A

Mini-Project Report on

# Parental Control System

Submitted in partial fulfillment of the requirements
for the degree of
BACHELOR OF ENGINEERING
IN
**Computer Science & Engineering**
(Artificial Intelligence & Machine Learning)

by

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**University of Mumbai**
**2023-2024**

# A. P. SHAH INSTITUTE OF TECHNOLOGY

## CERTIFICATE

This is to certify that the project entitled **"Parental Control System"** is a bonafide work of Sumant Bhise (22106026), Gaurav Kolambe (22106085), Ashutosh Pandey (22106076) submitted to the University of Mumbai in partial fulfillment of the requirement for the award of **Bachelor of Engineering** in **Computer Science & Engineering (Artificial Intelligence & Machine Learning).**

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## PROJECT REPORT APPROVAL

This Mini project report entitled "**Parental Control System"** by **Sumant Bhise (22106026), Gaurav Kolambe (22106085), Ashutosh Pandey (22106076)** is approved for the degree of ***Bachelor of Engineering*** in ***Computer Science & Engineering (AI&ML) 2024-25***.

External Examiner: _____

Internal Examiner: _____

Place: APSIT, Thane

Date:

# DECLARATION

We declare that this written submission represents my ideas in my own words and where other ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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# ABSTRACT

The Parental Control System is a comprehensive solution designed to help parents monitor and manage their child's digital activities effectively. The system consists of two main components: a web-based administration panel and a mobile application installed on the child's phone. The website serves as a centralized control hub, allowing parents to configure restrictions, set screen time limits, block inappropriate websites and apps, and track their child’s online activity. The mobile app enforces these settings in real-time, ensuring compliance with parental guidelines. Additionally, the system provides activity reports, and instant alerts, allowing parents to stay informed about their child's whereabouts and digital behavior. The platform is designed to be user-friendly, secure, and efficient, enabling parents to maintain a healthy balance between technology use and child safety. By integrating essential monitoring features with an intuitive interface, the Parental Control System offers a proactive approach to digital parenting, promoting a safe and controlled online environment for children.



**Keywords:** Parental Control System, digital parenting, child safety, web-based administration panel, mobile application, screen time limits, app restrictions, online activity tracking activity reports, real-time alerts

# INDEX

# CHAPTER 1

# INTRODUCTION

# 1. INTRODUCTION

**1.1 Overview:** In today's digital age, children are increasingly exposed to the internet and smart devices, making parental supervision more challenging. The Parental Control System is designed to help parents monitor, manage, and restrict their child's digital activities, ensuring a safe and controlled online environment. This system consists of two key components: a web-based administration panel for parents and a mobile application installed on the child's phone. The web interface allows parents to set restrictions, monitor activity, and receive real-time alerts, while the mobile app enforces these restrictions by limiting screen time, blocking inappropriate content, and tracking location.

With the growing concern over excessive screen time, cyber threats, and exposure to harmful content, the need for an effective parental control system has become essential. Many existing solutions lack flexibility, real-time monitoring, or user-friendly interfaces, making them difficult for parents to use effectively. Our system bridges this gap by providing a seamless, easy-to-use, and comprehensive monitoring solution that allows parents to supervise their child’s digital behavior while respecting their privacy. By integrating real-time alerts, location tracking, and content filtering, the system ensures a balanced approach to digital parenting, giving parents the tools they need to create a safe digital space for their children.

**1.2 Purpose:** The primary objective of the Parental Control System is to provide parents with an effective and user-friendly solution to monitor and manage their child’s online activities. The system is designed to help prevent excessive screen time, restrict access to inappropriate content, and ensure child safety through location tracking and real-time monitoring. By offering a centralized control panel, parents can easily configure and adjust restrictions based on their child's age, activity patterns, and online behavior.

With the increasing risks associated with cyberbullying, online predators, and exposure to harmful content, this system acts as a protective shield, ensuring that children engage with digital content in a safe and controlled manner. The implementation of automated monitoring, detailed activity reports, and customizable restrictions allows parents to make informed decisions about their child's digital habits. The Parental Control System ultimately aims to promote healthy technology usage, ensuring that children benefit from the digital world without falling victim to its risks.

