American International University-Bangladesh

Faculty of Science and Technology

Department of Computer Science

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Course: Software Development Project Management

Project Title: Child Safety & Parental Control Application

Section: B

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1.0 INTRODUCTION

The purpose of this document is to provide a detailed and structured overview of the **Child Safety & Parental Control Application**. This system is designed to safeguard children in real-world and digital environments by combining real-time location tracking, automated safety alerts, parental monitoring tools, and emergency communication features. The document serves as a foundational reference for all stakeholders involved, including parents, educators, law enforcement authorities, development teams, project sponsors, and external reviewers.

This document outlines the scope, objectives, methodologies, system components, risk factors, feasibility, and resource requirements associated with the development and deployment of the system. Its primary objective is to ensure a shared understanding of the project's purpose and deliverables among all parties while establishing a roadmap for development, implementation, and maintenance. It also serves as a decision-support artifact by documenting key assumptions, constraints, and dependencies that will influence the success of the system.

Audience:

- **Parents and Guardians:** To understand the features that enhance their children's safety, both online and offline.
- **Educational Institutions and Administrators:** To evaluate the system's role in improving student safety during commutes and on-campus activities.
- **Law Enforcement and Safety Organizations:** To explore how real-time alerts and risk classification can support emergency responses.
- **Development Team (Designers, Developers, Testers):** To gain a clear view of the system requirements, architecture, and implementation timeline.
- **Project Sponsors and Investors:** To assess project feasibility, budget allocation, and expected societal impact.
- **Compliance Bodies and Legal Authorities:** To ensure the system adheres to child protection, data privacy, and digital safety regulations.

Brief Objectives of This Document:

- To define the scope and boundaries of the **Child Safety & Parental Control Application** system clearly and precisely.
- To identify the roles, responsibilities, and interactions of all stakeholders.
- To provide a feasibility study covering technical, operational, and financial perspectives.
- To describe the selected software development methodology and justify its suitability.
- To outline system architecture, functional requirements, and workflow processes.
- To provide a project management plan including milestones, scheduling, effort estimation, and resource allocation.
- To highlight risk factors, mitigation strategies, and compliance considerations.
- To establish measurable success criteria and continuous monitoring mechanisms.

Overall, this document acts as a blueprint and living artifact for the Child Safety & Parental Control Application project. It will evolve throughout the project lifecycle, capturing updated requirements, user

feedback, and technological advancements, ensuring that the final system effectively protects children, builds parental trust, and contributes to safer communities.

2.0 PROJECT TITLE

Child Safety & Parental Control Application

3.0 OBJECTIVES

Main Objective:

- To design and implement a comprehensive **child safety and monitoring system** that leverages mobile and web technologies to provide real-time protection, parental oversight, and proactive safety measures for children in both physical and digital environments.

Sub-Objectives:

- Develop a role-based user system for Parents, Children, Law Enforcement Agencies, and System Administrators.

- Provide real-time location tracking and geofencing features that categorize areas into red (high risk), yellow (moderate risk), and green (safe).

- Enable automated safety alerts and protection queries that notify emergency contacts and law enforcement in case of suspicious activity or potential danger.

- Implement live video and audio streaming for parents to remotely monitor their children's surroundings.

- Facilitate screen monitoring and usage restriction tools for parents to manage children's digital exposure.

- Provide a panic button and emergency contact system to ensure rapid response in critical situations.

- Generate risk-based safety analytics and reports to support preventive decision-making by parents and guardians.

- Ensure data privacy, security, and compliance with child protection laws and digital safety standards.

- Design the platform for scalability and reliability to handle large volumes of users without service interruptions.

- Deliver a user-friendly interface optimized for mobile devices, ensuring accessibility for both tech-savvy and non-technical users.

Overall Objective:

The primary objective of the **Child Safety & Parental Control Application** project is to design, develop, and deploy a secure, reliable, and highly responsive child safety platform that protects children by combining real-time monitoring, predictive safety mechanisms, and proactive parental tools. The system aims to reduce risks faced by children in both public spaces and digital environments by empowering parents, guardians, and law enforcement agencies with actionable intelligence and instant communication tools.

Specific Goals:

1. Develop a Role-Based Access and User Management System Implement authentication and authorization mechanisms for different user roles (Parents, Children, Law Enforcement, Admins) ensuring tailored functionality, privacy, and secure data handling.

2. Enable Real-Time Location Tracking and Risk-Based Geofencing Integrate GPS tracking with maps that categorize locations into safety zones (red, yellow, green) based on crime records, traffic data, and user feedback.

3. Automated Protection Queries and Alerts Implement intelligent algorithms to detect unusual child movements, zone violations, or deactivated tracking, and trigger automated safety queries and emergency notifications.

