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MediLink: A Secure Role-Based Healthcare Management Platform with Integrated Rule-Based Clinical Decision Support and Multilingual Voice Interaction

Megharaj U[1], Suchita M[2], Smita D[3], Bharati A[4]
Bharatesh College Of Computer Applications Belagavi, India

Abstract: ***Digital healthcare adoption has expanded rapidly in recent years, yet many platforms continue to address isolated aspects of care delivery rather than offering an integrated patient experience. Existing telemedicine, electronic health record, and emergency-response systems typically operate as independent services, contributing to fragmented care, communication barriers, and delayed emergency response in linguistically diverse and connectivity-constrained regions. This paper presents MediLink, a hybrid online-offline healthcare support platform that consolidates rule-based symptom triage, multilingual interaction, electronic medical record management, doctor-patient communication, appointment scheduling, and GPS-based emergency ambulance coordination within a single Node.js and MongoDB-based system. The platform follows a layered architecture comprising presentation, application, business-logic, and database layers, with a cross-cutting authentication and role-based access control module. Its symptom-assessment component uses a rule-based, pattern-matching decision-support engine rather than a trained predictive model, deliberately designed as a modular layer so that a machine-learning or natural-language-processing-based model can be integrated in future iterations without architectural redesign. The system has undergone functional validation covering module-level workflows, database CRUD operations, authentication, appointment scheduling, and notification dispatch; formal quantitative evaluation involving benchmark datasets, load testing under varying traffic, and large-scale usability studies has not yet been conducted and is identified as future work. This paper discusses the system's design rationale, architecture, module composition, and validation approach, and positions MediLink against prior single-purpose telemedicine, electronic health record, and emergency-dispatch systems identified in the literature. The discussion highlights that architectural integration, rather than a single novel predictive algorithm, constitutes the primary contribution of this work, while acknowledging the need for further clinical and performance validation before real-world deployment.***

Keywords: ***hybrid healthcare platform; rule-based symptom triage; multilingual health access; role-based access control; NoSQL health information system***

I. INTRODUCTION

Healthcare delivery systems worldwide continue to face persistent challenges related to accessibility, coordination, and effective communication, and these challenges are often more pronounced in developing and semi-urban regions. Patients frequently experience difficulty scheduling timely consultations, maintaining organised medical records, and communicating efficiently with healthcare providers. Such difficulties are intensified by language diversity, limited digital literacy, and inconsistent internet connectivity, all of which restrict equitable access to care.

Digital health platforms, including telemedicine services, online appointment systems, and electronic health records, have partially addressed these issues. Systematic evidence indicates that telemedicine adoption improves patient satisfaction when service quality and communication are well designed [1], and electronic health record interoperability has been associated with measurable improvements in patient safety and coordination of care in high-income health systems [2]. However, most deployed solutions address a single functional dimension of healthcare delivery rather than providing an integrated experience, requiring patients to move between separate applications for consultation, record access, and emergency assistance.

Emergency medical response remains a particularly weak link in this fragmented landscape. Conventional ambulance dispatch continues to rely heavily on manual, call-based coordination, which is vulnerable to delays caused by unclear communication and

imprecise location information; recent systems research has proposed GPS- and cloud-based dispatch architectures specifically to reduce these delays [9]. Separately, language discordance between patients and providers has been shown to measurably affect care engagement and outcomes, particularly for populations with limited proficiency in the dominant clinical language [3].

This paper presents MediLink, a hybrid online-offline healthcare support system that integrates rule-based symptom triage, multilingual interaction, secure medical record storage, direct doctor-patient communication, appointment scheduling, and GPS-based emergency ambulance booking into a single Node.js and MongoDB-based platform. The remainder of this paper describes the problem context, reviews related work, details the system architecture and methodology, reports the validation activities undertaken to date, and discusses the limitations and future research direction of the system.

