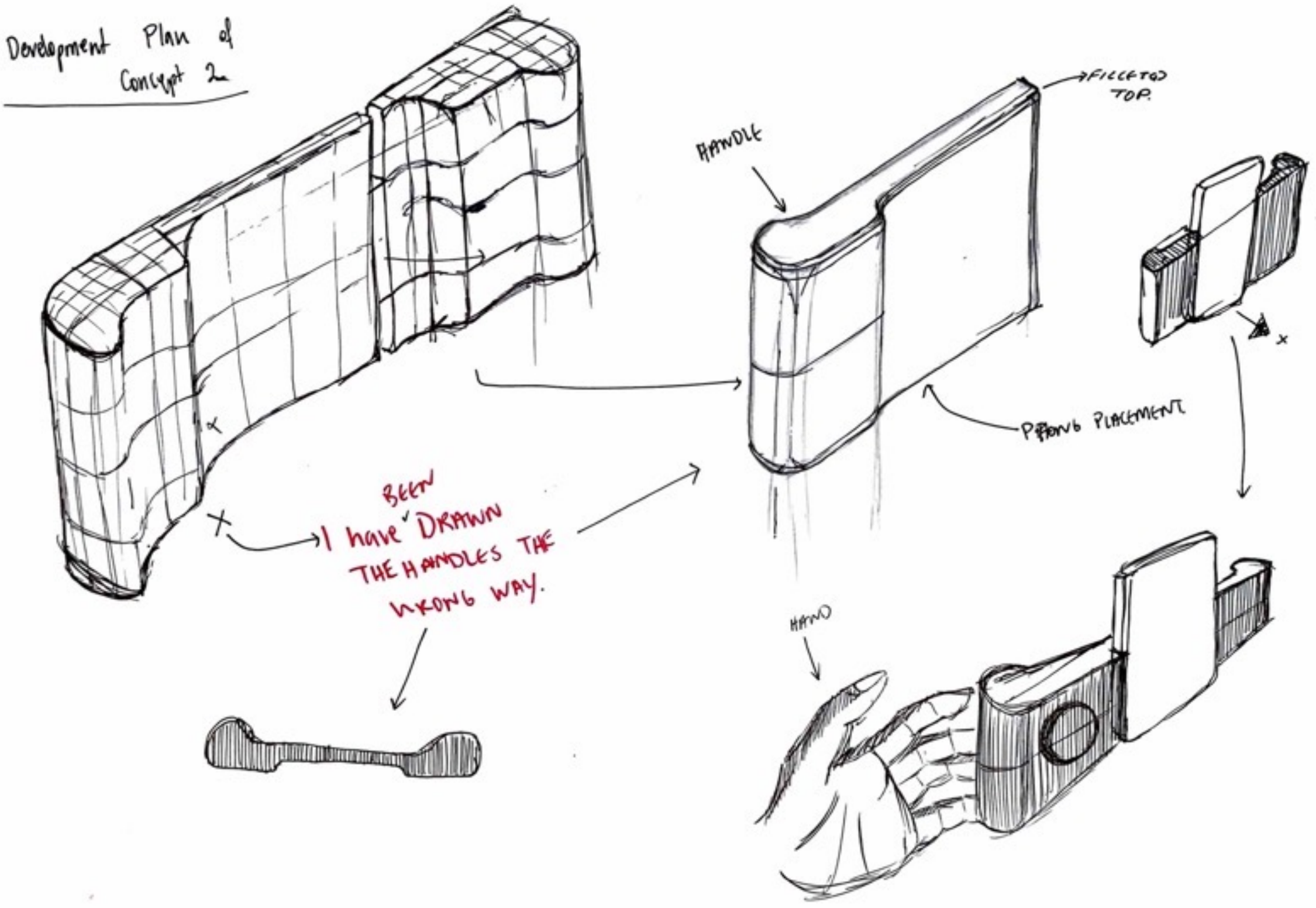
DESIGN DEVELOPMENT – Concept 2 - Handle



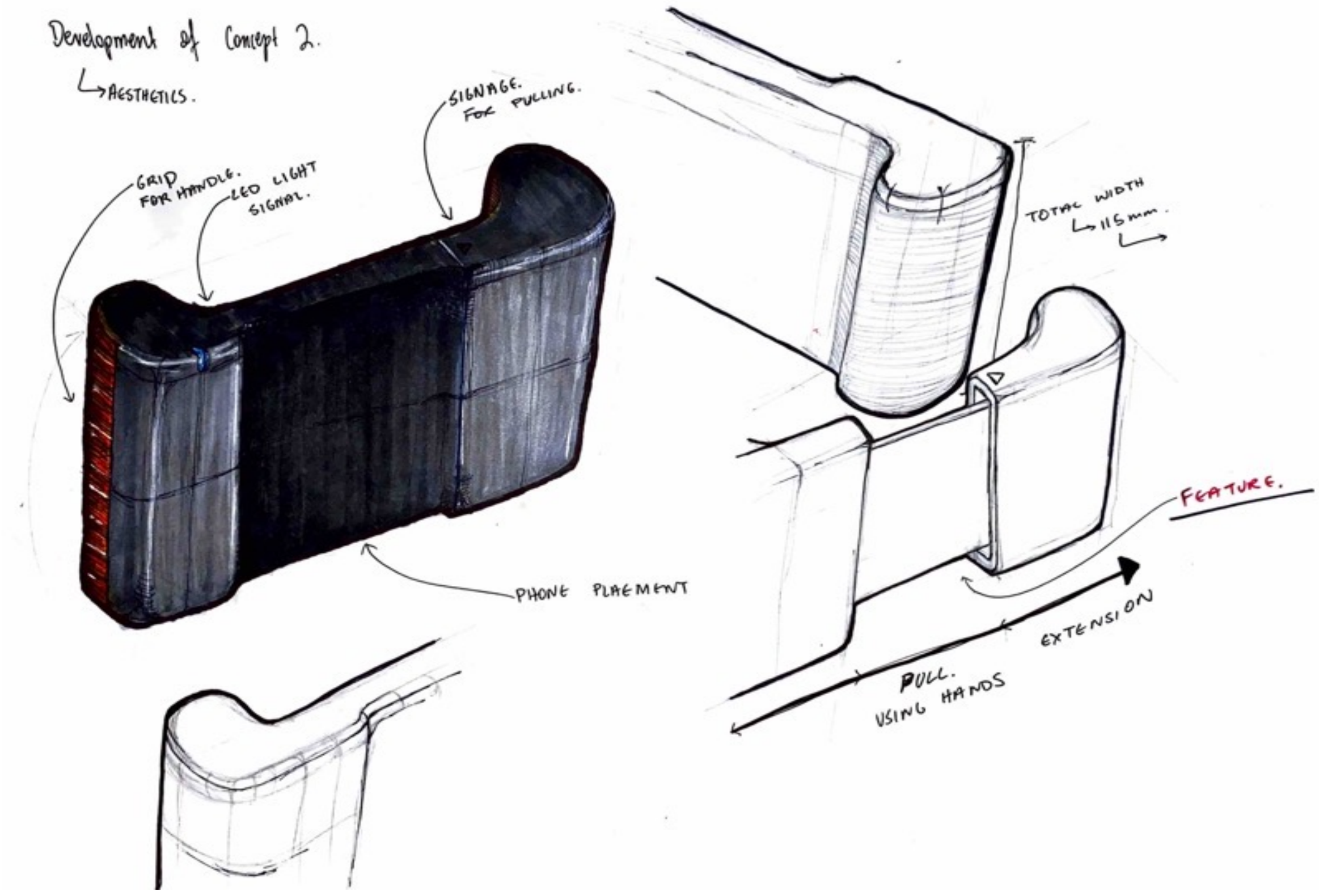
DESIGN DEVELOPMENT – Concept 2 - features



