International Journal of Advanced Research in Science, Engineering and Technology

Vol. 12, Issue 12, December 2025

ISSN: 2350-0328

IMPACT FACTOR 7.150

Companio:- AI-Powered Caretaker Management and Assistance Android App

Nehal Bhor, Sanjivani Kavathekar, Kartiki Joshi, Vaishnavi Shingare , Gayatri Mujumdar

Student, Department of Computer Engineering, Pimpri Chinchwad Polytechnic, Pimpri Chinchwad, Maharashtra, India
Student, Department of Computer Engineering, Pimpri Chinchwad Polytechnic, Pimpri Chinchwad, Maharashtra, India
Student, Department of Computer Engineering, Pimpri Chinchwad Polytechnic, Pimpri Chinchwad, Maharashtra, India
Student, Department of Computer Engineering, Pimpri Chinchwad Polytechnic, Pimpri Chinchwad, Maharashtra, India
Department of Computer Engineering, Pimpri Chinchwad Polytechnic, Pune, Maharashtra, India

ABSTRACT: The growing demand for reliable and transparent caregiving services has highlighted the need for a secure, intelligent, and user-friendly digital platform that connects families with verified caretakers. This project presents the design and development of a Caretaker Service Android Application, implemented using Java/XML for the frontend and Firebase Real-time Database with Firebase Cloud Storage for backend data management and document handling.

The application provides secure email-password–based authentication for families and caretakers, along with comprehensive profile management where caretakers can upload identity and qualification documents while families specify care requirements. A powerful search and filtering mechanism enables families to discover suitable caretakers based on skills, availability, and location. The platform supports job posting, applications, booking, and calendar-based scheduling, ensuring structured service coordination with automated reminders.

Integrated WhatsApp-based communication facilitates real-time interaction, while the payment and billing module supports UPI, cards, wallets, and refund handling for transparent transactions. To enhance trust, the system includes a two-way rating and review mechanism. Safety is prioritized through an SOS emergency feature, GPS tracking, and real-time admin alerts.

An admin dashboard oversees user management, bookings, disputes, and complaints through a ticketing system. Advanced AI-based fraud and risk detection evaluates caretaker behaviour and generates trust scores, while AI-driven dynamic pricing and scheduling optimizes service costs based on demand patterns. Overall, the proposed system delivers a scalable, secure, and intelligent caregiving platform that improves service quality, safety, and operational efficiency in the digital healthcare and home-care ecosystem.

KEY WORDS: Caretaker Service App, Android Application, Java/XML, Firebase Real-time Database, Cloud Storage, Booking & Scheduling, Digital Payments, SOS & GPS Tracking, AI Fraud Detection, Smart Caregiving Platform.

I.INTRODUCTION

In recent years, the demand for professional caretaker services has increased significantly due to factors such as urbanization, nuclear family structures, aging populations, and busy work lifestyles. Families often face challenges in finding reliable and verified caretakers for elderly care, child care, and patient assistance. Traditional methods such as local agents or word-of-mouth referrals lack transparency, security, and accountability, leading to issues related to trust, service quality, and safety.

With the widespread adoption of smartphones and mobile internet, digital platforms have emerged as an effective solution to bridge the gap between service providers and service seekers. Android-based applications, in particular, offer accessibility, real-time interaction, and scalability. However, existing caretaker platforms often

International Journal of Advanced Research in Science, Engineering and Technology
Vol. 12, Issue 12, December 2025
ISSN: 2350-0328
IMPACT FACTOR 7.150

fail to provide integrated features such as secure verification, structured booking, emergency support, and intelligent monitoring mechanisms.

The Caretaker Service Android Application is designed to address these limitations by offering a secure, centralized, and user-friendly system for managing caretaker services. Developed using Java/XML, the application leverages Firebase Realtime Database for instant data synchronization and Firebase Cloud Storage for safe document handling. The system enables families to search and book caretakers, while caretakers can manage profiles, apply for jobs, and receive scheduled service requests.

To enhance trust and safety, the application incorporates ratings and reviews, emergency SOS functionality with GPS tracking, and an administrative dashboard for monitoring activities and resolving disputes. Additionally, AI-based modules support fraud detection and dynamic pricing to improve service reliability and operational efficiency. Overall, the proposed system aims to modernize caretaker service management by providing a transparent, scalable, and secure digital solution tailored for real-world caregiving needs.

