iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 13 **Issue:** IV **Month of publication:** April 2025

DOI: https://doi.org/10.22214/ijraset.2025.68589

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 13 Issue IV Apr 2025- Available at www.ijraset.com

Human Safety Application

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Abstract: ***Thisprojectintroducesaninnovativeandroidapplicationdevelopedtoenhancepersonalsafety throughavarietyof critical features. The applicationincludesvoice-activatedemergencyassistance,di- rect access to local emergency services, route management for safer navigation, audio recording capa- bilitiesduringemergencies, andarepositoryof educationalresourcesaime datraisingsafetyawareness. Utilizing the Flutter framework and Dart programming language, the application aims to deliver an in- tuitive and responsive user experience, facilitating immediate support and information during critical situations. Byintegratingtechnologywithusercentricdesign,thisapplicationseeksnotonlytoprovideatoolforemergencyresponsebutalsotopromot eacultureofsafetyandpreparednessineverydaylife.***

Keywords: Personal Security, Real-Time Location Tracking, SOS Button, Discreet Voice Recording, Emergency Contacts, Law Enforcement Directory, User Empowerment.

I. INTRODUCTION

Inaneramarkedbyincreasingconcernsoverpersonal safety,thedemandforeffectivesolutionstoprotectin- dividualshasneverbeengreater. Emergenciescanoc- cur at any moment, often with little warning, makingit essential for people to have access to timely assis- tance.Statistics reveal that quick access to emergency services can significantly reduce the severity of inci- dents,makingitimperativetocreatetoolsthatenhance this accessibility.This project addresses this pressing need through the development of a comprehensive ap- plication that empowers users with various safety fea- tures.Byintegratingvoiceactivation,directserviceac- cess,andinformativeresources,theapplicationaspires to provide a holistic safety solution that can be easily accessed during stressful situations.

II. LITERATURE SURVEY

Severalstudieshaveexploredtechnologicalsolu- tions to enhance the safety and security of vulnera-ble populations.Dhana Lakshmi and Gayatri [5] pro- posed a system designed to provide a quick response forwomenfacingharassment,wherepressingabutton sendslocationinformationviaSMS.Thissystemincor-poratescomponentslikeaGPSmodule,GSMmodem, andabuzzertoalertpeoplenear by. Theincreasingrate ofcrimesagainstwomen,especiallyemployedwomen, has motivated the development of such systems.

In 2018, Vani, Purohit, and Tiwary [4] detailed a smarttechniqueforwomenandchildren'ssecuritythat uses GPS for location tracking and SMS alerts.Their systemaimstoprovidesecuritybyenablingwomenor children to activate GPS tracking and send SMS alerts to police and contacts in emergencies.These systems ofteninvolveequippingindividualswithadiscreetde- vice containing a GPS module.

Bonde.S [6] reviewed various techniques for women'ssafetyandsecurity,notingthatdespitetechno- logical advancements, creating a safe environment for womenremainsachallenge.

Womenfaceharassment in public and workplaces, highlighting the need for ef- fective safety measures.

Zutshi.S [7] introduced a mobile application fo- cused on improving women's safety by addressing the issue of slow police response times.The application aimstoprovideameansforwomentoreachthepolice discreetly and efficiently.

In2021,DaSilvaCosta[3]presentedtheWomen's Health Observer Tool (WHOT), a tool designed to as- sistwomenvictimsofviolence. WHOTbuildspsycho- behavioral profiles using facial expression recognition and digital questionnaires to assess intimate partner violence, adverse childhood experiences, and post- traumaticstressdisorder.Facialexpressionrecognition withinWHOTisbasedontheworkofPaulEkmanand the Facial Action Coding System (FACS).

Rodriguez. D.A[1]conductedasystematicreview of computer science solutions for addressing violence against women and children.They categorized solu- tionsintoonlinedetection(e.g.,cyberbullying),offline detection, safety systems, and education, highlighting theuseoftechnologieslikeAIandIoT.Thereviewem- phasizesthatviolenceagainstwomenandchildrenisa significantpublichealthissue, withwomenexperienc- ing physical, emotional, or sexual violence.