DESIGN DEVELOPMENT – Concept 2

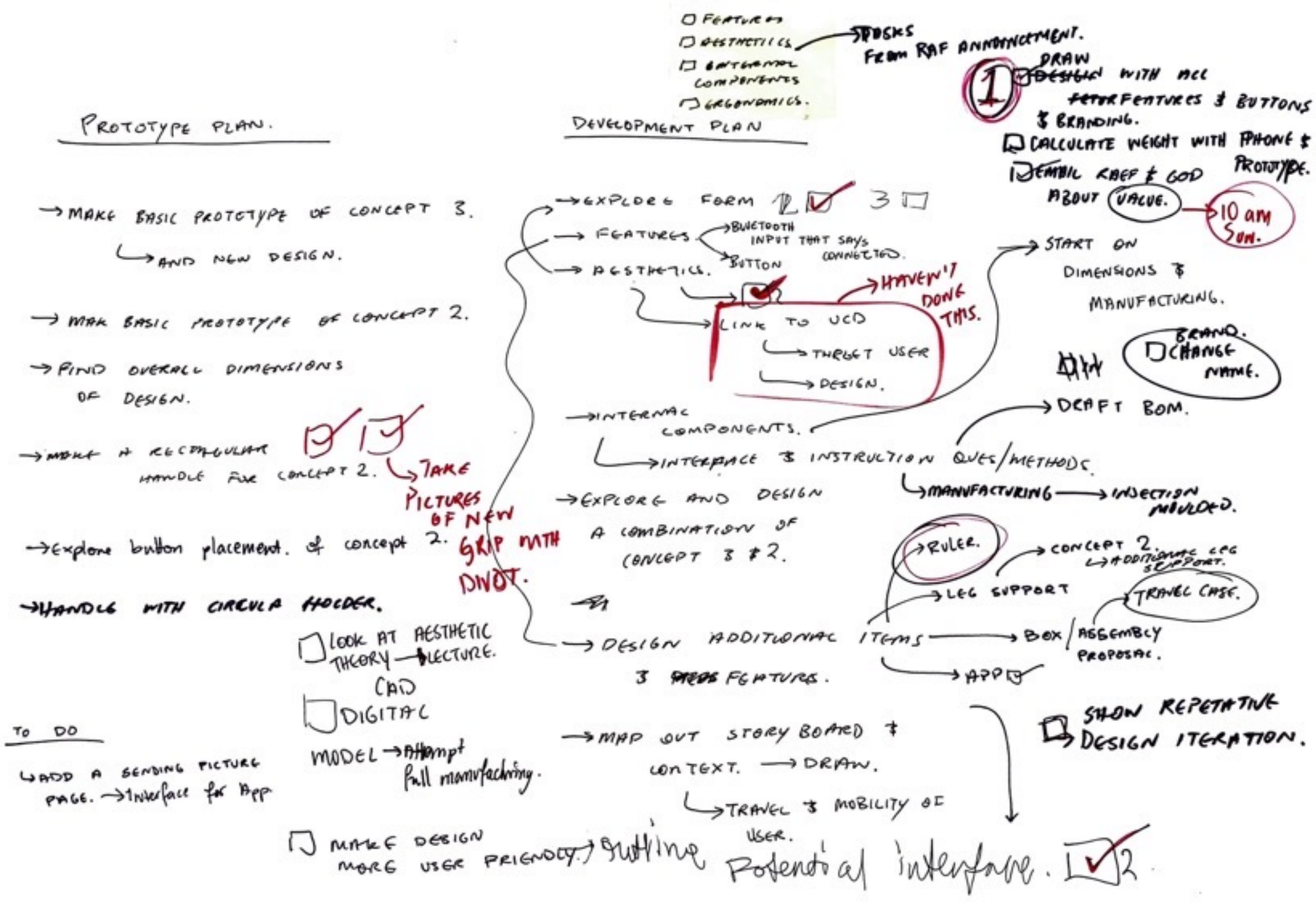


DESIGN DEVELOPMENT – Concept 2

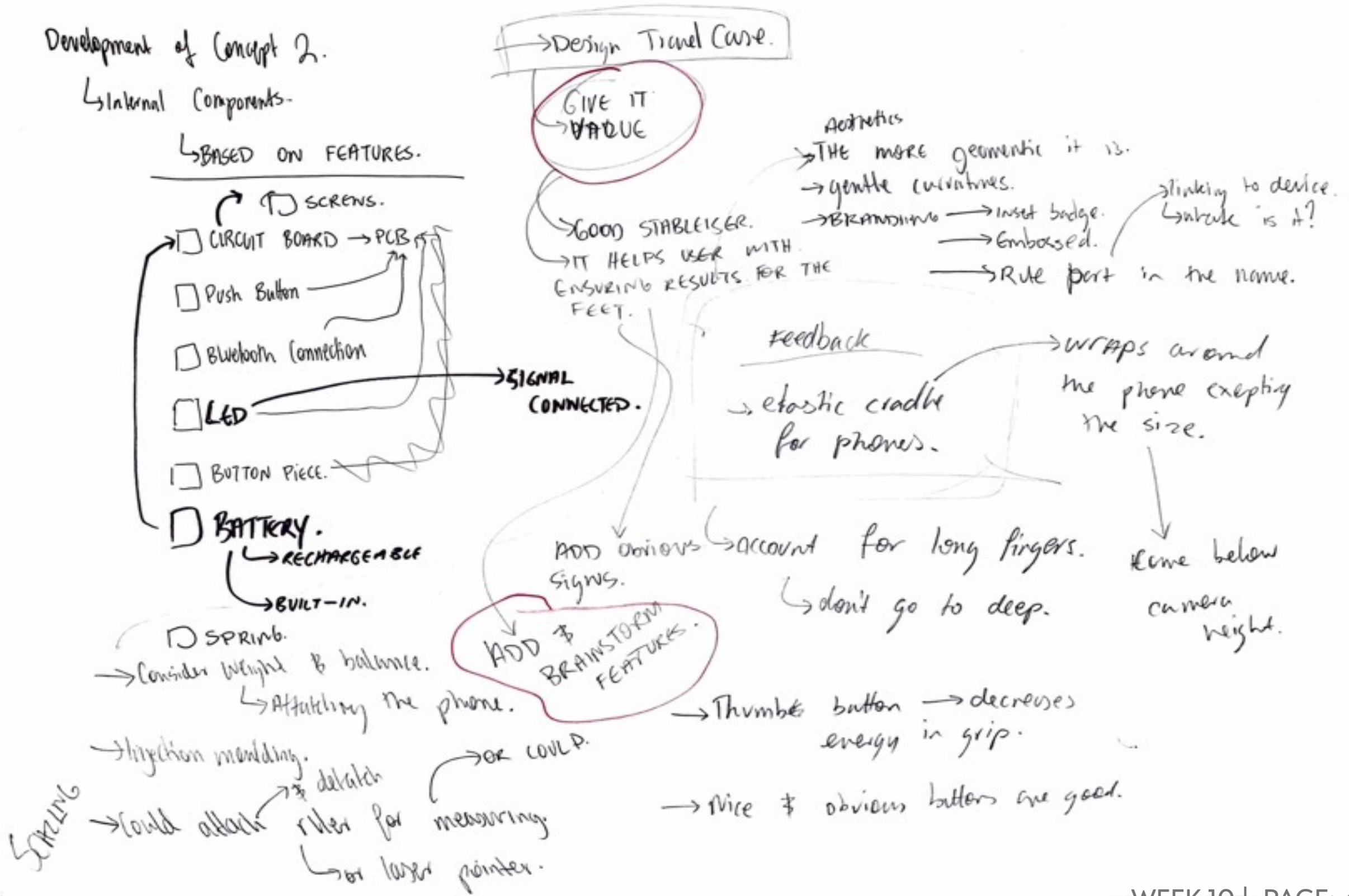


DESIGN DEVELOPMENT – Ergonomics and User testing

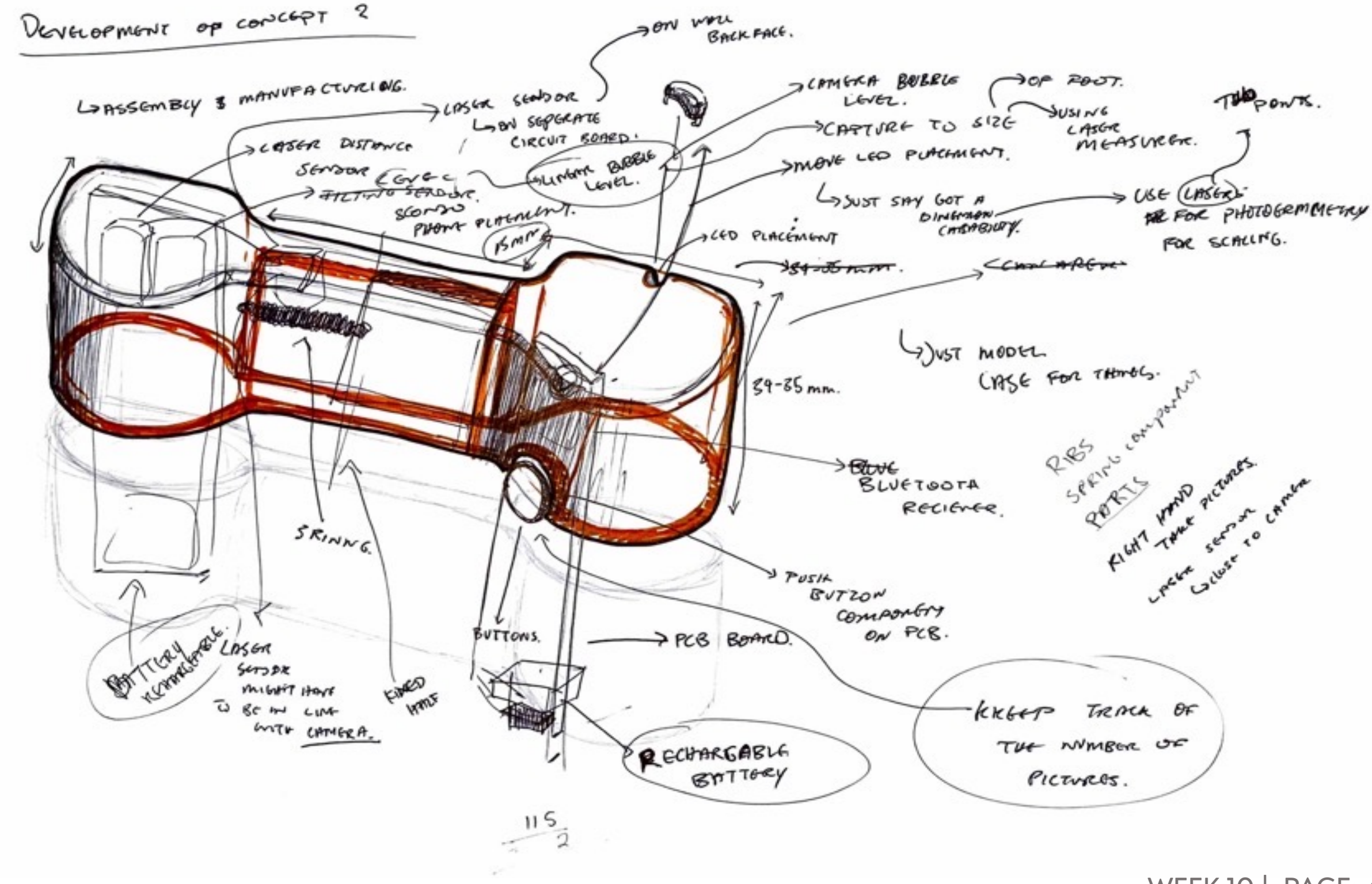
DESIGN DEVELOPMENT – Project Parts



DESIGN DEVELOPMENT – Internal components and feedback



DESIGN DEVELOPMENT – Internal Components



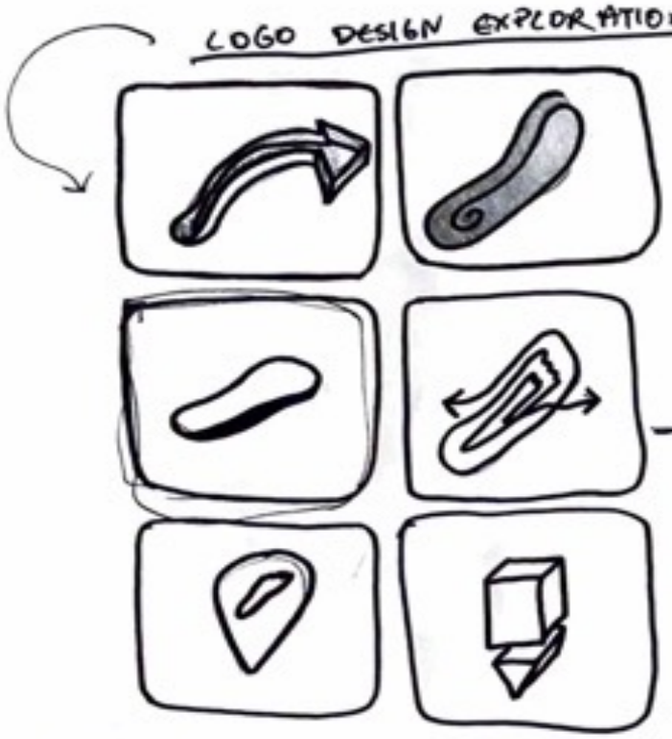
DESIGN DEVELOPMENT – Branding and interface development

INTERFACE

Development of Concept 2.

Interface on PHONE → APP.

LOGO DESIGN EXPLORATION



APP DESCRIPTION.

→LOGIN → SAFE LOGIN

→Home page that helps track Your shoes & connect with iOrthotics.

DESCRIPTION

→THIS APP WILL HELP WITH THE ORDERING PROCESS OF THE PRESCRIBED FOOT ORTHOTIC DEVICES.

