

PROFESSIONAL PRACTICE

A VISION FOR 2024: DESIGNING SUSTAINABLE AND HUMAN-CENTRIC SOLUTIONS

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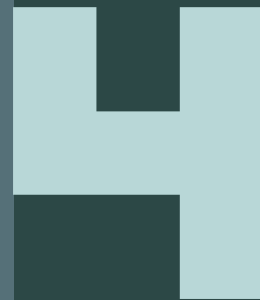
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INTRODUCTION



Learning Background and Goals Overview

In this project, we chose "Health" as the theme for speculative design, aiming to explore how future technologies can improve human health. Speculative design is used as a tool to create not only products but ideas about possible future lifestyles. The goal is to design a health product that integrates advanced technologies, focusing on improving health in the context of future societal and environmental changes.

Core Issues and Research Focus

This project focuses on the intersection of health and technology, exploring how wearable devices and emerging technologies can enhance health monitoring and management. It also examines the impact of environmental challenges, such as climate change, on health and how technology can address these issues for a healthier, more sustainable future.

Learning Journey: Starting Point and End Point

Starting Point: Skills and Knowledge at the Beginning of the Project

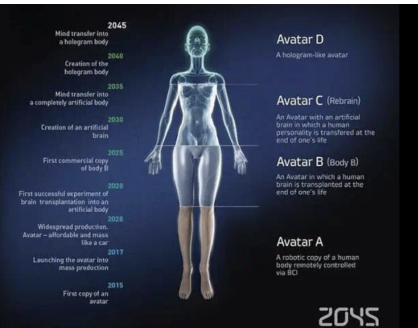
I had a basic understanding of design and technology but limited experience in user-centered design and prototyping. I lacked insight into applying technology to health product design and hadn't fully considered the connection between societal, environmental, and technological factors.

End Point: Skill Improvement and Shift in Thinking by the End of the Unit

By the end of the project, I significantly improved my design skills, especially in user experience and prototyping. I learned to integrate social and environmental challenges with technology solutions, particularly in health and sustainability. My focus shifted from just technology to designing more human-centered, sustainable solutions that address broader societal issues.



BACKGROUND RESEARCH



Current Mental Health and Well-being of People:

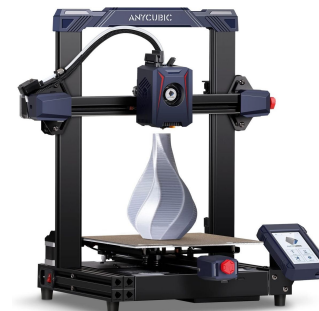
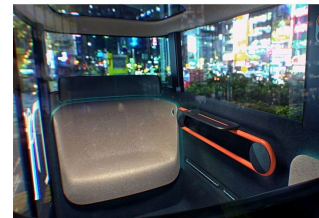
Advances in human body research suggest that within 30-40 years, we may extend lifespan and overcome diseases like cancer (Ma, 2025). This progress fuels a growing desire for improved health solutions in society (Ma, 2025).

Climate Change:

Climate change poses a global threat, with potential to cause economic collapse and environmental damage (IPCC, 2022). It contributes to societal anxiety and instability worldwide (IPCC, 2022).

Impact of Nuclear Wastewater:

Nuclear wastewater contains radioactive substances that could lead to severe health risks like cancer (WHO, 2025). This raises public concern about the long-term effects on human health (WHO, 2025).



Prediction of Future Human Life and Society

Autonomous Electric Vehicles:

Autonomous electric vehicles, such as those developed by Tesla, are expected to revolutionize transportation, making it more environmentally friendly (Tesla, 2019).

3D Printing Technology:

3D printing technology is rapidly advancing, with labs worldwide now equipped to print everything from human organs to building materials, transforming both daily life and industrial production (Tech Insights, 2025).

Human-Machine Interfaces:

Human-machine interface technology has made significant progress, allowing for seamless interaction between humans and machines, which will change how we work and communicate (FutureTech, 2025).