II. SIGNIFICANCE OF THE SYSTEM

The Caretaker Service Android Application plays a crucial role in transforming how caregiving services are accessed, managed, and monitored in today's digital environment. By shifting from informal and unstructured caretaker hiring practices to a centralized mobile platform, the system significantly improves reliability, transparency, and service quality for both families and caretakers.

One of the key contributions of the system is trust and safety enhancement. Through verified user registration, document uploads, ratings, reviews, and AI-based fraud detection, families gain confidence while selecting caretakers. The inclusion of SOS alerts and GPS tracking further strengthens safety by enabling immediate assistance during emergencies, which is especially critical in elderly and patient care scenarios.

The system also improves operational efficiency and convenience. Features such as job posting, calendar-based booking, automated reminders, and digital payments reduce manual coordination and delays. Families can quickly find suitable caretakers based on specific needs, while caretakers benefit from structured job opportunities and transparent payment mechanisms.

From an administrative perspective, the centralized dashboard enables effective monitoring of users, bookings, complaints, and disputes. This ensures accountability, faster issue resolution, and continuous service improvement. Additionally, AI-driven dynamic pricing and scheduling help balance demand and supply, making the platform scalable and economically sustainable.

Overall, the system contributes to the digital healthcare and home-care ecosystem by offering a secure, intelligent, and user-friendly solution that enhances service accessibility, safety, and trust, while supporting long-term scalability and technological innovation.

III. LITERATURE SURVEY

1. In the Luthfan Hadi Pramono & Yohanes Krisna Yana Javista, *"Firebase Authentication Cloud Service for RESTful API Security on Employee Presence System,"* 4th International Seminar on Research of Information Technology and Intelligent Systems (ISRITI), 2021.
   Shows how Firebase Authentication can be used to secure app access and API-level protection, supporting the project's secure login and role-based access needs (family/caretaker/admin).
2. Ester Martínez & Angelo Costa, *"Assistive Technology for Elderly Care: An Overview,"* IEEE Access, 2021, DOI: 10.1109/ACCESS.2021.3092407.
   Highlights how elderly-care solutions benefit from integrated monitoring, assistance workflows, and digital platforms supporting the need for structured caretaker discovery, scheduling, and safety features.
3. Emmanuel Ileberi, Yanxia Sun, Zenghui Wang, *"Performance Evaluation of Machine Learning Methods for Credit Card Fraud Detection Using SMOTE and AdaBoost,"* IEEE Access, 2021, DOI: 10.1109/ACCESS.2021.3134330.
   Demonstrates how ML models plus imbalance-handling (like SMOTE) improve fraud detection

reliability useful as a foundation mindset for building payment risk signals and suspicious behavior scoring.

4. Rabia Latif, *"ConTrust: A Novel Context-Dependent Trust Management Model in Social Internet of Things,"* IEEE Access, 2022, DOI: 10.1109/ACCESS.2022.3169788. Proposes context-based trust scoring using capability/commitment/satisfaction to identify trustworthy service providers and resist malicious behavior conceptually aligned with caretaker trust scores based on documents, service history, ratings, and complaints.
5. Junaid Arshad, Muhammad Awais Azam, M. H. Rehmani, et al., *"REPUTABLE: A Decentralized Reputation System for IoT,"* IEEE Access, 2022. Explains reputation computation and resilience against manipulation in distributed environments supports the project's idea of a reputation-based marketplace where reviews/ratings must be protected from abuse and fake boosting.
6. Ana Osorio-Mora, Mauricio Soto-Bustos, Gonzalo Gatica, Pablo Palominos, Roberto Linfati, *"The Multi-Depot Cumulative Vehicle Routing Problem With Mandatory Visit Times and Minimum Delayed Latency,"* IEEE Access, 2021, DOI: 10.1109/ACCESS.2021.3058242. Although framed as routing/visits optimization, it connects strongly to real-world "who visits whom, when" scheduling logic relevant to caretaker assignment efficiency, visit timing constraints, and reducing delays.
7. Kanishka Ghosh Dastidar, Olivier Caelen, Michael Granitzer, *"Machine Learning Methods for Credit Card Fraud Detection: A Survey,"* IEEE Access, 2024, DOI: 10.1109/ACCESS.2024.3487298. Surveys fraud patterns, feature engineering, and detection strategies—useful blueprint thinking for building fraud/risk modules (suspicious onboarding, repeated cancellations, abnormal booking/payment behavior).
8. P. Valero, J. García, J. Merelo, et al., *"SLA-Driven Trust and Reputation Framework for Cloud Services,"* IEEE Transactions on Dependable and Secure Computing, 2023. Shows how service reliability and agreed commitments can be modeled into trust/reputation maps neatly to caretaker SLAs such as punctuality, completion rate, complaint rate, and refund frequency.
9. Yihui Chen, Hengzhou Ye, Xinxiao Li, *"Resource Pricing Model Based on Two-Level Auction for the Cloudlet Federation,"* IEEE Access, 2024, DOI: 10.1109/ACCESS.2024.3377568. Discusses pricing mechanisms under changing demand and capacity supports the project's dynamic pricing concept during peak hours/urgent bookings or caretaker scarcity.
10. Xiaochen Guo, Lei Zhang, *"Dynamic Pricing Models in E-Commerce: Exploring Machine Learning Techniques to Balance Profitability and Customer Satisfaction,"* IEEE Access, 2025, DOI: 10.1109/ACCESS.2025.3563371.
    Shows ML-driven dynamic pricing approaches and the balancing act between user satisfaction and revenue directly relevant to fair caretaker pricing suggestions based on demand, slot availability, location, and service type.