→THIS APP WILL HELP WITH THE STO ORGANISATION OF PHOTOS

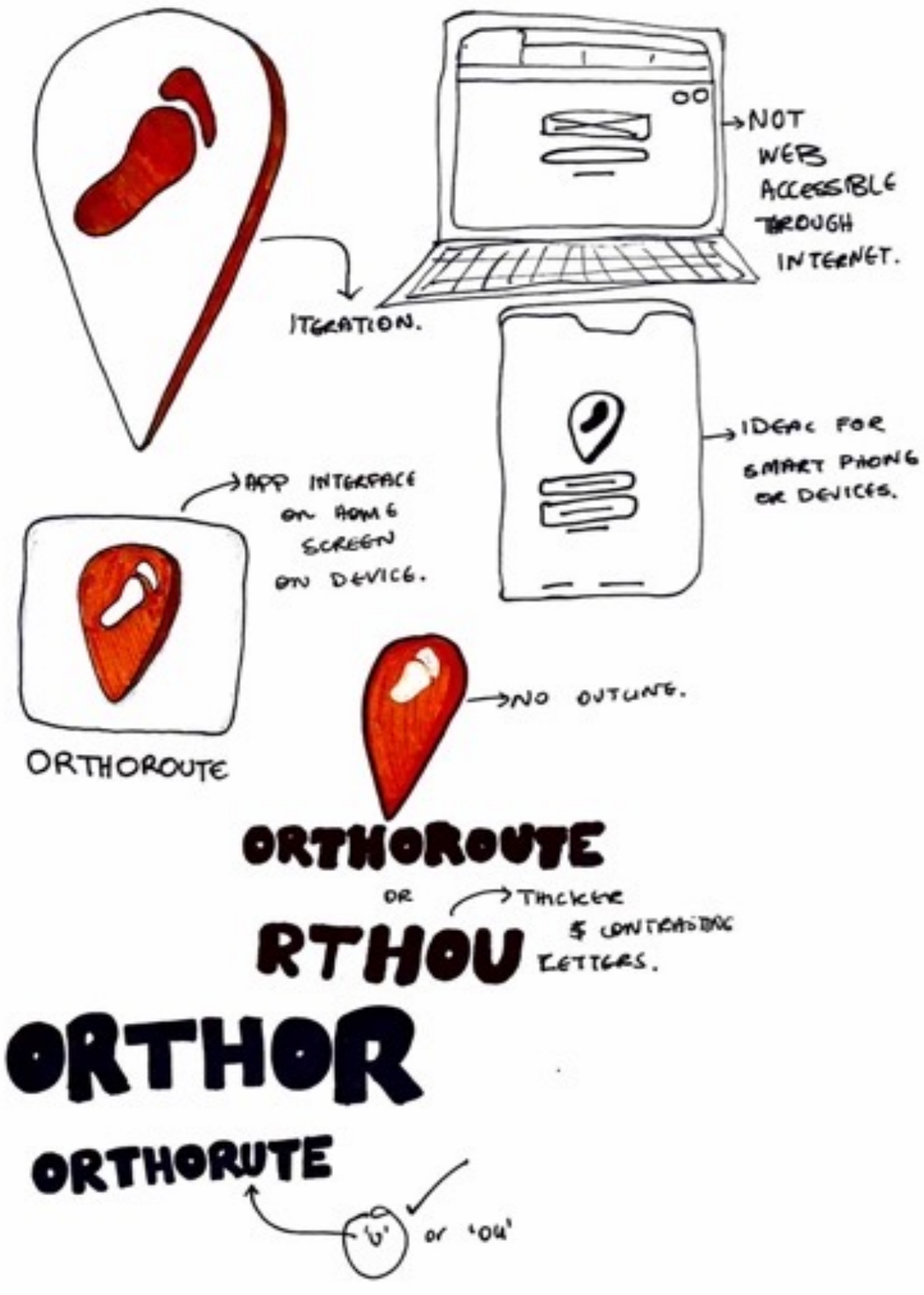
→ALSO HELP WITH THE INSTRUCTIONS FOR THE SCANNING PROCESS AND WILL CONNECT WITH THE DEVICE.

LOGO EXPLORATION/DEVELOPMENT

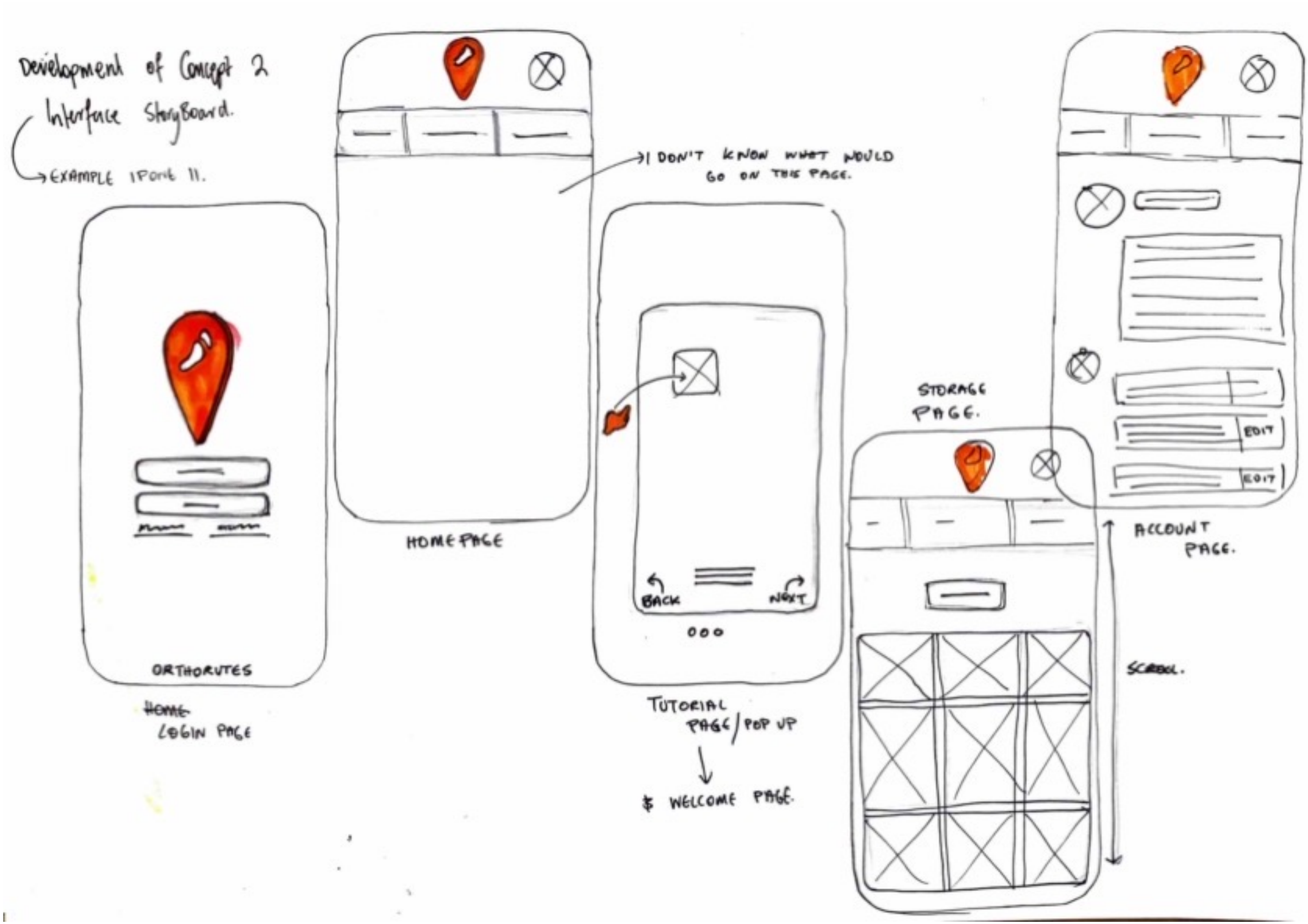
→FOOT PRINT

Foot Route.

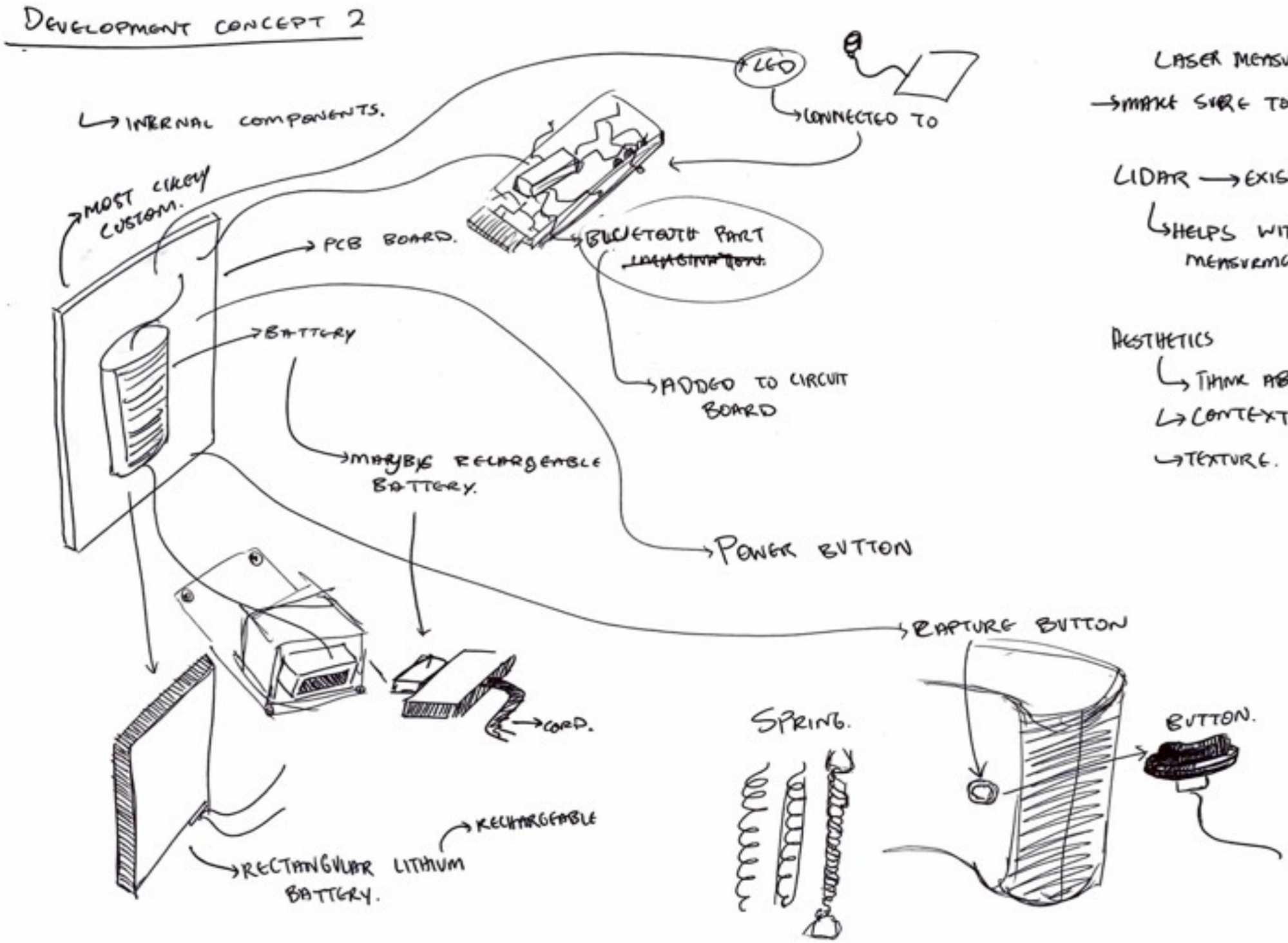
ORTHOROUTE



DESIGN DEVELOPMENT – WK 7



DESIGN DEVELOPMENT – Internal Components



DESIGN DEVELOPMENT – Branding development

Development of Concept 2.