4. Emergency Response Mechanisms Introduce panic button functionality and automated calling systems that immediately notify emergency contacts and law enforcement authorities.

5. Parental Digital Monitoring Tools Allow parents to monitor screen time, block harmful content, and access browsing history to ensure safe online behavior.

6. Live Video and Audio Surveillance Provide parents with the ability to stream live video and audio from the child's device for quick situational awareness.

7. Safety Analytics and Reporting Generate reports on child activity, last known locations, and high-risk zones to assist in preventive decision-making.

8. System Scalability and Security Ensure the architecture supports large-scale usage with minimal downtime while maintaining compliance with international security standards (e.g., GDPR, COPPA).

9. User-Centric Interface and Accessibility Design an intuitive mobile-first interface that is accessible to diverse users, ensuring smooth navigation and usability.

10. Continuous Feedback and Improvement Establish mechanisms for gathering user feedback, monitoring system performance, and adapting features to evolving safety challenges.

4.0 JUSTIFICATION

The increasing concerns surrounding child safety in both physical and digital environments highlight the urgent need for proactive technological solutions. With rising urban risks—such as traffic hazards, criminal activity, and online threats—traditional monitoring methods are no longer sufficient. Parents and guardians seek real-time awareness of their children's activities, and society requires systems that can prevent, detect, and respond to risks promptly.

The **Child Safety & Parental Control Application** project addresses these critical gaps by offering a technology-driven, all-in-one child safety and monitoring platform.

Purpose of the System:

The primary purpose of this system is to protect children from physical and digital threats by providing parents with real-time monitoring, instant alerts, and proactive safety controls. The system seeks to:

- Enable parents and guardians to maintain continuous awareness of their child's location and safety status.

- Provide emergency communication and rapid response mechanisms through automated alerts, panic buttons, and direct calls to trusted contacts or police.

- Offer digital safety features like screen monitoring, usage restrictions, and browsing supervision to protect children online.

- Facilitate data-driven safety decisions by analyzing real-time location data, incident trends, and environmental risks.

- Ensure compliance with privacy and child protection laws, balancing safety with ethical use of monitoring technologies.

- Support scalability and adaptability, allowing future integration with AI-driven risk detection, wearable devices, and advanced parental analytics.

Beneficiaries of the System:

1. **Children:**
   The primary beneficiaries, as the system enhances their physical and digital safety by reducing exposure to risks. It empowers them to travel, study, and engage socially with reduced fear.

2. **Parents and Guardians:**
   Gain real-time visibility and control over their children's activities, along with peace of mind knowing they can intervene instantly in emergencies.

3. **Educational Institutions:**
   Schools and universities can adopt the system to safeguard students during commutes, field trips, and on-campus activities.

4. **Law Enforcement Agencies:**
   Authorities benefit from faster notifications, access to real-time data, and actionable intelligence to respond to incidents.

5. **Technical Teams:**
   Developers, testers, and support staff benefit from a structured, maintainable, and secure system architecture designed for long-term stability.

6. **Society at Large:**
   By reducing incidents of child harm and enhancing community safety, the system contributes to societal well-being, strengthens trust in technology, and fosters a safer environment for future generations.

5.0 System Overview

The Child Safety & Parental Control Application is a mobile-based system designed to provide real-time protection and monitoring for children while giving parents effective tools to ensure safety in both physical and digital environments. It functions as a dual-role platform, where children and parents interact with the system through separate but interconnected accounts.

Child Module:
The child module runs on the child's smartphone and continuously shares **live GPS data** with the backend using the Google Maps API. It includes an **SOS panic button** for emergencies and detects unsafe behavior such as route deviations, entering high-risk "Red Zone" areas, or disabling location services. In such cases, the system issues **automated safety queries** to the child; if unanswered, it immediately escalates the alert to parents and emergency services.

Parent Module:
The parent module provides a secure mobile dashboard where guardians can view their child's current location, last-known position, movement history, and nearby police stations. Parents can also configure safety zones (Green, Yellow, Red), manage emergency contacts, and apply digital parental controls such as screen-time restrictions, app blocking, and browsing history monitoring. In critical situations, parents may access live video/audio streaming to verify their child's safety in real time. The system ensures that parents receive instant notifications and escalation alerts whenever unusual activity is detected.

Backend & Intelligence Engine:
The backend acts as the core processing hub, handling GPS and activity data, classifying areas into safety zones based on crime records, traffic density, and community input. It manages protection queries, escalation workflows, and encryption, while enforcing role-based access control to ensure data confidentiality and privacy

Communication & Notification System:

The application leverages Firebase Cloud Messaging (FCM) for push notifications, guaranteeing real-time delivery of alerts. In emergencies, the system triggers sequential phone calls to multiple emergency contacts and, if required, directly connects to local authorities (e.g., 999). This ensures parents are notified within seconds of a potential threat.

