

Product Design Title

Student Name

Student ID no

Department

8th Nov 2024

Example : 01

Smart Kitchen Planner

& Waste Reducer

C S SAI KIRAN

LASER BASED FITNESS SYSTEM FOR ATHLETES

NAME:DILIP KUMAR D

REG NO:192212105

DEPT:ELECTRONICS AND COMMUNICATION ENGINEERING

16 NOVEMBER 2024

- Product Problem
- Solution

Product Problem

Example : 02

The main problem with a QR code scanning device that allows only one transaction at a time is slow processing. This creates delays, especially in busy places, leading to:

1. **Long Wait Times:** Multiple people waiting for their turn, which frustrates customers.
2. **Poor User Experience:** People may abandon the device for faster alternatives.
3. **Limited Efficiency:** High-volume settings, like events or stores, may need extra devices, increasing costs.
4. **Error Impact:** One error can stop all transactions, causing more delays.

The solution would be to allow the device to handle multiple transactions at once, making it faster and more efficient.

Solution

1. **Enable Multi-Transaction Support:** Allow the device to process multiple transactions at once, reducing wait times.
2. **Queue System with Notifications:** Let users queue their transactions and notify them when it's their turn to scan.

Project Overview

Example : 01

THE PROBLEM

1. The regular cone drill can't measure how fast or quick someone moves on its own.
2. Coaches have to watch and guess, so you don't get exact details about your performance.
3. Without this information, it's hard for athletes to know how to get better.

SOLUTION

1. A laser-based device automatically measures how fast and quick you move.
2. It provides real-time feedback to help athletes understand and improve performance.
3. This makes training more accurate and effective compared to traditional cone drills.

- Product Domain Study
(LinkedIn Article 1500-200 words)

Product domain study

Example : 01

SUMMARY

A QR code scanning device designed to allow only one transaction at a time is a specialized system intended to enhance security and streamline operations. It works by scanning QR codes generated for individual transactions and ensuring that only one transaction can be processed per scan, preventing simultaneous or overlapping actions. This feature is particularly useful in high-security environments where managing transactions one at a time is crucial, such as in payment systems, secure data exchanges, or inventory management. By limiting the device to a single transaction, it helps minimize errors, fraud, and unauthorized access, improving both efficiency and trust in the system.

Article Link:

https://www.linkedin.com/posts/keerthi-chekka-967a23330_activity-7269621546606874624-5REo?utm_source=share&utm_medium=member_android



Product domain study

Example : 02

LINKEDIN ARTICLE:

ARTICLE:

CONCLUSION

The laser-based agility training system is a revolutionary tool that addresses the limitations of traditional cone drills. By offering real-time feedback, randomized movement patterns, and customizable settings, this system provides athletes with a more dynamic, engaging, and effective way to train. Whether used by professional athletes or amateurs, the system's ability to track performance metrics and provide immediate feedback makes it an invaluable resource for improving agility, speed, and reflexes. As more athletes and coaches adopt this technology, it's clear that the future of sports training lies in innovation and precision.

- Problem Statement
(User needs)

Problem Statement

Example : 01

Riya is a security-conscious individual who needs a dependent and convenient way to secure and access her belongings because she values safety, wants to eliminate the hassle of traditional keys, and prefers using advanced, technology-driven solutions for day-to-day tasks.

Problem Statement

Example : 01

Vamsidhar Reddy, a Kho Kho player, **needs a** more exciting way to improve his speed and reflexes, **because** traditional drills like cones are predictable and don't show his progress instantly. A tool that provides real-time feedback can help him track his abilities and gain an edge over others.

- My Role
- My responsibilities

Project Scope

Example : 01

MY ROLE

The goal is to design a laser-based system that helps athletes improve their speed and reflexes. It works by using a rotating laser to create random challenges during practice, making training more engaging and effective.

MY RESPONSIBILITIES

- Setting up the physical device
- Program the device
- User Experience Enhancement
- Testing the device with coach/athletes
- Get the feedback from coach/athletes
- Redesign the product based on feedback

Project Scope

Example : 02



My role:

As the Developer for this Smart Grocery Shopping and Meal Planning App, I am responsible for overseeing the development, design, and implementation of the app's core features for personalized, user-friendly experiences.



Responsibilities:

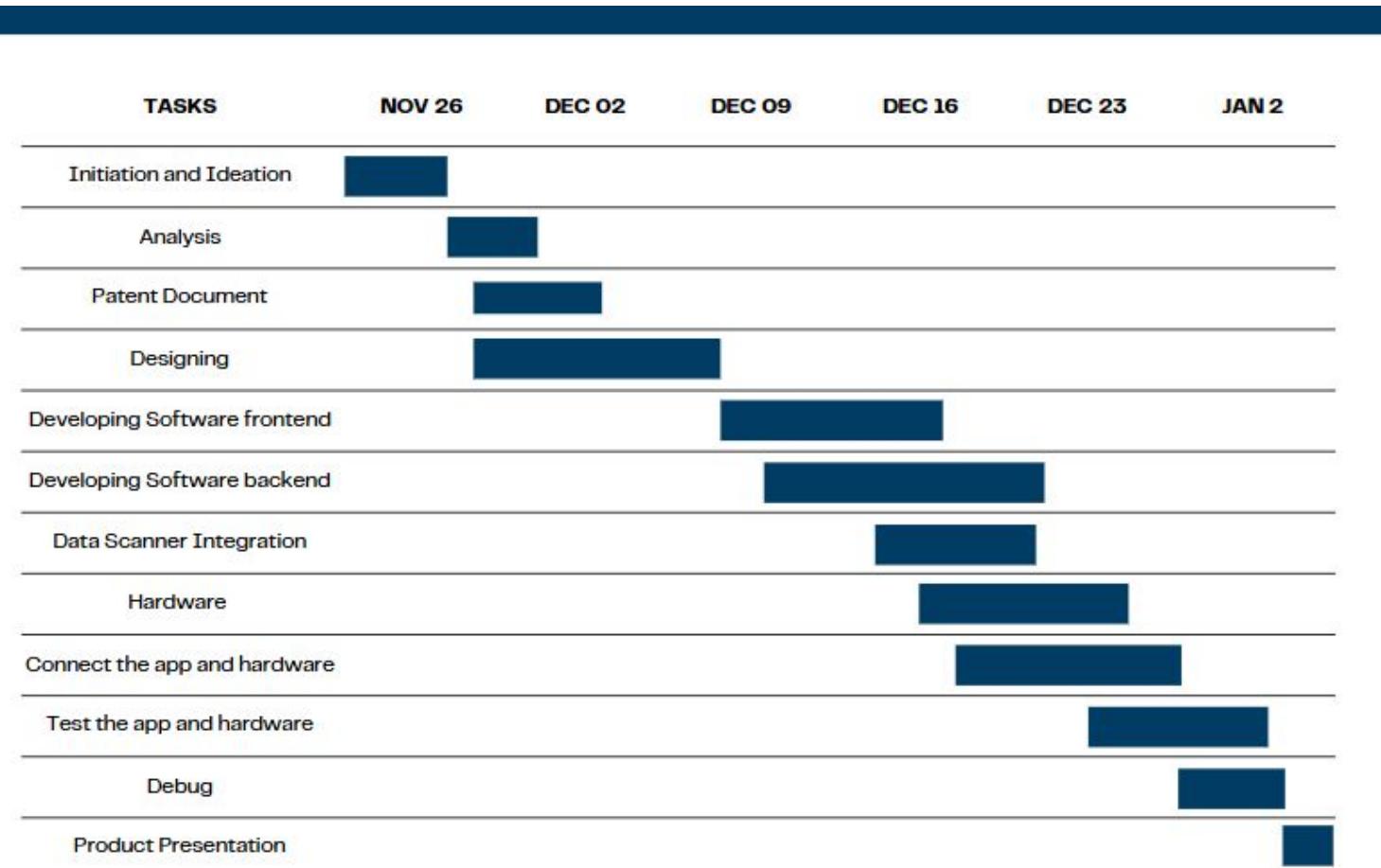
- Conducting user interviews to gather insights on grocery shopping habits, dietary preferences, and sustainability goals.
- Creating paper and digital wireframes to visualize app layouts and user flows before development.
- Developing low and high-fidelity prototypes to demonstrate key features like personalized meal plans and sustainability tips.
- Conducting usability studies to test and refine the app's design

