



**SECP1513-05 TECHNOLOGY AND INFORMATION SYSTEM
SEMESTER 1 2025/2026**

**DESIGN THINKING REPORT:
A DIGITAL SOLUTION TO SUPPORT CHILDREN WITH AUTISM**

**Lectures name :
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KUMPULAN 6

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Link Youtube video : https://youtu.be/A_jiNfuI_UE

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1.0 INTRODUCTION

This report serves as a foundational submission for the SECP1513 Technology and Information Systems course, Semester I 2025/2026. The project aims to design a non-functional digital solution that will facilitate communication, provide access to resources, and offer educational support for Autism, including individuals, caregivers, educators, and therapists.

With technology advancing rapidly, digital applications and online resources are increasingly used to support children with autism. These tools can aid learning, communication, behaviour management, and daily routines. They offer personalized and accessible support for both children and caregivers. **To what extent can digital applications support children with autism?** This question guides the project's focus by prompting an evaluation of how effectively technology meets real-world needs within the autism community.

This report examines how digital applications support children with autism. Using the Design Thinking process, it documents the identification of user needs, idea development, and the creation of a non-functional digital prototype, with the objective of understanding current solutions and identifying practical improvements. The goal is to enhance daily support for children with autism and their parents by addressing specific user needs and iterating on potential digital tools.

This project adopts the Design Thinking methodology to ensure a user-centred and empathetic approach to problem-solving. The process begins with the empathy phase, where user insights are gathered through survey, observations, and research. This is followed by problem definition, idea generation through brainstorming sessions, the development of a non-functional digital prototype, and usability testing with potential users. Each phase is documented with relevant evidence to support the design decisions made.

2.0 DETAIL STEP

This design thinking process consists of five phases, Empathy, Define, Ideate, Prototype and Test. During the empathy phase, we conduct a survey and get 20 responses from others. It shows that there are a lot of people who do not have a deep understanding about autism. They do not know the symptoms of autism. The survey also shows that the parents need some help in monitoring the health of their autistic children. They need a simple and non-invasive monitoring method. Apart from conducting surveys, we also review some case studies and articles about autism health monitoring. It helps us to know more about the defect features of the monitoring system.

After finishing the empathy phase, we do the define phase to list out all the problems from the previous phase. We analyse all the data we have collected and find the main problem. The main problem is autistic children often face health and emotional issues as the communication barrier with the parents and caregivers make it difficult to be detected. The users need a health monitoring system that is simple and user-friendly. The system also can track the health trends every time. It should be a clear and visual health indicator for caregivers.

By stating the problem, we have a discussion to decide the features of the system we want to do. First and foremost, we decided to conduct an app called 'HELLO BUDDIES'. Its main feature is to track the health condition of autistic children all day. It should also be implemented inside smartwatches for autistic children. It is an SOS system. If they feel they are in an uncomfortable and dangerous situation, they can press it to call their parents and caregivers.

As we have the idea, we need to transform it into a tangible and testable prototype. We develop an app and collaborate with Smartwatch companies (ex. Samsung, apple, xiaomi) to implement it in their products, the smartwatch. We also build a website for the users so they can share their experience when facing autistic children. The website will update the information about autism to let users know more about their children. The design of the website is using the soft colour to prevent sensory overload and also simple icons instead of heavy text.

After developing the prototype, we test it. We find some people act as caregivers to use the app and websites. We walk through all the processes and it is good to be used and easy to be learned by users just go through the flow only once. However, they also give some feedback that the icon should be larger to make it easier to be used.

3.0 PROBLEM, SOLUTION, TEAMWORKING

3.1 PROBLEM

Neurodevelopmental conditions such as autism affect approximately 1 in 31 children, impacting their development, behavior, and overall well-being (CDC). Despite this prevalence, support for children with these conditions and their caregivers often remains limited (World Health Organization). Existing digital resources are often fragmented, lack personalisation, or are not designed with sensory sensitivities in mind. Based on the empathy phase, which included survey, research, and observations of user behaviour, it was identified that many existing digital tools are either too complex, overstimulating, or not specifically designed for children with autism. Families frequently face barriers, such as difficulty accessing health care and long wait lists, leaving them to search for alternative forms of assistance (Boulton & Guastella, 2025). Research also shows that individuals with autism experience ongoing difficulties in daily life, particularly in emotional regulation, decision-making, self-care, and managing everyday responsibilities (Wiklund et al., 2014).