II. PROBLEM STATEMENT

Patients in linguistically diverse and connectivity-constrained regions are typically required to use multiple, disconnected digital tools to manage different aspects of their healthcare: one application for teleconsultation, another for record storage, and a manual, call-based process for emergency transport. This fragmentation increases the cognitive and logistical burden on patients, particularly those with limited digital literacy, and creates gaps in continuity of care. Existing consumer health applications also rarely provide native multilingual support beyond a small number of dominant languages, and few are designed to remain functional when internet connectivity is intermittent. There is consequently a need for a single, modular healthcare platform that unifies preliminary symptom guidance, record management, provider communication, appointment scheduling, and emergency coordination, while remaining usable by non-technical, multilingual users under variable connectivity conditions.

III. OBJECTIVES

1) To design a unified platform that provides essential healthcare support under both online and offline conditions.
2) To enable multilingual interaction (Kannada, Hindi, and English) for users from diverse linguistic backgrounds.
3) To provide a rule-based symptom-assessment module as a preliminary, non-diagnostic decision-support tool.
4) To ensure secure, role-based storage and structured management of electronic medical records.
5) To facilitate direct and continuous communication between doctors and patients beyond a single consultation.
6) To integrate GPS-based ambulance booking and emergency coordination directly into routine healthcare workflows.

IV. LITERATURE REVIEW AND RESEARCH GAP

A. Telemedicine and Patient-Centred Care

Telemedicine platforms have been widely studied for their capacity to extend access to consultation services beyond physical clinical settings. A systematic review of patient-satisfaction measurement instruments for telemedicine found that satisfaction is shaped by multiple interacting factors, including communication quality, technical usability, and continuity of care, underscoring that satisfaction with remote consultation cannot be attributed to connectivity alone [1]. This body of work motivates MediLink's inclusion of structured, persistent doctor-patient communication rather than a single-session consultation model.

B. Electronic Health Record Interoperability

Electronic health record systems have improved documentation accuracy and clinical decision support within institutional settings, but interoperability across providers remains a recurring limitation. A systematic review of high-income health systems found that poor interoperability negatively affects multiple dimensions of care quality, including safety, timeliness, and patient-centredness [2], while a separate review of semantic interoperability approaches highlighted that inconsistent data models continue to restrict the portability of patient information across systems [4]. These findings support MediLink's design choice to centralise medical records within a single patient-owned record store rather than distributing them across institution-specific systems.

C. AI-Assisted and Rule-Based Symptom Assessment

A substantial body of research has examined the diagnostic and triage performance of automated symptom-assessment tools. Early audit studies of web-based symptom checkers reported considerable variability in diagnostic and triage accuracy across different platforms and clinical presentations [5], and subsequent benchmarking work comparing symptom checkers against medical laypersons found that machine-generated triage recommendations do not consistently outperform basic human judgement [6]. More recent evaluations of AI-based symptom checkers in specific clinical domains, such as a multicentre randomised controlled trial in rheumatology, have reported improved diagnostic-accuracy outcomes under controlled conditions [7], while chatbot-based mental-

health screening tools have shown that conversational accuracy varies substantially between lay and expert users [8]. This literature collectively indicates that symptom-checking accuracy is highly dependent on implementation and evaluation methodology, and that any accuracy claim requires dedicated benchmark evaluation rather than architectural description alone — a gap that MediLink's current rule-based implementation has not yet closed, and which is addressed explicitly in Section 16 (Limitations).

D. Language Barriers and Emergency Coordination

Language discordance between patients and providers has been associated with reduced engagement in shared decision-making and diagnostic communication; a mixed-methods study of patients with cardiovascular disease found that limited proficiency in the clinical language measurably affected patients' perception of and participation in their own care [3]. Separately, systems research on emergency medical transport has proposed GPS-enabled, cloud-coordinated ambulance dispatch as a mechanism to reduce response-time variability associated with manual, call-based coordination [9]. MediLink's multilingual interface and integrated GPS ambulance-booking module draw directly on these two strands of evidence.