# CHAPTER 2

# LITERATURE SURVEY

# 2. LITERATURE SURVEY

## 2.1 Literature Review

**[1]** Xiaoqin Zhu, Chen Deng, Wanyue Bai. **Parental control and adolescent internet addiction: the moderating effect of parent child relationships**. The Department of Applied Social Sciences, The Hong Kong Polytechnic University, Kowloon. **(2023)**

The study examined how maternal and paternal controls, including behavioral and psychological controls, influence adolescent Internet addiction, along with the moderating effects of adolescent gender and parent-child relationships. Hierarchical regression analyses showed that while both parents' behavioral controls negatively predicted adolescent Internet addiction, psychological control had a marginally positive effect. The influence of maternal and paternal controls was equal and did not differ between sons and daughters. Although adolescent gender was not a significant moderator, the quality of the parent-child relationship played a crucial role. A positive father-child relationship strengthened the protective effect of paternal behavioral control while weakening the negative impact of both paternal and maternal psychological control on adolescent Internet addiction.

**[2]** Wesley Sanders, Justin Parent, Rex Forehand. **Parenting to Reduce Child Screen Time: A Feasibility Pilot Study**. University of Vermont, Boston VA Hospital, Alpert Medical School of Brown University. **(2018)**

This pilot study explored the feasibility and preliminary outcomes of a one-session intervention aimed at helping parents reduce their child's screen time. The results indicated that participants could be recruited, randomized, and retained over six weeks at a reasonable cost. The intervention was successfully implemented and led to changes in technology-specific parenting practices, positively impacting one of two measures of child screen time. Parents expressed satisfaction with the intervention and felt more confident in managing their child's screen time. Overall, the study suggests that this intervention is a promising approach to addressing excessive screen time in children.

**[3]** Wendy S. Grolnick, Eva M. Pomerantz. **Issues and Challenges in Studying Parental Control: Toward a New Conceptualization**. Clark University, University of Illinois, Urbana-Champaign. **(2019)**

The article discusses the historical and conceptual confusion surrounding the role of parental control in socialization. It explores the development of a contemporary approach that differentiates among various forms of control, proposing that only parenting marked by pressure, intrusion, and domination should be classified as "control." Parenting primarily based on guidance should be referred to as "structure" instead. The article emphasizes the advantages of distinguishing between these two dimensions of parenting, rather than continuing to label them all as forms of control.

**[4]** Norah Alqahtani, **A State of the Art Review of Internet Risks on Children**. Centre for Security, Communications and Network Research, Plymouth University, Plymouth,Hemaya Group,**(2018)**

Children use the Internet daily at home and school, benefiting from its resources but also facing significant risks such as cyber harassment and child exploitation. Cybercriminals exploit technological advancements, making children vulnerable online. Increased online opportunities correlate with higher exposure to risks, especially if parents are unaware and fail to implement protective measures. Excessive Internet use is a growing global concern, with studies highlighting both its positive and negative impacts on children's lives

**[5]** C. Yang and H. Guiqiong. **Self-regulation and Supervision: A Study on Online Privacy Protection of Chinese and American Children in Mobile Apps,***2022 IEEE 8th International Conference on Cloud Computing and Intelligent Systems (CCIS)*, Chengdu, (**2022)**

This paper examines the protection of children's online privacy in mobile apps in China and America, considering children's vulnerability and the Internet's high level of concealment. It analyzes industry self-regulation and administrative supervision in both countries, providing a comparative assessment of their privacy protection measures. Based on this analysis, the paper suggests improving guardian informed consent, enhancing industry self-regulation, and strengthening administrative oversight to ensure effective online privacy protection for children in China.

**[6]** Lynn Schofield Clark, **Parental Mediation Theory for the Digital Age,** *Department of Media, Film and Journalism Studies, University of Denver*, (**2021)**

This article explores the theory of parental mediation, which examines how parents use interpersonal communication to mitigate perceived negative effects of media on their children. It evaluates the theory's strengths and limitations within media effects and sociocultural research. To address the emotional dynamics introduced by digital media in family life, the paper incorporates insights from Hochschild's work on emotions and Vygotsky's social development theory to reconsider children's agency in parent-child interactions. The study concludes by advocating for the inclusion of participatory learning—where parents and children engage with digital media together—alongside traditional parental mediation strategies such as active guidance, restriction, and co-viewing.