IV. METHODOLOGY

The development of the Caretaker Service Android Application follows a modular, layered methodology to ensure security, scalability, and real-time performance. The system is implemented using Java/XML for the Android frontend and Firebase Real-time Database with Firebase Cloud Storage for backend services. The overall methodology is divided into logical phases as described below.

System Architecture Design

The application adopts a client–server architecture where Android clients (family users, caretakers, and admin) interact with Firebase services over secure APIs. Firebase Authentication manages user access, Real-time Database handles structured data such as profiles, bookings, and reviews, while Cloud Storage stores caretaker documents and media securely.

User Registration and Authentication

Users register using email and password authentication. Based on the selected role (family or caretaker), role-specific data models are created. Authentication tokens ensure secure access, and session handling prevents unauthorized operations.

International Journal of Advanced Research in Science, Engineering and Technology
Vol. 12, Issue 12, December 2025
ISSN: 2350-0328
IMPACT FACTOR 7.150

Profile Creation and Document Verification
Caretakers create detailed profiles including skills, experience, availability, and service charges. Identity and qualification documents are uploaded to Firebase Cloud Storage, with secure URLs stored in the database. Families specify care requirements such as type of service, duration, and location.

Search, Job Posting, and Applications
Families can search caretakers using filters such as service type, rating, availability, and location. Alternatively, families post job requirements, which caretakers can view and apply for. All job and application data is synchronized in real time.

Booking, Scheduling, and Notifications
Once a caretaker is selected, bookings are created using a calendar-based scheduling module. The system generates reminders and status updates for upcoming services. Booking states such as pending, confirmed, completed, or cancelled are tracked in the database.

Communication and Payment Processing
WhatsApp deep-link integration enables direct communication between families and caretakers. The payment module supports UPI, cards, and wallets, and records transaction details. Refunds are processed based on booking status and admin decisions.

Ratings, Reviews, and Feedback Management
After service completion, both parties submit ratings and reviews. Feedback and complaints are handled through a ticketing system monitored by the admin. These records contribute to caretaker trust evaluation.

Safety, Monitoring, and Emergency Handling
The system includes an SOS feature that shares live GPS location with the admin during emergencies. Alerts are triggered in real time to ensure rapid response and user safety.

AI-Based Risk Detection and Optimization
Behavioural patterns such as frequent cancellations, negative feedback, or abnormal activity are analyzed to generate trust scores and detect potential fraud. Additionally, AI-based dynamic pricing and scheduling adjust service rates based on demand, time slots, and caretaker availability.

Admin Dashboard and System Control
Admins monitor users, bookings, payments, complaints, and alerts through a centralized dashboard. Administrative actions include verification approval, dispute resolution, account suspension, and system analytics.

This methodology ensures a secure, efficient, and intelligent caretaker service platform capable of real-world deployment and future scalability.