E. Research Gap

Despite progress in each of these individual areas, the reviewed literature does not describe a single system that combines rule-based preliminary triage, multilingual interaction, centralised and offline-accessible medical records, continuous provider communication, and GPS-based emergency coordination within one modular architecture. Existing systems typically address one or two of these dimensions in isolation. MediLink is positioned to close this integration gap architecturally; it does not claim to resolve the triage-accuracy limitations documented in Section 4.3, which remain an open area for future quantitative evaluation.

Table 1. Comparative Positioning of MediLink Against Related Work

Study / System	Primary Focus	Multilingual Support	Emergency Module	Integration Scope
Du & Gu (2024) [1]	Telemedicine satisfaction measurement	Not addressed	Not addressed	Single-domain (teleconsultation)
Li et al. (2022) [2]	EHR interoperability & safety	Not addressed	Not addressed	Single-domain (records)
Knitza et al. (2024) [7]	AI-based symptom checker (rheumatology)	Not addressed	Not addressed	Single-domain (triage)
Mohamed Yusuf Sulthan et al. (2025) [9]	GPS-based ambulance dispatch	Not addressed	Core focus	Single-domain (emergency transport)
MediLink (proposed)	Integrated healthcare support	Kannada, Hindi, English	Integrated GPS ambulance booking	Multi-domain (triage, records, communication, emergency)

V. EXISTING SYSTEM

In the prevailing landscape, patients typically rely on separate, purpose-built applications for teleconsultation, personal health record storage, and appointment booking, with emergency transport arranged through manual telephone-based dispatch. Electronic health record access is frequently institution-centric, requiring patients to depend on physical documents or multiple provider portals to maintain a continuous medical history. Multilingual support in existing consumer-facing health applications is generally limited to a small set of dominant languages, and most platforms assume continuous internet connectivity, which restricts usability in low-connectivity regions.

VI. PROPOSED SYSTEM

MediLink addresses these limitations by consolidating the following modules within a single platform: user registration and role-based login; dedicated Patient, Doctor, and Admin dashboards; a rule-based symptom-assessment module accepting text or voice input; a hybrid online/offline synchronisation layer; a multilingual interface supporting Kannada, Hindi, and English; an electronic medical records module; a secure doctor-patient messaging module; appointment scheduling with doctor registration-number verification; a notification module; a reports and analytics module; and a GPS-based emergency ambulance booking module.

Role-Based Access Control (RBAC) governs data visibility across all modules, ensuring that sensitive medical information is accessible only to authorised users in the appropriate role.

VII. SYSTEM ARCHITECTURE

MediLink follows a layered architecture consisting of a Presentation Layer (patient, doctor, and admin interfaces), an Application Layer (request routing and API handling implemented in Node.js), a Business Logic Layer (appointment management, electronic medical record management, notification handling, and the rule-based AI processing component), and a Database Layer implemented in MongoDB. Authentication and role-based access control operate as a cross-cutting module spanning all layers, consistent with standard practice for multi-role healthcare information systems. Figure 1 illustrates this layered structure.