**[7]** Meyran Boniel-Nissim, Yaniv Efrati & Michal Dolev-Cohen**. Parental Mediation Regarding Children's Pornography Exposure: The Role of Parenting Style, Protection Motivation and Gender,**School of Social Sciences and Humanities, Kinneret Academic College,Department of Education and Society and Culture, Beit Berl College,Department of Educational Counseling,(**2022)**

This study examines the relationship between parenting styles (authoritarian, authoritative, and permissive), gender, and parental mediation strategies (restrictive, active, and co-use) in addressing children's exposure to pornography, using protection motivation theory. Based on a survey of 1,070 Israeli parents of 10- to 14-year-olds, findings indicate that authoritarian and permissive parents, with lower authoritative traits, engage in lower-quality communication and are less active in mediation. In contrast, authoritative parents recognize the risks of pornography consumption and adopt more restrictive and active mediation strategies. Additionally, fathers tend to have more dysfunctional communication about pornography than mothers, leading to less active mediation efforts.

# CHAPTER 3

# PROBLEM STATEMENT

# 3. PROBLEM STATEMENT

With the increasing integration of digital devices into everyday life, children are exposed to a vast online world that can be both beneficial and harmful. While the internet provides educational resources, entertainment, and communication opportunities, it also presents risks such as:

- **Unrestricted Internet Access:** Children may access inappropriate websites, social media platforms, or engage in unsafe online interactions without parental oversight.
- **Excessive Screen Time:** Prolonged device usage can lead to **health issues**, including poor sleep, eye strain, and decreased physical activity, affecting a child's overall well-being
- **Struggles with Digital Balance:** Parents need a way to allow beneficial internet usage while preventing addiction and over-reliance on digital devices.

Given these concerns, there is an urgent need for a Parental Control System that provides parents with a centralized platform to monitor, manage, and restrict their child's digital activities.

To develop a Parental Control System that enables parents to monitor and manage their child's digital activities, ensuring safe browsing, balanced screen time, and real-time supervision for a secure online environment. The system should provide content filtering, usage tracking, and remote accessibility to help parents set restrictions and receive alerts. By offering a user-friendly platform, it aims to promote healthy digital habits and online safety for children.

# CHAPTER 4

# EXPERIMENTAL SETUP

# 4. EXPERIMENTAL SETUP

## 4.1 Software Setup

### 1. Programming Languages:

- **Dart:** Dart is an open-source programming language developed by Google, primarily used for building cross-platform mobile applications with the Flutter framework. It is known for its fast performance and expressive syntax, making it a popular choice for Android and iOS development.

### 2. Android Development:

- Android Studio: Android Studio is an integrated development environment (IDE) specifically designed for developing Android applications. It is built on JetBrains IntelliJ IDEA and provides a range of tools, such as code editing, debugging, and performance analysis.
- SDK Setup: During installation, ensure the necessary SDK tools are selected (Android SDK, SDK Platform-tools, and Emulator). You can later install additional SDK versions based on the Android app you are developing.
- Android Emulator: Create virtual devices (AVDs) with different screen sizes, resolutions, and Android versions. Useful for testing different configurations without needing physical devices.
- **Android Profiler**: Android Profiler is a set of performance monitoring tools integrated into Android Studio, designed to help developers analyze and optimize the performance of their Android applications. It provides real-time insights into the app's CPU, memory, and network usage, making it easier to detect performance bottlenecks, troubleshoot issues, and improve app performance.

- **Firebase:** Firebase is a backend tool for Android applications that acts as the backend of the project

**3. Version Control and Collaboration:**

- **Git**: Git is a distributed version control system used for tracking changes in source code during software development. It helps teams collaborate and manage code efficiently.
- **GitHub/GitLab/Bitbucket:** Cloud-based repositories for hosting and collaborating on Android projects. They provide features like issue tracking, pull requests, and CI/CD integration.
- **GitHub Actions**: GitHub Actions is a CI/CD automation tool that allows developers to automate build, test, and deployment workflows for Android applications.

**4. Version Control and Collaboration:**

- **Google Play Console**: The Google Play Console is the platform where developers manage, publish, and monitor their Android applications on the Google Play Store.
- **Android App Bundles (AAB)**: Android App Bundles are the recommended publishing format for Android apps, offering optimized APKs for different device configurations.
- **Fastlane**: Fastlane is an automation tool for Android and iOS that simplifies deployment, screenshots, and release management processes.
- **Firebase App Distribution**: Firebase App Distribution provides a way to distribute pre-release versions of an Android app to testers for feedback before publishing.