Digital tools, from symptom trackers to behavior-monitoring apps, are changing how families manage these challenges. By putting targeted information and support at parents' fingertips, they provide real-time, practical help families can rely on (Boulton & Guastella, 2025). To better support children and families facing neurodevelopmental challenges, it is crucial for stakeholders, including policymakers, healthcare providers, and developers, to invest in and expand access to effective digital tools. (Boulton et al.)

3.2 SOLUTION

In response to challenges faced by families of children with autism, our team developed ‘HELLO BUDDIES’ a prototype digital system integrating a mobile app **for parents**, a **smartwatch interface for children**, and a companion **website**. The project's objective is to improve safety, support emotional regulation, and simplify daily monitoring for families of autistic children, while ensuring accessibility and sensory friendliness.

The **mobile app for parents** prioritizes real-time monitoring and assistance. Key features include alerts when an SOS is triggered, irregular heart rates are detected, or the child leaves a safe zone. The **geo-fencing tool enables parents to set boundaries** and receive instant notifications when those boundaries are crossed. An **activity log** allows parents to monitor daily steps, sleep patterns, and stress markers to support informed caregiving.

The **smartwatch for children** offers a streamlined, intuitive interface to reduce cognitive and sensory overload. A prominent **SOS button** lets the child quickly request help and provides vibration feedback for reassurance. Passive GPS **location sharing** ensures safety while maintaining a discreet, stress-free experience. Passive **Heart Rate Detection** enables the parent to monitor their child, the parent could see their child whether they are panicking or not. Also it will act as a reminder and alert the parent if the children don't use the smartwatch within their 30s.

The **website** serves as a resource and support hub for parents and caregivers. It features articles and videos on autism care, emotional support, and coping strategies. A **community forum** provides parents with a safe space to share experiences, seek advice, and offer peer support. An interactive demo lets users explore the mobile app and smartwatch features before adoption.

This solution seeks to deliver holistic support by integrating safety monitoring, emotional assistance, and community engagement into a user-focused, inclusive digital ecosystem.

3.3 TEAMWORKING

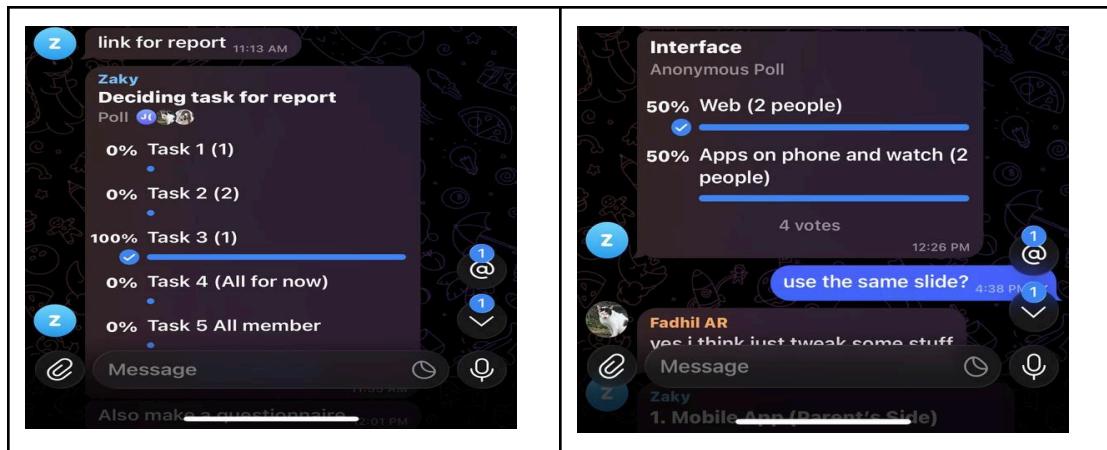
Effective teamwork was essential to the successful completion of our project. We assigned specific responsibilities to each team member based on their strengths, including user research, brainstorming, interface design, documentation, and presentation preparation. The findings were then shared with the rest of the team to ensure a common understanding of user needs. We maintained collaboration throughout all phases of the Design Thinking process, from empathy to testing.

In the **define phase**, **all team members** examined the empathy data together and clearly described the main problems. Group discussions ensured we viewed the problem from the user's perspective.

During the **ideate phase**, **Zaky and Tan Jun Chen** led brainstorming sessions and idea-generation activities. All team members shared ideas, and the best ones were chosen through group discussion and agreement.

During the **prototype phase**, **all of us** helped design the digital model using tools such as Figma. The rest of the team provided feedback on layout, colour choices, and ease of use to help us improve the design.

We held regular discussions and brainstorming sessions to refine ideas, using **WhatsApp** for communication, **Google Docs** for writing, and **Figma** for prototyping. When challenges arose, such as differing opinions, we resolved them through open discussion and consensus. Cooperation, respect, and communication helped us develop a cohesive, user-centred digital solution aligning with project objectives.