Product development cycle

- Gantt chart
- Project timeline

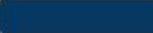
Project Plan

Example : 01



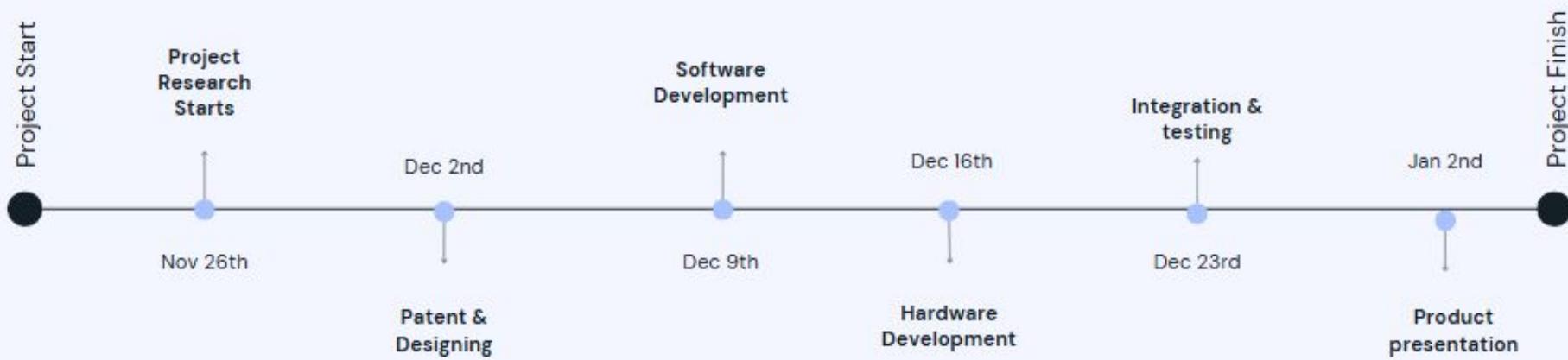
Project Plan

Example : 02

S.N O'	TASK NAME	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5
1	Ideation					
2	Planning					
3	Prototyping					
4	Testing					
6	Prototype testing & Feedback					
7	Redesign					
8	Product development					
9	Product Finalization					

Project Timeline

Example : 02



Project Timeline

Example : 02

TIMELINE	DESCRIPTION
Nov 1-5	Define objectives and prepare datasets. Create basic mockups and plan roles.
Nov 6-12	Develop backend and database structure. Implement for data retrieval and processing.
Nov 13-20	Build and integrate frontend interface. Add data visualization and input features.
Nov 21-30	Create home page, add the tabs to be included in database, add information.
Dec 1 to 8	Perform testing (unit and integration). Fix bugs, optimize, deploy, and present

Understanding the User

- User Persona 01
- User Persona 02

User Persona

Example : 01

Frustrations/Pain Points

Nor have time nor have a habit to check Validity of the food items while purchasing
It Users struggle with reusing leftovers
Due to a lack of knowledge and the quick Development of bacteria in stored food.



Ashna, 27 years
MBA, Banker,
Lives In Delhi, India.

“

I try to save food wastage
To save resources put in it.

”

Motivations

Financial Efficiency:

Users see food wastage as a direct waste of Money, which motivates them to reduce Food waste to save more food and avoid Food waste.

Goals

Achieve minimal food wastage to Save their resources.

Personality

Extrovert

Calm

Traveler

User Persona

Example : 02



AGE: 19 YEARS

EDUCATION: B.E ECE

HOMETOWN:

Kadapa, Andhra Pradesh

OCCUPATION: Student at Sreeetha School of Engineering

PROBLEM STATEMENT

Vamsidhar Reddy, a KHO KHO player, typically uses cone drills to warm up before playing. However, setting up the drills manually in real-time often hinders his performance. He needs a device that can automate the drill setup, allowing him to efficiently complete the exercises while recording essential data such as total time, movement speed, and reflexes.

GOALS:

- **Enhance Reaction Speed:** Improve athlete's response to unpredictable signals.
- **Adaptability:** Adjustable device for varied training intensities.

FRUSTRATION:

- **Frustrated by Existing Data Calculations:** Lacks reliable metrics for tracking progress.
- **Limited Challenge of Cones and Static Drills:** Predictable drills reduce engagement and realism.

- User Journey Map

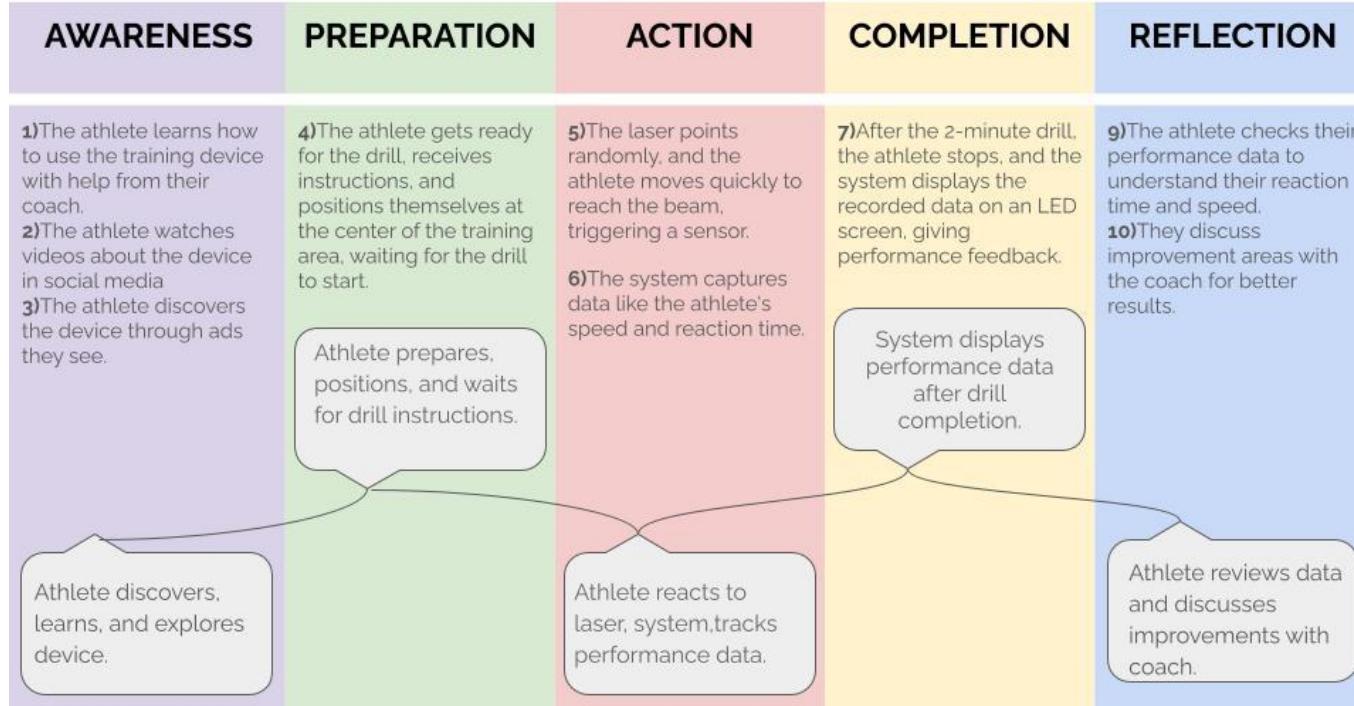
User Journey Map

Example : 01

Phases	Grocery Shopping	Cooking and Consuming	Managing Leftovers	Disposal and Reflection
User's Actions (Steps the User takes)	<ul style="list-style-type: none"> Explore Grocery items Look for Offers. Get the Best Offers. 	<ul style="list-style-type: none"> Cooking grocery items. Eating the food. 	<ul style="list-style-type: none"> Keeps Leftovers in fridge. Donates it to poor. 	<ul style="list-style-type: none"> Throws away the Leftovers.
User's Thoughts	<ul style="list-style-type: none"> Feeling Confused Searching for Groceries. Excited To Get The Best Offers. 	<ul style="list-style-type: none"> Feeling happy to eat Food tries to finish Everything Worried about leftovers 	<ul style="list-style-type: none"> Confusion to manage Leftovers. Annoyed by difficulty To re-use food. 	<ul style="list-style-type: none"> Feels Regretful And Helpless to throw away The food.
User's Feelings (Emotions)				
User's Statements	" I only buy fresh Groceries and get best Offers on grocery."	"I don't repeat meals, I Make fresh meals daily."	"I often donate the Leftovers to stray animals"	"I feel helpless throwing Leftovers, I feel food as a Privilege"
Opportunities	<ul style="list-style-type: none"> Bulk Buying Suggestions In app grocery list Product Validity Date Generative artificial intelligence Or cart 	<ul style="list-style-type: none"> Generative AI Giving recipe suggestions & Exact quantity of food. Personalized Recipes 	<ul style="list-style-type: none"> Storage And preservation Techniques for leftovers. 	<ul style="list-style-type: none"> Organic food waste Composting techniques. Generative AI food waste Use suggestions

