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Background

Diabetes is a major global health challenge, requiring early and accurate prediction to improve patient care. Traditional models often expose sensitive medical data to privacy risks. To address this, we developed a secure diabetes prediction system using federated learning, enabling model training without sharing personal data. Our solution improves prediction accuracy while maintaining strict privacy standards.

Objective

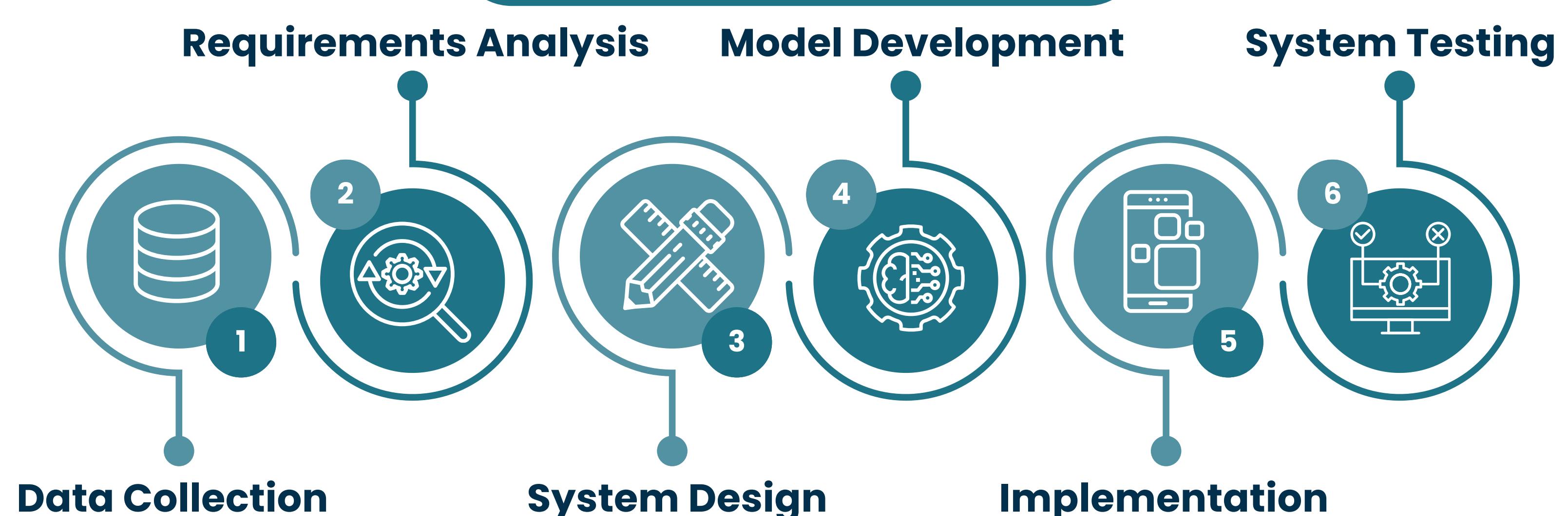
Our objective is to build a secure and accurate diabetes prediction system using modern technologies, ensuring high-precision risk prediction while protecting user data privacy.