Shenoy.M. V [2] proposed a holistic framework forcrimeprevention,response,andanalysis,emphasiz- ing women's safety.

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Their approach integrates crime analysis using GIS, crime prevention strategies, and emergency response, leveraging community participa- tion.Theyhighlightthatwhiletechnologicalsolutions exist, integrating them with societal intervention and crime analysis is crucial for effective women's safety management.

III. PROPOSED SYSTEM

Theproposedsystemisdesignedasamultifaceted applicationthatencompassesavarietyofessentialfea- tures aimed at improving user safety.Key functionali- ties include:

1) Voice Activation:

The application will utilize advanced speech recogni- tion technology to activate when it detects the phrase "Help, help, help." Upon activation, it will automati- cally dial pre-saved emergency contacts and share the user's real-time location with them.This feature aims toprovideimmediateassistance,eveniftheuserisun- abletointeractwiththeirdeviceduetopanicorinjury.

2) EmergencyServiceAccess:

Users will have direct access to local emergency ser- vicessuchaspolice,ambulance,andfirebrigades. The appwillstreamlinecommunicationwiththeseservices, allowing users to connect with them through a single tap.This feature is particularly crucial in situations where every second counts.

3) RouteManagement:

The application will allow users to save and manage theirfrequentlytraveledroutes. Thisfunctionalitywill enable users to navigate safely and avoid high-risk ar- eas.By utilizing GPS technology, the app can also provide alerts if the user deviates from their scheduled route.

4) AudioRecording:

In emergency situations, users may need to document events for legal or personal reasons.The application will include an audio recording feature that activates during emergencies, capturing critical audio evidence for later review.This feature can be vital in cases in- volving disputes or legal proceedings.

5) EducationalResources:

To promote safety awareness, the application will fea- ture a section dedicated to safety blogs and curated YouTubevideos.Theseresourceswillcovertopicssuch as personal safety tips, emergency preparedness, and first-aidprocedures,empoweringuserswithknowledge that can help them in various situations.

IV. OBJECTIVES

Theprimaryobjectivesofthisprojectareasfol-lows:

1) User-CentricDevelopment:

Tocreateanintuitiveanduser-friendlyapplicationthat prioritizes personal safety in its design and functional- ity.Ensuring that the application is easily navigable, especially under stress, is essential.

2) IntelligentMonitoring:

To understand a machine learning-based system capa- ble of detecting speed and recognizing through real- timevideoprocessing. Alsoexploringtechniquessuch asimagepreprocessing,edgedetection,andOCRareemployedtohelpenforcetrafficregulationsandreduce road accidents [9].

3) SeamlessCommunication:

To facilitate direct communication with local emer- gency services, ensuring users can reach out for help with minimal effort and time [7].

4) EducationalOutreach:

To provide users with access to valuable educational content that informs them about safety practices, en- hancing their preparedness for potential emergencies.

5) BiometricSecurityEnhancement:

To study ATM security and user authentication which isdonebyanalysingintegrationofConvolutionalNeu- ral Networks (CNNs) into biometric systems.That aimed to minimize spoofing and identity fraud while improving verification precision and operational scal- ability [8].

6) RobustEmergencyFeatures:

Toimplementareliablereal-timelocation-sharingfea- turethatactivatesduringemergencies, enablingusersto providetheirex actwhere aboutstoemergencycontacts [4].

V. SYSTEM ARCHITECTURE

The architecture of the proposed system is designed to ensure efficiency, reliability, and user engagement.It consists of several components:

1) Client-Side Application:Built with Flutter, the client-side application will offer a responsive and interactive user interface.Flutter's framework allows for cross-platform compatibility, ensuring that the application functions seamlessly on both Android and iOS devices.
2) BackendServices: ThebackendwillhandleAPI requests for emergency contacts, location services, andaudiorecordings.Utilizingcloudserviceswill ensurethatdataissecurelystoredandeasilyacces- sible [9] .
3) Database Management:A secure cloud-based database will be employed to store user profiles, saved routes, and resource links.This setup will facilitate efficient data retrieval and management [8].