BRANDING.

ORIGINAL ~~AN~~ NAME.

ORTHO ROUTE. → FOOT PRINT

ORTHOROUTE

ORTHO REMOTE

ORTHO — ROUTE.

ROUTE

ORTHO — REMOTE.

FEEDBACK

FEEDBACK FROM TUTOR SUGGESTS THAT THE NAME DOESN'T LINK TO THE PRODUCT OR UNDERSTOOD BY THE USER.

KEYWORDS

- SELF
  - → CAMERA HOLDER
  - → HELPER
  - → PHONE HOLDER.
- → FOOT
- → SUPPORT
- → SHOT
- → PICTURE

→ SELF PICTURE

→ PHOTOGRAMMETRY.

→ SELF MODELLING.

→ Remote Helper.

→ REMOTE ORTHOTICS.

→ REMOTICS.

→ ORTHOSES.

→ ~~REMOTICS~~

→ FOOTOTICS

→ FOOTHOTICS.

→ FOOTHOSES.

→ REMOSES.

→ ORTHOMOTE

→ MODELLING

→ REMODELLING.

→ REMOTE SCAN

→ REMOTAGRAM

→ PHOTOREMOTE

→ ROOT → FOOT & REMOTE OROTICS. ORTHICS ROOTHOTE.

→ ROTE.

→ ROTICS.

→ SCAN

→ HOLDSCAN

→ SUPORTICS.

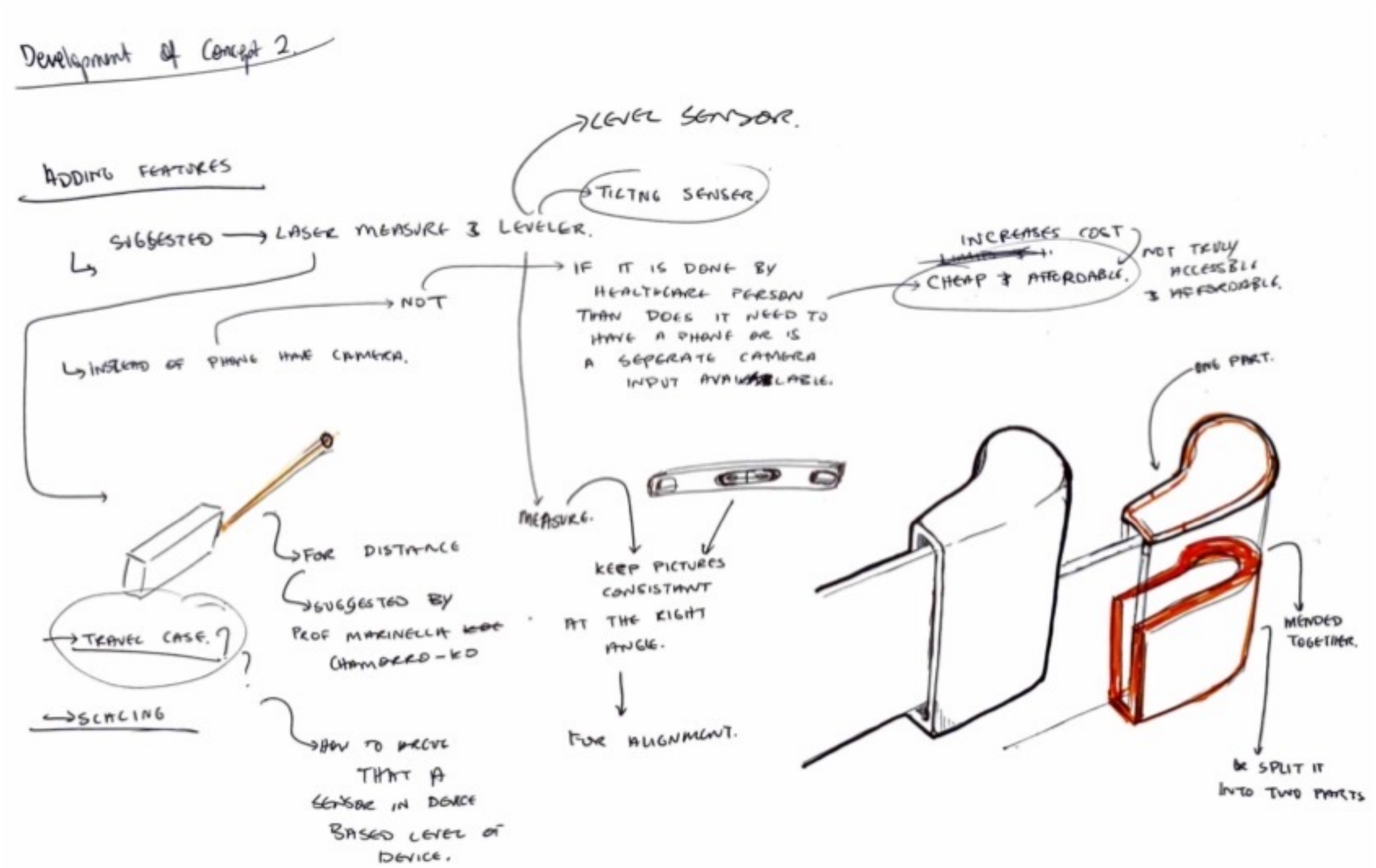
SUPORTICS. ROTE REMOTREY.

→ BEST NAME SO FAR.

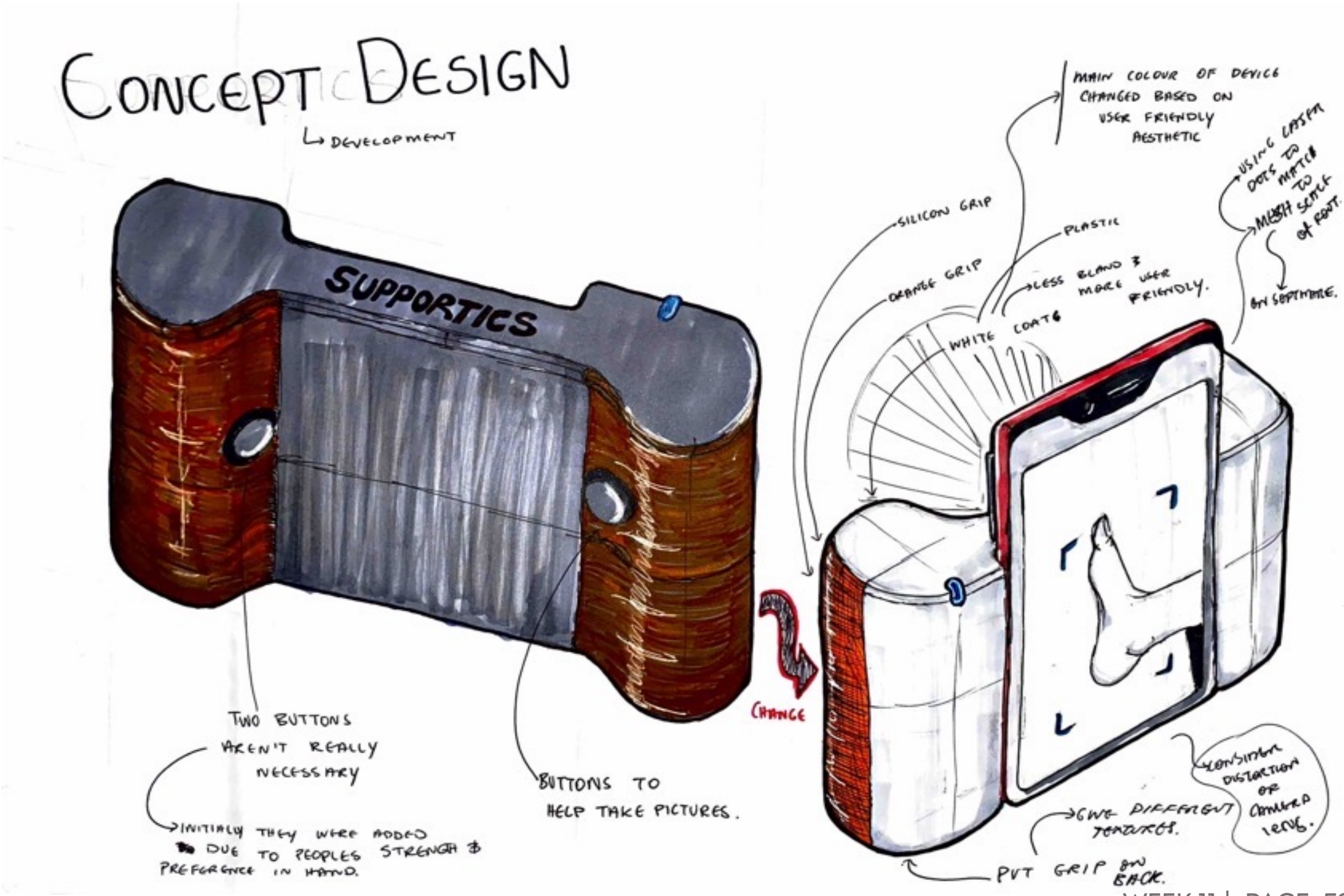
SUPPORTICS. SUPPORTHES.

SUPPORTICS IS AN APP THAT HELPS PATIENTS CONNECT WITH PODIATRISTS IN/FROM REMOTE AREAS TO HELP WITH THE ORGANISATION AND PREPARATION FOR ORTHOTIC DEVICES, FOR ~~THE~~ PATIENTS.

DESIGN DEVELOPMENT – Internal Components



DESIGN DEVELOPMENT – Aesthetics and features



DESIGN DEVELOPMENT – Concept system implementation

Development of Concept 2

↳ DEVELOPMENT ON SUPPORTICS

NOTES FROM → FEEDBACK & EMAIL.

→ PEOPLE DON'T HAVE THE COMPLIANCE & RETENTION TO THIEK PAIN IN REMOTE AREAS.

→ I AM DESIGNING A ~~EAR~~ RIG THAT SUPPORTS MOBILE PHONES ~~THAT~~ TO HELP CAPTURE PICTURES OF FEET FOR THE PURPOSE OF PHOTO GRAMMETRY SOFTWARE & FOOT ORTHOTIC DEVICES.

→ BASED ON RESEARCH
↳ THE SPECIFIED DESIGN WOULD BE ~~USED BY~~ A RIG TO HOLD PHONES & SMART ~~DEVI~~ DEVICES BY PEOP

→ NEEDS TO BE A LOCAL HEALTHCARE.

SCANNING | INFORMATION NEEDS TO BE SENT TO THE QUEENSLAND HEALTH | CLINICS. TO BE LOGGED WITH MANUFACTURE.

IDEAL SYSTEM

↳ FEEDBACK LOOP.,

PATIENT NEEDS HELP/ CONSULTATION WITH PODIATRIST / OR ANY HEALTH CARE WORKER

ASK

OVER PHONE ASKS FOR REMOTE CONSULTATION

→ TELEHEALTH.