User Journey Map

Example : 02



- Competition Analysis

Competitive analysis

Example : 01

Competitor Name	Competitor Type (Direct/Indirect)	Location	Product Offering	Price (\$-\$ \$\$)	Website	Business Size	Target Audience	Unique Value Proposition
Libby	Indirect	America	Discover and enjoy ebooks and audiobooks from your local library	free	libby.com	Large	Entrepreneurs, students	In-depth articles on startups, innovation, and success stories
Wattpad	Indirect	Canada	Online book reading app fanfiction,short stories,novels and more	free	wattpad.com	Large	General audience	Focus on uplifting stories and social initiatives
Goodreads	Indirect	America	Discover,track and share your readings with friends	free	goodreads.com	Large	Busy professionals, students	Professionals, students Quick, concise news summaries tailored for fast consumption
Booksphere	Direct	India	Daily feeds with interesting books and categories	free	booksphere.com	Small	Young adults, students	Personalized learning experience with diverse topics and books

Competitive analysis

Example : 02

Competitor Name	Price	Target Audience	Unique Value Proposition
XYZ Industrial Sorter	₹41,500	Medium and large workshops	High-speed sorting with customizable settings.
SortEasy Pro	₹24,900	Small businesses and workshops	Compact design with multi-size sorting capability.
QuickSort Mini	₹16,600	Local hardware shops	Affordable and lightweight machine for quick sorting.
AutoNut Pro	₹33,200	Small manufacturers	Durable and reliable with low maintenance needs.
This Product	₹8,300	Small workshops, hardware shops	Affordable, easy to use, and designed for minimal upkeep.

Business potential

- Gap analysis
- Target audience
- Market size

Business Potential

Example : 01

GAP ANALYSIS

- Incorporating advanced noise cancellation, personalized sound profiles, and health monitoring capabilities
- Catering to specific needs and preferences, such as athletes, musicians, and audiophiles, with specialized earphones
- Focusing on eco-friendly materials, reducing electronic waste, and implementing responsible manufacturing practices.

TARGET AUDIENCE

young adults and teens, frequent travelers, people fed up with wires, and people who listen to music in the gym.

UNIQUENESS

My device will provide multiple no of noise and it will provide real time feedback and insights from the earphones

MARKET SIZE

1)The market size in India is ₹800–2,500 crore

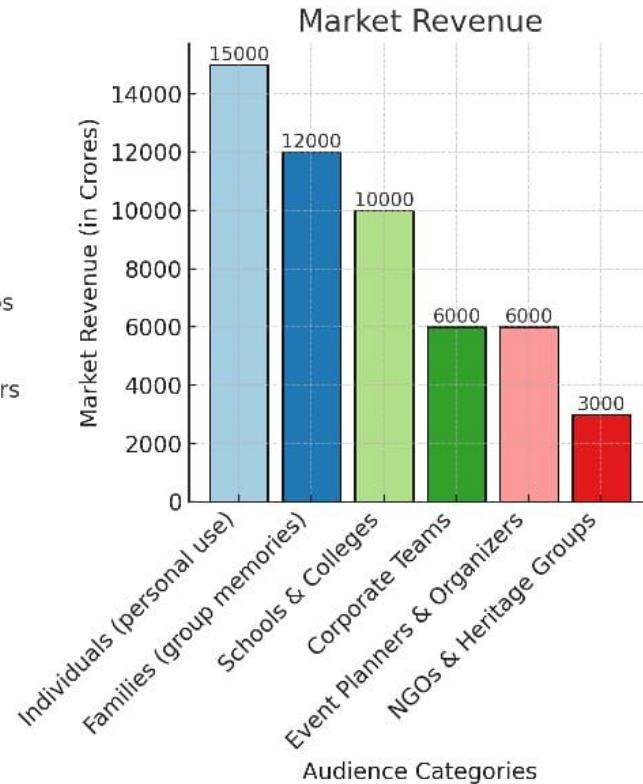
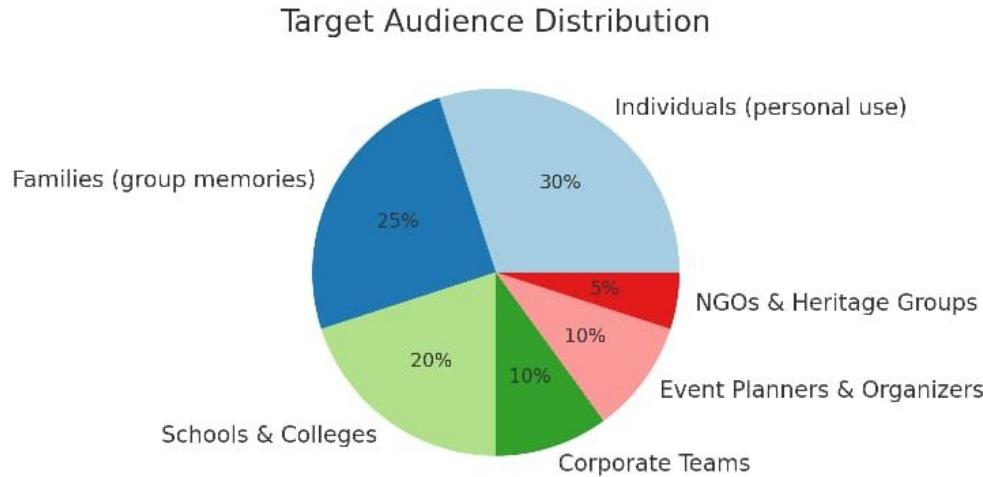
SOURCE:STATISTICA 2022

2)The market size in world is USD 4.89 billion in 2023 to USD 8.39 billion by 2031, growing at a CAGR of 6.2% in the forecast period (2024-2031)

SOURCE:STATISTICA 2022

Business Potential

Example : 01



User Pain Points

- Pain Point 01
- Pain Point 02
- Pain Point 03

User Pain Points

Example : 01

PAIN POINTS

Limited no of drills: Manual cone drills need frequent setup, slowing training sessions and reducing the number of drills athletes can compete effectively.

Limited engagement: Manual drills don't provide dynamic or interactive experiences, making training less engaging for athletes.

Lack of performance data: Manual drills don't track reflexes or speed, preventing athletes from measuring or tracking progress effectively.

User Pain Points

Example : 02

1. Complex Navigation:

- **Description:** Users often find it difficult to navigate through cluttered and complex interfaces.
- **Impact:** This leads to frustration and a poor user experience, causing users to leave the platform.

2. Inconsistent Content Quality:

- **Description:** The quality of content varies widely, making it hard for users to find reliable and accurate information.
- **Impact:** Users may waste time sifting through low-quality posts, leading to dissatisfaction and decreased trust in the platform.