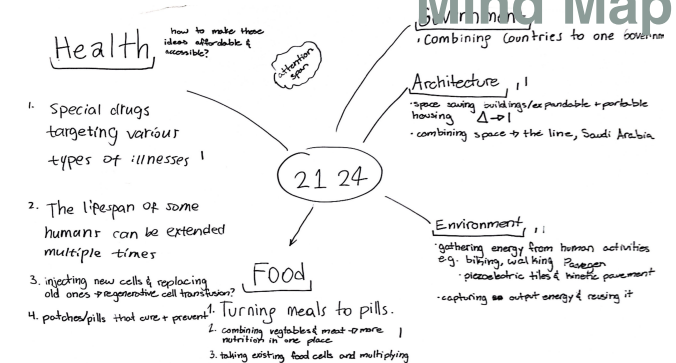
CREATIVE PROCESS: TRANSFORMATION AND DEVELOPMENT

Week 1: Initial Thoughts and Project Planning

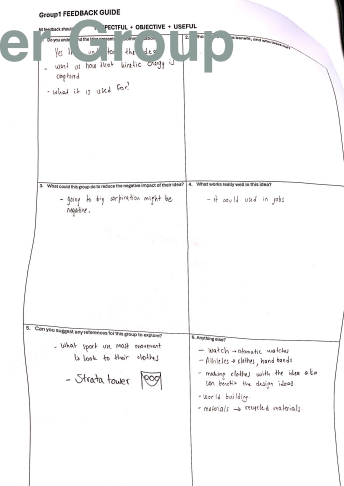
In Week 1, our group explored various topics related to future technological advancements and their potential societal impact. We focused on how people perceive life changes, the challenges they face, and how future social and technological advancements could solve these problems. I divided my research into two parts: first, analyzing the current environmental and technological landscape, where I explored issues like climate change and resource depletion; and second, looking into future predictions, including emerging technologies such as autonomous driving, health tech, and AI. Through this research, I found that most studies focus on broad societal issues, with little emphasis on individual behaviors and interactions with technology.

As a result, our discussions led to a health-focused approach, integrating new energy technologies, and we decided to design a wearable device, like a wristband or watch, that generates and stores energy from the user's movement to improve health and conserve energy. After further discussions with another group, we refined the product concept: a wearable device that collects kinetic energy during movement. Reflecting on this process, I realized the importance of having a clear research focus while maintaining flexibility. Despite technological advancements, current resources and research still have limitations.

Team Brainstorming Mind Map



Outcome of Discussion with Another Group





Week 2:

Defining Product Direction and Exploring Feasibility

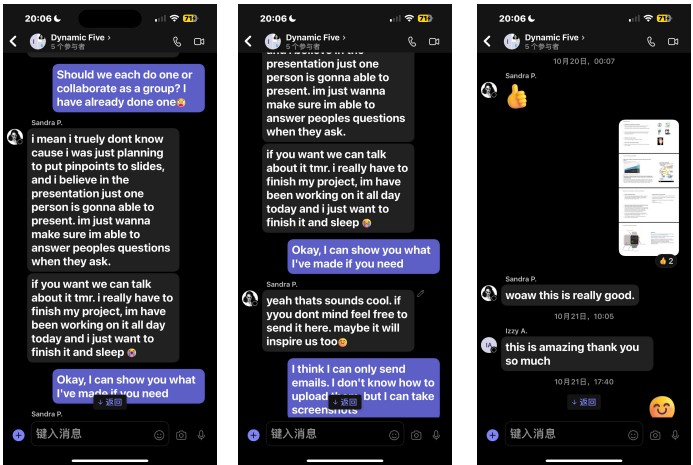
In Week 2, we finalized our preliminary product concept and decided to design a wearable device, like a wristband, that generates kinetic energy from the human body to save energy. We conducted research and experiments on kinetic energy and found that this method is feasible, which led us to expand our design ideas. Additionally, I deepened my background research, reviewing news articles and refining my thinking. I found that my approach to the research question became clearer, and I was able to better understand the research logic. In parallel, our team held discussions to refine the research direction.

Week 3: User Research and Design Adjustments

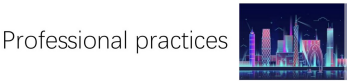
In Week 3, we focused on developing a user profile and refining our product design. After considering various user groups, we identified the environmental group as the ideal target audience for our wearable device, as they would likely value a sustainable energy-generating product. We also thought about the potential impact of our product in the future, especially how it might evolve and what capabilities it could have. However, during this phase, I recognized that my ability to communicate ideas clearly could be improved. Some of my suggestions were not immediately understood by my team members, which highlighted an area I needed to work on. At the same time, I presented a more refined product concept based on kinetic energy harvesting from the body, particularly heart rate fluctuations.

We also started to think about how to give the product a futuristic design and whether traditional design concepts were appropriate or if we should take a more innovative approach. During the discussions with our team members, I learned that we had not yet confirmed whether we would continue working together as a single group. With the addition of a new member, we ended up creating two separate PowerPoint presentations. I was responsible for one of them and shared the content with my team, ensuring that everyone was aligned and moving forward with the project.