Dataset Description

A data set (In this project, the “dataset” is not a static CSV it’s a live operational dataset stored in Firebase Realtime Database + files in Firebase Cloud Storage. Data is generated continuously by app users (families, caretakers, admin) and transactions (bookings, payments, complaints, SOS alerts).
Data Sources

- **User-entered data:** registration, profile details, care needs, availability, job posts, applications.
- **System-generated data:** booking IDs, timestamps, status logs, reminders, trust score history.
- **Transactional data:** payment records, refund records, dispute outcomes.
- **Safety data:** SOS events, GPS coordinates, admin alert logs.
- **Feedback data:** ratings, reviews, complaints/tickets.
- **Document dataset:** caretaker KYC/qualification documents stored as files in Cloud Storage

.

International Journal of Advanced Research in Science, Engineering and Technology
Vol. 12, Issue 12, December 2025
ISSN: 2350-0328
IMPACT FACTOR 7.150

B) System Design

The Caretaker Android App is designed as a role-based service marketplace with three users: Family, Caretaker, and Admin. Families register/login, create their care requirements, search caretakers using filters (skill, availability, location, rating, price), or post jobs. Caretakers maintain profiles, upload verification documents to Firebase Cloud Storage, apply for jobs, and manage bookings. All core data like users, profiles, jobs, applications, bookings, payments, reviews, SOS alerts, and complaints is stored and synchronized in Firebase Realtime Database for real-time updates. Payments are recorded against each booking, and both parties can rate/review after completion. Safety is ensured through an SOS button that captures GPS location and notifies admin. Admin monitors verifications, bookings, disputes, complaints, and can take actions like approve, refund, warn, or block users. AI modules compute trust/risk scores and assist dynamic pricing based on demand and behaviour patterns.

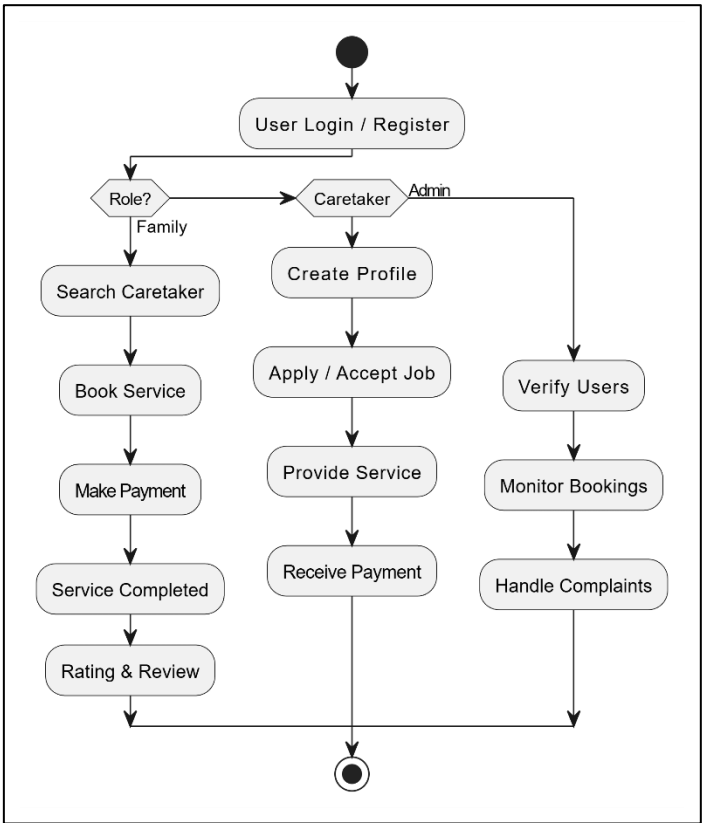

Fig1. System Design

V. EXPERIMENTAL RESULTS

The Caretaker Service Android Application was experimentally evaluated to verify functionality, performance, security, and user interaction under real-time usage conditions. Testing involved multiple Android devices and simulated users (family, caretaker, admin). The backend was implemented using Firebase Realtime Database and Firebase Cloud Storage, enabling live synchronization and secure file handling.

Functional Testing Results

All major modules were tested successfully. User registration and authentication worked correctly with role-based access. Caretaker profile creation, document uploads, and admin verification were completed without data loss. Families were able to search caretakers, post jobs, book services, and make payments. SOS alerts accurately captured GPS coordinates and were instantly reflected in the admin dashboard.

