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Android-based Parent-child safety and location Monitoring system

Shinde Dhanashri[1], Jadhav Sakshi[2], Rasal Rutuja[3], Sargar Namiksha[4], Ms.Rajwade V.V

Sharadchandra Pawar Institute of Technology, Baramati, Pune ,India.

Abstract - In the present digital age, smartphones and internet technologies have become an integral part of children's daily lives. Children use mobile devices for online education, entertainment, gaming, communication, and social networking. While technology has created numerous opportunities for learning and development, it has also introduced several risks such as cyberbullying, online harassment, exposure to inappropriate content, digital addiction, identity theft, and physical safety threats. Parents are increasingly concerned about their children's safety in both online and offline environments.

INTRODUCTION

Technology has transformed the way children interact with the world. Smartphones and tablets are now common among school-going children. Online classes, digital assignments, educational videos, gaming platforms, and social media applications are part of everyday life. Although these technologies provide educational growth and communication convenience, excessive and unsupervised usage may lead to serious consequences.

Children may unknowingly access harmful websites, interact with strangers online, or spend excessive time playing games. Such activities can negatively affect their academic performance, physical health, and mental well-being. Moreover, safety concerns related to unknown locations, kidnapping risks, or emergency situations require immediate parental attention.

NEED FOR THE SYSTEM

The increasing number of cybercrime cases involving children highlights the urgent need for digital monitoring systems. Reports indicate that children are vulnerable to cyberbullying, phishing attacks, inappropriate advertisements, and online gaming addiction. Additionally, working parents often find it difficult to track their child's physical location during school hours or travel.

SYSTEM OVERVIEW

The Parent Child Safety and Monitoring Application consists of two interconnected modules: the Parent Module and the Child Module.

The Child Module is installed on the child's smartphone. It runs in the background and collects essential data such as GPS location, app usage statistics, and activity logs. This information is securely transmitted to the cloud database.

TECHNOLOGIES USED

The application is developed using Android Studio as the development environment. Java or Kotlin programming language is used for coding the application logic. Firebase Authentication is implemented to provide secure login and registration features. Firebase Realtime Database is used to store user data securely in the cloud. GPS and Location Services are integrated to enable real-time tracking. Internet connectivity ensures data synchronization between devices.

FEATURES OF THE APPLICATION

The system provides secure user authentication for both parent and child accounts. Real-time GPS tracking allows parents to monitor the child's live location on a map interface. Geofencing functionality enables parents to define safe zones such as home or school and receive alerts when the child enters or exits these zones.

LITERATURE REVIEW

Previous research studies on parental control systems indicate that digital monitoring significantly improves child safety and reduces online risks. GPS-based tracking systems are effective in preventing physical safety threats. Screen time management tools have shown positive results in reducing digital addiction among teenagers.

RESEARCH METHODOLOGY

The research methodology includes both primary and secondary data collection methods. Surveys were conducted among parents to understand concerns related to smartphone

usage. Interviews with teachers and guardians provided insights into digital behavior patterns of children.

RESULTS AND DISCUSSION

The survey analysis revealed that a significant percentage of parents are worried about excessive screen time and online safety. Many children spend more than three hours daily on smartphones. Parents expressed a strong need for a reliable monitoring solution.

ADVANTAGES

The application improves physical and digital safety of children. It provides real-time monitoring and instant emergency alerts. The system is user-friendly and accessible. Cloud-based storage ensures secure data management. It promotes responsible digital behavior and strengthens trust between parents and children.

LIMITATIONS

The system requires continuous internet connectivity for real-time updates. GPS tracking may increase battery consumption. Privacy concerns may arise if the system is misused. Technical knowledge is required for installation and setup.

FUTURE ENHANCEMENTS

Future improvements may include artificial intelligence-based behavior analysis to detect unusual activity patterns. Integration of harmful content detection algorithms can further enhance safety. Face recognition-based authentication and advanced encryption techniques may improve security. Offline data caching features can be added to handle network instability.

CONCLUSION

The Parent Child Safety and Monitoring Application provides a comprehensive solution to address modern child safety challenges. By integrating GPS tracking, screen time monitoring, application usage reports, and emergency alert systems, the application ensures both digital and physical protection. The system enhances parental awareness while encouraging responsible technology usage among children. With further advancements and awareness programs, such applications can play a vital role in building a safer digital future for the next generation.

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