Team Division of Labor Discussion



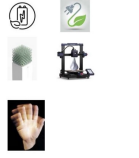
Personal PPT Draft



Student: Lexuan Xu GroupD
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Background

- Building now and will be in the future
- 1. New energy supply guarantees effective energy conservation and carbon reduction. In the future, the main energy consumption will be nuclear energy and aggregated solar energy.
- 2. 3D printing technology is currently receiving more consumer attention, and houses in the future will be built by 3D printing technology and drones.
- Definition of kinetic energy
- The energy of an object by mechanical motion.
- How do we capture kinetic energy?
- Capture pressure of heartbeat in wrist and makes it into another form of energy.



Current energy problem

- 2023 Clean energy or record growth, fossil fuels will enter the age of decline
- The problem of climate change affects the whole world, and people are not very active in the awareness of energy conservation, and need to find sustainable energy.
- A large proportion of the greenhouse gases that blanket the Earth and trap the sun's heat are produced through energy production, that is, by burning fossil fuels to generate electricity and heat. Fossil fuels, such as coal, oil, and natural gas, are by far the largest contributors to global climate change.

Solutions to problems with our products

- Product working principle
- The human heartbeat generates pressure, which is captured and converted into energy combined with the product's mechanical kinetic energy, which makes it generate kinetic energy when the human body moves.
- How can the product help the future world and the energy of the product solve environmental problems?
- The product helps to reduce fossil fuel and energy waste and increase eco-friendliness and sustainability. Encourage people to actively face environmental issues, etc. through the influence of product publicity to understand renewable energy and the measures of protecting the earth.
- The energy collected by each product is stored by the detection and controller designed and power supply that can be charged into other electronic products.
- The magnetic activation function of the product can absorb, collect and replace energy.
- Product design consumer group
- Attention to world development issues, environmentalists
- People who are concerned in the spontaneous creation of energy by the human body
- People who love electronic products and technological products
- People who love sports

Product design prototype



Self reflection

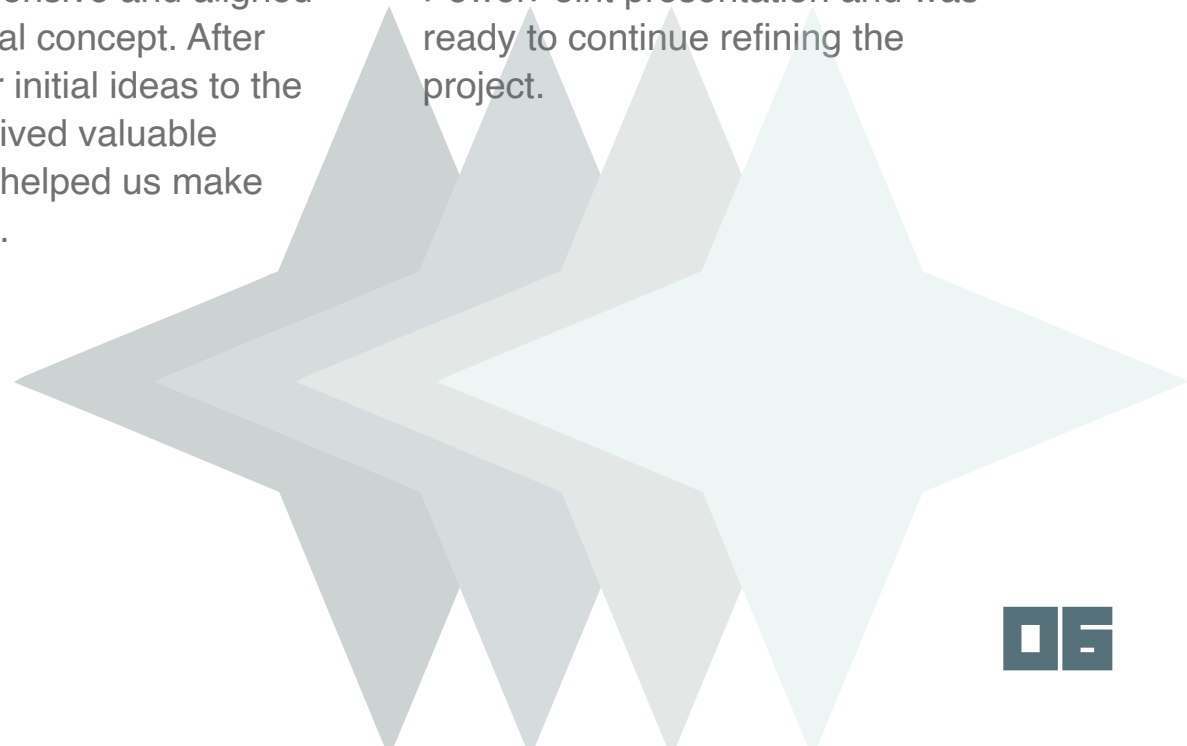
- In this assignment, I found that my research ability has improved. I have focused my thinking on the user needs and user habits rather than lengthy tests. My work team has developed my understanding of design. In this design, I have designed more practical and detailed tasks based on functionality and research. These helped to further identify, explore, confirm and accurate hypotheses based on research.
- In the group discussion, I realized that I needed to improve the sequence of my thinking. My thoughts would be limited, and would only think about one area without considering other points. In comparing my thoughts, I find myself improving, focusing more on the main idea and exploring in depth. In the process of meeting the problems, I found that I will have more to improve in professional design and I need to learn more scientific production.
- I found that the team members were strong in product color design and conception, which I think is what I need to improve most. What I can do now is to expand on the original basis. In the final summary, I found that I made some progress, because I would jump from the central point of my experience and design rather than focus it.