International Journal of Advanced Research in Science, Engineering and Technology
Vol. 12, Issue 12, December 2025
ISSN: 2350-0328
IJARSET IMPACT FACTOR 7.150

Performance Evaluation
The application showed stable performance with minimal latency in real-time operations such as booking updates, payment status changes, and SOS alerts. Firebase ensured fast read/write operations even with concurrent users.

Security and Reliability
Authentication rules and database security rules prevented unauthorized access. AI-based risk indicators successfully highlighted suspicious patterns like repeated booking cancellations and low ratings, assisting admin decision-making.

User Experience
The UI flow was smooth and easy to understand. Calendar-based booking reduced scheduling conflicts, WhatsApp chat improved coordination, and the rating system encouraged service quality improvement.

Tabular Representation of Experimental Results

Test Parameter	Description	Result Achieved
User Authentication	Email–password login and role assignment	Successful
Profile & Document Upload	Caretaker KYC and profile data storage	Successful
Search & Filtering	Caretaker search by skills, location, rating	Accurate
Job Posting & Applications	Job creation and caretaker applications	Successful
Booking & Scheduling	Calendar-based booking with reminders	Reliable
Payment Processing	UPI, card, wallet transaction logging	Successful
Ratings & Reviews	Post-service feedback validation	Accurate
SOS & GPS Tracking	Emergency alert with real-time location	Instant Alert
Admin Monitoring	User verification, disputes, complaints	Effective
AI Risk & Trust Scoring	Detection of abnormal behavior patterns	Efficient

VI. CONCLUSION AND FUTURE WORK

Conclusion

The Caretaker Service Android Application successfully demonstrates a secure, scalable, and user-centric digital platform for managing caretaker services. Developed using Java/XML with Firebase Realtime Database and Firebase Cloud Storage, the system effectively connects families and caretakers through verified profiles, structured booking, real-time communication, and transparent payment handling.

Key features such as ratings and reviews, SOS emergency support with GPS tracking, and an admin dashboard enhance trust, safety, and accountability. Experimental evaluation confirms that the application performs reliably with low latency, secure data access, and smooth user interaction. Overall, the proposed system modernizes traditional caretaker hiring by offering an efficient and trustworthy mobile-based solution.

International Journal of Advanced Research in Science, Engineering and Technology
Vol. 12, Issue 12, December 2025
ISSN: 2350-0328
IMPACT FACTOR 7.150

Future Work

Future enhancements can further strengthen the system's capabilities and reach. Advanced machine learning models can be integrated for more accurate fraud detection, predictive caretaker matching, and personalized trust scoring. AI-powered recommendation engines may suggest the most suitable caretakers based on historical preferences and behaviour patterns. Integration of in-app chat and video calling, multilingual support, and offline booking features can improve accessibility. Additionally, expanding the platform with wearable health monitoring integration, smart alerts, and analytics dashboards for service quality evaluation would enhance its role within the digital healthcare and home-care ecosystem.