3. Privacy Concerns:

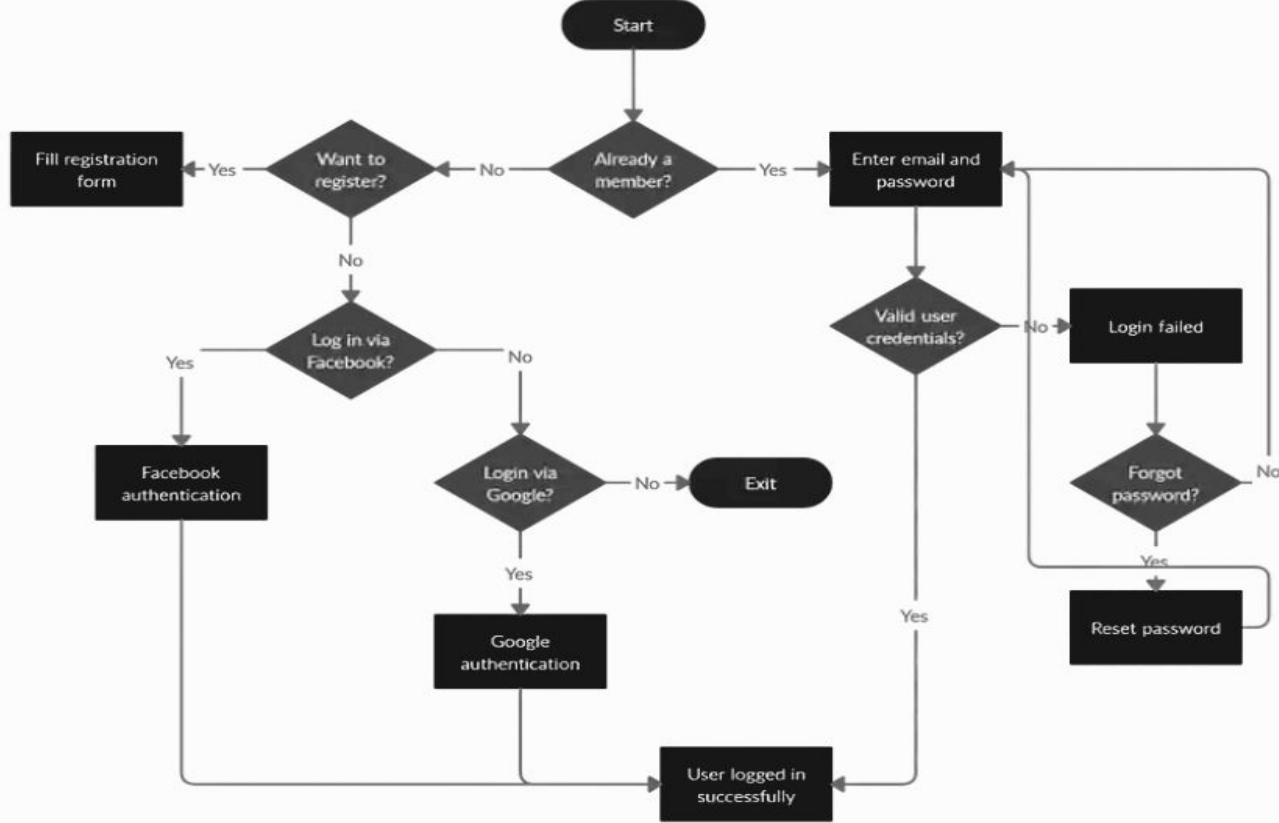
- **Description:** Users are concerned about the privacy and security of their data on tech forums.
- **Impact:** Privacy concerns can deter users from fully engaging with the platform and sharing valuable information.