Week 4: Presenting Preliminary Design and Team Feedback

In Week 4, we focused on preparing our preliminary presentation and refining the design based on feedback from our previous discussions. Our team discussed the key points to include in the presentation and summarized them into a clear narrative. As part of the preparation, I conducted additional research on energy issues, specifically kinetic energy, and how it could be applied in our product. I also reviewed articles and scientific analyses to ensure our approach was grounded in practical research. While working on the presentation, I realized that my research might be too broad, and I needed to focus more on the specific aspects related to our product's design and functionality.

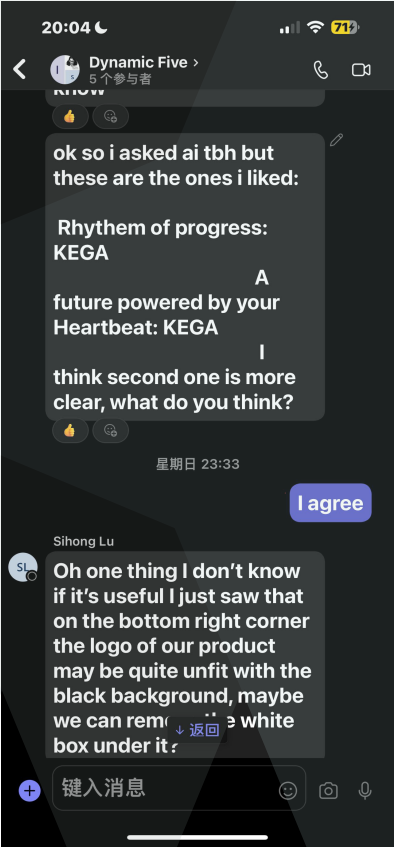
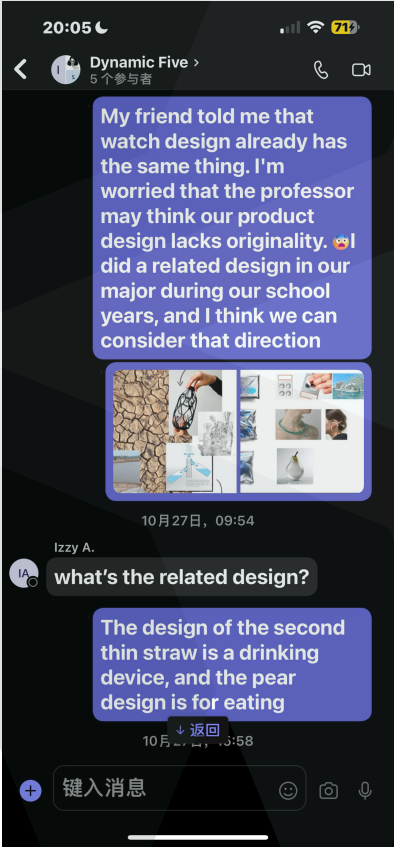
During this week, I also started working on the product's design, considering both its functionality and appearance. I created a draft of the prototype and began sketching some basic shapes for the device. However, I found that the initial design lacked a futuristic look, which I had hoped to achieve. Despite this, the functional aspects of the design were comprehensive and aligned with our original concept. After presenting our initial ideas to the team, we received valuable feedback that helped us make improvements.

