Healthcare And Healthtech

MedAI

Rajasthan Technical University, Kota

Arjun Dhakad (Electronics Instrumentation and Control Engineering)
Ayush Nagar (Electronics Instrumentation and Control Engineering)
Vaishnavi Agarwal (Electronics Instrumentation and Control Engineering)
Vaibhav Purbia(Electronics Instrumentation and Control Engineering)
Ridhima Shekhawat(Information Technology)
Lakshya Sharma(Computer Science and Engineering)

Problem Statement :

Access to timely and accurate medical diagnostics is a challenge, especially in remote areas due to a shortage of healthcare professionals. Traditional ECG, X-ray, and radiology analysis requires experts, causing delays.

Solution :

- **AI Diagnostic Platform:** Automate analysis of ECG, X-rays, and scans.
- **Telemedicine Integration:** Enable remote consultations and monitoring.
- **Mobile Health App:** Track vital signs, medical history, and test results.
- **Edge AI for Remote Healthcare:** Deploy AI-powered devices for instant diagnosis

Show Stopper

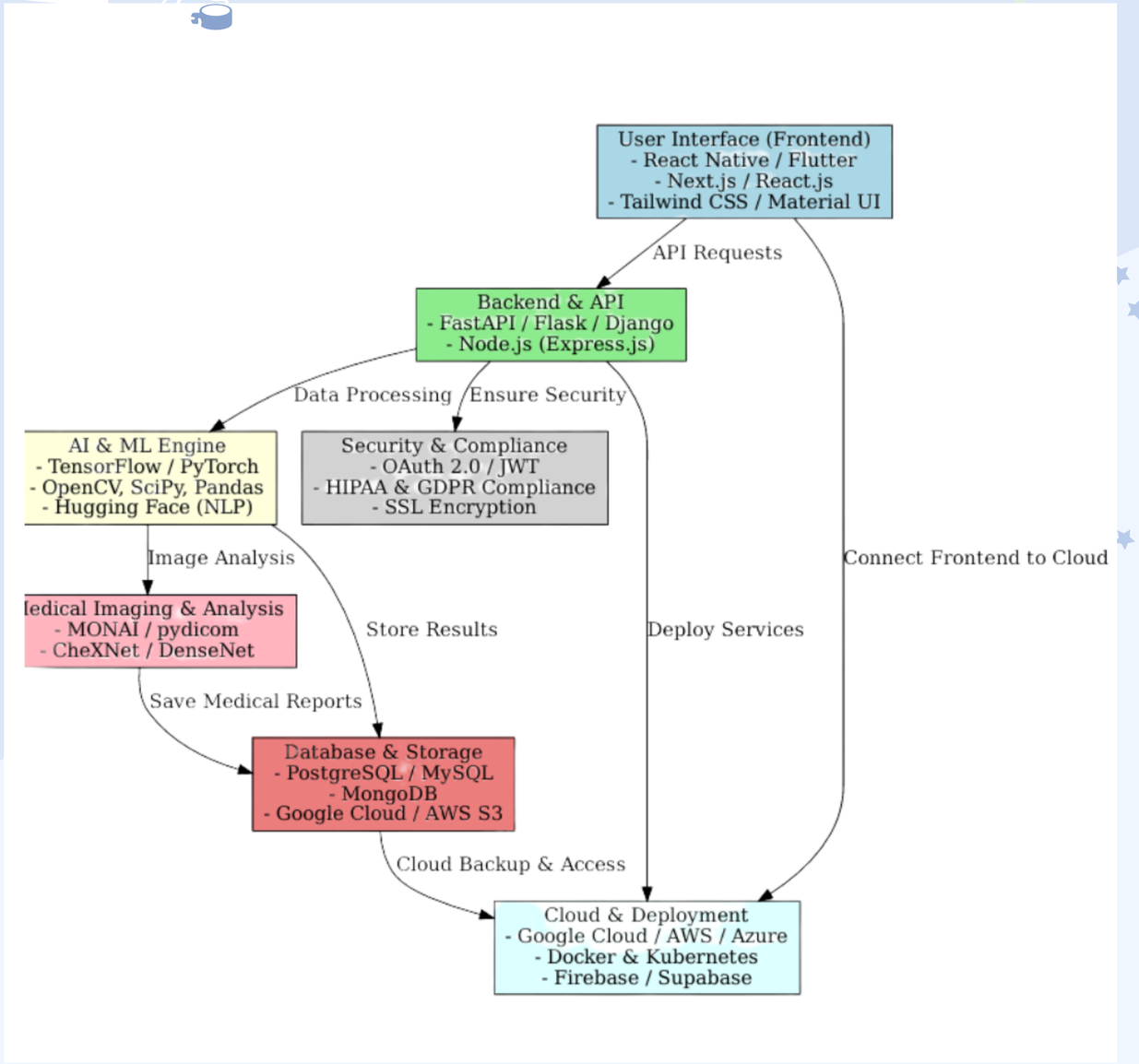
- **Limited AI Adoption in Healthcare** :- Resistance from hospitals and doctors in trusting AI-driven diagnostics.
- **Regulatory & Compliance Hurdles** :- Strict medical data laws (HIPAA, GDPR) requiring secure handling and approvals.
- **Data Quality & Bias** :- Need for large, diverse datasets to ensure accurate and unbiased AI predictions.
- **Integration with Existing Systems** :- Challenges in connecting AI with hospital databases, EHRs, and IoT devices.
- **Trust & Explainability** :- Ensuring AI decisions are interpretable and acceptable to healthcare professionals.
- **Scalability & Cost** :- Making AI-powered diagnostics affordable and accessible for large-scale deployment.
- **Rural & Remote Accessibility** :- Overcoming connectivity issues for AI-driven diagnostics in low-internet areas.