4.0 DESIGN THINKING ASSESSMENT

Assessment at the end of the project demonstration focuses on evaluating the final prototype of the activity engagement and safety monitoring system. The assessment examines whether the proposed smartwatch and mobile application effectively reduce parental monitoring burden while remaining simple and non-intrusive for children with ASD. Feedback is gathered on usability, clarity of information, and overall relevance to real-world caregiving needs.

Design Thinking Phase	Description
Empathy Phase	In the empathy phase, the team validated survey and research data to ensure accuracy and relevance. Based on these findings, a user persona was developed: a working mother of a school-aged child with high-functioning autism who requires extra care. She prioritizes her child's safety, emotional well-being and needs timely updates. This assessment confirmed that issues such as safety concerns and manual monitoring reflect real parental challenges, forming a strong foundation for the Define phase.
Define Phase	During the Define phase, assessment ensured that the problem statement accurately reflected user needs rather than technical solutions. The team developed a user-centred problem statement: <i>Working parents of children with autism need a reliable way to monitor their child's safety in real time.</i> The problem definition was evaluated for clarity, specificity, user focus, and alignment with insights gathered during the empathy phase, ensuring it was supported by research rather than assumptions.
Ideate Phase	Assessment in the ideation phase focused on evaluating the range of ideas generated and the rationale for selecting the final concept. The team explored multiple solutions, including a mobile application, smartwatch alerts, calming tools, and location tracking. These ideas were assessed based on feasibility, simplicity, and suitability for children with autism, leading to the selection of a smartwatch-based monitoring solution.

Prototype Phase	During the prototype phase, assessment evaluated whether the interface design of the mobile application and smartwatch addressed user needs identified earlier. The team developed a mock-up featuring real-time safety alerts, and customizable notifications for parents of children with autism. User feedback focused on usability, simplicity, and accessibility for both parents and children with ASD before proceeding to testing and final demonstration.
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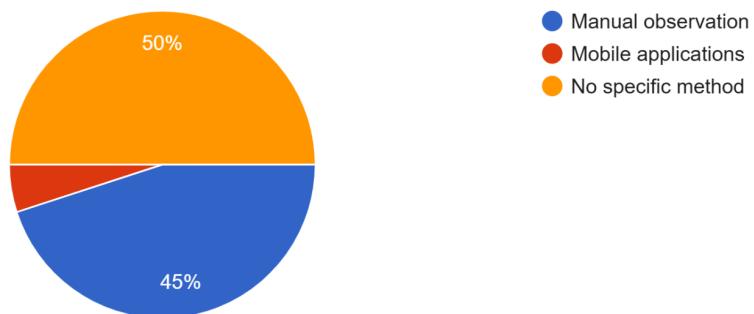
5.0 DESIGN THINKING EVIDENCE

5.1 EMPATHY PHASE



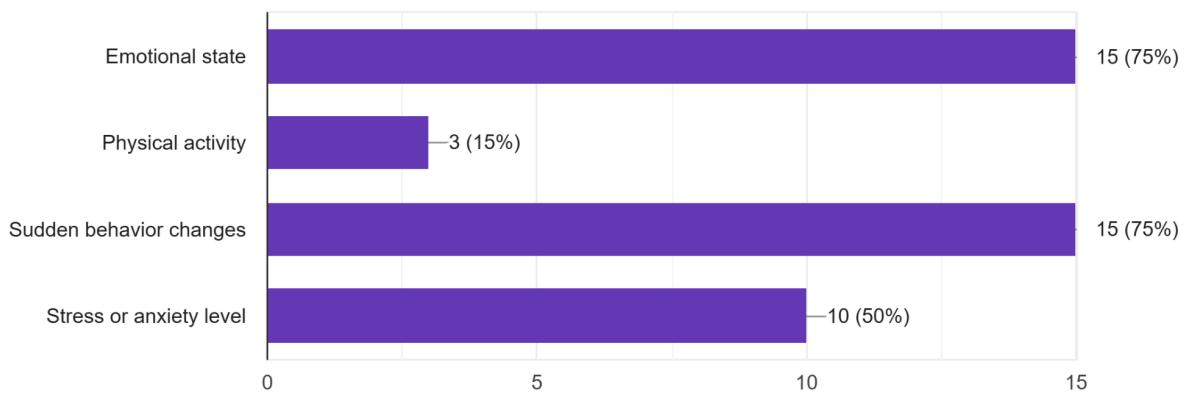
How do you currently monitor the health of a child with autism?