The team agreed to make some changes to the exterior design, focusing on creating a more futuristic and visually appealing look. We also decided to refine the presentation and ensure that it accurately conveyed our concept and its potential impact. By the end of the week, I had updated the layout and content of our PowerPoint presentation and was ready to continue refining the project.



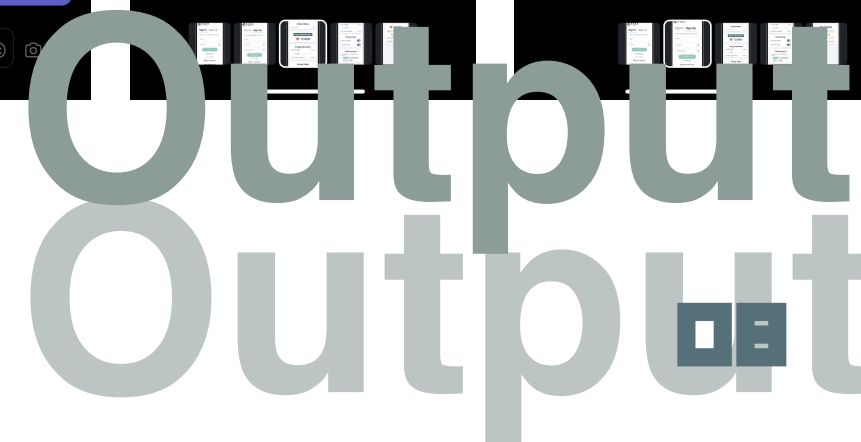
Team Ideas

Proposal Discussion



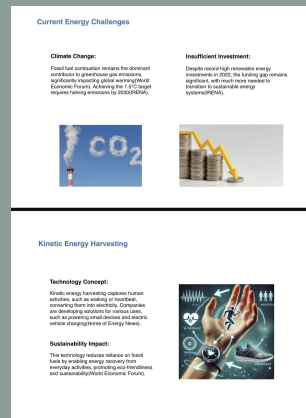
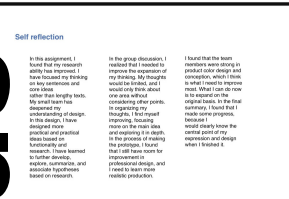
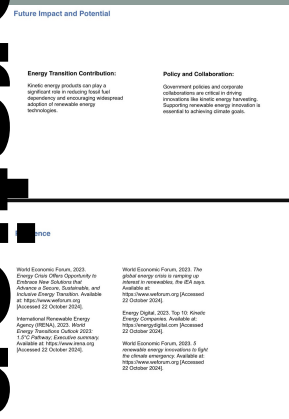
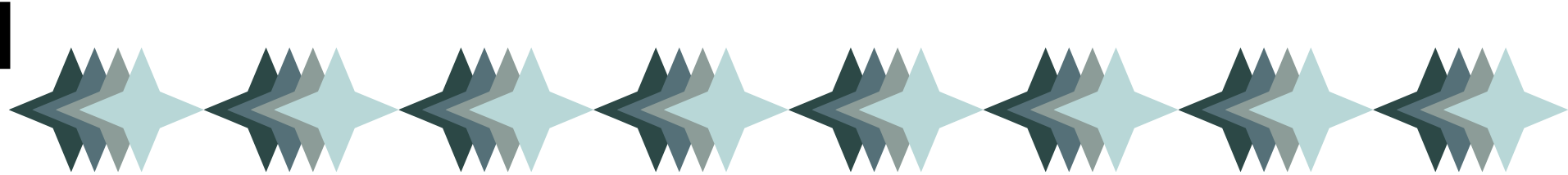
Personal PPT Design Refinement and Concept Presentation





Task Distribution

Team Collaboration and



Research Process

Target Audience:

The product appeals to environmentally-conscious consumers, tech enthusiasts, and athletes interested in sustainable, self-generated energy solutions.



I ultimately iterated my user base



Logo Design



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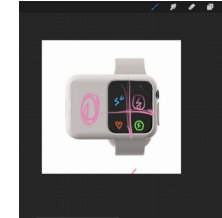
Detecting energy function

"The team built on my foundation to create a design sketch, and we agreed to proceed with a futuristic circular watch design."