Fig. 1. Layered System Architecture of MediLink

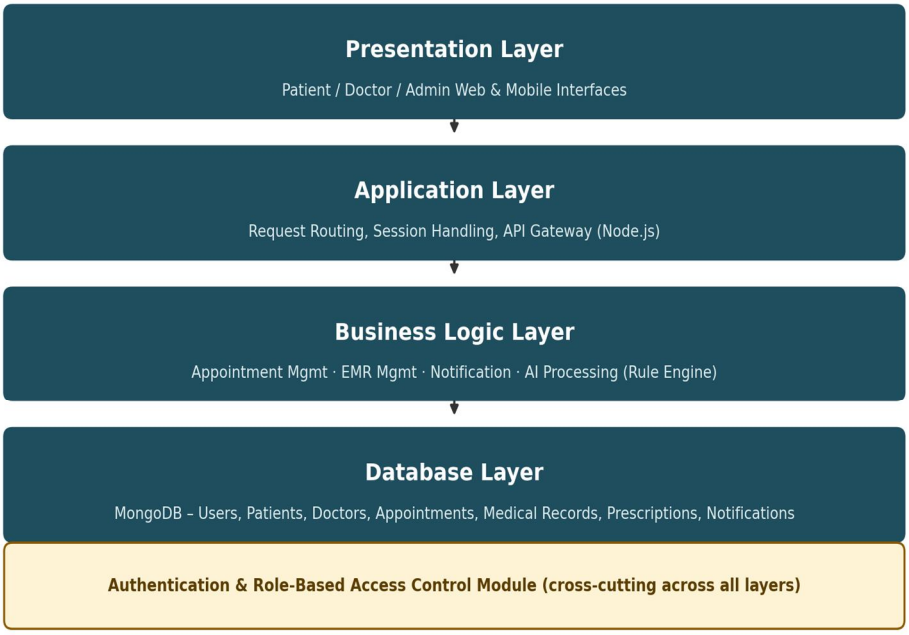

Figure 1. Layered System Architecture of MediLink

Figure 2 illustrates the operational workflow followed by a typical user session: authentication precedes access to a role-specific dashboard, from which the user may initiate appointment or medical-service requests; these requests trigger database operations, which in turn generate notifications and are reflected in the reports and analytics module.

Fig. 2. Operational Workflow of MediLink

Figure 2. Operational Workflow of MediLink

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VIII. METHODOLOGY

A. Rule-Based Symptom Assessment

The symptom-assessment module accepts either typed text or spoken input; voice input is converted to text using the browser-native Web Speech API (SpeechRecognition interface) prior to processing, which allows symptom entry without typing and improves accessibility for elderly users and users with limited typing proficiency.

The resulting text is normalised and matched against a predefined base of symptom-condition rules, developed with reference to publicly available healthcare guidance material and general clinical domain knowledge, to generate a preliminary, non-diagnostic recommendation.

The module is explicitly designed as a decision-support aid rather than a diagnostic tool, and its output is intended to guide the user toward an appropriate next step — self-care guidance, specialist referral, or emergency escalation — rather than to identify a specific medical condition.

The rule base is implemented as a modular component so that a trained machine-learning or LLM-based classifier could be substituted in a future iteration without requiring changes to the surrounding application architecture. For the purposes of academic rigour, the authors should enumerate the specific guideline sources (for example, named WHO, CDC, or national clinical-guidance documents) used to construct the rule base in the final submitted version, as "publicly available domain knowledge" alone is unlikely to satisfy reviewer expectations for methodological transparency.

B. Hybrid Online-Offline Operation

In online mode, MediLink provides live consultation scheduling, real-time messaging, and immediate database synchronisation. In offline mode, previously retrieved medical records, consultation history, and symptom notes remain locally accessible; pending changes are queued and synchronised automatically once connectivity is restored, preserving data consistency across sessions.

IX. ALGORITHM AND DECISION LOGIC

The following pseudocode is a representative illustration of the rule-based decision logic described by the project team; it is provided to clarify the module's control flow for review purposes and is not a direct extraction from the underlying source code, which was not made available for this manuscript.

```
INPUT: symptom_text OR symptom_voice
 1. IF input_mode == voice:
transcript <- speech_to_text(symptom_voice)    ELSE:        transcript <- symptom_text
2. tokens <- normalise_and_tokenise(transcript)
3. matched_rules <- match_against_rule_base(tokens, symptom_condition_rules)
4. IF matched_rules is EMPTY:
RETURN "insufficient information - recommend consultation"
5. severity <- evaluate_severity(matched_rules)
6. IF severity == HIGH:
RETURN escalate_to_emergency_module()
ELSE IF severity == MODERATE:
RETURN recommend_specialist(matched_rules)
ELSE:
RETURN recommend_home_care(matched_rules)
```

This logic does not constitute medical diagnosis; the output is explicitly framed to the user as preliminary guidance, and high-severity matches are routed directly to the emergency ambulance-booking module described in Section 6.