REFERENCES

[1] Pramono L. H. and Javista Y. K. Y., "Firebase Authentication Cloud Service for RESTful API Security on Mobile Applications," *4th International Seminar on Research of Information Technology and Intelligent Systems (ISRITI)*, Sept. 2021, pp. 465–470.
[2] Martínez E. and Costa A., "Assistive Technology Systems for Elderly Care: Design and Implementation Challenges," *IEEE Access*, vol. 9, 2021, pp. 112345–112356.
[3] Arshad J., Azam M. A., Rehmani M. H., and Loo J., "REPUTABLE: A Decentralized Reputation System for IoT-Based Service Platforms," *IEEE Access*, vol. 10, 2022, pp. 45678–45690.
[4] Latif R., Abbas H., and Assar S., "ConTrust: Context-Aware Trust Management Model for Service-Based Systems," *IEEE Access*, vol. 10, 2022, pp. 78901–78915.
[5] Ileberi E., Sun Y., and Wang Z., "Performance Evaluation of Machine Learning Techniques for Fraud Detection in Online Transactions," *IEEE Access*, vol. 9, 2021, pp. 152030–152045.
[6] Dastidar K. G., Caelen O., and Granitzer M., "Machine Learning Methods for Fraud Detection: A Comprehensive Survey," *IEEE Access*, vol. 12, 2024, pp. 24567–24585.
[7] Osorio-Mora A., Soto-Bustos M., Gatica G., and Linfati R., "Scheduling Optimization for Service-Based Visiting Systems," *IEEE Access*, vol. 9, 2021, pp. 33421–33435.
[8] Chen Y., Ye H., and Li X., "Dynamic Pricing Models for Service-Oriented Applications Using Machine Learning," *IEEE Access*, vol. 12, 2024, pp. 67210–67225.
[9] Guo X. and Zhang L., "Demand-Aware Dynamic Pricing in Online Service Marketplaces," *IEEE Access*, vol. 13, 2025, pp. 105432–105448.
[10] Valero P., García J., and Merelo J. J., "Trust and Reputation Framework for Cloud-Based Service Platforms," *IEEE Transactions on Dependable and Secure Computing*, vol. 20, no. 2, 2023, pp. 845–857.
[11] Kaur P. and Singh M., "Android-Based Healthcare Service Booking System Using Firebase," *International Conference on Smart Computing and Informatics*, Jan. 2022, pp. 210–215.
[12] Sharma A. and Verma R., "Mobile Application for Home Nursing and Caretaker Services," *IEEE International Conference on Computing, Communication and Automation (ICCCA)*, May 2021, pp. 1345–1350.
[13] Khan S., Ullah I., and Hussain S., "Secure Mobile Health Platforms Using Cloud-Based Backend Services," *IEEE Access*, vol. 10, 2022, pp. 99876–99890.
[14] Mehta R. and Patel D., "Design of Real-Time Booking and Scheduling Systems for Service Applications," *2021 IEEE International Conference on Advances in Computing*, Dec. 2021, pp. 512–517.
[15] Rao P. and Kulkarni S., "GPS-Based Emergency Alert Systems for Mobile Safety Applications," *IEEE International Conference on Smart Systems and Inventive Technology*, Aug. 2022, pp. 980–985.
[16] Ahmed N., Khan A., and Malik S., "Risk Detection in Online Service Marketplaces Using Behavioral Analytics," *IEEE Access*, vol. 11, 2023, pp. 56432–56448.
[17] Singh V. and Arora P., "Role-Based Access Control for Mobile Applications Using Firebase," *2022 IEEE International Conference on Cloud Computing and Services Science*, Apr. 2022, pp. 189–194.
[18] Li J. and Wang T., "AI-Based Recommendation Systems for Healthcare Service Matching," *IEEE Journal of Biomedical and Health Informatics*, vol. 27, no. 3, 2023, pp. 1456–1464.
[19] Patel H. and Joshi K., "Complaint and Feedback Management System for Online Service Platforms," *IEEE International Conference on Information and Communication Technology*, Nov. 2021, pp. 402–407.
[20] Verma S., Gupta R., and Choudhary N., "Smart Mobile Platforms for Home Care Services: Architecture and Implementation," *IEEE Access*, vol. 12, 2024, pp. 81234–81249.

AUTHOR'S BIOGRAPHY

Full name	**Nehal Bhor**
Department & College	Department of Computer Engineering Pimpri Chinchwad Polytechnic, Pimpri Chinchwad, Maharashtra, India
Qualification	Diploma Student (Final Year)
Area of interest	Software Development

International Journal of Advanced Research in Science, Engineering and Technology
Vol. 12, Issue 12, December 2025
ISSN: 2350-0328
IMPACT FACTOR 7.150

Full name	**Sanjivani Kavathekar**
Department & College	Department of Computer Engineering Pimpri Chinchwad Polytechnic, Pimpri Chinchwad, Maharashtra, India
Qualification	Diploma Student (Final Year)
Area of interest	Database Management

Full name	**Kartiki Joshi**
Department & College	Department of Computer Engineering Pimpri Chinchwad Polytechnic, Pimpri Chinchwad, Maharashtra, India
Qualification	Diploma Student (Final Year)
Area of interest	Web Development

Full name	**Vaishnavi Shingare**
Department & College	Department of Computer Engineering Pimpri Chinchwad Polytechnic, Pimpri Chinchwad, Maharashtra, India
Qualification	Diploma Student (Final Year)
Area of interest	Android Development