Rapid prototyping - Ideation

- Process Diagram/
- Flow Diagram/
- Sketches / drawings

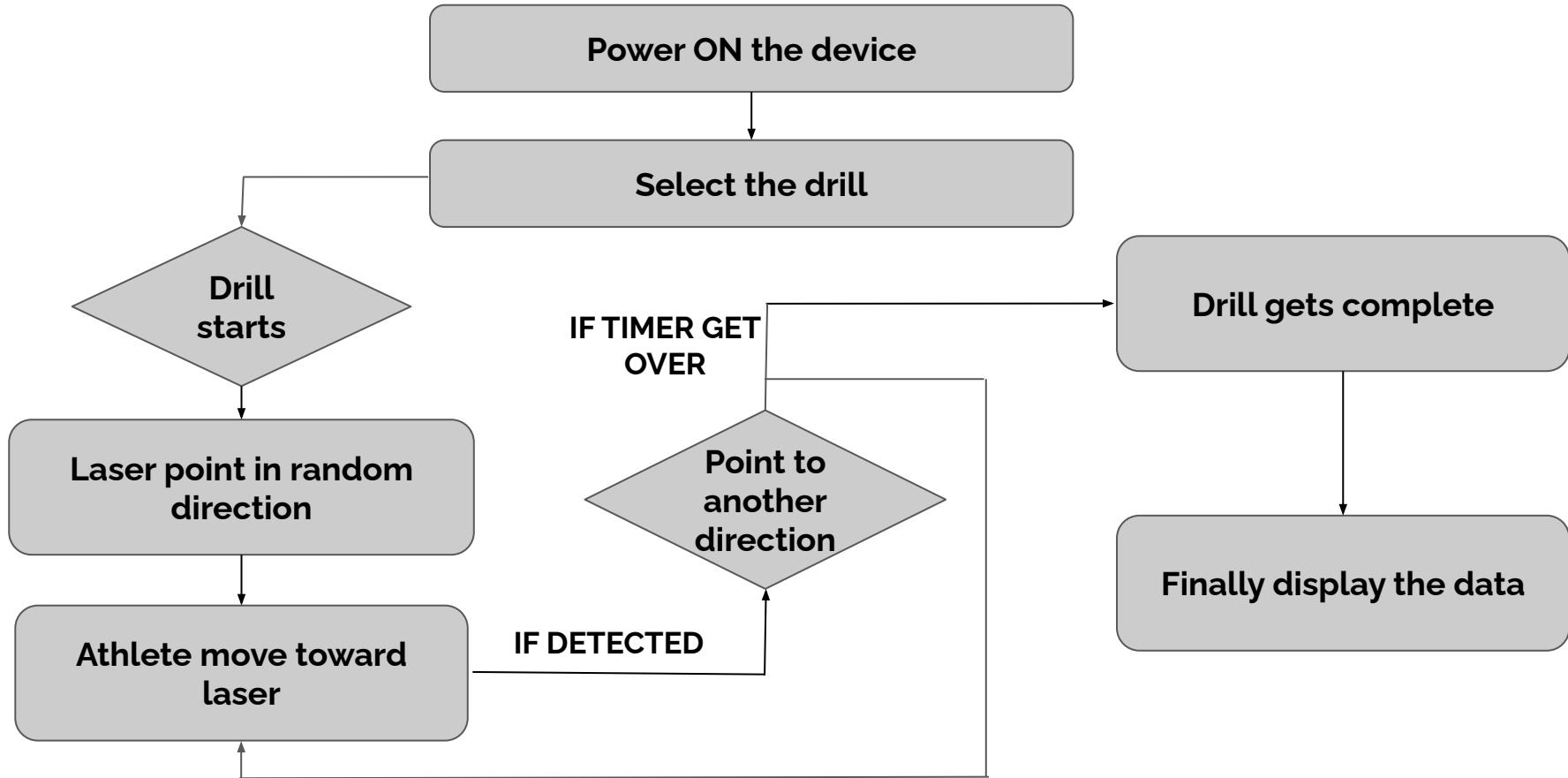
Flow Diagram

Example : 01



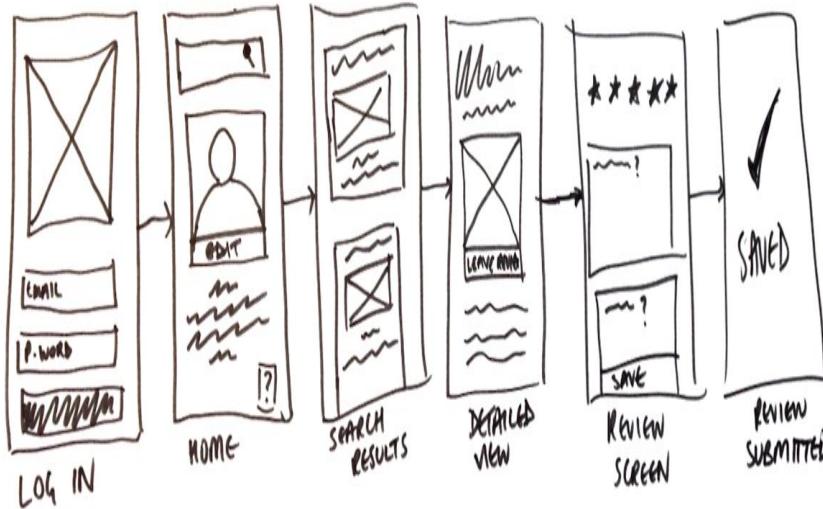
Flow Diagram

Example : 02

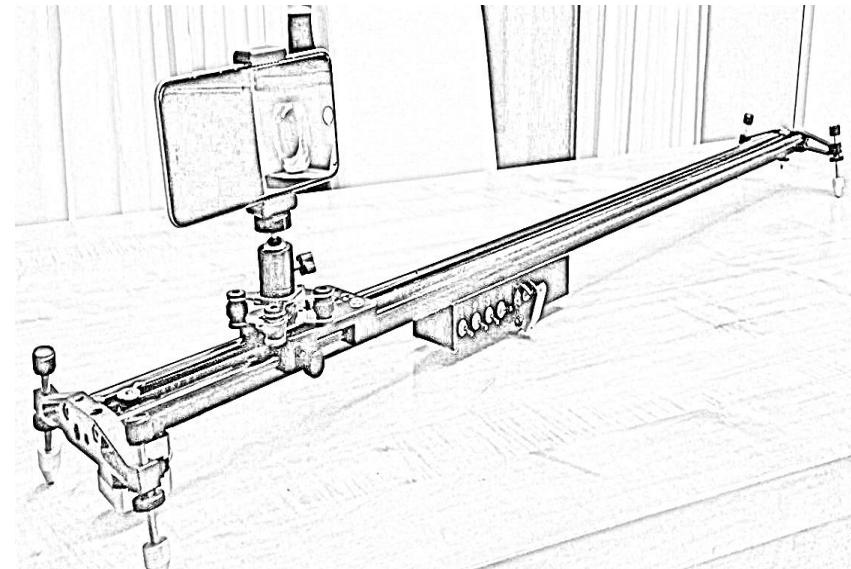


Product Sketches

Example : 01



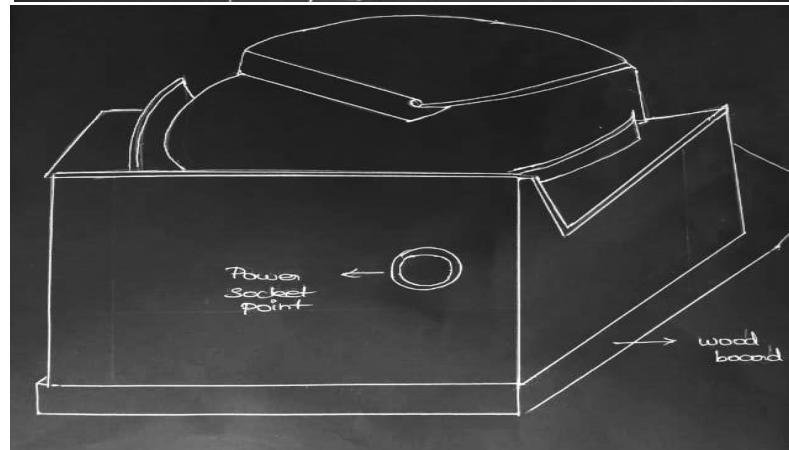
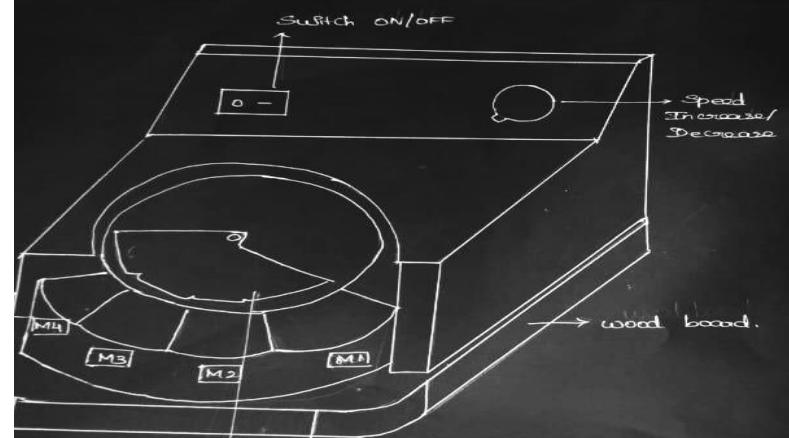
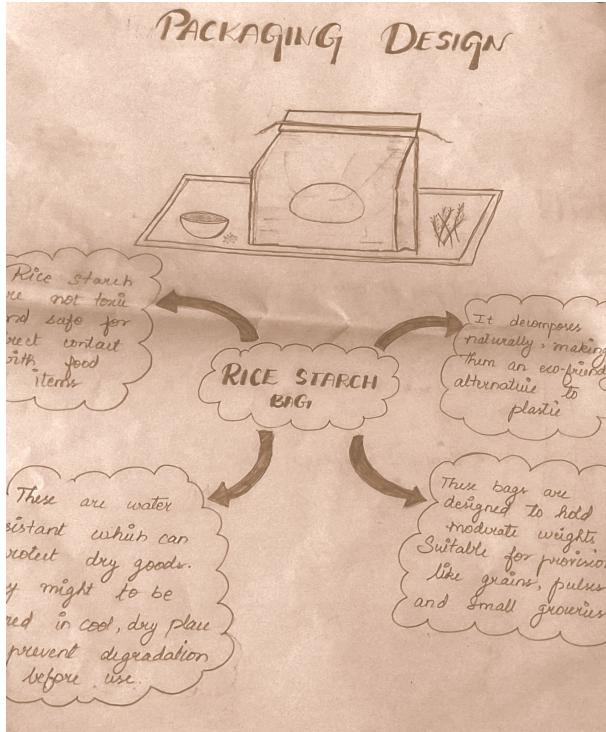
Paper Wireframes



Paper sketches

Product Sketches

Example : 01



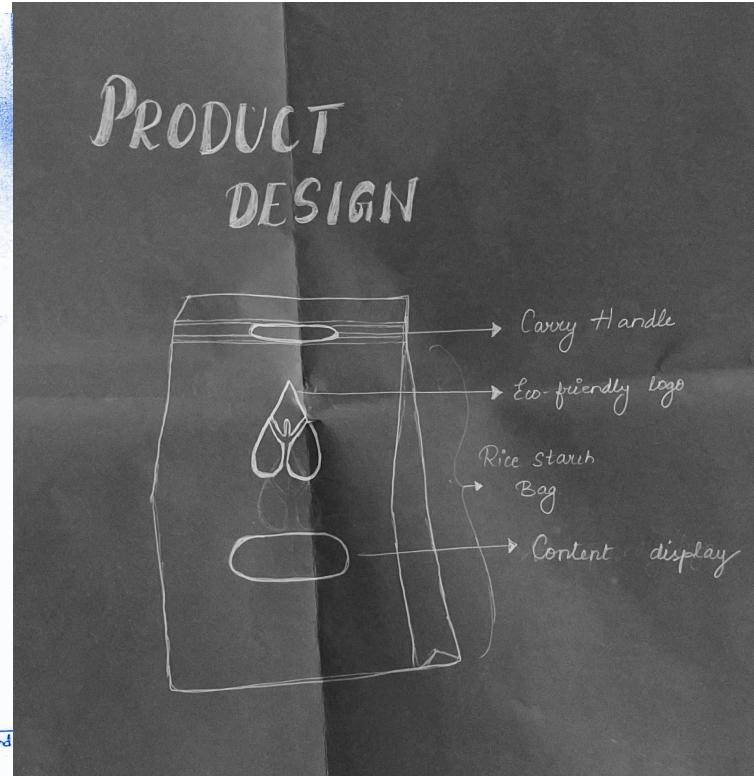
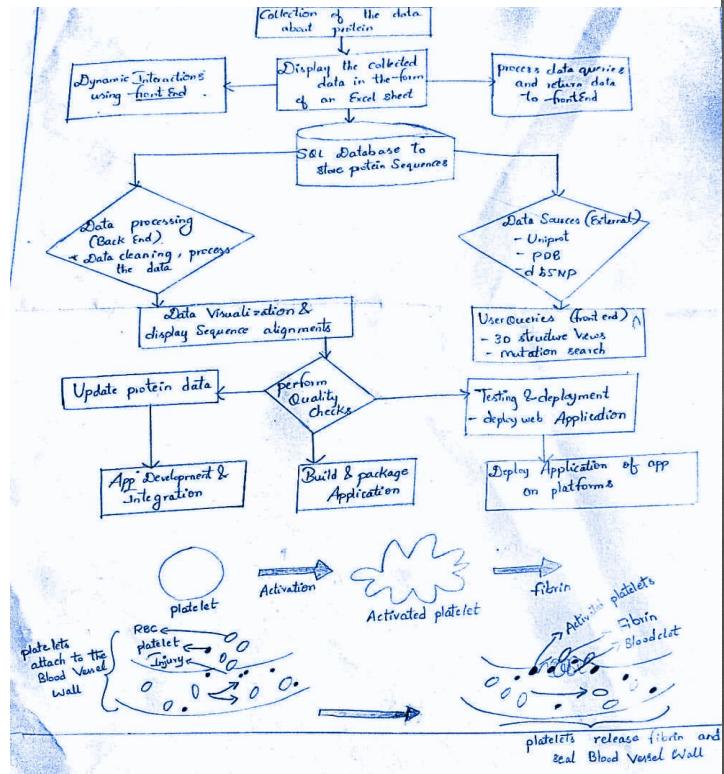
Paper sketches

Mockups low fidelity - (convergence)