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X. TECHNOLOGY STACK

Table 2. Technology Stack

Layer / Component	Technology	Notes
Frontend	React.js, TypeScript, Tailwind CSS	Component-based, responsive UI across patient, doctor, and admin dashboards
Backend	Node.js, Express.js	RESTful APIs for authentication, appointments, records, prescriptions, notifications
Database	MongoDB Atlas (NoSQL, document-oriented)	Cloud-hosted document store
Authentication & Security	JSON Web Tokens (JWT), bcrypt password hashing	Stateless token-based auth with role-based access control
API architecture	REST API	Client-server communication over HTTPS
State management	React Context API	Client-side application state
Voice input	Web Speech API (SpeechRecognition)	Browser-native; language/browser coverage should be verified for Kannada and Hindi
Version control	Git, GitHub	Source control and collaboration
Deployment (proposed)	Vercel (frontend), Render (backend), MongoDB Atlas (database), Cloudinary (file storage, where applicable)	Cloud deployment target; authors to confirm production status vs. development configuration

XI. DATABASE DESIGN

As MediLink is implemented on MongoDB Atlas, data is organised as document collections rather than relational tables. The confirmed collections are: users, patients, doctors, appointments, medicalRecords, prescriptions, notifications, departments, roles, activityLogs, feedback, and emergencyContacts. Because authentication is implemented statelessly via JSON Web Tokens rather than server-side session storage, no separate session or authentication collection is required; credential verification (bcrypt-hashed passwords) is performed against the users collection at login. Relationships between entities (for example, a patient's association with multiple appointments or medical records) are represented through document references rather than relational joins, consistent with standard NoSQL design practice.

Table 3. Module-to-Data Mapping

Module	Function	Primary Collections
Authentication & RBAC	JWT-based login and role-based access control	users, roles
Patient / Doctor / Admin Dashboard	Role-specific interface and data views	patients, doctors, users
Symptom Assessment	Rule-based preliminary triage (text/voice input)	medicalRecords (session logs)
Appointment Scheduling	Booking and doctor-availability management	appointments, doctors
Electronic Medical Records	Storage of diagnosis, prescriptions, history	medicalRecords, prescriptions
Notification	Alerts for appointments, records, emergencies	notifications
Emergency Ambulance Booking	GPS-based dispatch request	emergencyContacts, notifications, activityLogs
Patient Feedback	Post-consultation ratings and feedback capture	feedback
Reports & Analytics	Administrative reporting	activityLogs, departments

XII. IMPLEMENTATION

MediLink has been implemented as a modular system in which each functional area (authentication, appointments, records, notifications, and the rule-based assessment engine) is developed as a distinct component. The frontend is built with React.js and TypeScript, using Tailwind CSS for styling and the React Context API for client-side state management. The backend exposes RESTful endpoints via Node.js and Express.js, secured with JWT-based stateless authentication and bcrypt password hashing, and communicates with MongoDB Atlas over authenticated connections. Source control is maintained using Git and GitHub. The proposed deployment target is a cloud configuration comprising Vercel (frontend), Render (backend), MongoDB Atlas (database), and Cloudinary for file storage where applicable; the authors should confirm in the final manuscript whether this reflects the deployed production environment or a target configuration, as this affects how the Results and Limitations sections should be phrased. Role-based dashboards restrict data visibility according to user type, and the hybrid synchronisation logic caches recently accessed records locally and reconciles them with the MongoDB backend once connectivity is restored.

XIII. RESULTS

At the current stage of development, MediLink has undergone functional and workflow-level validation rather than formal quantitative benchmarking. Table 4 summarises the validation activities completed to date.

Table 4. Validation Testing Summary

Test Type	Scope	Outcome
Functional testing	All implemented modules	Modules perform as designed
End-to-end workflow verification	Login through dashboard to service completion	Verified
User interface testing	Patient, Doctor, and Admin dashboards	Verified
Database CRUD operation testing	MongoDB collections	Verified
Authentication and authorization testing	RBAC module	Verified
Appointment booking workflow validation	Scheduling module	Verified
Medical record management validation	EMR module	Verified
Report generation verification	Reports & analytics module	Verified
Notification workflow testing	Notification module	Verified
Error handling and exception testing	Cross-module	Verified

Quantitative metrics such as symptom-assessment accuracy against a benchmark dataset, response-time performance under varying system load, and large-scale usability outcomes have not yet been measured. These are identified explicitly as future work in Section 17 rather than estimated, consistent with the evidence-based reporting standard adopted for this manuscript.