↳ SYSTEM PAIRS GP's & SPECIALISTS WITH REMOTE PATIENTS

→ CURRENT REMOTE CONSULTING SYSTEM.

ANS

CONSULTATION IS DONE OVER PHONE. OR COMPUTER. OR

CONSULTATION

OR PHYSICAL CONSULTATION. → OR A NURSE OR LAYPERSON TRAVELS DOWN TO COMMUNITY AND PERFORMS CONSULTATION IN PERSON IN LOCAL AREA.

BASED ON CONSULTATION THE DOCTOR WILL PERFORM/ OR PRESCRIBE A INSOLE OR SIMILAR ~~ORTHOTIC~~ device ~~for~~ PATIENT.

ORTHOTICS WILL

→ SEND CONCEPT DESIGN THROUGH MAIL TO EITHER GP/HEALTH PRACTIONER/ LAY PERSON/local carer.

PERFORM / USE DESIGN & GET THE NECESSARY PICTURES FOR THE ~~DESIGN~~ MODEL OF THIER FOOT IN A NON-WEIGHT BEARING POSITION.

→ RESEARCH OUTLINED THAT THIS POSITION WAS OPTIMAL.

PATIENT FOOT.

DESIGN DEVELOPMENT – Concept system implementation

Development.

CONTINUING FROM LAST PAGE.

→ AFTER ~~PEOPLE~~ TAKING PICTURES OF FEET.

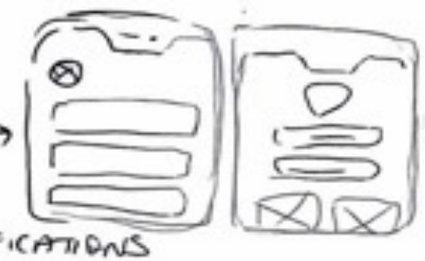
→ HEALTHCARE WORKER/ LAY PERSON WOULD SEND PICTURES.

PICTURES/AND DETAILS FROM APP ARE SENT TO MAIN OR CLINIC/ HEALTH CENTER THAT CAN PROCESS & LODGE 3D MODELS OF FEET TO MANUFACTURES

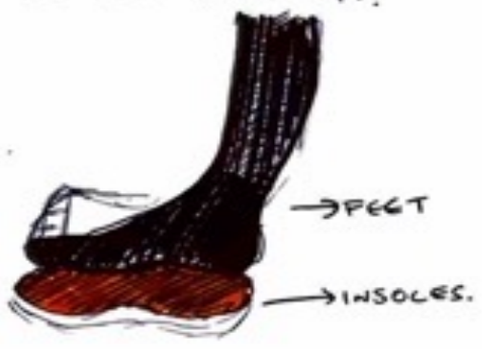
↳ E.G. I. ORTHOTICS.

AND

INPUT NECESSARY DETAILS & SPECIFICATIONS OF PATIENTS FEET FOR PHOTOGRAMMETRY → SPECIFIC TO ORTHOTICS → ON PHONE APP.



MANUFACTURES/ THIRD PARTY CUSTOM ORTHOTIC COMPANY SENDS INSOLES/ DEVICES THAT WERE PRESCRIBED THROUGH MAIL. TO PATIENT.



QUESTIONS FROM EMAIL.

↳ ADD VALUE & INCREASE PERSPECTIVE/DIRECTION OF BRIEF

↳ INCREASE VALUE OF DESIGN.

- THERE IS A NEED TO ATTEND TO PEOPLE IN REMOTE AREAS.

↳ HELP WITH THE TREATMENT & PRESCRIPTION OF FOOT CONDITIONS, FOR PEOPLE THAT LACK RESOURCES TIME & TRAVEL TIME.

- UTILISES PHOTOGRAMMETRY SOFTWARE THAT IS A QUICKER & ~~GROWING~~ SOFTWARE ~~IN~~ THAT IS ~~EFF~~ EFFECTIVE

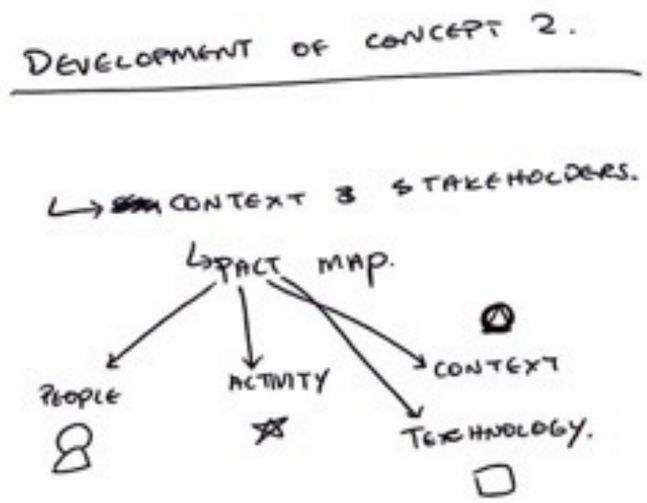
GROWING IN HEALTHCARE.

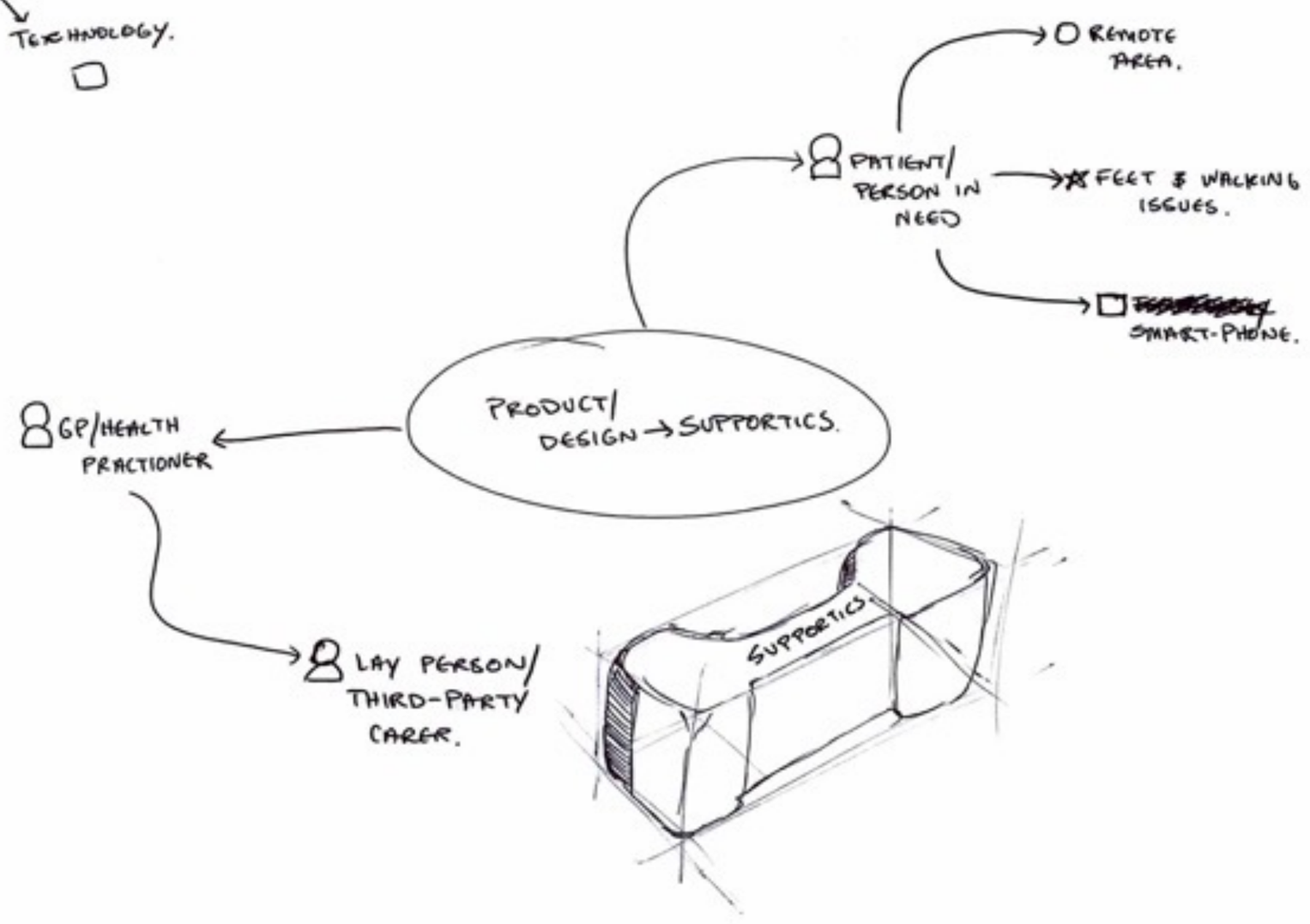
- THE DEVICE WOULD BE SENT TO CLINICS & HEALTHCARE FACILITIES THAT WOULD SEND WITH THIRD-PARTY CARER TO USE

- ENSURING AT MOST ACCURACY FOR PICTURES THROUGH FEATURES FROM THE DEVICE.

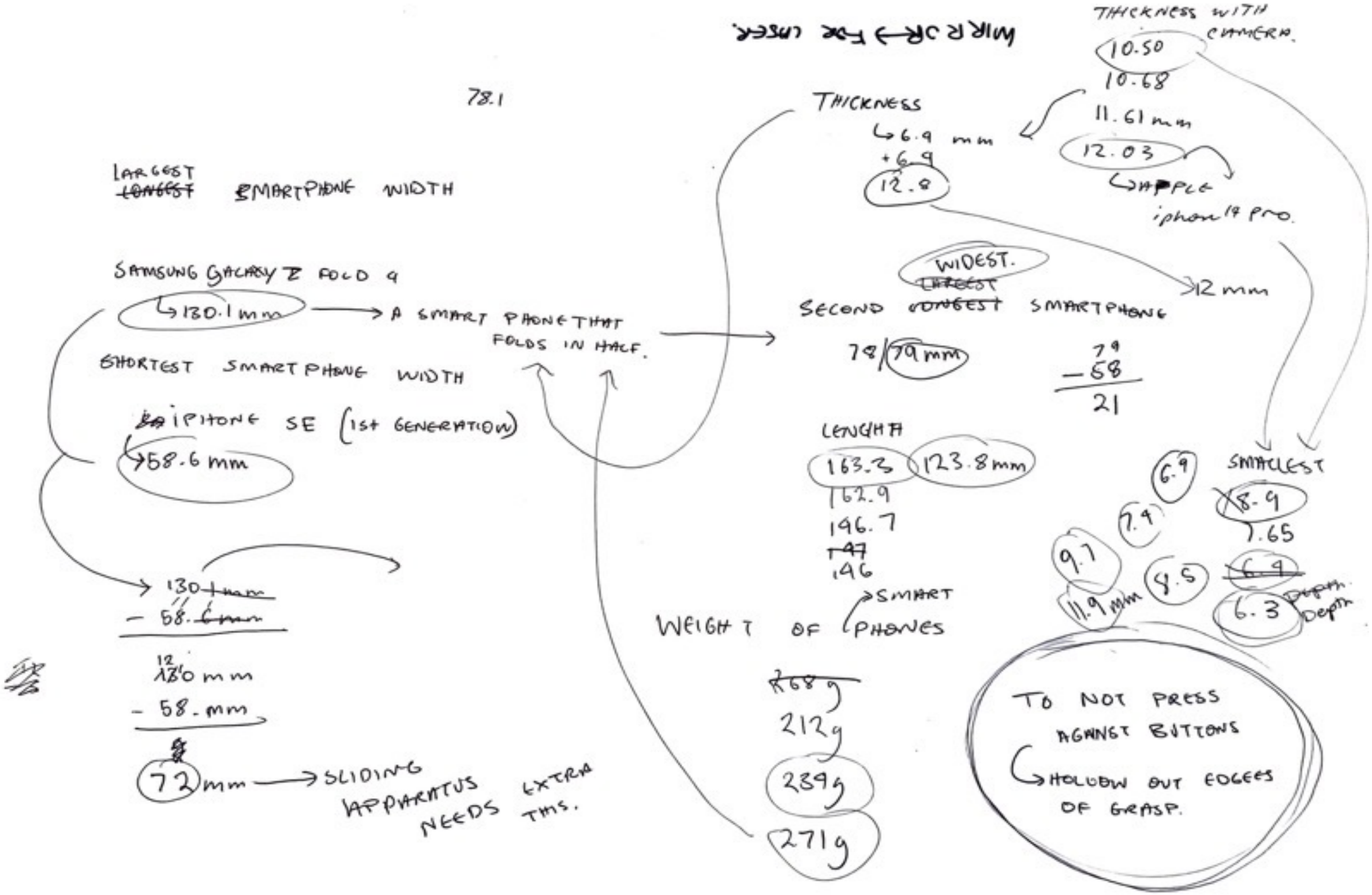
↳ DISTANCE → LIGHTING
↳ FOCUS
→ STABILITY
→ CONSISTANCY