Administrative Oversight:

An admin dashboard allows system administrators to oversee platform performance, review activity logs, and conduct security audits. This layer guarantees compliance with privacy policies and maintains overall system reliability.

Key Integrated Features:

- Dual-role access for parents and children
- Live GPS tracking with safety zone classification
- Automated danger detection and escalation
- SOS panic button with secure cancellation option
- Parental controls: screen-time, content filtering, browsing reports
- Live video/audio streaming for emergencies
- Strong encryption and data privacy safeguards
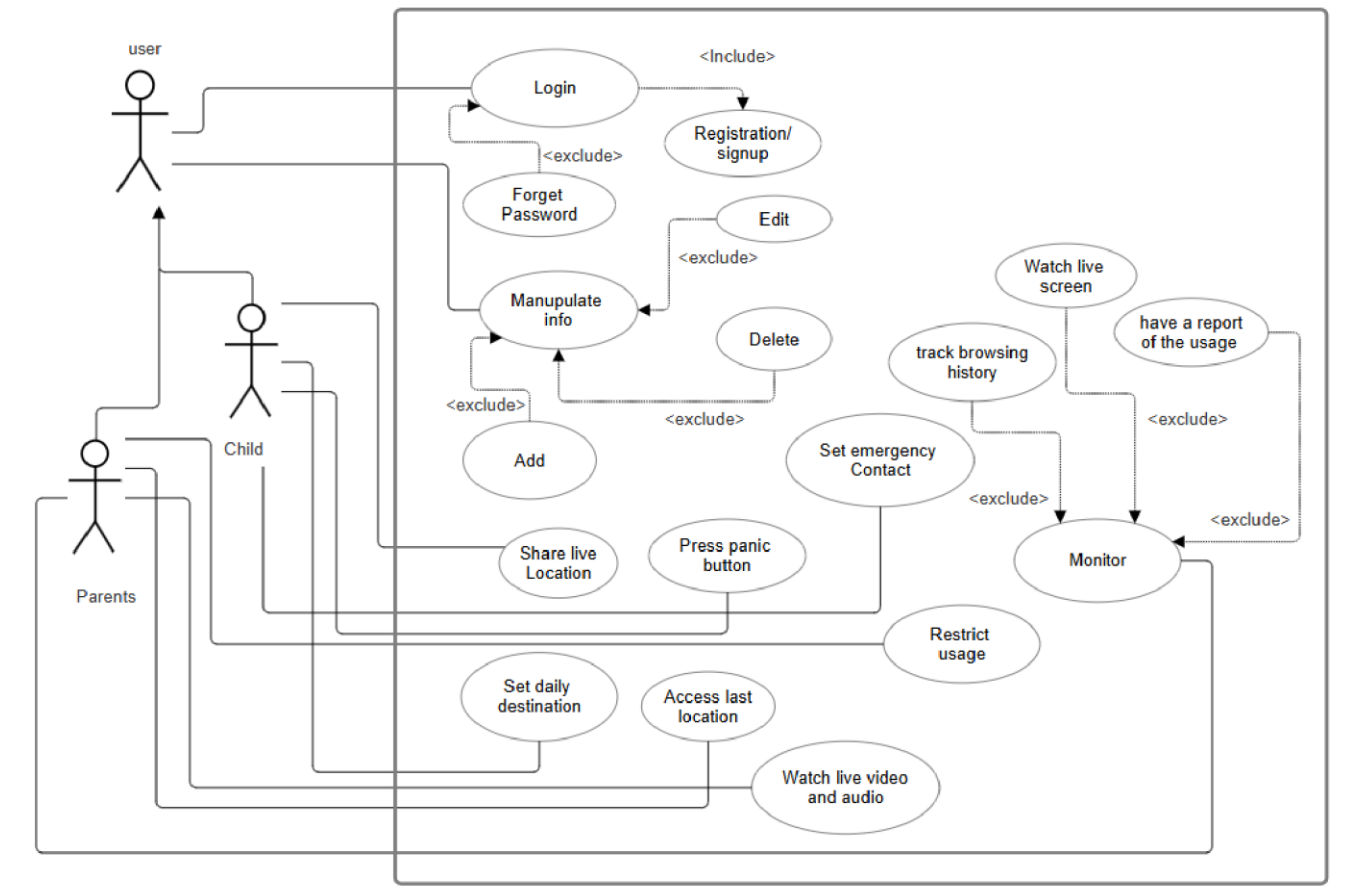- Real-time alerts and emergency calling workflow

Use Case Diagram:

Fig 1: Use case diagram

6.0 STAKEHOLDERS ANALYSIS

Stakeholder Group	Category	Expectations
Parents / Guardians	External – Primary	Monitor children's location and activities, receive safety alerts, configure safety zones and parental controls, view activity reports, and communicate during emergencies.
Children	External – Primary	Use the app for safety monitoring, respond to safety queries, trigger SOS panic button, and share real-time location securely.