Methodology

- **Building Trust in AI** :- Use explainable AI (XAI) to provide transparent, interpretable results for doctors.
- **Ensuring Compliance** :- Implement HIPAA, GDPR-compliant data encryption and secure cloud storage.
- **Improving Data Quality** :- Train AI models on large, diverse datasets to reduce bias and enhance accuracy.
- **Seamless Integration** :- Design API-based compatibility with hospital EHRs, PACS, and IoT medical devices.
- **Enhancing AI Explainability** :- Develop doctor-friendly dashboards with AI confidence scores and report summaries.
- **Optimizing Scalability & Cost** :- Use cloud & edge AI to reduce operational costs and support large-scale deployment.
- **Expanding Rural Access** :- Deploy Edge AI & offline capabilities for diagnostics in low-connectivity areas.

Tech stack

- **Frontend**:- React Native/Flutter (mobile), Next.js/React.js (web).
- **Backend**:- FastAPI/Flask/Django, Node.js (Express.js).
- **AI & ML**:- TensorFlow/PyTorch (image analysis), OpenCV (preprocessing), Hugging Face (NLP).
- **Medical Imaging**:- MONAI, DICOM (pydicom), CheXNet.
- **Database & Storage**:- PostgreSQL/MySQL, MongoDB, Google Cloud/AWS.
- **Cloud & Deployment**:- Google Cloud/AWS, Docker.
- **Security**:- OAuth 2.0, HIPAA/GDPR compliance, SSL encryption.



MedAI Financial Distribution

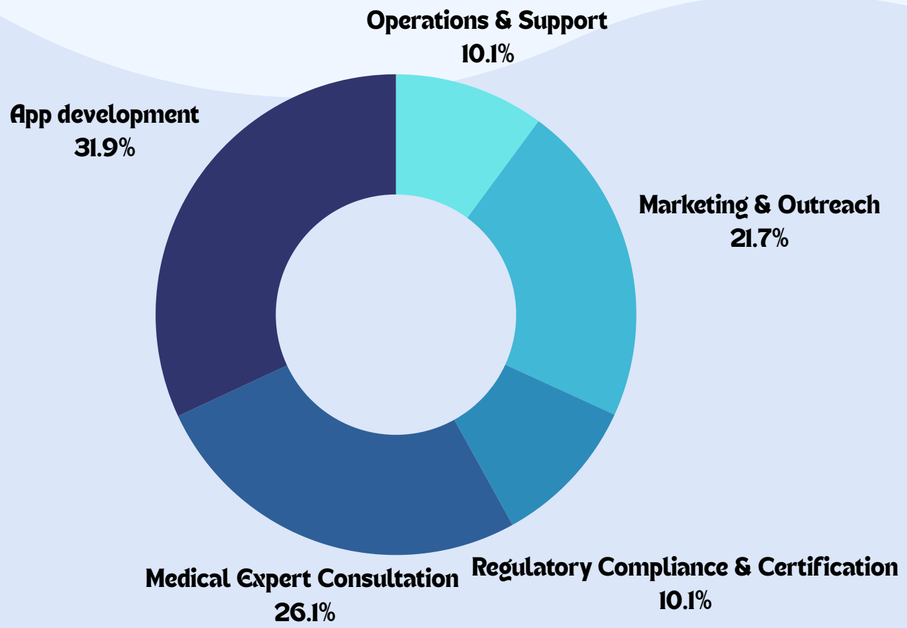
1. App Development
Cloud & Server Costs: ₹2-5 lakh/year
Maintenance & Updates: ₹5-10 lakh/year

2. Medical Expert Consultation
Doctor/ Radiologist Advisory Fees: ₹1-2 lakh/month
Data Annotation & Validation: ₹5-10 lakh

3. Regulatory Compliance & Certification
Legal & Licensing Fees: ₹2-5 lakh

4. Marketing & Outreach
Initial Marketing & Promotions: ₹5-10 lakh

5. Operations & Support
Operational Costs: ₹2-5 lakh/year
(**Source**:-Google data enhanced by AI)



Expected Outcomes & Impact

- **Faster & More Accurate Diagnoses** :- AI-driven efficiency
- **Bridging Healthcare Gaps** :- Bringing advanced diagnostics to rural areas
- **Reducing Healthcare Costs** :- Less dependency on expensive tests
- **Doctor Assistance** :- AI as a supporting tool, not a replacement
- **Scalable AI-driven healthcare solution** improving diagnosis speed, accessibility, and affordability.

Role of Team Members

- **Presenter**
  Vaishnavi Agarwal
- **Tech Support**
  Lakshya Sharma
  Vaibhav Purbia
- **PPT Design**
  Arjun Dhakad
  Ayush Nagar
- **Financial Analysis :**
  Vaibhav Purbia
- **Content Creator and Research**
  Ridhima Shekhawat

Thank you