- Ideation alternatives/
- Iterations /
- Learnings

Ideation Sketches

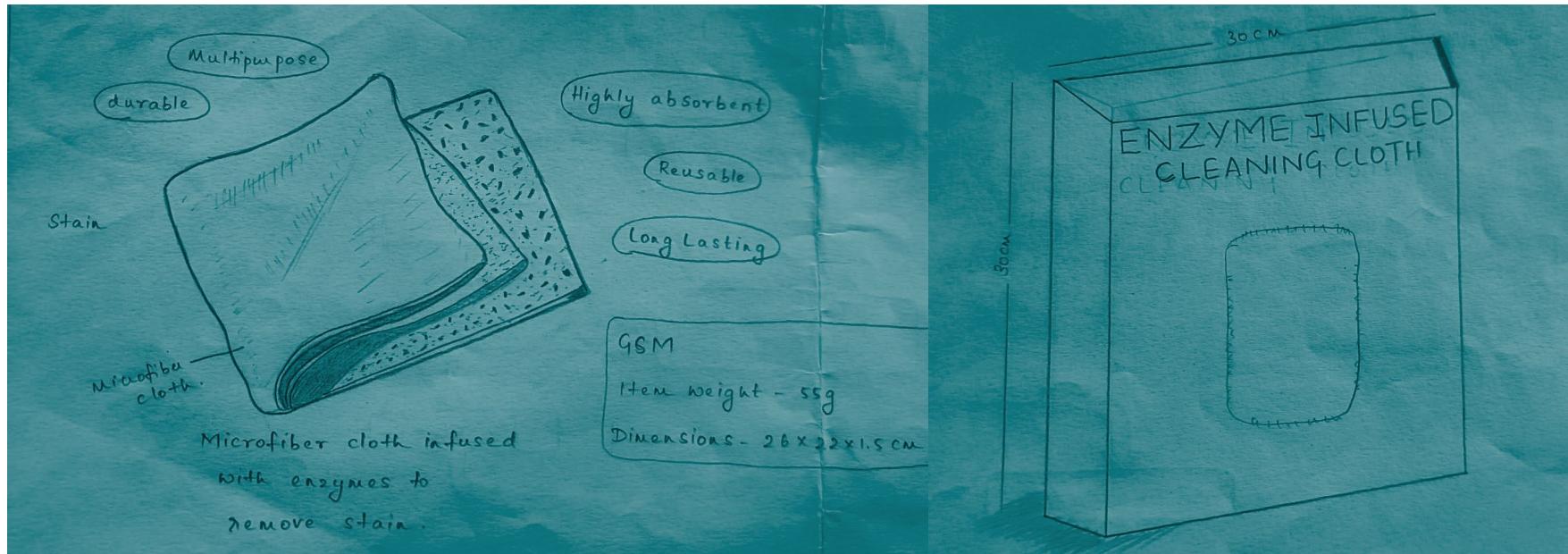
Example : 01



Free hand drawings / doodles

Ideation Sketches

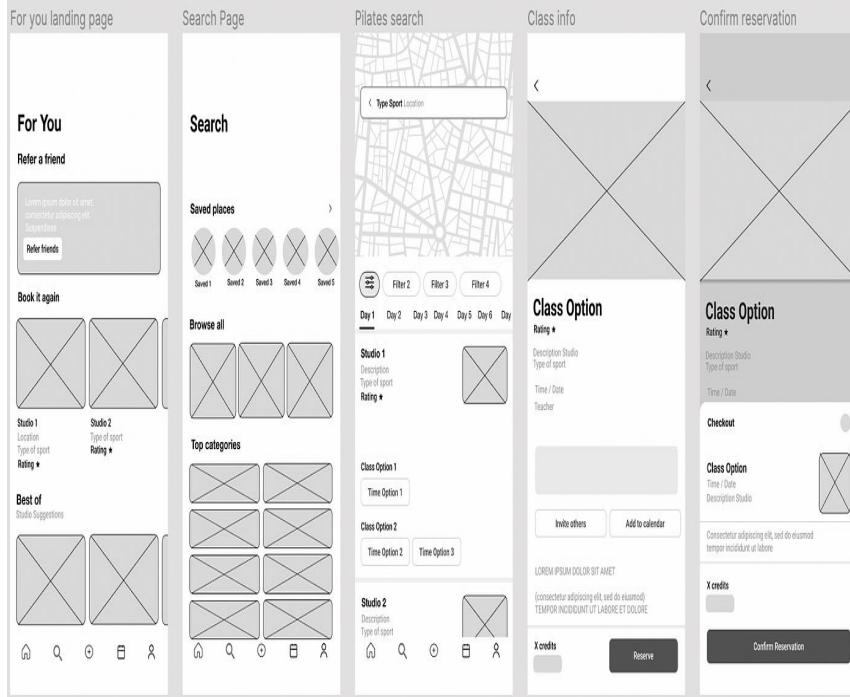
Example : 02



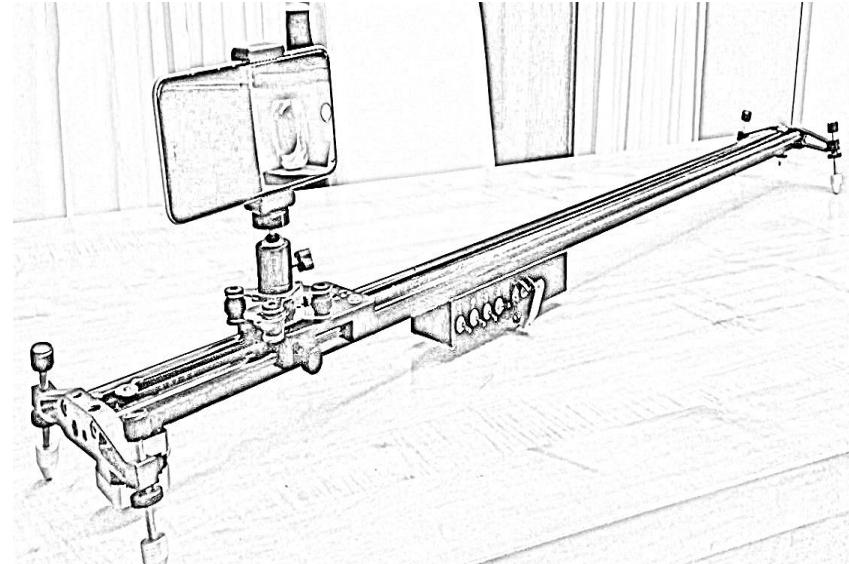
Free hand drawings / doodles

Mockup low fidelity

Example : 01



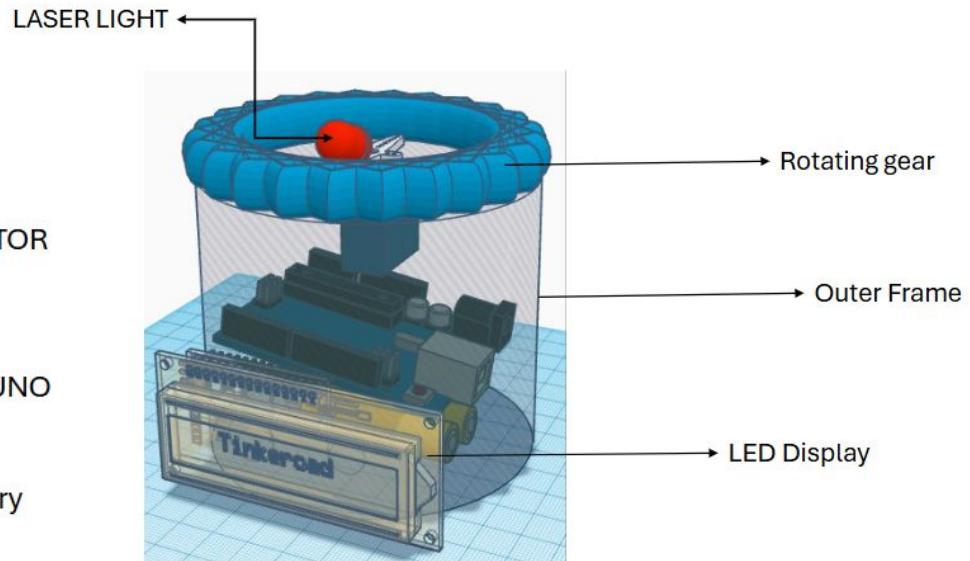
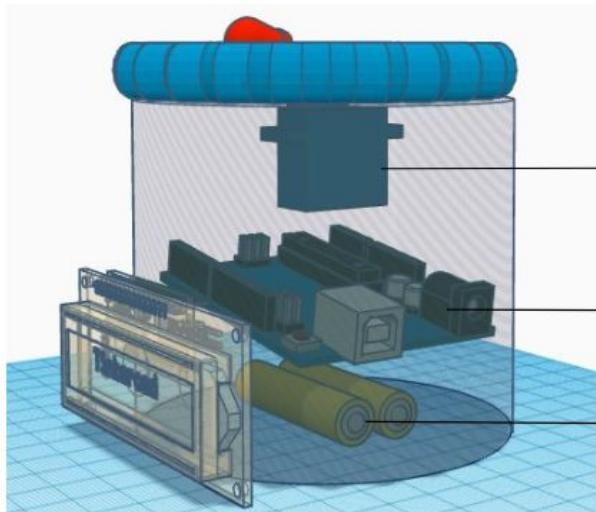
Digital Wireframes