Law Enforcement Staff	External– Secondary	Receive automated emergency alerts, access location data for rapid response, and coordinate with parents or guardians in high-risk incidents.
Technical Support Staff	Internal – Secondary	Maintain system performance, deploy updates and patches, troubleshoot issues, and provide user support.
Project Manager	Internal – Secondary	Oversee project lifecycle, coordinate teams, manage risks and schedules, and ensure stakeholder requirements are met.
IT Security Team	Internal – Secondary	Enforce authentication and privacy policies, secure data storage, monitor for breaches, and apply preventive security measures.
System Administrators	Internal – Secondary	Manage user accounts and configurations, monitor logs, maintain servers and databases, and ensure compliance with privacy standards.

7.0 Feasibility Study

Before initiating the full-scale development of the Child Safety & Parental Control Application Child Safety Application, a comprehensive feasibility study is necessary to evaluate the practicality, sustainability, and overall success potential of the proposed solution. This section assesses both technical and financial feasibility to ensure that the project can be executed effectively with available resources, infrastructure, and anticipated outcomes.

7.1 Technical Feasibility

Technical feasibility focuses on assessing the technology stack, infrastructure, and technical expertise required to develop, deploy, and maintain the system. It ensures that the current technological ecosystem can support the application's requirements.

7.1.1 Technology Availability

- **Frontend Technologies**: Android Studio (Kotlin/Java) and Flutter for cross-platform deployment. These frameworks provide modern UI components, smooth rendering, and responsive design suitable for mobile applications.
- **Backend Technologies**: Firebase (Realtime Database) or Node.js with Express.js to handle real-time data, live tracking, and notification systems. Firebase Authentication will secure user access.
- **Database Systems**: Firebase Realtime Database will be used for storing user data, locations, emergency contacts, and historical records with high scalability.
- **Third-Party APIs**: Google Maps API for real-time location visualization, geofencing, and safe route suggestions.

- **Version Control**: GitHub/GitLab for collaboration, source control, and CI/CD integration.

7.1.2 Infrastructure Readiness

- **Server Requirements**: Cloud-based hosting (Firebase, Google Cloud, or AWS) capable of supporting thousands of concurrent users, ensuring availability and performance.
- **Device Requirements**: The system is mobile-first, compatible with Android and iOS smartphones. Parents and children can use the application without additional hardware dependencies.
- **Cross-Platform Accessibility**: The application can be extended to web dashboards for parents in future releases.

7.1.3 Developer and Resource Competency

- The project team consists of Android developers, backend engineers, QA testers, UI/UX designers, and project managers experienced with mobile app development.
- The team is skilled in Firebase integration, Google Maps API usage, and security protocols, minimizing the learning curve.
- Ample documentation, SDKs, and online resources for Firebase and Android frameworks support the team's efficiency.

7.1.4 Security and Compliance

- SSL/TLS encryption for secure communication between the app and servers.
- Role-based access (parents vs. children) to control data visibility.
- End-to-end encryption for live video and audio streaming.
- Compliance with local child protection laws and international privacy standards (e.g., GDPR, COPPA) to safeguard minors' data.

7.2 Financial Feasibility

Financial feasibility determines whether the project is economically viable by analyzing development costs, operational expenses, and the potential return on investment (ROI).

7.2.1 Estimated Development Cost

A preliminary budget of **BDT 3,50,000** is estimated as follows:

Task	Estimated Cost (BDT)
Requirement Analysis	40,000
System Design	55,000
Frontend Development (3 Dev x 4 month)	60,000
Backend Development (5 Dev x 4 month)	1,00,000
Testing & Debugging	60,000
Deployment & Documentation	35,000

These costs cover developer salaries, cloud hosting, Google Maps API usage, and administrative expenses.

7.2.2 Infrastructure and Hosting Costs

- Firebase Hosting and Google Cloud Services offer scalable pay-as-you-go pricing.
- Estimated monthly operational cost: BDT 4,000–6,000, covering hosting, notifications (Firebase Cloud Messaging), and database storage.

7.2.3 Human Resource Costs

- Core team of **6–7 members**: 2 Android developers, 1 backend engineer, 1 UI/UX designer, 1 QA tester, 1 project manager, and 1 system administrator.
- Agile development helps reduce wasted effort, optimizing costs.

7.2.4 Return on Investment (ROI)

Although the app's primary goal is social good rather than direct profit, its indirect ROI includes:

- **Enhanced child safety**, reducing crime risks and giving parents peace of mind.
- **Institutional benefits** for schools and communities adopting the solution.
- **Long-term scalability** by integrating premium parental features (subscription model).
- **Reduced dependency** on manual safety practices by using AI-based real-time alerts.