DESIGN DEVELOPMENT – Concept system implementation (PACT)





DESIGN DEVELOPMENT – Phone dimensions



DESIGN DEVELOPMENT – Rough Prototyping







DESIGN DEVELOPMENT – Final Model Development

DESIGN DEVELOPMENT – Final Model Development

DESIGN DEVELOPMENT – Working Prototype developement

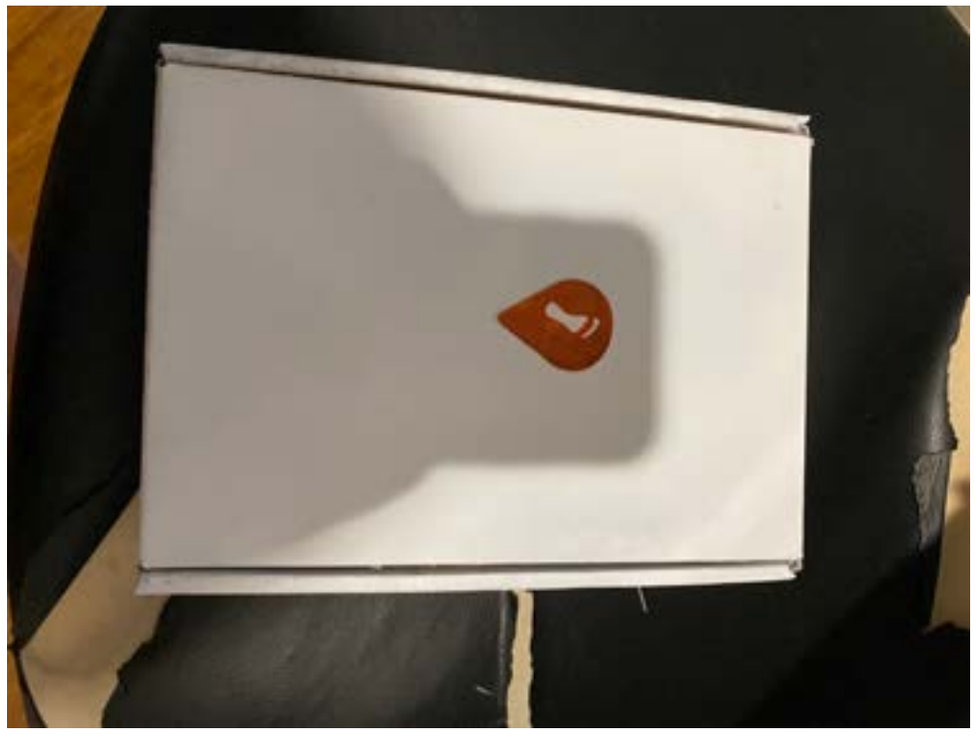
DESIGN DEVELOPMENT – Final Prototype Developement