# CHAPTER 5

# IMPLEMENTATION

### 5.1 Block Diagram of Proposed System

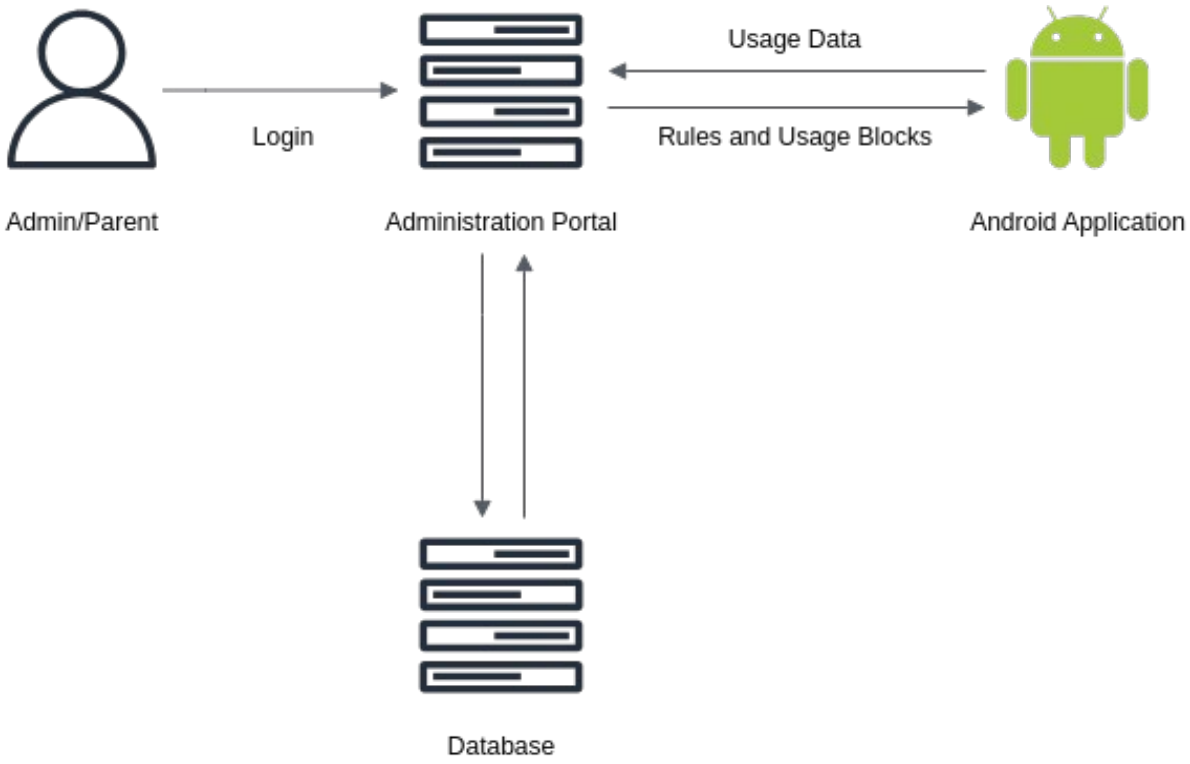


**Fig 5.1** Block diagram of the implemented system

**Admin/parent:** This represents the user (parent or administrator) who logs into the system to monitor

**Administration Portal:** This serves as the control center where parents can set rules, view usage data, and apply restrictions. It acts as a bridge between the parent and the Android application installed on the child's device

**Android Application:** Installed on the children's device, it enforces the rules set by the parent. It sends usage data back to the Administration Portal and receives rules and usage blocks that restrict certain activities.

**Database:** Stores login credentials, rules, usage data, and restrictions. Connected to the Administration Portal, ensuring real-time updates between the parental dashboard and the children's device.

The Parental Control System is developed using Flutter for the frontend and Firebase for the backend. Flutter is an open-source UI toolkit developed by Google that allows for cross-platform development. Firebase provides backend services such as authentication, real-time database, and cloud functions, making it an ideal choice for this project.

The system consists of two main components: a mobile application installed on the child's device and a web dashboard for the parents. The mobile application is responsible for implementing restrictions on app usage based on parental settings. The web dashboard enables parents to monitor and configure app usage settings remotely. Communication between the mobile app and the web dashboard is facilitated using Firebase services.

User authentication is implemented using Firebase Authentication, allowing parents and children to sign up using email and password or Google sign-in. The authentication state is maintained using Firebase services to ensure secure access. The system also monitors app usage by fetching installed applications on the child's device and tracking their usage. This data is stored in Firebase Firestore, enabling real-time monitoring.