7.2.5 Funding Sources

- Government grants or child safety initiatives.
- NGO and non-profit organization funding.
- Institutional adoption by schools or communities.
- Future premium subscription services for advanced parental monitoring features.

8.0 System Components

The **Child Safety & Parental Control Application** system is composed of several interconnected modules that collectively ensure real-time child safety monitoring, emergency responsiveness, parental control, and secure communication. These components are categorized based on their roles and responsibilities, including user management, location tracking, emergency handling, parental monitoring, and security. Breaking the system into components ensures modularity, maintainability, scalability, and efficient feature enhancement.

8.1 User Management Component

This component manages all aspects of user access, authentication, and account personalization. **Key Features:**

- User registration and login (with email/phone).

- Profile creation with personal details and secure password rules.
- Role-based access (Parent, Child).
- Password recovery and verification.
- Two-factor authentication (optional).
- Session and token management.

Associated Roles:

- Parents, Children, Admins.

8.2 Location & Map Component

Handles real-time location services, safe zone categorization, and navigation.
Key Features:

- Live map displaying child and parent locations.
- Red/Yellow/Green zone categorization based on safety data.
- Integration with Google Maps for navigation.
- Highlighting nearest police stations and safe areas.
- Last location tracking in case of network or device shutdown.

Associated Roles:

- Parents, Children.

8.3 Live Location Sharing Component

Enables continuous tracking and sharing of child's location with parents.
Key Features:

- Real-time GPS location sharing.
- Background tracking for uninterrupted updates.
- Route deviation alerts if a child goes off the daily destination path.
- Location history for parental review.

Associated Roles:

- Parents, Children.

8.4 Emergency Detection & Automated Query Component

Detects unusual activity and triggers safety checks.
Key Features:

- Detects entry into Red/Yellow zones.
- Sends automated queries ("Are you safe?") to the child.

- Escalates to parents if the child does not respond.
- Detects tampering (location off, app deactivated).

Associated Roles:

- Parents, Children.

8.5 Automatic Calling & Notification Component

Ensures rapid emergency communication.
Key Features:

- Automatic notification to parents in danger situations.
- Sequential calls to 5 emergency contacts until answered.
- Direct call to nearest police station (999) if contacts are unavailable.
- Instant push alerts for parents.

Associated Roles:

- Parents, Emergency Contacts, Police.

8.6 Panic Button Component

Provides children a quick way to call for help.
Key Features:

- On-screen panic button for instant activation.
- Auto-call and alert dispatch to emergency contacts.
- Stop button with password entry to cancel false alarms.
- Automatic location sharing with police.

Associated Roles:

- Children, Parents.

8.7 Emergency Contact Component

Manages critical contact information.
Key Features:

- Add up to five emergency contacts.
- Verification of contact numbers
- Editable and updatable contacts with password verification.
- Prioritized call sequence (Parents → Relatives → Others).

Associated Roles:

- Parents, Children.

8.8 Daily Destinations Component

Helps parents predefine safe travel routes.
Key Features:

- Set daily destinations (school, tuition, playground).
- Alerts when a child deviates from set destinations.
- Route suggestions via safe zones.

Associated Roles:

- Parents, Children.

8.9 Child Monitoring Component

Allows parents to supervise digital activities of children.
Key Features:

- Browsing history monitoring.
- Live screen sharing.
- Screen-time reports (per app and overall usage).
- Restriction alerts for unsafe websites.

Associated Roles:

- Parents.

8.10 Live Video & Audio Component

Provides parents remote access for visual and audio monitoring.
Key Features:

- Parents can activate child's camera and microphone.
- One-way video/audio streaming for safety.
- Secure storage of recordings.
- Access restricted only to authorized parents.

Associated Roles:

- Parents, Children.

8.11 Usage Restriction Component

Helps parents manage digital wellness.
Key Features:

- Restrict access to unsafe websites and apps.
- Set daily screen time limits.
- Phone auto-lock after defined hours.
- Social media usage control.

Associated Roles:

- Parents, Children.

8.12 Reporting & Analytics Component

Generates reports and insights from system usage.
Key Features:

- Child's travel history and visited locations.
- Screen-time analysis.
- Safety alerts summary.
- Downloadable reports for parental records.

Associated Roles:

- Parents, Admins.

8.13 Security & Compliance Component

Ensures user safety, privacy, and data compliance.
Key Features:

- End-to-end encryption for video, audio, and location data.
- GDPR/COPPA compliance for child data protection.
- Secure authentication with strong password policies.
- Role-based access controls.

Associated Roles:

- Parents, Admins, IT Security.