(20 条回复)



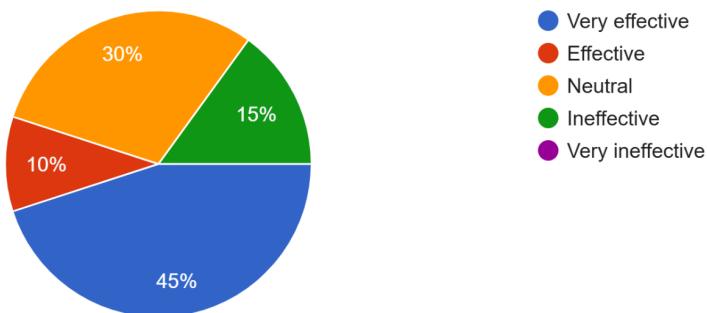
What aspects of health are most difficult to monitor? (Select all that apply)

(20 条回复)



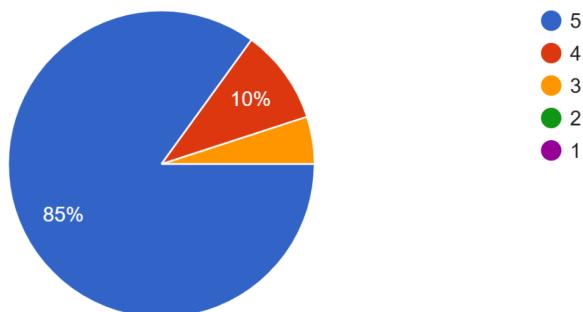
Do you feel current health monitoring methods are effective?

(20 条回复)



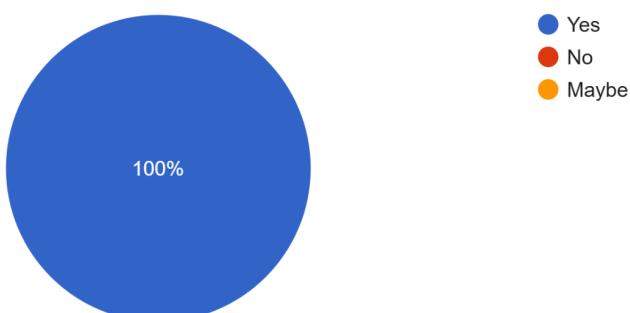
How important is early detection of health or emotional changes in autism children? (5 means very important)

(20 条回复)



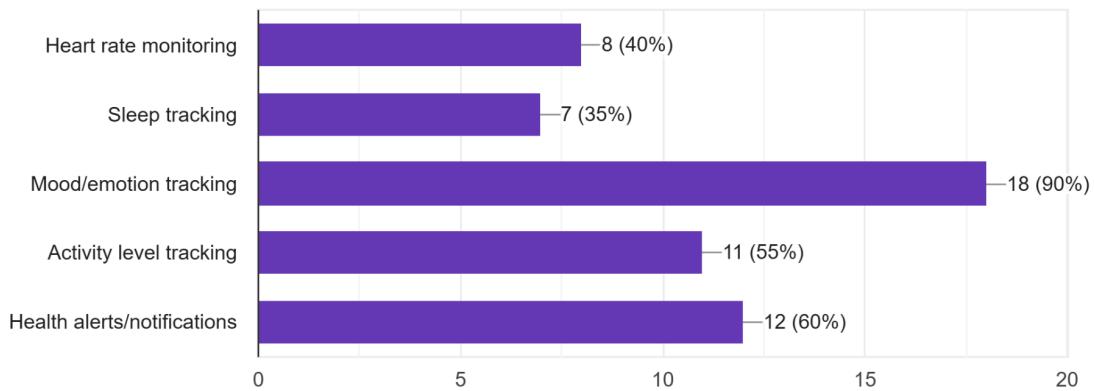
Would you be interested in using a technology-based health monitoring system?

(20 条回复)



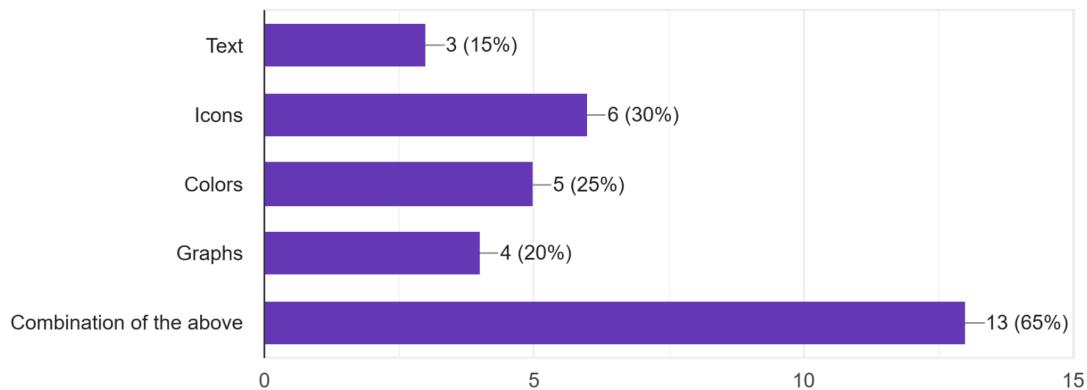
Which features would you find most useful? (Select all that apply)