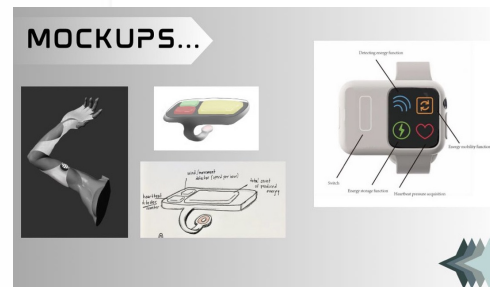
Switch

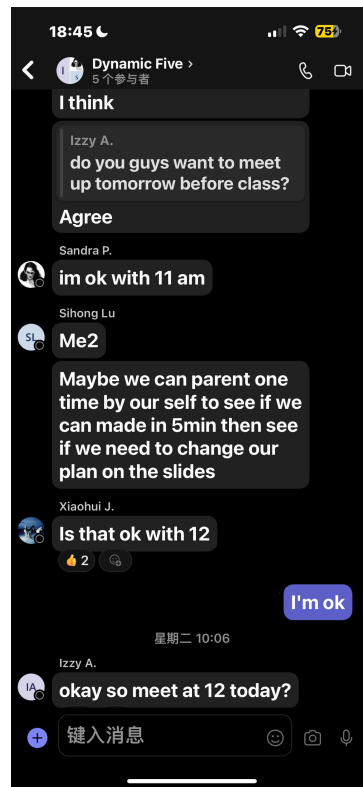
Energy storage function

Heartbeat pressure acquisition



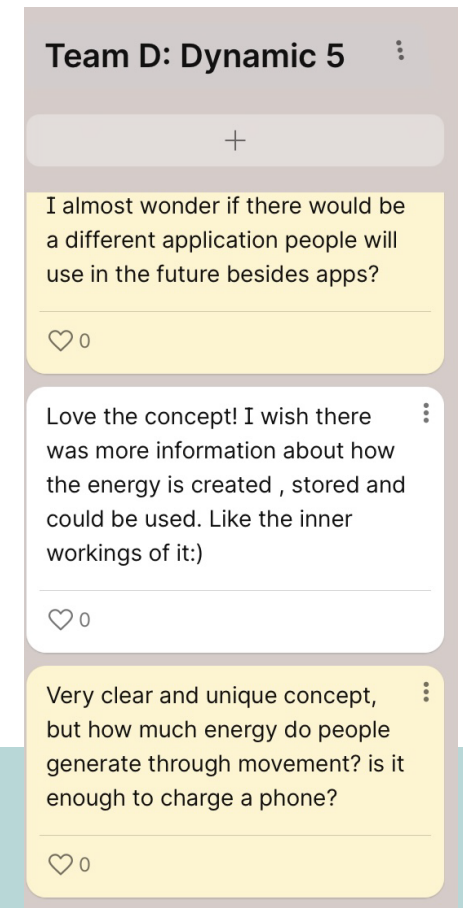
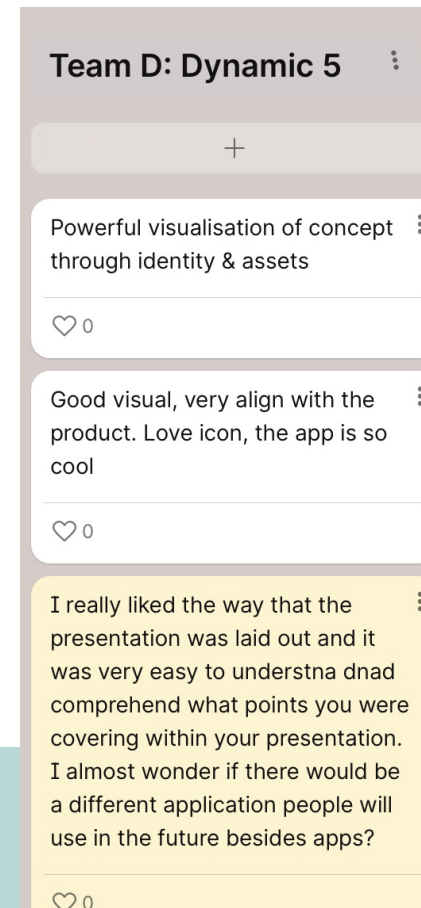
Energy mobility function





The chat records of our group meeting and discussion.