VI. IMPLEMENTATION

Theimplementationphaseencompassesseveral critical steps to bring the application to life:

1) DevelopmentEnvironmentSetup:

InitialstepsinvolvesettinguptheFlutterdevelopment environment and integrating necessary packages for voice recognition and audio recording functionalities. Thisincludesconfiguringlibrariesthatcanhandlereal- time audio input.

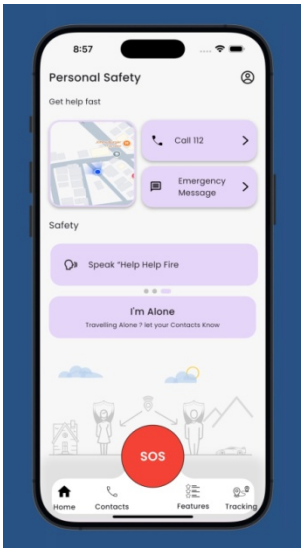


Figure1:HomePage

2) UserInterfaceDesign:

Theuserinterfacewillbedesignedwithafocusonsim- plicity and ease of use.A minimalist design approach willensurethatuserscanquicklyaccessfeatureswith- out unnecessary distractions during emergencies [8].

3) BackendFunctionalityDevelopment:

APIswillbedevelopedtomanageemergencycontacts and audio recordings, ensuring that these services are robust and secure.The backend will also handle loca- tiontrackingandroutingfunctionalities,requiringcare- ful attention to data accuracy and reliability [9].

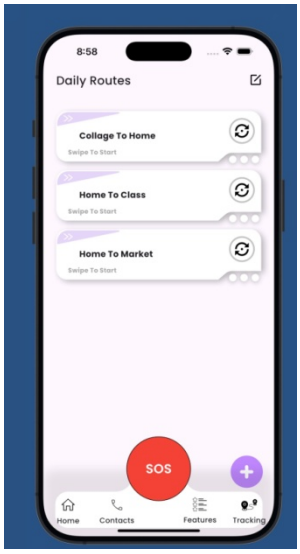


Figure2:DailySavedRoutes

4) TestingandQualityAssurance:

Comprehensive testing will be conducted to identify andresolvebugs,ensuringthatallfunctionalitieswork seamlessly.Testing will include user scenarios simu- lating real emergencies to validate the effectiveness of voicerecognitionandemergencyserviceconnectivity.

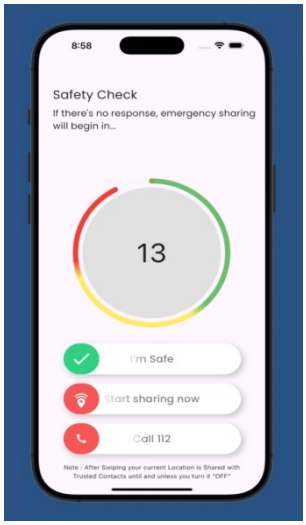


Figure3: EmergencySystem

VII.RESULTS AND FUTURE SCOPE

Uponcompletionofthetestingphase,theapplicationdemonstratedahighsuccessrateindetectingvoicecommandsandsuccessfullycontactin gemergencyser- vices.User feedback was overwhelmingly positive, particularly regarding the ease of use and the stream- lined access to critical features.

Theaudiorecordingfeaturewasrecognizedaspar- ticularlyvaluable,providingusers withameanstodoc- ument emergencies for future reference.Additionally, theroutemanagementfunctionality[9]waspraisedfor enhancinguserconfidencewhiletraveling,especiallyin unfamiliar areas.

Despitethesuccesses,somechallengeswereidenti- fied.Forinstance,variationsinvoiceclarityandback- ground noise can affect the accuracy of the voice ac- tivation feature.Future enhancements may include re- finingthevoicerecognitionalgorithmstoimproveper- formance in various conditions, as well as considering theintegrationofadditionalsafetyfeatures[8],suchas automatic alerts based on unusual user behavior.