DESIGN DEVELOPMENT – Final Prototype Development

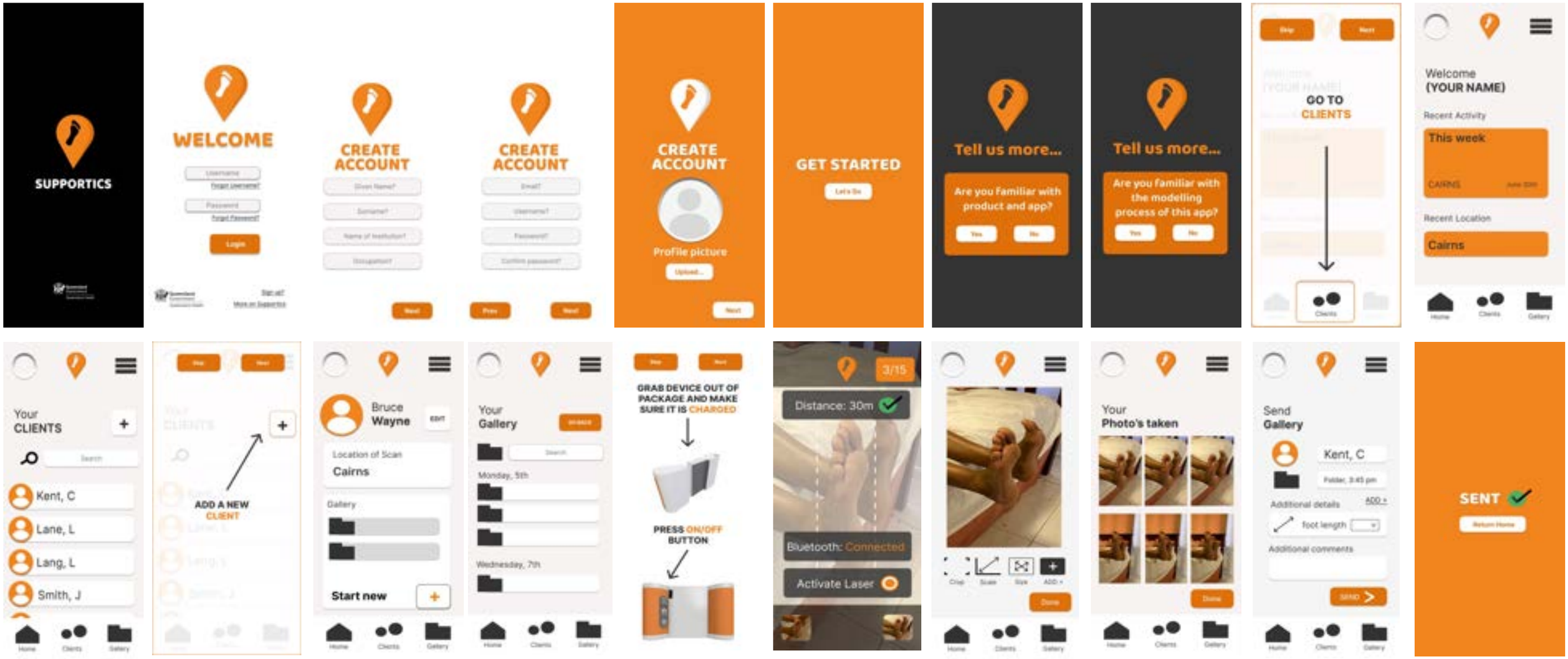




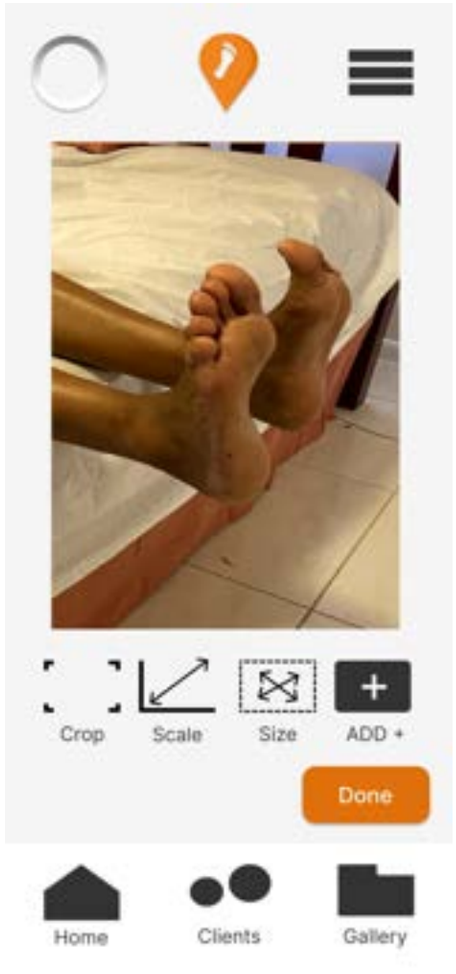


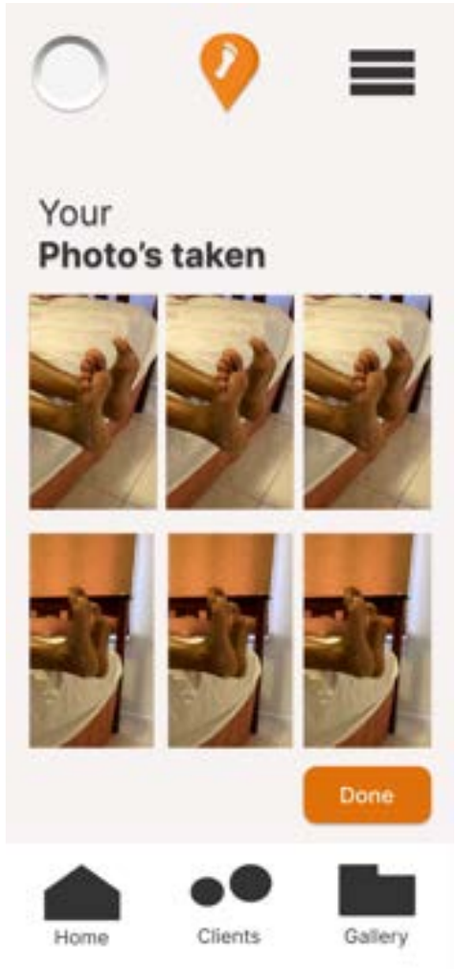


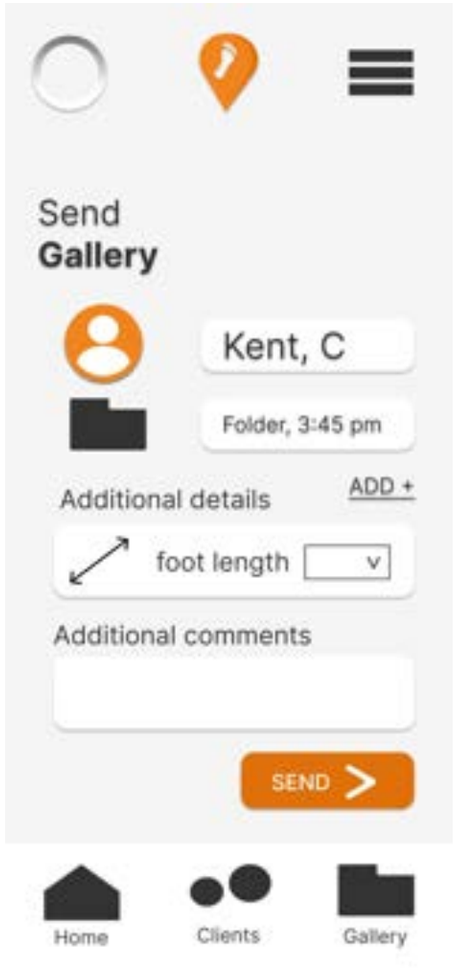
DESIGN DEVELOPMENT – APP INTERFACE DEVELOPMENT

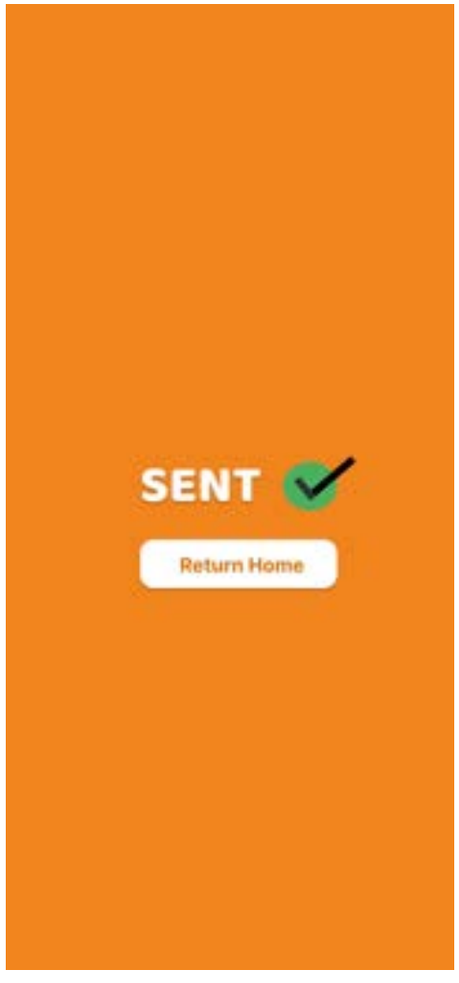


DESIGN DEVELOPMENT – APP INTERFACE DEVELOPMENT









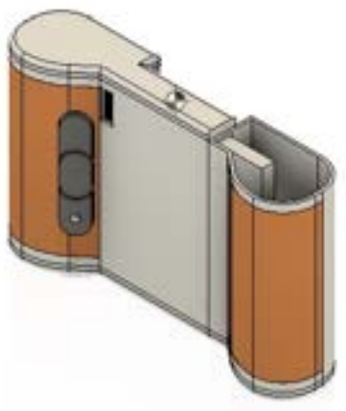
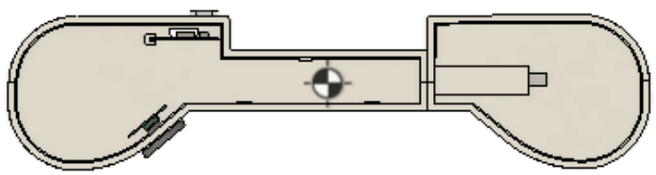
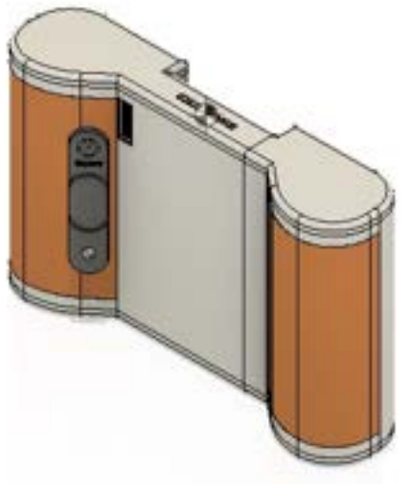
DESIGN DEVELOPMENT – CAD MODELLING PROGRESS

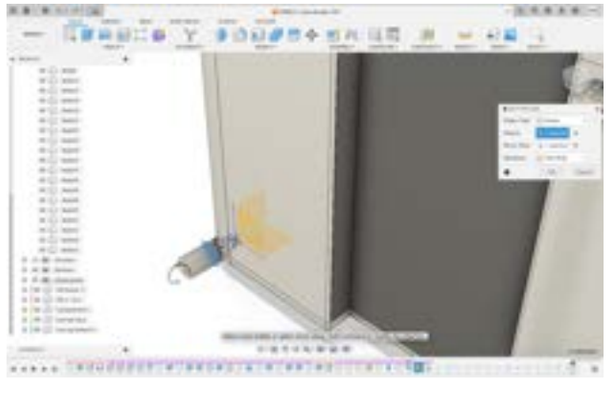
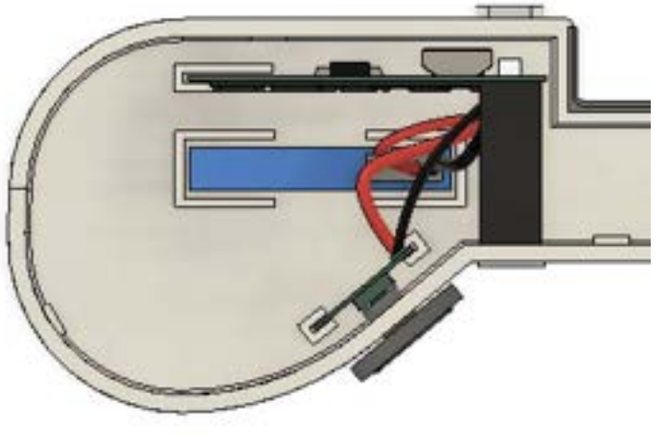




