SOEN6841: Software Project Management

Winter 2025

FEASIBILITY STUDY

FOR

AI-DRIVEN HEALTH MONITORING APP

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Submitted to:

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3. Feasibility Study

Objective:

The feasibility study aims to assess the practicality of developing and implementing the AI-Driven Health Monitoring App by evaluating its technological, operational, and economic aspects. This study ensures that the proposed solution is viable, scalable, and capable of meeting user needs while adhering to industry standards and regulations. Key objectives include:

- Assessing the suitability of the technology stack, including AI models, cloud infrastructure, and wearable device integration.
- Analyzing the feasibility of implementation, considering resource availability, integration complexity, and potential risks.
- Evaluating the operational impact on users, healthcare providers, and regulatory bodies while identifying potential challenges and benefits.
- Estimating development costs, revenue potential, and ROI to determine the financial sustainability of the project.
- Ensuring compliance with HIPAA, GDPR, and security protocols to protect user data and maintain regulatory adherence.

Technical Feasibility

Evaluation of the Technology Requirements for the Software Solution

The AI-Driven Health Monitoring App requires a sophisticated technology stack that integrates real-time health monitoring, AI-driven analytics, and secure data processing. The following technologies will be used:

- **Mobile Application Development:** React Native for cross-platform (iOS & Android) compatibility.
- **Backend Infrastructure:** Node.js for scalable backend services.
- **Database Management:** PostgreSQL for structured health data and Firebase for real-time syncing.

- **AI & Machine Learning Models:**
  - Random Forest for exercise recognition.
  - Support Vector Machines (SVM) for heart disease detection.
  - Convolutional Neural Networks (CNN) for fatigue and stress detection.
- **Cloud Services & APIs:** Google Cloud, AWS Lambda for serverless execution, and RESTful APIs for integration with wearable devices.
- **Predictive Analytics Module:** Uses AI-driven insights to detect potential health risks based on user data trends and past records.
- **Emergency Alert Integration:** Automated alert system that notifies emergency contacts and healthcare providers in case of critical health anomalies.
- **Security Measures:** End-to-end encryption, compliance with HIPAA and GDPR regulations.
- **Wearable Device Integration:** Google Pixel Watch, Apple Watch, Fitbit SDKs.

This technology stack ensures high performance, scalability, and security while facilitating seamless data processing and AI-powered insights.

Assessment of the Feasibility of Implementing the Required Technology

Implementing the required technologies is feasible due to:

- **Availability of Open-Source Libraries:** TensorFlow and PyTorch support AI model development.
- **Cloud Infrastructure Readiness:** AWS and Google Cloud offer scalable, cost-effective storage and processing power.
- **Third-Party API Support:** Most wearable devices provide SDKs, simplifying integration.
- **Potential Technical Risks & Mitigation Strategies:**
  - **Risk:** AI model accuracy may degrade over time.
  - **Mitigation:** Regular model retraining using updated datasets.
  - **Risk:** Real-time processing delays due to large datasets.
  - **Mitigation:** Optimized database indexing and caching techniques.

Operational Feasibility

Analysis of the Operational Impact of the Proposed Solution on Existing Processes

- **For Users:** Easy-to-use mobile app for real-time health tracking.
- **For Healthcare Providers:** Integration with patient management systems to enhance preventive care.
- **For Regulatory Bodies:** Compliance with GDPR and HIPAA ensures privacy protection.
- **For Developers:** Scalable infrastructure allows for continuous improvements.

Identification of Potential Challenges and Benefits in the Operational Context

Challenges:

- **User Adoption Resistance:** Solution – Educational campaigns and intuitive UI/UX design.
- **Integration with Existing Medical Systems:** Solution – API standardization for interoperability.
- **Ensuring AI Reliability:** Solution – Continuous validation and improvements.

Benefits:

- **Early Disease Detection:** Reducing hospital visits.
- **User Engagement:** Gamification and AI-driven insights improve long-term adoption.
- **Reduced Healthcare Costs:** Preventative health measures lower long-term medical expenses.

Economic Feasibility

Estimation of the Economic Viability of the Project

Cost Category	Estimated Cost
Development	$100,000
AI Model Training	$40,000
Cloud & Infrastructure	$30,000
Security & Compliance	$20,000
Marketing & User Acquisition	$25,000
Maintenance & Support	$15,000/year
Total Estimated cost (first year)	$230,000

Consideration of Resource Availability, ROI, and Cost-Benefit Analysis

- **ROI Projection:**
  - **Revenue sources:** One-time app purchase ($30) + premium AI insights ($5/month).
  - **Expected user base:** 100,000 users in Year 1.
  - **Potential revenue:** $3 million.
  - **Payback period:** ~9 months.