(20 条回复)



Do you prefer health information displayed in?

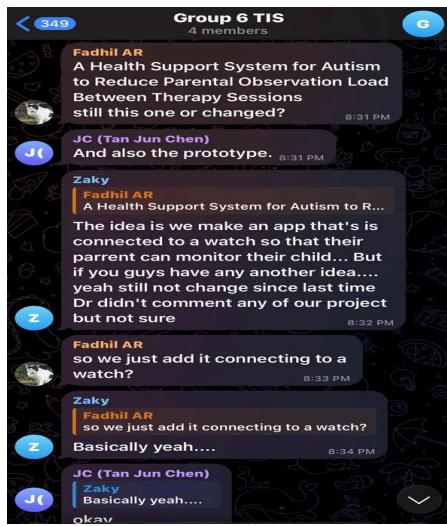
(20 条回复)



5.2 DEFINE PHASE

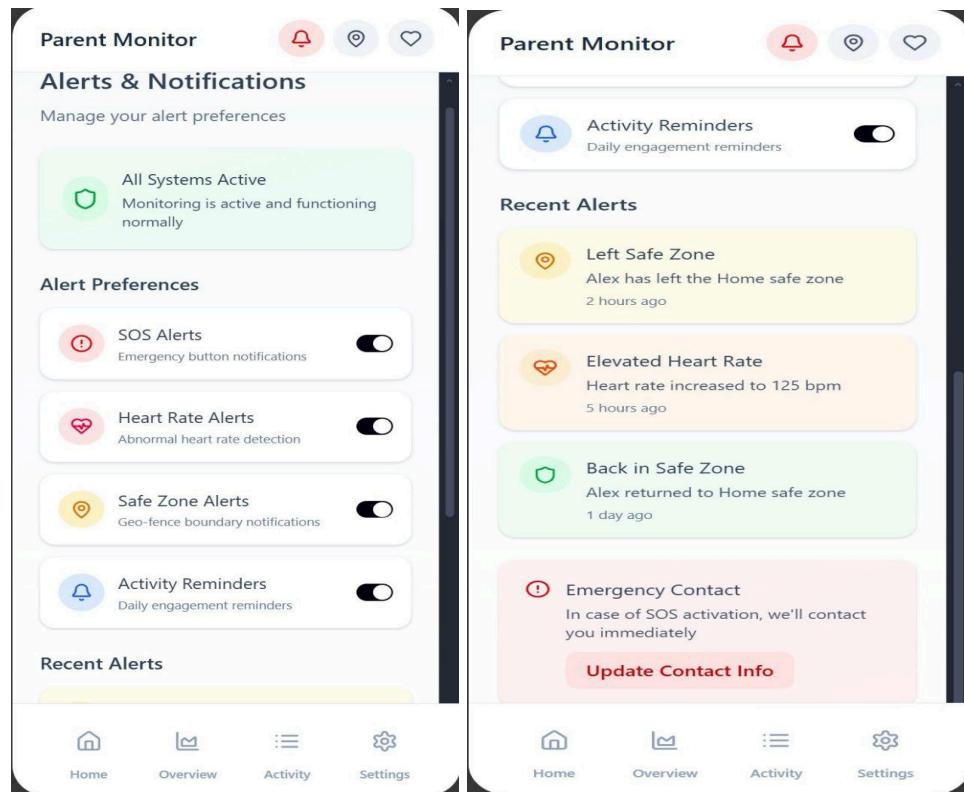


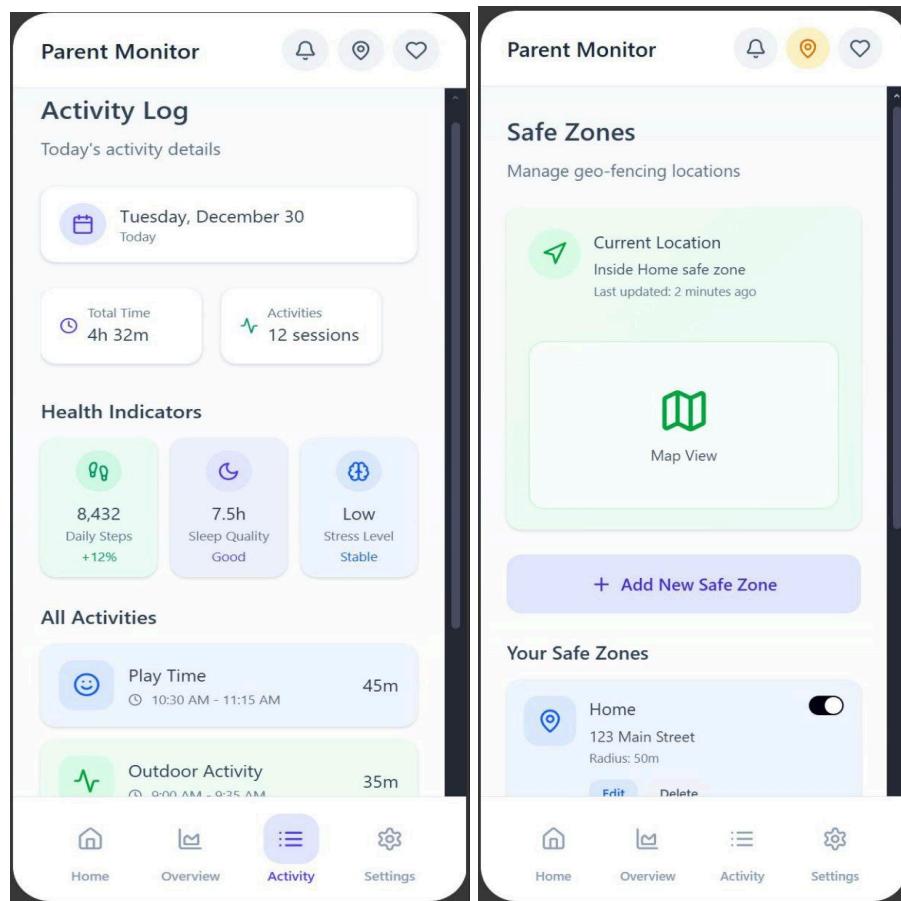
5.3 IDEATE PHASE

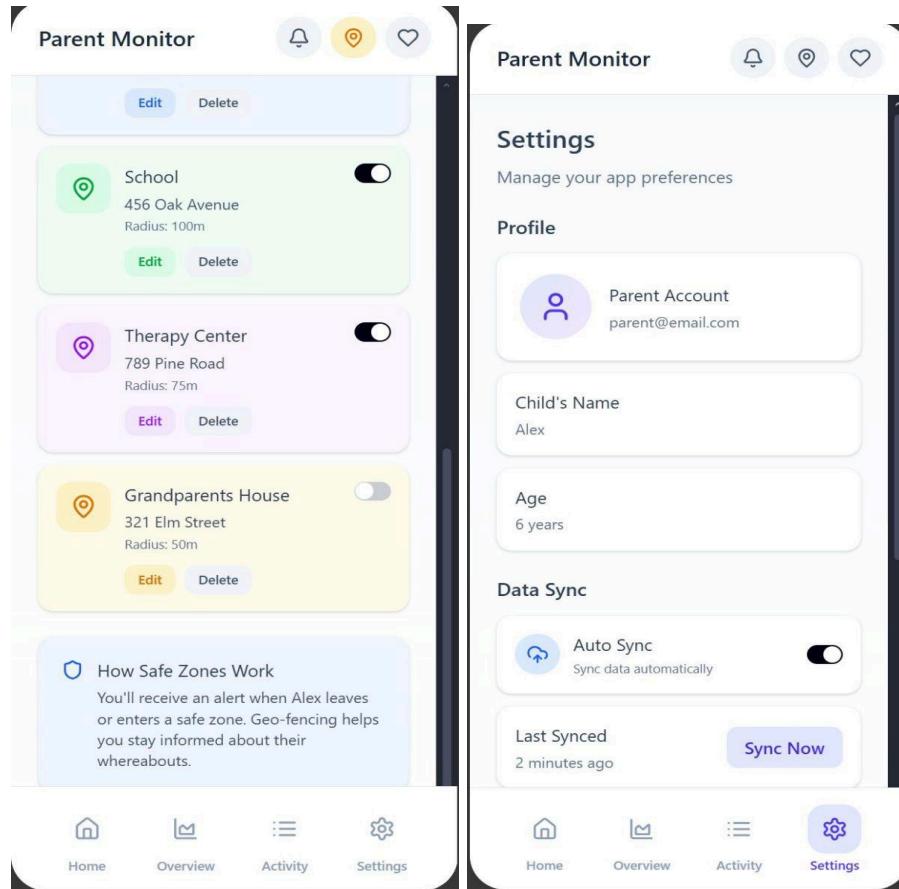


5.4 PROTOTYPE PHASE

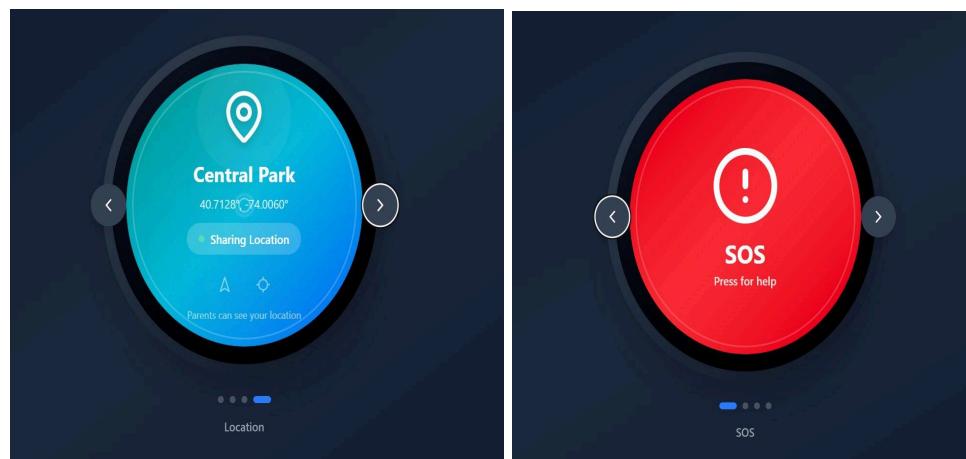
5.4.1 INTERFACE PHONE (PARENT)







5.4.2 INTERFACE SMARTWATCH (CHILD)



5.4.3 INTERFACE WEBSITE

Website ▾

HELLO BUDDIES

Home Features About Contact Get Started

Supporting Parents, Empowering Children

A comprehensive platform to monitor your child's progress, access expert resources, and connect with a caring community of parents navigating autism together.

Join Our Community → Explore Features



HELLO BUDDIES

Home Features About Contact Get Started

Everything You Need in One Place

Comprehensive tools and support designed specifically for parents of children with autism

 Progress Monitoring

Track your child's developmental milestones, behaviors, and daily activities with easy-to-use monitoring tools.

 Education Hub

Access expert articles, videos, and resources on autism care, therapy techniques, and coping strategies.

 Community Forum

