Project Title: AI-Driven Patient Risk Prediction System

Role: AI Ethics Officer

Company: Cigna Health

Objective: Develop an AI system to predict patient risk levels, enabling doctors and nurses to prioritize care and insurance providers to streamline approvals and claims processing.

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1. Project Planning Phase (Month 1)

Timeline: January 2022

Key Activities:

- **Stakeholder Engagement:** Conducted meetings with doctors, nurses, and hospital administrators to understand the requirements and ethical considerations for the AI system.
- **Requirement Gathering:** Collaborated with the data science team to outline the technical and ethical requirements of the AI model.

Key Team Members:

- **Data Scientists:** Dr. Emma J., Dr. Alex S.
- **Medical Experts:** Dr. Laura W., Nurse John D.
- **Project Manager:** Michael B.
- **IT and Data Security:** Sarah T.

Software Tools Used:

- **Jira:** For project management and tracking progress.
- **Confluence:** For documentation and requirement gathering.

2. Development Phase (Months 2-4)

Timeline: February - April 2022

Key Activities:

- **Data Collection and Preparation:** Ensured the data used was anonymized and obtained patient consent where necessary.

- **Bias Detection and Mitigation:** Utilized IBM AI Fairness 360 to identify and mitigate biases in the training data.
- **Algorithm Selection and Training:** Worked with data scientists to select appropriate algorithms and validate the model's fairness.

Key Team Members:

- **Data Scientists:** Dr. Emma J., Dr. Alex S.
- **Data Engineers:** Lisa G., Tom M.
- **Ethics Committee:** Myself, Dr. Susan C.

Software Tools Used:

- **IBM AI Fairness 360:** For bias detection and mitigation.
- **TensorFlow:** For model training and development.
- **Jupyter Notebooks:** For experimentation and documentation.

3. Testing and Validation Phase (Month 5)

Timeline: May 2022

Key Activities:

- **Model Testing:** Conducted rigorous testing to ensure model accuracy, fairness, and reliability.
- **Stakeholder Review:** Presented the model to stakeholders for feedback and validation.
- **Ethical Review:** Conducted an ethical review to ensure the model adheres to our ethical guidelines.

Key Team Members:

- **Quality Assurance:** Anna R., Mark T.
- **Medical Experts:** Dr. Laura W., Nurse John D.
- **Ethics Committee:** Myself, Dr. Susan C.

Software Tools Used:

- **scikit-learn:** For testing model performance.
- **Google’s What-If Tool:** For analyzing model behavior and fairness.

4. Deployment Phase (Month 6)

Timeline: June 2022

Key Activities:

- **Deployment Strategy:** Developed a deployment plan ensuring data security and compliance with healthcare regulations.
- **Training and Support:** Provided training sessions for doctors and nurses on using the new system.
- **Launch:** Successfully launched the AI system in partner hospitals.

Key Team Members:

- **IT and Data Security:** Sarah T., Tom L.
- **Training Coordinators:** Jessica A., Robert H.
- **Project Manager:** Michael V.

Software Tools Used:

- **Docker:** For containerizing the application.
- **Kubernetes:** For managing deployment across multiple hospitals.
- **Splunk:** For monitoring system performance post-deployment.

5. Monitoring and Evaluation Phase (Months 7-12)

Timeline: July - December 2022

Key Activities:

- **Continuous Monitoring:** Established continuous monitoring of the AI system to track performance and detect any drift in model predictions.
- **Feedback Collection:** Collected feedback from medical staff to identify areas for improvement.
- **Periodic Reviews:** Conducted periodic reviews to ensure ongoing compliance with ethical standards and regulatory requirements.

Key Team Members:

- **IT and Data Security:** Sarah T., Tom L.
- **Data Scientists:** Dr. Emma J., Dr. Alex S.
- **Medical Experts:** Dr. Laura W., Nurse John D.

Software Tools Used:

- **Prometheus:** For monitoring system performance and alerting.
- **Tableau:** For visualizing performance metrics and feedback.
- **Jira:** For tracking issues and improvements.

Conclusion

In my role as the AI Ethics Officer, I played a crucial part in ensuring the ethical development and deployment of the AI-Driven Patient Risk Prediction System. By working closely with diverse teams, utilizing advanced software tools, and adhering to strict timelines, we successfully developed and implemented a system that not only enhances patient care but also streamlines insurance processes. The project exemplifies our commitment to ethical AI practices and continuous improvement.

This structured and detailed report highlights my contributions and the collaborative efforts of the team, showcasing how we ensured the ethical and successful deployment of an AI system in a healthcare setting.