One of the key functionalities of the system is remote app locking. Parents can lock specific applications from the web dashboard, and the child's device enforces these restrictions. The Firebase Firestore stores the list of locked applications, and the mobile application continuously checks these restrictions in real-time to ensure compliance.

To enhance parental control, the system includes push notifications to alert parents if a child attempts to access a restricted application. This feature is implemented using Firebase Cloud Messaging (FCM), ensuring that notifications are delivered to the correct device when necessary.

The mobile application is deployed on Android using Flutter, while the web dashboard is hosted using Firebase Hosting. Testing is conducted on emulators and real devices to verify the functionality of all features, ensuring smooth operation and responsiveness.

This project successfully integrates Flutter and Firebase to create a scalable and efficient

parental control system. The real-time monitoring and control capabilities provide parents with a convenient way to manage their child's digital activities, ensuring a safer and more controlled online experience.

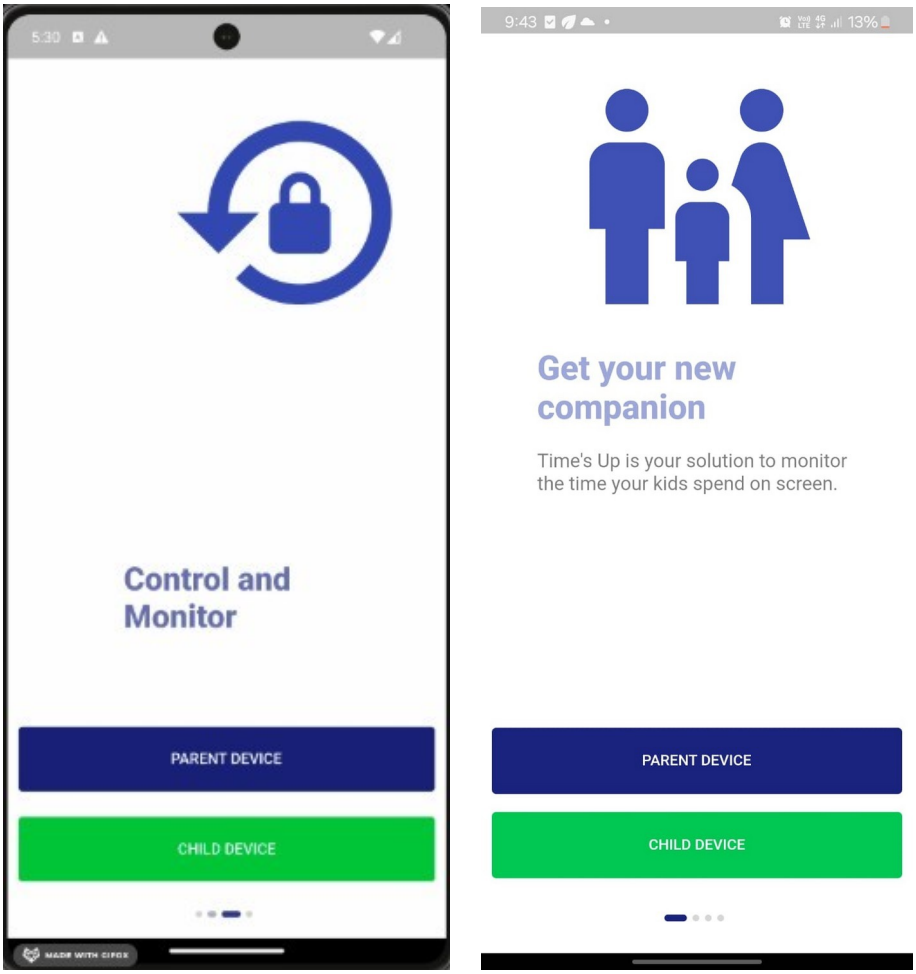


**Fig 5.2 login page for parent and child**

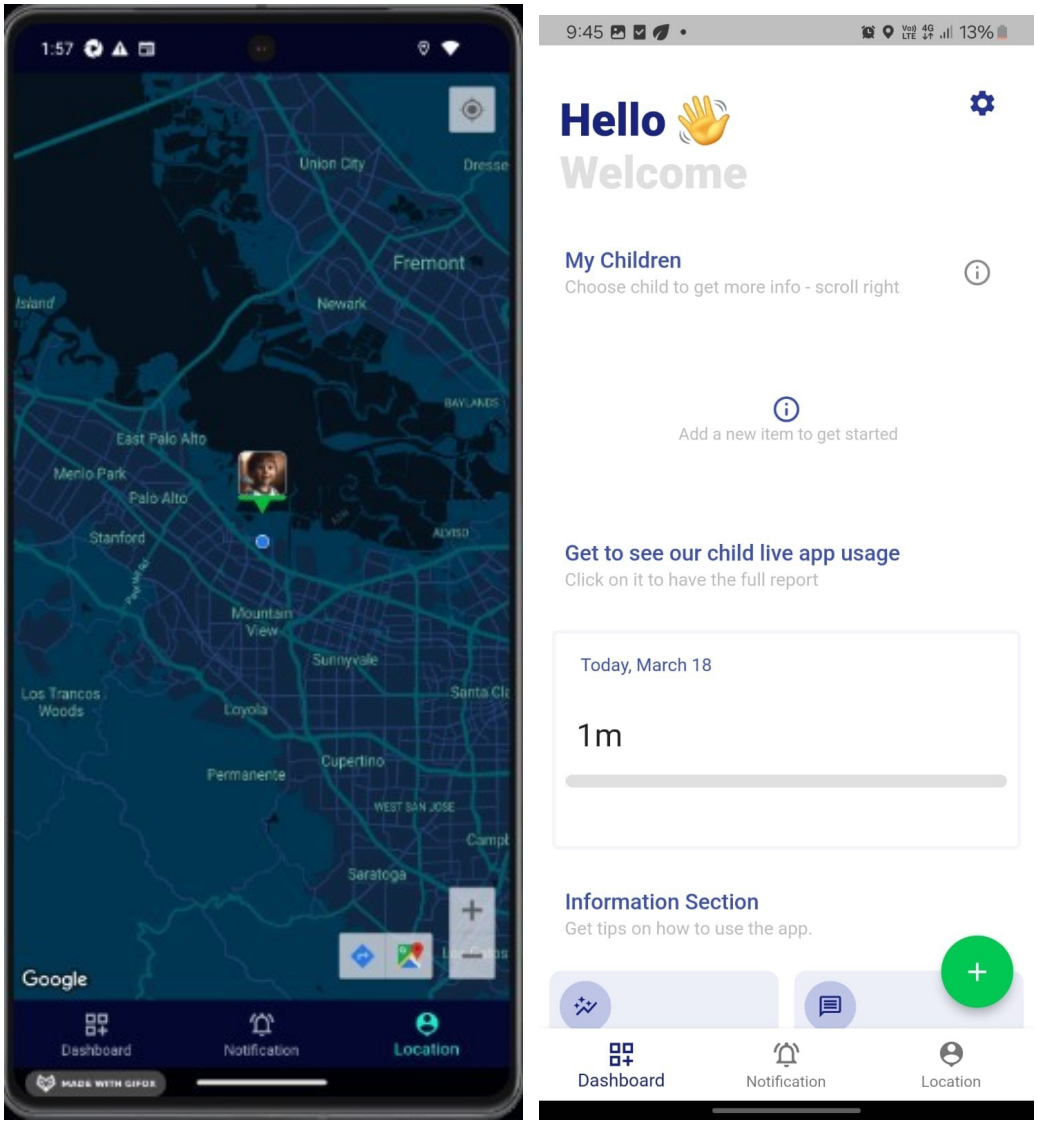


**Fig 5.3 Geotracking and Parent Dashboard**

# CHAPTER 6

# CONCLUSION

# 6. CONCLUSION

The Parental Control System provides parents with an effective, all-encompassing tool to manage and safeguard their child's digital interactions. By combining a user-friendly web-based administration panel and a mobile app, the system offers seamless, real-time enforcement of digital restrictions. Parents are empowered to establish clear boundaries, monitor online activity, and receive instant alerts and reports, ensuring they stay informed and in control. With these features, the platform fosters a balanced approach to technology use, promoting both safety and healthy screen time habits for children. Overall, the Parental Control System not only enhances child safety but also facilitates responsible digital parenting. Its secure and efficient interface allows parents to navigate the complexities of modern technology while protecting their child's online experiences. As digital environments continue to evolve, this comprehensive system stands as a proactive solution, offering peace of mind and contributing to the overall well-being of families in an increasingly connected world.

Overall, the Parental Control System not only enhances child safety but also facilitates responsible digital parenting. Its secure and efficient interface allows parents to navigate the complexities of modern technology while protecting their child's online experiences. As digital environments continue to evolve, this comprehensive system stands as a proactive solution, offering peace of mind and contributing to the overall well-being of families in an increasingly connected world.

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