Connect with other parents, share experiences, ask questions, and find support from those who understand.

 Care Resources

Find therapists, support services, educational materials, and tools tailored to your family's needs.

HELLO BUDDIES

Home Features About Contact **Get Started**



Our Mission

HELLO BUDDIES was created by a group of students dedicated to supporting families raising children with autism. We've designed this platform to provide parents with essential tools and resources they need.

Our platform brings together the essential tools you need - from tracking your child's progress to learning from expert resources and connecting with a supportive community that truly understands your journey.

You're not alone. Together, we can help our children thrive and celebrate every milestone along the way.

 **Built with Love & Understanding**
Every feature is designed with care and empathy, informed by research and insights from the autism community.

HELLO BUDDIES

Home Features About Contact **Get Started**

Get In Touch

Have questions? Want to learn more? We're here to help and support you every step of the way.

Name

Email

Message

Contact Information

 Email
support@hellobuddies.com

 Support Line
+1 (555) 123-4567

 Address
123 Care Street
Hope City, HC 94102

Support Hours
Monday - Friday: 9:00 AM - 6:00 PM

Send Message

HELLO BUDDIES

Send Message

Home Features About Contact **Get Started**

Support Hours

Monday - Friday: 9:00 AM - 6:00 PM
Saturday: 10:00 AM - 4:00 PM
Emergency support available 24/7

HELLO BUDDIES
Supporting parents and empowering children on the autism journey, together.

Quick Links

- Home
- Features
- About
- Contact

Resources

- Education Hub
- Community Forum
- Parent Resources
- Support Services

Connect With Us

Join our community and stay updated

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Made with ❤️ for families everywhere

6.0 REFLECTIONS

FADHIL ATHA RAMADHAN

From this design thinking project, I gained knowledge regarding the importance of understanding user needs before developing any digital solution. Through the design thinking process, I learned how empathy, problem definition, and ideation contribute to creating a meaningful and user-centred design. I plan to further improve my potential in the industry by strengthening my skills in prototyping tools and continuously refining my understanding of the design thinking process, as these skills will be frequently applied in future courses and professional practice.