Peer Evaluation and Suggestions for the Presentation



<https://www.canva.com/design/DAGUTjFUTQA/q-oGjuJ4zQXpx6emEwiCTA/edit>

Week 5: Finalizing the Presentation and Addressing Design Gaps

In Week 5, our focus shifted to finalizing the presentation and product design. The team worked together to edit and format the presentation, ensuring that all key points were clearly communicated. We also rehearsed the presentation, with each team member practicing their parts to ensure a smooth and cohesive delivery. As I reviewed our progress, I realized that our project lacked a systematic design concept, and we had not delved deeply enough into the design research. Our discussions on design were limited, and I felt that more inspiration and experimental research were needed to strengthen our ideas.

During this week, I also reflected on the need for stronger reasoning to support our design concepts, as we had fewer experiments or data to demonstrate how our product would solve real-world problems.

Despite these gaps, I gained insight into advanced presentation techniques and learned how to better structure content for clarity. The final product design was still in progress, and we mainly focused on creating prototypes and posters. However, I felt that the project could benefit from a more comprehensive presentation, such as a user manual or more detailed product specifications. By the end of the week, we had completed the final draft of the presentation, and I was ready to share it with the team for further review and refinement.



Week 6: Presentation and Feedback

In Week 6, the focus shifted to preparing for the final presentation. Our team worked together to refine the content, ensuring that all aspects of our project were clearly communicated. We rehearsed multiple times to ensure a smooth delivery, and each team member practiced their part to build confidence. However, during the presentation, one of our team members was absent due to illness, which created some challenges in managing the presentation flow. Despite this setback, the remaining team members successfully presented the project, and we received constructive feedback from both our mentor and classmates. The feedback we received highlighted several areas for improvement, particularly in terms of the software design and how our product might evolve in the future.

Our mentor raised questions about whether mobile devices would continue to be used, or if they would be replaced by newer technologies. Additionally, feedback from classmates pointed out that we needed more concrete demonstrations of how our product would generate and use energy. They suggested that we conduct further experiments to support our claims and better illustrate the product's potential. Reflecting on the process, I recognized that our team still faced challenges in organizing and presenting our ideas effectively. However, the feedback was invaluable, and it provided clear directions for future improvements in both the product and our teamwork.

VISUAL OUTCOMES



Reflective Summary and Self-Improvement

Learning Journey

Reflecting on my journey throughout this project, I see a significant transformation in my approach to design and collaboration. At the beginning of the unit, I was uncertain about my role within the team and how my existing skills would contribute to our collective goals. I entered the project feeling a little unsure of myself, wondering whether I had enough experience or the right approach to make a meaningful contribution. However, this uncertainty quickly turned into a learning opportunity. Over the course of the project, I gained a much deeper understanding of my strengths and weaknesses as a designer, which has given me a more solid sense of direction for the future. Initially, my focus was heavily on creativity and generating bold ideas.

I thought that coming up with something visually striking was the key to a successful design. However, as the project progressed, I realized that design is not just about making things look good but also about solving real-world problems and addressing practical challenges. My understanding of design began to shift towards balancing aesthetics with functionality. This change was influenced by the feedback we received throughout the process, especially when we started testing and refining our ideas. It became clear that a beautiful product is useless if it doesn't serve the user's needs or function efficiently in the real world. Through this transformation, I became more focused on user-centered design, ensuring that my ideas were not only visually appealing but also practical, sustainable, and relevant to the target audience.

As I navigated through the project, I also learned to embrace uncertainty and adapt to new ideas and perspectives. At first, I was hesitant to deviate from my initial designs, but as the team collaborated and provided feedback, I started to recognize the importance of flexibility. This adaptability allowed me to explore different approaches to problem-solving and experiment with various design solutions. My learning journey was deeply influenced by the collaborative nature of the project, and I quickly realized that being open to change and continuous improvement is essential for growth as a designer. This realization helped me see design as a process rather than a final product—an ongoing journey of iteration and refinement.

Creative Process Transformation

The transformation of my creative process throughout this project has been one of the most profound aspects of my learning. Early on, I approached design from a very individual perspective, focusing mainly on my own ideas and vision. However, as the project progressed, I recognized the importance of collaboration and teamwork. While individual creativity is important, collective input and feedback often lead to better, more refined ideas. Working alongside my team, I began to value the perspectives of others and saw how the integration of diverse viewpoints could strengthen the design.