9.0 Process Model to be Followed

For the development of the **Child Safety & Parental Control Application** child safety application, the Scrum framework of Agile Software Development has been selected. This choice is based on the evolving and dynamic requirements of safety applications, the need for real-time responsiveness, and the importance of continuous collaboration with stakeholders (parents, children, and safety authorities).

Why Scrum (Agile Framework)

- **Continuous Feedback Integration:**
  Scrum ensures frequent interaction with stakeholders (parents, children, and law enforcement). This allows for real-time feedback and adjustments to core features such as emergency notifications, automated protection queries, and live location tracking.
- **Incremental Delivery:**
  Instead of waiting for the entire application to be built, functional modules like live location sharing, panic button, and emergency calling can be developed and delivered in sprints (2–3 weeks). Parents can test features early and provide feedback, ensuring the solution evolves to meet real safety needs.
- **Flexibility & Adaptability:**
  Child safety requirements are dynamic and may evolve with new technologies, safety regulations, or user expectations. Scrum allows changes in requirements at any stage without disrupting the overall project flow.
- **Enhanced Quality:**
  With testing integrated into every sprint, issues such as false alarms, location inaccuracy, or privacy vulnerabilities can be detected and resolved early, ensuring a high-quality, reliable safety application.
- **Team Collaboration & Transparency:**
  Daily stand-up meetings, sprint reviews, and retrospectives promote close collaboration among developers, testers, and stakeholders, ensuring that progress is transparent and obstacles are quickly addresse

Comparison of Software Development Process Models

Criteria	Agile (General)	Scrum (Agile Framework)	Waterfall	Lean
Continuous delivery	✔	✔ (via Sprints)	✖	✔
Fixed-length iterations	✔ (varies)	✔ (2–4 weeks)	✖	✖
Sequential approach	✖	✖	✔	✖
Adapts to evolving needs	✔	✔	✖	✔
Risk management	Medium	High (per Sprint)	Low	Medium
Best suited for	Changing projects	Complex, dynamic projects	Static needs	Process efficiency

Model Overviews and Suitability

- **Agile (General):**
  Iterative and incremental approach emphasizing flexibility, continuous delivery, and stakeholder involvement. Good for evolving requirements, but broad in scope.
- **Scrum:**
  A structured Agile framework with defined roles (Product Owner, Scrum Master, Development Team) and ceremonies (Sprint Planning, Daily Stand-ups, Reviews, Retrospectives). Ideal for complex projects like *Child Safety & Parental Control Application* where frequent updates and safety-critical features demand structured agility.
- **Waterfall:**
  Linear and sequential. Suitable for projects with fixed requirements. However, its rigidity makes it unsuitable for child safety applications where requirements may change due to evolving risks or technology.
- **Lean:**
  Focuses on eliminating waste and maximizing value. While efficient, it lacks structured iteration and user-centered feedback cycles needed for safety-critical systems.

Why Scrum is the Best Fit for This Project

- **Evolving Requirements:**
  Child safety applications must adapt quickly to new threats, law enforcement integrations, or parental feature requests. Scrum allows flexibility in incorporating these changes.
- **User-Centric Development:**
  Parents' feedback is central to shaping features like emergency contacts, monitoring tools, and safe zones. Scrum ensures these inputs are continuously integrated.
- **Frequent Releases:**
  Minimum viable features (MVP) like live tracking, panic button, and emergency notifications can be deployed early, while advanced features like screen monitoring or predictive analytics are added in later sprints.
- **Risk Management:**
  Short sprint cycles reduce the risk of system failure by identifying issues early, such as inaccurate GPS tracking or delayed notifications.
- **Team Collaboration:**
  Developers, testers, and stakeholders collaborate closely, ensuring every sprint delivers tangible value toward child safety.

Justification

- Scrum supports iterative development with continuous parental and stakeholder feedback.
- It ensures incremental delivery of core features (panic button, automated danger detection, live video/audio monitoring).
- It is flexible and adaptive to evolving safety standards and parental concerns.
- Built-in continuous testing enhances reliability and security, which are critical for child safety.
- Unlike Waterfall's rigidity or Lean's narrow scope, Scrum balances structure with adaptability, making it the most suitable model for this project.