XIV. DISCUSSION

The principal contribution of MediLink, as currently validated, lies in its architectural integration of previously siloed healthcare functions rather than in a novel predictive algorithm. Consolidating triage guidance, records, communication, scheduling, and emergency coordination within one role-based platform is expected to reduce the context-switching burden documented in fragmented digital-health environments. The choice of a rule-based, rather than machine-learning-based, symptom-assessment engine offers a transparency advantage consistent with concerns raised in the symptom-checker literature regarding unverified accuracy claims [5], [6], while trading off the adaptability that a trained model could offer — a trade-off the modular architecture is designed to accommodate in future iterations. The inclusion of Kannada and Hindi alongside English directly addresses the language-concordance concerns documented in prior clinical-communication research [3], and the GPS-based ambulance module reflects dispatch-efficiency approaches proposed in recent emergency-response systems literature [9]. These design choices are, at this stage, architectural and qualitative claims; the quantitative validation needed to substantiate their real-world impact remains future work.

XV. ADVANTAGES

1) Consolidates triage, records, communication, scheduling, and emergency response within a single platform, reducing fragmentation across separate applications.
2) Rule-based triage logic is explainable and auditable, avoiding unverified black-box accuracy claims.
3) Modular architecture allows future replacement of the rule engine with a trained ML/NLP or LLM-based model without redesigning the platform.
4) Native multilingual support (Kannada, Hindi, English) addresses documented language-concordance barriers in care communication.
5) Concrete, industry-standard security implementation: JWT-based stateless authentication combined with bcrypt password hashing and role-based access control.
6) Voice-based symptom entry via the Web Speech API improves accessibility for elderly users and those with limited typing proficiency.
7) Hybrid online/offline design maintains record accessibility under intermittent connectivity.

XVI. LIMITATIONS

1) No quantitative accuracy evaluation has yet been performed for the rule-based symptom-assessment module against a benchmark clinical dataset.
2) No response-time or load-testing benchmarks have been conducted under varying concurrent-user conditions.
3) Validation to date is functional and workflow-level; no formal usability study with an external patient or clinician cohort has been conducted.
4) The rule-based engine, by design, may not generalise well to atypical or overlapping symptom presentations, unlike a trained model.
5) The specific clinical guideline sources used to construct the symptom-condition rule base have not yet been enumerated; this should be documented explicitly before submission, as general reference to "publicly available domain knowledge" is insufficient methodological detail for peer review.
6) Voice input relies on the browser-native Web Speech API; recognition accuracy and language coverage for Kannada and Hindi vary across browsers and devices and have not been independently verified.
7) No independent security audit or penetration test has been performed on the JWT/bcrypt authentication implementation.
8) The system does not replace professional medical diagnosis, and this limitation should be clearly disclosed to end users within the application interface.
9) The proposed cloud deployment configuration (Vercel/Render/MongoDB Atlas/Cloudinary) should be confirmed as either a live production environment or a target architecture before the manuscript states it as implemented.

XVII. FUTURE SCOPE

1) Conducting a large-scale user evaluation with real patient and clinician cohorts.
2) Performance benchmarking, including response-time measurement under varying system load.
3) Optimisation or replacement of the rule-based engine with a trained AI model, evaluated against the benchmarking methodologies discussed in Section 4.3.
4) Development of explainable-AI features to maintain transparency if a trained model is introduced.
5) Integration with wearable health devices for continuous monitoring.
6) Cloud deployment and formal scalability analysis.
7) Enhanced cybersecurity mechanisms, including independent security auditing.
8) Comparative evaluation against existing healthcare management systems using consistent, published benchmarks.