One of the most significant changes in my creative process occurred when we began considering practical

factors such as material constraints, user experience, and environmental sustainability. Initially, my ideas were driven by an abstract concept of what a futuristic product could look like, without considering how it would function in the real world. However, as we progressed, I began to think more critically about the feasibility of our ideas. For example, we had initially wanted to incorporate complex technology into the wearable device, but after researching and discussing its feasibility, we realized that the technology was not yet advanced enough for our project's timeline. This realization led to a shift in our approach, and we refocused on more practical solutions that could be effectively implemented. This transformation in my creative process taught me the importance of grounding creative ideas in reality. While it is important to think outside

the box, I learned that the most successful designs are those that not only inspire but also serve a practical purpose. My ability to think critically about my designs and make adjustments based on feedback and constraints has grown significantly throughout the course of the project.

Skills and Capabilities Acquired

Throughout this project, I have developed a wide range of skills and capabilities that will serve me well in the future. One of the most important skills I have gained is project management. At the beginning, I was focused on the design aspect of the project and didn't think much about time management or task delegation. However, as the project progressed, I realized that managing time and resources was essential for the success of the project. I learned to

break down tasks into smaller, manageable steps and assign responsibilities based on each team member's strengths. This helped us stay on track and meet deadlines while ensuring that everyone's contributions were valued. In addition to project management, I also developed my ability to collaborate effectively within a team. This project emphasized the importance of teamwork and communication. There were moments when our ideas conflicted, but through open communication and active listening, we were able to find common ground and create a unified vision. I learned how to give constructive feedback and accept criticism in a way that helped refine our ideas and improve our designs. These experiences taught me that collaboration is not just about sharing ideas; it's about building on each other's strengths and learning from each other.

Another key capability I gained was a deeper understanding of the importance of research in the design process. Early on, I struggled with how to approach research in a focused way. However, as the project progressed, I became more skilled at identifying reliable sources, synthesizing information, and applying it directly to our design decisions. This helped me to better understand user needs, as well as the technical and environmental considerations that were integral to our product. The research aspect of the project helped me realize that design is not just about creativity—it's also about understanding the context in which the design will be used and ensuring that it serves a real purpose.

Challenges and Problem Solving

Throughout the project, I faced several challenges that tested my problem-solving abilities and my resilience. One of the first challenges occurred when we realized that some of our design ideas were not as feasible as we had initially thought. Initially, I found it difficult to accept that our original ideas might not work, but over time, I learned to view these challenges as opportunities to think critically and creatively. We had to rethink our design multiple times, and each iteration brought us closer to a more practical and effective solution. Another major challenge occurred when a key team member left the project midway through the unit. This added pressure to the remaining team members, who had to take on additional responsibilities.

At first, I felt overwhelmed by the additional workload, but I soon realized that it was an opportunity to step up and demonstrate my leadership and organizational skills. I volunteered to manage the presentation and coordinate tasks, which helped the team stay focused and on track. This experience taught me how to handle unexpected changes and how to maintain a positive attitude under pressure. In addition to these challenges, I also faced difficulties in balancing the creative and practical aspects of the project. Early on, I focused heavily on the creative aspects of the design, but as the project progressed, I realized that practical considerations, such as functionality and sustainability, were just as important. This shift in focus required me to adjust my approach and ensure that our design was not only visually appealing but also functional and feasible.

Team Dynamics and Collaboration

Working in a team was both rewarding and challenging. Early on, we struggled to align our ideas and establish clear communication. However, as the project progressed, we learned how to collaborate more effectively by sharing ideas openly and respecting each other's opinions. One of the key lessons I learned was the importance of active listening. By listening carefully to others, I was able to better understand their perspectives and contribute more thoughtfully to the project. Collaboration also taught me the value of compromise. There were moments when team members had differing opinions on design direction, but through discussion and negotiation, we were able to reach a consensus that worked for everyone.

This process taught me how to manage conflict and find solutions that balanced everyone's input. I also learned that leadership within a team is not just about giving instructions; it's about facilitating communication and fostering a collaborative environment where everyone feels valued and heard.



Future Preparedness

Looking forward, I feel much more confident in my ability to approach future design projects. The skills I have developed, particularly in project management, teamwork, and problem-solving, will be invaluable as I move forward in my studies and career. I have learned the importance of balancing creativity with practicality, and I am now more focused on designing solutions that are not only innovative but also functional and sustainable. This project has also taught me the importance of resilience and adaptability. In the face of challenges and setbacks, I learned to stay focused and keep pushing forward. This mindset will be crucial as I continue my design journey and encounter new obstacles. I am confident that the lessons I have learned—both in terms of skills and

personal growth—will serve me well in future projects, and I am excited to apply these insights as I continue to develop as a designer.

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