10.0 EFFORT ESTIMATION

By using the Constructive Cost Model. Based on an estimated size of 12 KLOC (thousand lines of code), the required development effort is approximately 32.61 person-months

Project Type: Organic
Estimated size: 12 KLOC (12,000 lines of code)
Effort (E): $2.4 \times (12)^{1.05} \approx 32.61$ person-months
Time (T): $2.5 \times (32.6)^{0.38} \approx 2.5 \times 3.32 \approx 9.3$ months
Available Duration: 16 weeks (~ 4 months)
Developer's monthly salary: BDT 20,000.
To meet the 16-week deadline, a team of at least 8 full-time developers is necessary

Human Resource Requirements for Operation

Role	Count	Responsibilities
System Administrator	1	System setup, maintenance, user control
Frontend Mobile App Developers	5	Design, coding
Backend Mobile App Developer	6	Coding, deployment
Requirement Analyst	2	Interface design and user experience testing
QA Tester	2	Testing and bug reporting
Support Staff	1–2	User support and training

11.0 ACTIVITY DIAGRAM
Activity Network Diagram:

Activity List with Dependencies:

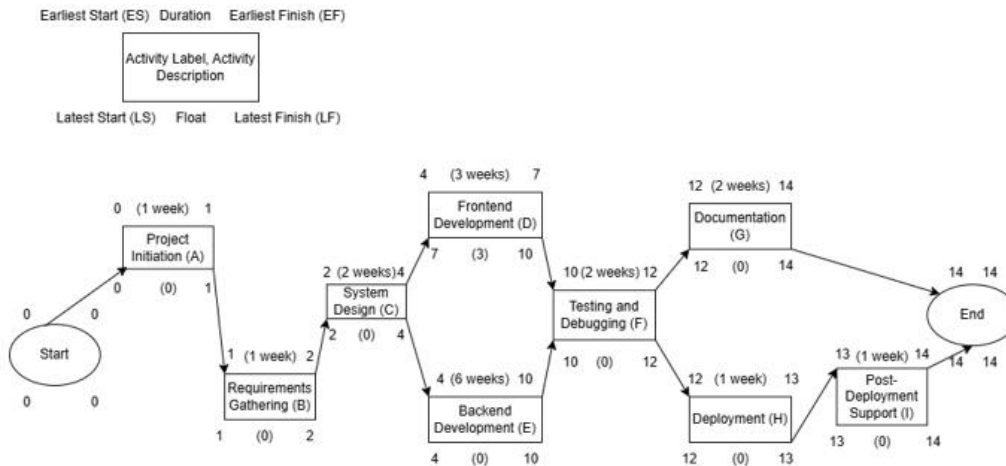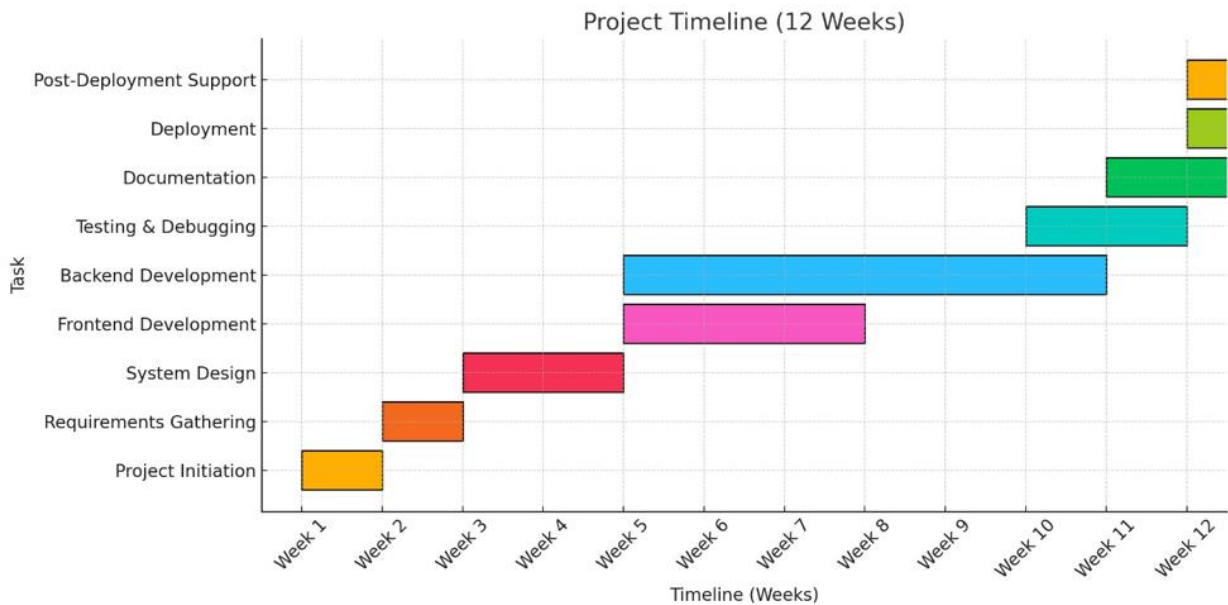| Activity ID	Task	Predecessor(s)
A	Project Initiation	—
B	Requirements Gathering	A
C	System Design	B
D	Frontend Development	C
E	Backend Development	C
F	Testing & Debugging	D, E
G	Documentation	F
H	Deployment	F
I	Post-Deployment Support	H