Digital sketches

Mockup low fidelity

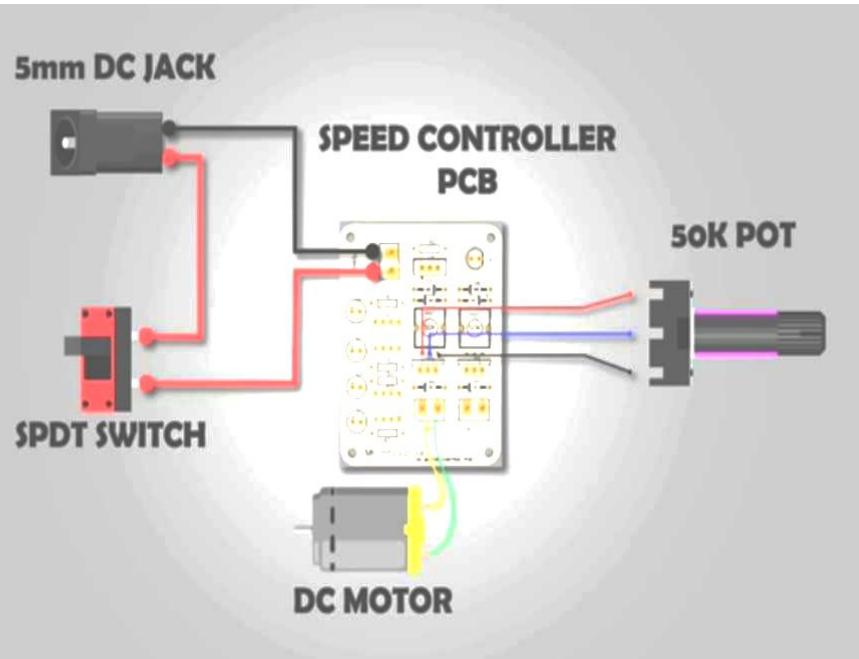
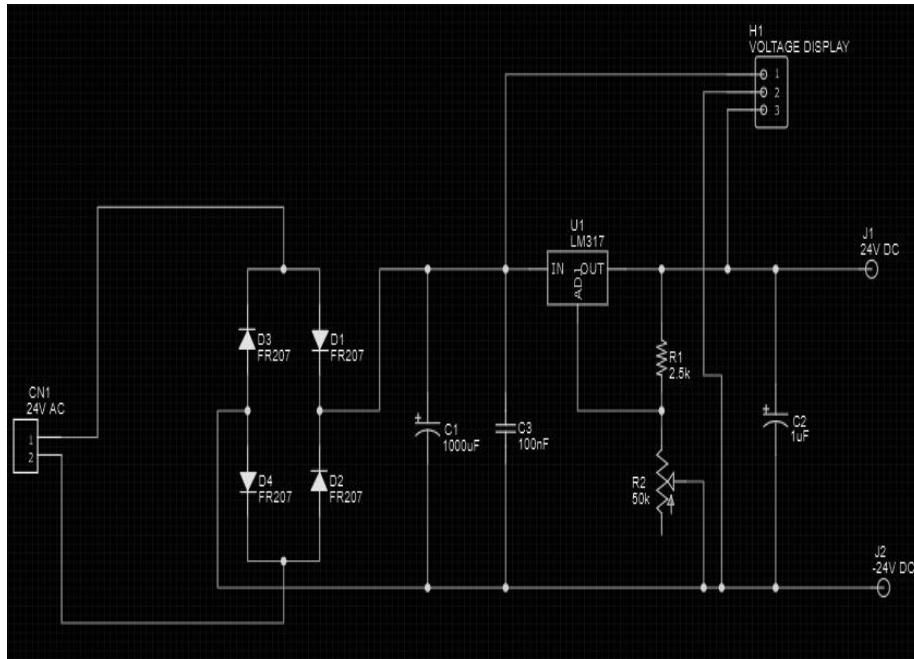
Example : 02



TinkerCad 3D model

Technical Drawings

Example : 01



Circuit diagrams TinkerCad

Usability Studies

Example : 01

Round 1: Initial Study

Participants: 5–7 users (SLE patients/caregivers).

Findings:

1. **Navigation Issues:** Features like "Insights" were hard to find.
2. **Tedious Symptom Logging:** Manual input felt overwhelming.
3. **Unclear Graphs:** Hard to interpret trends.
4. **Flare-Up Alerts:** Lacked actionable guidance.

Improvements:

- Simplify navigation (add a bottom bar).
- Use sliders/toggles for symptoms.
- Add tooltips to graphs.
- Provide actionable tips with alerts.

Round 2: Refined Study

Participants: 5–7 new users.

Findings:

1. **Improved Navigation:** Bottom bar worked well.
2. **Faster Logging:** Sliders reduced input time.
3. **Better Alerts:** Users liked actionable tips.
4. **Graph Complexity:** Some wanted interactive features like zoom and filters.

Final Recommendations:

- Make graphs interactive.
- Improve visual hierarchy for urgent tips.
- Add onboarding to guide new users.

List of Components

Example : 01

Component	Material	Specifications
Slider rail	Aluminum alloy or carbon fibre	Light weight,length 60-120cm
Motor	Metal	Stepper motor or dc motor
Camera mount	Aluminium or stainless steel	Ball head for angle adjustment
Power source	Lithium ion cells	Voltage 12v for motors and controllers
Pulley & Belt	Rubber belt,aluminium or steel pulley	Pulleys:16-tooth or 20-tooth gt2 compatible pulley

List of Components

Example : 02

List of all the items

- Stepper Motor
- A4988 Driver
- A4988 Shield
- Arduino UNO
- Power supply 12 volt, 3 amp
- ON/OFF Switch
- Shaft Holder

Product Design Hi fidelity

- Actual product/
- Product video/ youtube
- Branding /

Mockup Design hi fidelity

Example : 01



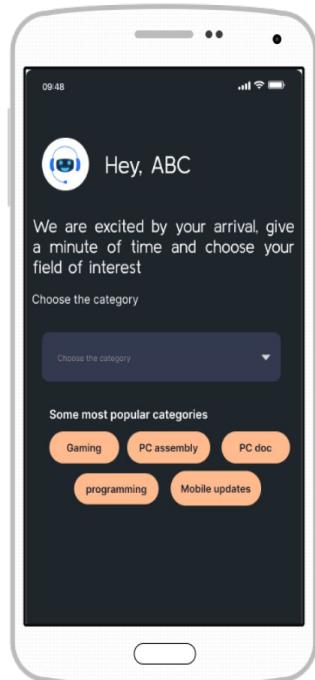
Product 01

Product 02

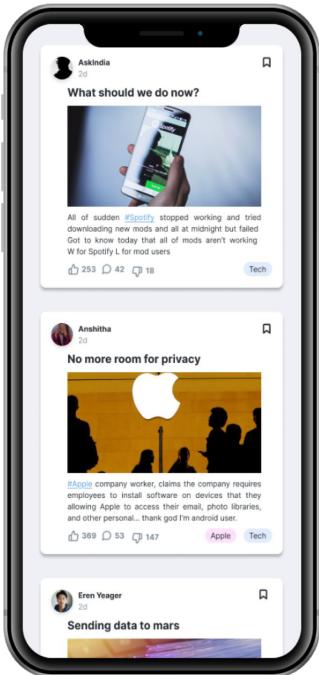


This visual represents an eco-friendly, minimalist look with natural materials and earthy colors to highlight the product's sustainable and natural qualities.