XVIII. CONCLUSION

This paper has presented MediLink, a hybrid online-offline healthcare support system that integrates rule-based symptom triage, multilingual interaction, secure medical record management, direct doctor-patient communication, appointment scheduling, and GPS-based emergency ambulance coordination within a single modular platform. By consolidating functions that are typically distributed across separate applications, MediLink addresses a documented integration gap in the digital-health literature.

The system has been functionally validated at the module and workflow level; formal quantitative evaluation of triage accuracy, performance under load, and large-scale usability remains necessary before the platform can be considered ready for clinical deployment, and is identified as the primary direction for future work.

XIX. ACKNOWLEDGEMENT

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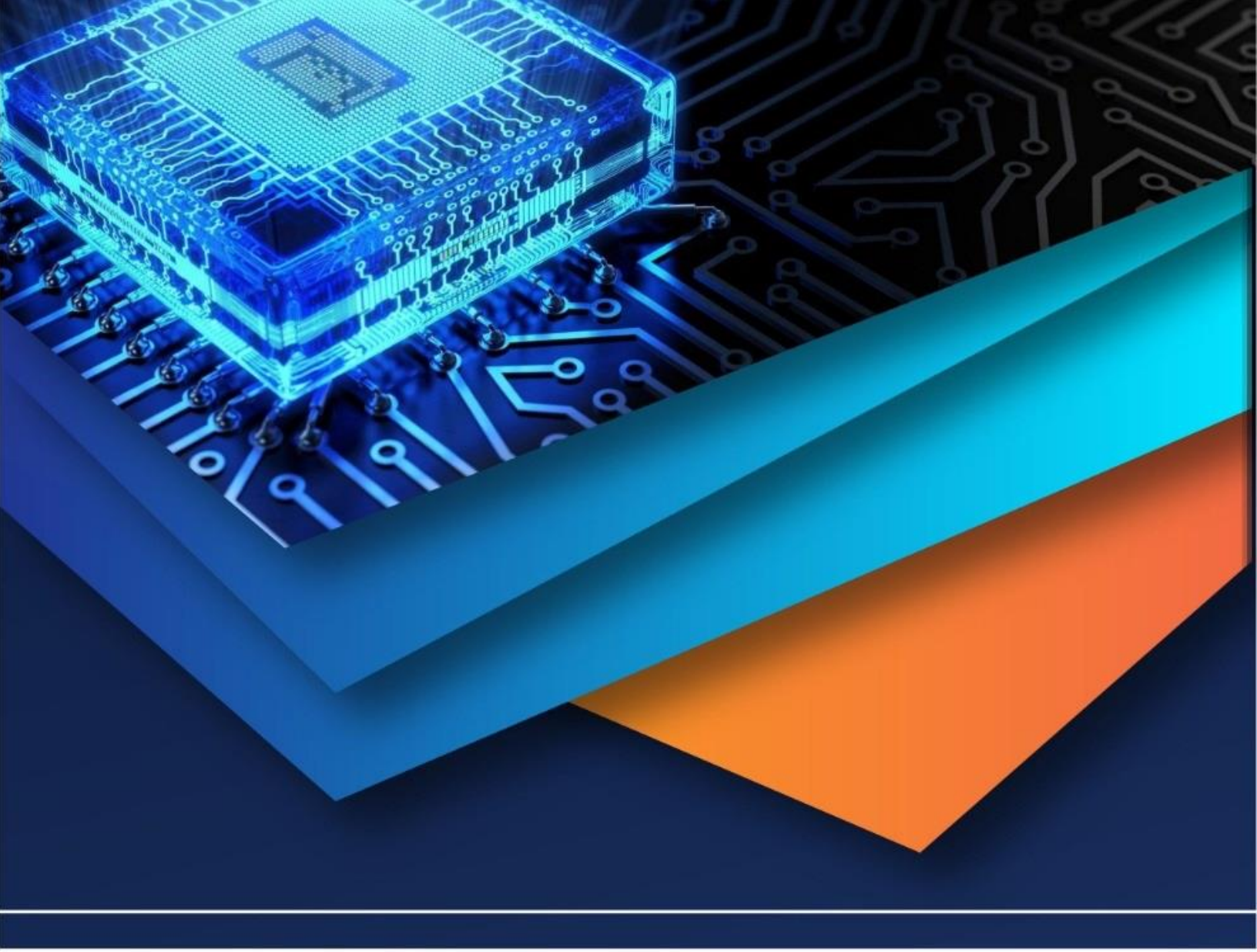
REFERENCES