ZAKY ZULHADI

This Design Thinking project exposed me to a new way of approaching problem-solving for individuals with Autism Spectrum Disorder (ASD). Instead of focusing only on technical solutions, the process emphasized understanding the daily challenges faced by children with autism. By applying user-centered principles and conducting research, our team was able to shape ideas that were more meaningful and practical. Responsibilities were divided based on individual capabilities, which improved our overall collaboration. Throughout the project, repeated refinement and feedback played an important role in developing a digital communication tool aimed at helping children with ASD communicate more independently.

TAN JUN CHEN

From this design project, I aim to gain more industry-relevant knowledge and hand-on experience that will prepare me for future employment. I aim to be a professional who can design a user-friendly and innovative system which can positively impact society. This project trains me to think beyond technical knowledge and focus on the user's need in developing systems. By practicing empathy, problem definition, ideation, prototyping and testing, I learn how to approach problems systematically and creatively. To improve my potential in the industry, I plan to enhance both my technical and soft skills. This includes improving my communication skills, learning new tools and technologies related to my field.

UMAIRAH NASUHA BINTI KAMARUDIN

Through this Design Thinking project, I learned how empathy informs the development of solutions for children with Autism Spectrum Disorder (ASD). I conducted research that enhanced my understanding and underscored the importance of user-centered design. We allocated tasks according to team members' strengths. By collaborating throughout each phase, I developed practical teamwork skills. I also observed how iterative processes and feedback contributed to creating a digital communication app that enabled children with ASD to express their needs more effectively.

7.0 TASK

GROUP MEMBER	EACH MEMBER TASKS
1. FADHIL ATHA RAMADHAN	<ul style="list-style-type: none"> ● Ideation ● Design thinking assessments ● Phase evaluation ● App prototype planning and designing.
2. ZAKY ZULHADI	<ul style="list-style-type: none"> ● Ideation ● Smartwatch Prototype planning and design ● Making a design thinking evidence ●
3. TAN JUN CHEN	<ul style="list-style-type: none"> ● Developing and designing web ● Conducting survey ● Report editing ● Analyse survey responds ● Clearly state the detail steps in each phase
4. UMAIRAH NASUHA BINTI KAMARUDIN	<ul style="list-style-type: none"> ● Introduction writing ● Problem identification ● Solution description ● Documentation of teamworking process ● Report editing

8.0 REFERENCE

- Boulton, Kelsie, and Adam Guastella. “Can Apps and Digital Resources Support Your Child with Autism or ADHD? Here’s What to Look For.” *Medicalxpress.com*, Medical Xpress, 7 Jan. 2025, medicalxpress.com/news/2025-01-apps-digital-resources-child-autism.html. Accessed 8 Jan. 2026.
- Boulton, Kelsie Ann, et al. “Apps and Digital Resources for Child Neurodevelopment, Mental Health, and Well-Being: Review, Evaluation, and Reflection on Current Resources.” *Journal of Medical Internet Research*, vol. 27, 1 Jan. 2025, pp. e58693–e58693, <https://doi.org/10.2196/58693>. Accessed 11 Mar. 2025.
- CDC. “Data and Statistics on Autism Spectrum Disorder.” *Autism Spectrum Disorder (ASD)*, CDC, 15 Apr. 2025, www.cdc.gov/autism/data-research/index.html.
- World Health Organization. “WHO Caregivers Skills Training for Families of Children with Developmental Delays and Disorders.” *Www.who.int*, 2022, www.who.int/teams/mental-health-and-substance-use/treatment-care/who-caregivers-skill-training-for-families-of-children-with-developmental-delays-and-disorders.
- DiGuiseppi, C, et al. “Associations of Adaptive Behavior and Wandering with Serious Injuries in Young Children with Autism: Study to Explore Early Development.” *Journal of Autism and Developmental Disorders*, 20 Aug. 2025, <https://doi.org/10.1007/s10803-025-06978-7>.
- Mini, Daniella. “Dear Mother of an Autistic Child: A Few Things You Should Know....” *Autism Parenting Magazine*, 21 Nov. 2021, www.autismparentingmagazine.com/mother-of-an-autistic-child/.
- Wiklund, M., Bengtsson, A., & Gerdner, A. (2014). Difficulties in everyday life: Young persons with attention-deficit/hyperactivity disorder and autism spectrum disorders perspectives. Scandinavian Journal of Caring Sciences, 28(1), 51–60.