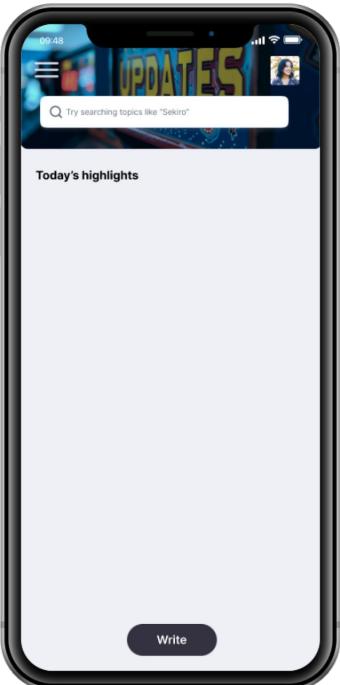
Mockup Design Hi fidelity



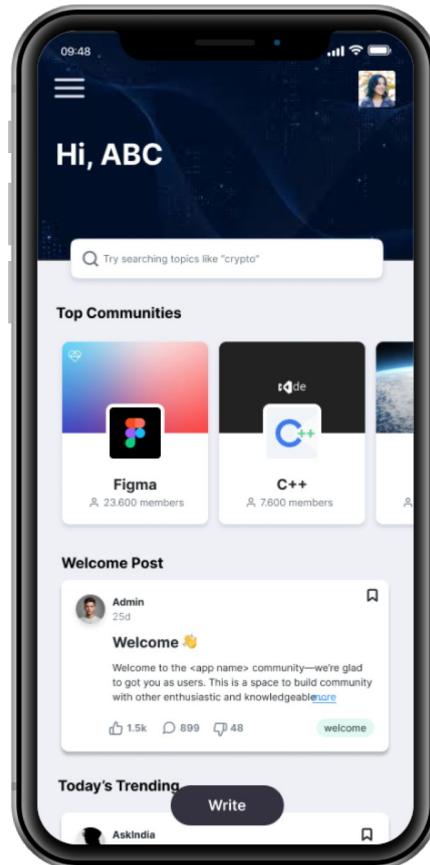
Field of interest page



Content page



Forum page



Home page

Figma Link : [Tech forum application](#)

Usability Studies - (Testing)

- Round 01 - usability finding
- Round 02 - usability finding

Product Design Mockups

- Sample product/
- Packaging /
- Branding /

Product Design hi fidelity

Example : 01



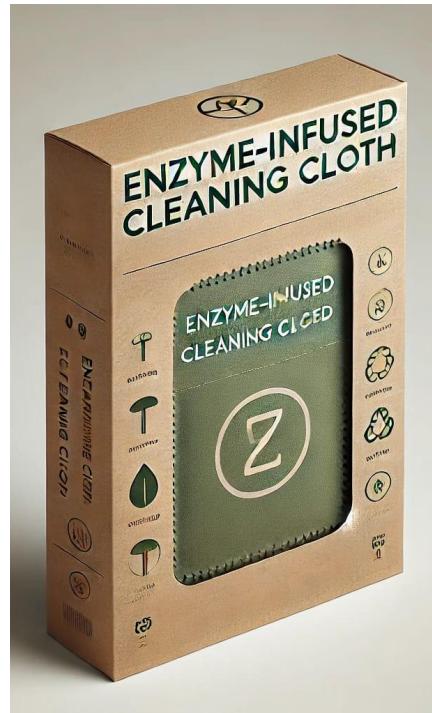
Product Sample 01



Product Sample 02

Product Design hi fidelity

Example : 02



Product Sample 03 Product Sample 04

Product Design Mockups

- Project impact
- What I learned

Project learning

Example : 01

Project Impact

- The impact of the telepresence robot on interaction and engagement is profound, as it offers a dynamic, real-time.
- It enhances engagement by making more interactive.
- The telepresence robot enables seamless interaction between remote participants, enhancing education and workplace communication.
- It improves engagement by providing a sense of physical presence in virtual settings.
- The project fosters greater accessibility, breaking down geographical barriers for students and employees.

What I learnt

Technological Innovation: You gained experience in integrating robotics, communication systems, and user interfaces to create a functional and adaptable product for remote interaction.

Problem-Solving Skills: You have developed solutions to challenges such as remote engagement, classroom management, and enabling seamless communication across distances.

Impact of Technology: You've witnessed how technology can bridge gaps, increase accessibility, and improve engagement, making education and work more inclusive and flexible.

Project learning

Example : 02

Improved Transaction Efficiency

- **Businesses:** Streamlined payment process, reducing waiting time for both customers and business owners.
- **Customers:** Faster and smoother transactions, enhancing customer satisfaction and experience.

2. Cost-Effective Solution for Small Businesses

- **Affordable** alternative to traditional point-of-sale systems, making it accessible for small businesses with limited budgets.
- Reduces the need for expensive hardware, such as card readers or cash registers.

3. Increased Security

- **Data Protection:** Secure QR-based transactions reduce the risk of fraud compared to manual or card-based systems.
- **Encryption** ensures customer data is protected during transactions.

4. Portability & Flexibility

- **Portable** design allows businesses to accept payments anywhere, providing flexibility for mobile vendors, remote transactions.
- Ideal for businesses on the go, easier to accept payments from anywhere

Project impact

What I learnt:

- **Cross-Disciplinary Collaboration:** Effective communication and sharing of ideas lead to better solutions and a more successful outcome.
- **Branding and Marketing:** I discovered how branding, packaging, and clear messaging are essential to positioning the product in the market. It taught me how the visual identity and customer experience must align to build trust and brand loyalty.
- **Security and Privacy:** Designing for security was a key takeaway. Ensuring that the product uses encryption and safe transaction processes is crucial, particularly for payment-related devices where trust is paramount.
- **Market Awareness:** Through competitive analysis and understanding market size, I learned how to position a product to cater to the needs of small businesses while capitalizing on market trends like digital payments and cashless transactions.
- **Impact Assessment:** I learned how to measure a product's impact beyond just sales—by considering its efficiency, cost-effectiveness, and contribution to customer satisfaction and business growth.

Product Design Patent

- Unique Patent features
- Draft proposal

Product Design Patent

Example : 01

PATENT

CLAIM: wherein the Digital IR proximity sensor detect the athlete's presence at a distance up to 200 cm, ensuring accuracy and precision in tracking movement towards the laser-projected target.

CLAIM: The system as claimed in claim 1, wherein the servo motor rotates randomly among four directions: north, south, east, and west, with intervals between rotations determined based on sensor input data from the athlete's movement.

CLAIM: wherein a built-in timer controls the duration of the drill, limiting the exercise to a predefined time, such as 2 minute and the drill automatically gets over

Drive link : [Patent draft proposal](#)

Product Design Patent

Example : 02

Unique patent feature

Badge Level System

Users earn badges based on their demonstrated expertise in certain topics. These badges are dynamically awarded based on:

- The Interaction they have made.
- The helpfulness of their contributions (upvotes or accepted answers).
- The quantity of technical topics they've engaged with. The badges are not static and change over time, reflecting a user's growth within the community.

Tailored Topic Recommendations

The app learns from users' interactions, such as the posts they read or the questions they answer, and suggests relevant discussions or threads. This ensures that every user sees content they genuinely care about, making the forum smarter and more engaging than typical discussion boards.

Patent draft proposal

Draft Proposal: Develop a comprehensive Tech Forum Application that enhances user engagement through personalized content, real-time interactions, and community-building features. The app leverages AI to learn from user interactions, suggesting relevant discussions and threads. It also includes dynamic badge systems to recognize user expertise and contributions, fostering a vibrant and supportive community.

Drive link : [Tech forum application patent draft proposal](#)

Next Steps

- Step A
- Step B
- Step C
- Step D - all ISO codes
and Industrial approvals

Next Steps

Example : 01

Step A:

- Refine the Product
- Refine App Design based on Usability Feedback
- Improve AI Models for Accurate flare-up Prediction and Symptom-trigger Correlation
- Smoothen Integration with Wearable Devices as well as Data Handling Security

Step B: Prototyping and Testing

- Create high-fidelity prototype of the app as well as the wearable components
- Test functional design of the product in several contexts of use.
- Beta test with real users to verify forecasts and insights.

Step C: Documentation and Filing

- Prepare technical documentation for patent filing. Prepare user manuals, application guides, and data security policies. Prepare application materials for ISO certification.

Next Steps

Example : 02

Step D: Compliance and Industrial Approvals

ISO Codes & Industry Approvals:

- **ISO 27001:** Ensure the app meets information security management standards.
- **ISO 9001:** If applicable, ensure quality management practices are in place, especially if the app handles sensitive data.
- **GDPR Compliance:** Make sure the application complies with data protection regulations like the General Data Protection Regulation (GDPR).
- **PCI DSS Compliance:** If your app handles payments, ensure it's compliant with Payment Card Industry Data Security Standards.
- **App Store & Play Store Approvals:** If the app is mobile, ensure it meets the respective guidelines for Google Play and Apple App Store for approval.

Industry Certifications:

- If the app operates in specific industries (e.g., tech, education, or finance), research and apply for necessary industry certifications that validate the app's credibility.
- Conduct security audits by certified third parties for added trustworthiness.

Thanks - Let's connect

- Email ID / Phone no
- Profile pic / Social media handle

THANK YOU, LET'S CONNECT



E mail:

PROFESSIONAL

romanshia*****@sse.saveetha.com

PERSONAL

romanshia*****@gmail



63749*****



Thank
you!

Let's connect

- Email ID : chandrug*****@saveetha.com
- Linkedin : [link](#)