[1] Y. Du and Y. Gu, "The development of evaluation scale of the patient satisfaction with telemedicine: a systematic review," BMC Medical Informatics and Decision Making, vol. 24, p. 31, 2024. https://doi.org/10.1186/s12911-024-02436-z
[2] E. Li, J. Clarke, H. Ashrafian, A. Darzi, and A. L. Neves, "The impact of electronic health record interoperability on safety and quality of care in high-income countries: systematic review," Journal of Medical Internet Research, vol. 24, no. 9, e38144, 2022. https://doi.org/10.2196/38144
[3] E. Wang, T. Al-Rousan, W. Mansour, D. Oliva, N. Herrick, B. Desai, and L. Alshawabkeh, "Language barriers in patients with cardiovascular disease: a mixed methods study," JACC: Advances, 2022. https://doi.org/10.1016/j.jacadv.2022.100077
[4] S. Palojoki, L. Lehtonen, and R. Vuokko, "Semantic interoperability of electronic health records: systematic review of alternative approaches for enhancing patient information availability," Journal of Medical Internet Research, 2024. https://doi.org/10.2196/53535
[5] H. L. Semigran, J. A. Linder, C. Gidengil, and A. Mehrotra, "Evaluation of symptom checkers for self-diagnosis and triage: audit study," BMJ, vol. 351, h3480, 2015. https://doi.org/10.1136/bmj.h3480
[6] M. L. Schmieding, R. Mörgeli, M. A. L. Schmieding, M. A. Feufel, and F. Balzer, "Benchmarking triage capability of symptom checkers against that of medical laypersons: survey study," Journal of Medical Internet Research, vol. 23, no. 3, e24475, 2021. https://doi.org/10.2196/24475
[7] J. Knitza et al., "Diagnostic accuracy of a mobile AI-based symptom checker and a web-based self-referral tool in rheumatology: multicenter randomized controlled trial," Journal of Medical Internet Research, vol. 26, e55542, 2024. https://doi.org/10.2196/55542
[8] S. M. Jungmann, T. Klan, S. Kuhn, and M. Wittkowski, "Accuracy of a chatbot (Ada) in the diagnosis of mental disorders: comparative case study with lay and expert users," JMIR Formative Research, vol. 3, no. 4, e13863, 2019. https://doi.org/10.2196/13863
[9] K. S. Mohamed Yusuf Sulthan, K. P. Gousic, D. Chitradevi, B. Siddarth, M. Tamil Suriyan, and T. P. Hirthicknath, "A smart emergency ambulance hiring system for real-time medical response," Journal of Neonatal Surgery, vol. 14, no. 18S, pp. 1288-1290, 2025.

APPENDIX: AUTHOR INFORMATION

1) Megharaj Upadhye is a research-oriented undergraduate scholar pursuing a Bachelor of Computer Applications (BCA) at Bharatesh College of Computer Applications, Belagavi, Karnataka, India. His academic interests focus on technological innovation and the application of artificial intelligence to real-world business problems. His current research explores the intersection of business analytics, machine learning, and interactive software systems, with a particular emphasis on developing intelligent, user-centric applications that bridge data-driven insights with practical operational decision-making.
2) Suchita Madiwalar is a third-semester BCA student at Bharatesh College of Computer Applications, Belagavi, and contributed to this research as part of the college's research and innovation initiatives. Her academic interests include data science, machine learning, and analytical modelling for business applications.
3) Prof. Smita Desai is Vice Principal and Assistant Professor at Bharatesh College of Computer Applications, Belagavi. She holds a Master of Computer Applications (MCA) degree and has qualified NET and SET, with extensive experience in academic instruction and research supervision. She provided technical guidance and mentorship throughout the development of this research work.



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