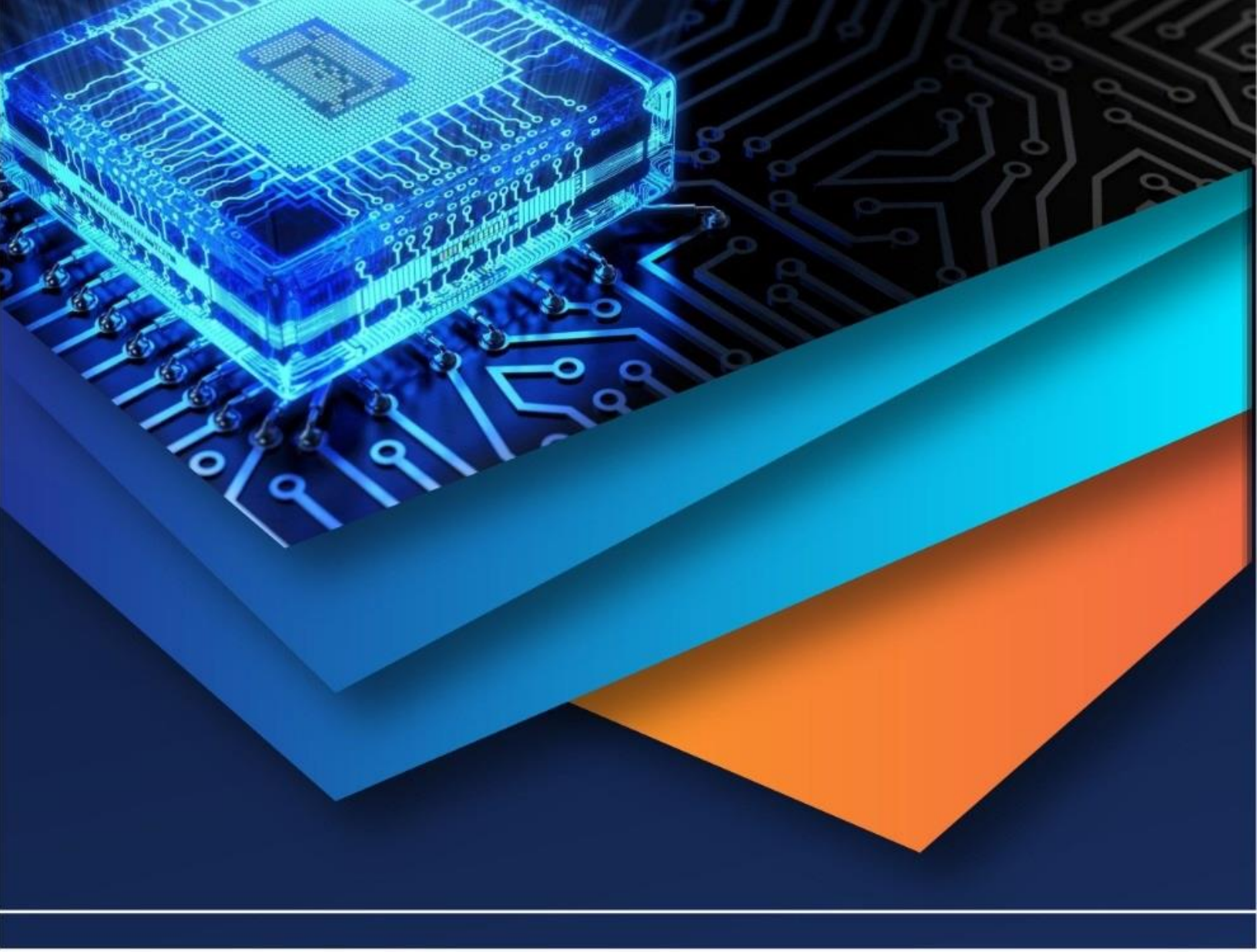
VIII. CONCLUSION

This project successfully illustrates the potential of a comprehensive personal safety application.By integrating a range of critical features into a single, cohesiveplatform,theapplicationaddressessignificant gaps in existing solutions and caters to the evolving needs of users seeking safety and security.As emer- genciescanhappenunexpectedly,theabilitytorespond quicklycanmakeasignificantdifferenceinoutcomes. Continued development, iterative improvements, and user feedback will be crucial in enhancing the appli- cationâs effectiveness and broadening its user base. Ultimately, this application aims not only to assist individualsinemergenciesbutalsotofosteraproactive approach to personal safety.

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