Fig 2: Activity Network Diagram

Gantt Chart:

12.0 RISK ANALYSIS

Risk Factor	Possibility	Impact	Risk Category	Mitigation Plan
Requirement Creep	High	High	Scope Risk	Freeze requirements post-SRS; implement strict change request process
Developer Unavailability	Medium	High	Resource Risk	Cross-training, assign backups, maintain documentation

Data Breach	Low	High	Security Risk	Use encrypted data storage, HTTPS, 2FA, secure authentication
Tech Stack Incompatibility	Medium	Medium	Technical Risk	Perform early technology stack validation via prototype
Server Downtime	Medium	High	Infrastructure Risk	Use cloud services with 99.9% SLA; enable monitoring and auto-restart
Server Downtime	Medium	High	Infrastructure Risk	Use cloud services with 99.9% SLA; enable monitoring and auto-restart
Miscommunication with Stakeholders	Medium	Medium	Communication Risk	Weekly meetings, shared dashboards, clear documentation
Inadequate Testing	Medium	High	Quality Risk	Establish QA strategy early; automate unit/integration testing
Compliance Violations	Low	High	Legal/Regulatory Risk	Ensure all data policies follow GDPR/local laws
Budget Overrun	Medium	High	Financial Risk	Include 10-15% buffer; perform weekly financial reviews
Project Timeline Delay	Medium	High	Time Risk	Apply buffer to sprints; track milestones using Gantt & Jira
Third-party API Failure	Low	Medium	Dependency Risk	Use alternatives or caching fallback logic
Underestimated Scope	Medium	High	Planning Risk	Review scope with stakeholders; add contingency scope buffer
Key Member Resignation	Low	High	HR Risk	Create documentation and peer handovers
API Integration Challenges	Medium	Medium	Technical Risk	Test external APIs in staging early; have mock services ready
Performance Bottleneck	Medium	Medium	Performance Risk	Use load testing tools, profile bottlenecks, scale backend properly

Hosting Cost Increase	Low	Medium	Financial Risk	Estimate based on usage; monitor resource usage monthly
Ineffective Testing Strategy	Medium	High	QA Risk	Include test planning in early design phase; conduct end-to-end testing
Limited User Feedback During Testing	Medium	Medium	Validation Risk	Conduct surveys and collect feedback in sandbox environments
Toolset Incompatibility	Medium	Medium	Technical Risk	Select tools after pilot testing and team consensus
Unexpected Legal Restrictions on Data Storage	Low	High	Compliance Risk	Store data in local jurisdiction; review local data laws before deployment
Overlapping Roles Causing Confusion	Medium	Medium	Role Risk	Define RACI matrix (Responsible, Accountable, Consulted, Informed)
Low Quality of Uploaded Learning Materials	Medium	Medium	Content Risk	Introduce content review and approval workflow
Hosting Cost Increase	Low	Medium	Financial Risk	Estimate based on usage; monitor resource usage monthly
Data Loss / Corruption	Low	High	Data Risk	Enable database backups; implement integrity checks
UI/UX Complexity Confusing Users	Medium	Medium	Design Risk	Apply minimalist UX patterns; collect early usability feedback
High Churn of Temporary Users	Medium	Low	Operational Risk	Automate deactivation/removal of inactive accounts
UI Inconsistencies Across Modules	Medium	Low	UX Risk	Define and enforce a UI Style Guide and reusable components

13.0 BUDGET:

Our fee for the entire development of the project, from planning to final deployment, is **4,50,000 BDT**. The breakdown is provided below:

Task	Estimated Cost (BDT)
Requirement Analysis	40,000
System Design	55,000
Frontend Development (5 Dev x 4 month)	1,00,000
Backend Development (7 Dev x 4 month)	1,40,000
Testing & Debugging	80,000
Deployment & Documentation	35,000

14.0 CONCLUSION

The Child Safety & Parental Control Application project stands as a comprehensive initiative that bridges technology and social responsibility to safeguard children in today's fast-changing world. Through the integration of real-time monitoring, automated alerts, and intelligent risk assessment, the system offers a proactive approach to child safety, ensuring peace of mind for parents and guardians. The adoption of the Scrum process model enabled flexibility, collaboration, and continuous improvement throughout the development cycle, making the project adaptive to changing needs and future enhancements.

Careful stakeholder analysis, feasibility studies, and structured risk management further ensured that the project remained both realistic and sustainable. Beyond its technical achievements, this project reflects the power of effective project management in transforming ideas into impactful solutions. By aligning innovation with ethical responsibility, Child Safety & Parental Control Application not only addresses an urgent societal concern but also establishes a framework for future advancements in safety-focused technologies.