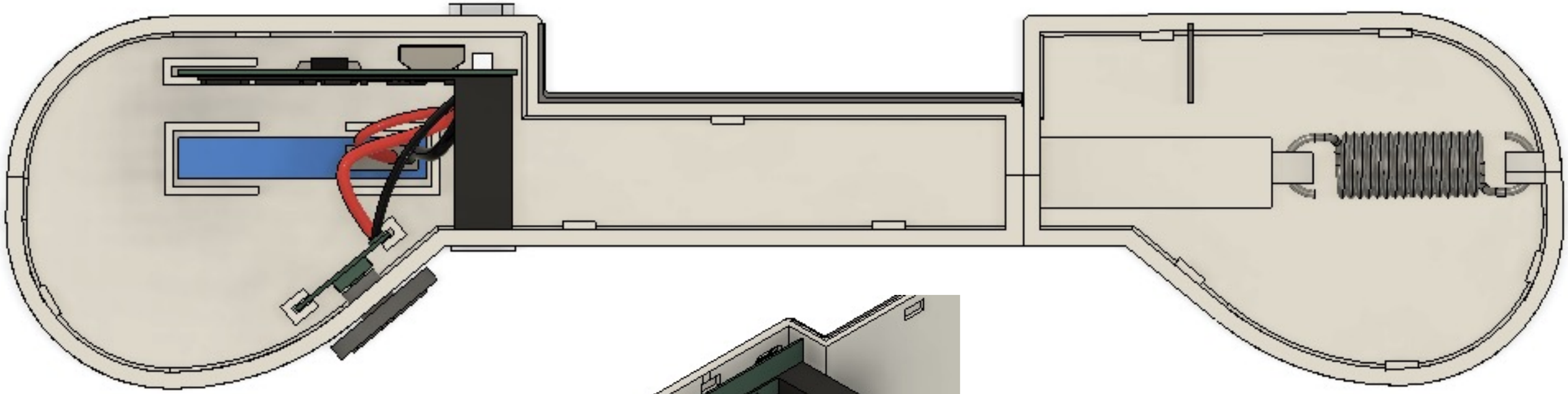


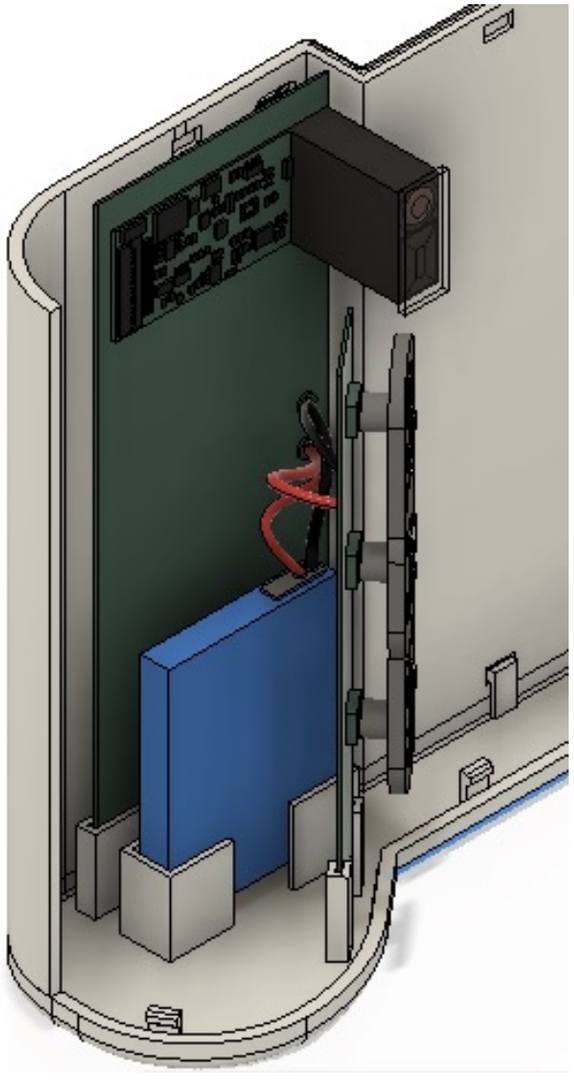


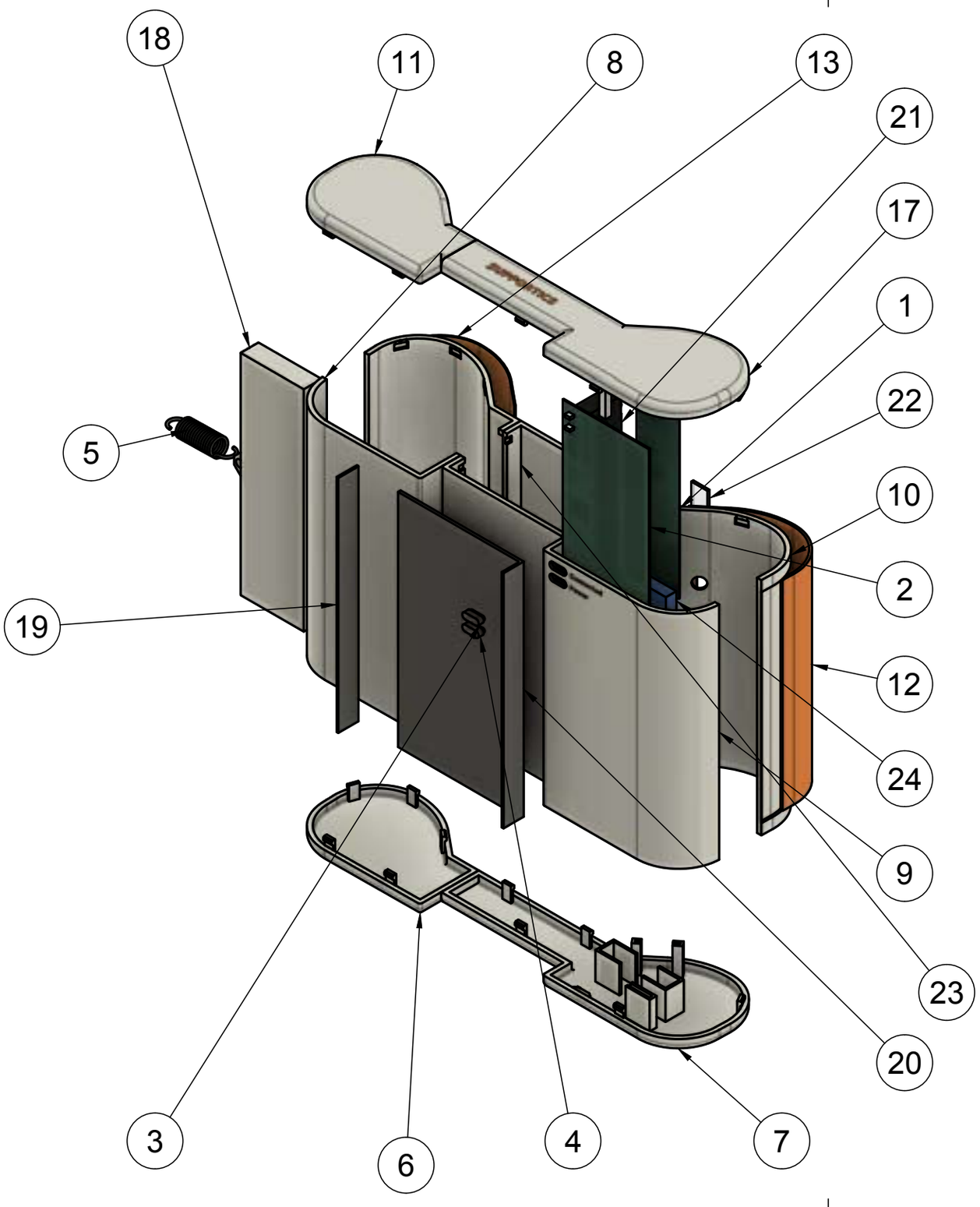



DESIGN DEVELOPMENT - ASSEMBLY



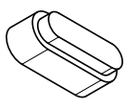


DESIGN DEVELOPMENT – EXPLODED VIEW

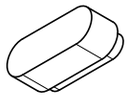


Parts List	
Item	Part Name
1	PCB Board 1 (Button)
2	Pcb 2 v2
3	Led Cap Top Part
4	Led Cap Bottom Part
5	Spring
6	Short Bottom Part
7	Long Bottom Part
8	Left Front Part
9	Right Front Part
10	Right Back Part
11	Short Top Part
12	Right Grip Part
13	Left Grip Part
14	Capture Button
15	Power Button (1)
16	Laser Button
17	Long Top Part
18	Slide Part
19	Short Mobile Grip Part
20	Long Mobile Grip Part
21	Laser Sensor
22	Glass Panel
23	Left Back Part
24	Lithium Battery

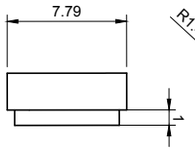
DESIGN DEVELOPMENT – EXAMPLES OF TECHNICAL DRAWINGS



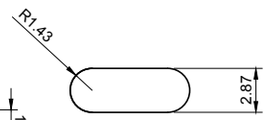
REAR PICTORIAL VIEW



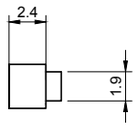
FRONT PICTORIAL VIEW



TOP VIEW

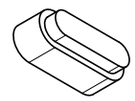


FRONT VIEW

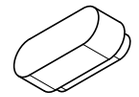


SIDE VIEW

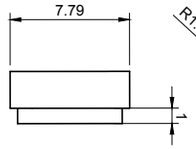
Dept.	Technical reference	Created by: Milli Mehari Abraha 8/11/2023	Approved by
		Document type	Document status
		Title: LED CAP TOP PART	DWG No.: 4
			Rev. / Date of issue / Sheet: 5/25



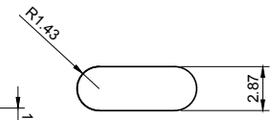
REAR PICTORIAL VIEW



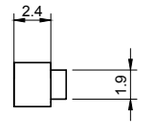
FRONT PICTORIAL VIEW



TOP VIEW

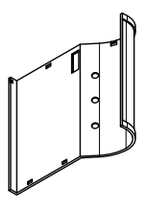


FRONT VIEW

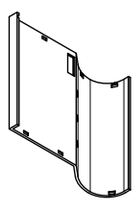


SIDE VIEW

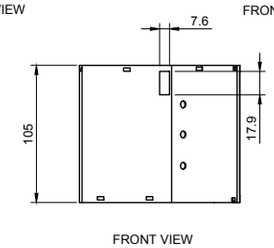
Dept.	Technical reference	Created by: Milli Mehari Abraha 8/11/2023	Approved by
		Document type	Document status
		Title: LED CAP TOP PART	DWG No.: 4
			Rev. / Date of issue / Sheet: 5/25



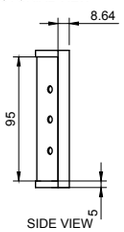
REAR PICTORIAL VIEW



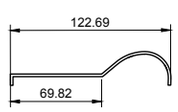
FRONT PICTORIAL VIEW



FRONT VIEW

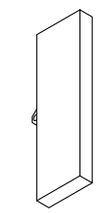


SIDE VIEW

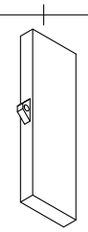


TOP VIEW

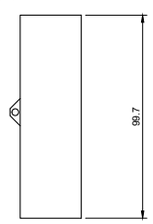
Dept.	Technical reference	Created by: Milli Mehari Abraha 8/11/2023	Approved by
		Document type	Document status
		Title: RIGHT BACK PART	DWG No.: 11
			Rev. / Date of issue / Sheet: 12/25



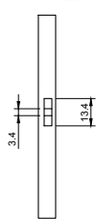
REAR PICTORIAL VIEW



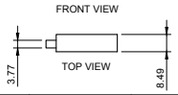
FRONT PICTORIAL VIEW



FRONT VIEW



SIDE VIEW



TOP VIEW

Dept.	Technical reference	Created by: Milli Mehari Abraha 8/11/2023	Approved by
		Document type	Document status
		Title: SLIDE PART	DWG No.: 18
			Rev. / Date of issue / Sheet: 19/25

DESIGN DEVELOPMENT – BILL OF MATERIALS

Part Number	Partner Image	Part Name	Quantity of each part per unit	Mass	Overall Dimensions	Manufacturing Method	Finish	Material	Colour	Production	Additional Comments
1		PCB Board 1(Button)	1	n/a	23 x 28 x 84	n/a	n/a	FR - 4	Green	Standard	
2		PCB Board 2	1	n/a	188 x 122 x 119	n/a	n/a	FR - 4	Green	Standard	
3		LED Cap Top Part		0.073g	8 x 3 x 3	Injection moulding	n/a	Acyrlic Plastic	Clear	Standard	
4		LED Cap Bottom Part	2	0.073g	8 x 3 x 3	Injection moulding	n/a	Acyrlic Plastic	Clear	Standard	
5		Spring	1	2.387g	31 x 8.185 x 8	n/a	n/a	Steel	Silver	Standard	
6		Short Bottom Part	1	6.097g	65 x 45 x 9	Injection moulding	matte	ABS Plastic	White	Custom	
7		Long Bottom Part	1	10.143g	123x 45 x 15	Injection moulding	matte	ABS Plastic	White	Custom	
8		Left Front Part	1	19.277g	65 x 20 x 105	Injection moulding	matte	ABS Plastic	White	Custom	
9		Right Front Part	1	33.027g	123 x 19 x 105	Injection moulding	Gloss	ABS Plastic	White	Custom	
10		Right Back Part	1	25.651g	123 x 26 x 05	Injection moulding	Gloss	ABS Plastic	White	Custom	
11		Short Top Part	1	6.189g	65 x 45 x 8	Injection moulding	Gloss	ABS Plastic	White	Custom	
12		Right Grip Part	1	7.368g	53 x 26 x 95	Injection moulding	Matte/Rough Texture	Rubber/Silicone	Orange	Custom	
13		Left Grip Part	1	4.415g	53 x 26 x 95	Injection moulding	Gloss	Rubber/Silicone	Orange	Custom	
14		Capture Button	1	0.846g	13 x 11 x 24	Injection moulding	Gloss	ABS Plastic	White	Custom	
15		Power Button	1	0.846g	13 x 11 x 24	Injection moulding	Gloss	ABS Plastic	White	Custom	
16		Laser Button	1	0.846g	13 x 11 x 24	Injection moulding	Gloss	ABS Plastic	White	Custom	
17		Long Top Part	1	9.198g	123 x 45 x 22	Injection moulding	Gloss	ABS Plastic	White, Orange	Custom	
18		Slide Part	1	26.057g	35 x 8 x 100	Injection moulding	Gloss	ABS Plastic	White	Standard/ custom	
19		Short Mobile Grip Part	1	0.883g	0.7 x 10 x 105	Injection moulding	Matte	Rubber/Silicone	Grey	Standard	
20		Long Mobile Grip Part	1	10.218g	58 x 10 x 105	Injection moulding	Matte	Rubber/Silicone	Grey	Standard	
21		Laser Sensor	1	5.002g	38 x 20 x17	n/a	n/a	Fr - 4	n/a	Standard	Supplier: JRT-Measure
22		Glass Panel	1	0.152g	8 x 1 x 19	Cut	Gloss	Glass	Clear	Standard	
23		Left Back Part	1	15.806g	65 x 26 x 105	Injection moulding	Gloss	ABS Plastic	White	Custom	
24		Lithitum Battery 3.7V	1	21g	38 x 13 x 58	Standard Part	n/a	PVC Cover	Blue	Standard	

DESIGN DEVELOPMENT – PROTOTYPE SCENE PICTURES

DESIGN DEVELOPMENT – CAD model pictures.

DESIGN DEVELOPMENT – Example of renders