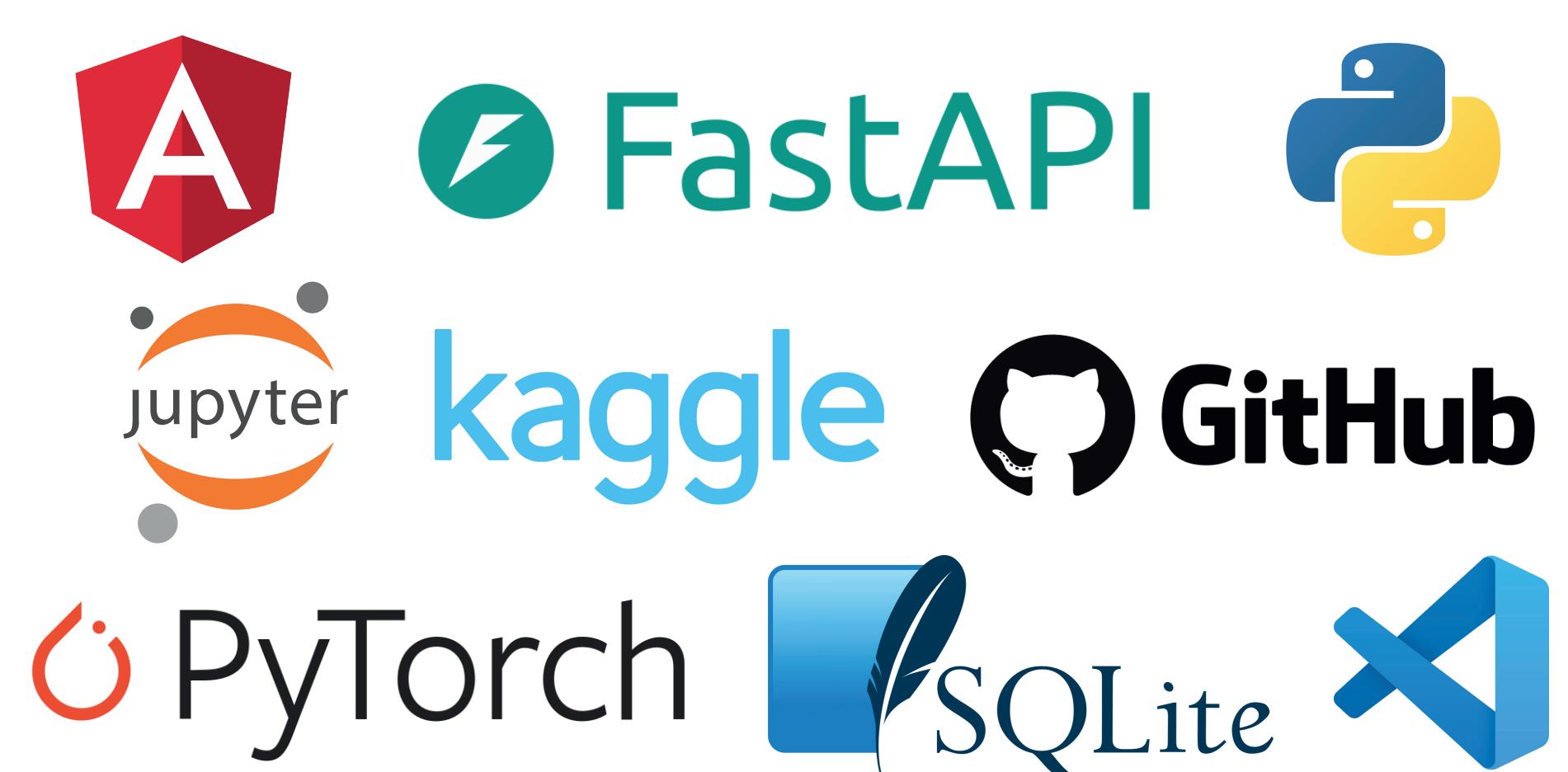
Statistics

- 537 million adults (aged 20–79) are currently living with diabetes — that's 1 in 10 people worldwide
- The number is expected to rise to 643 million by 2030 and 783 million by 2045
- In 2021, diabetes caused 6.7 million deaths, equivalent to one death every 5 seconds

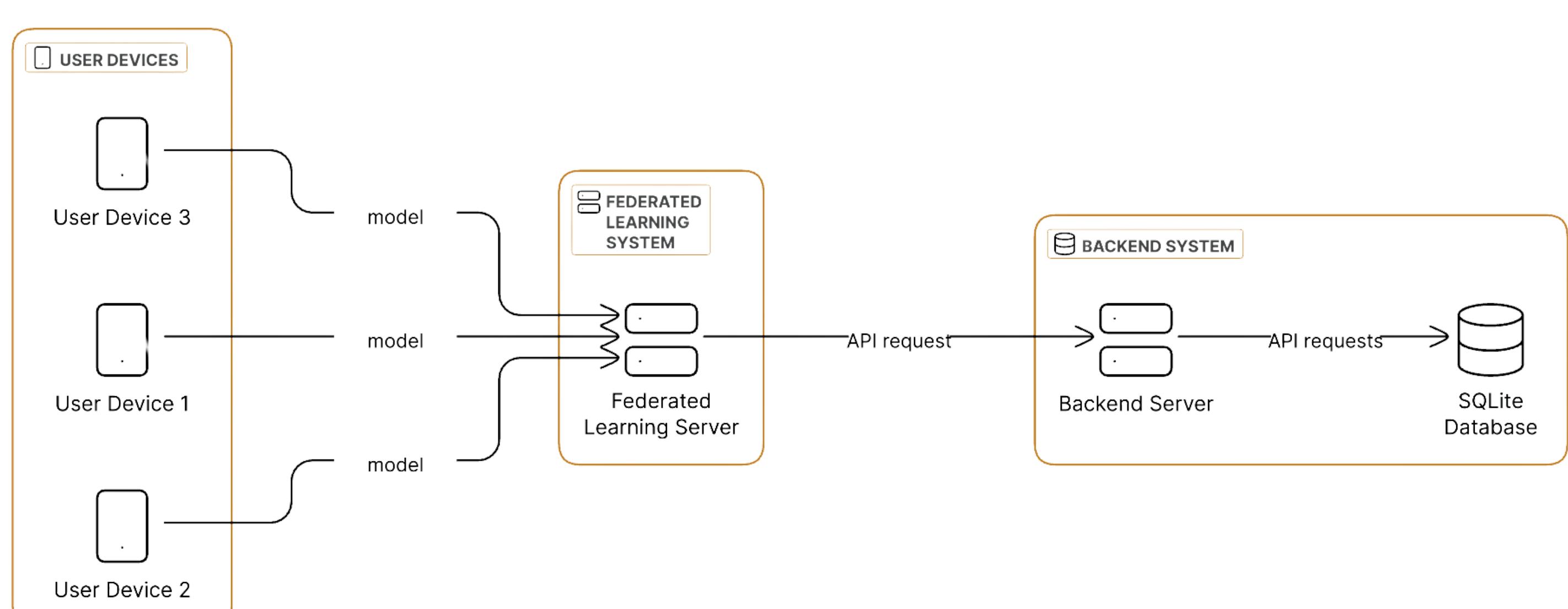
Methodology



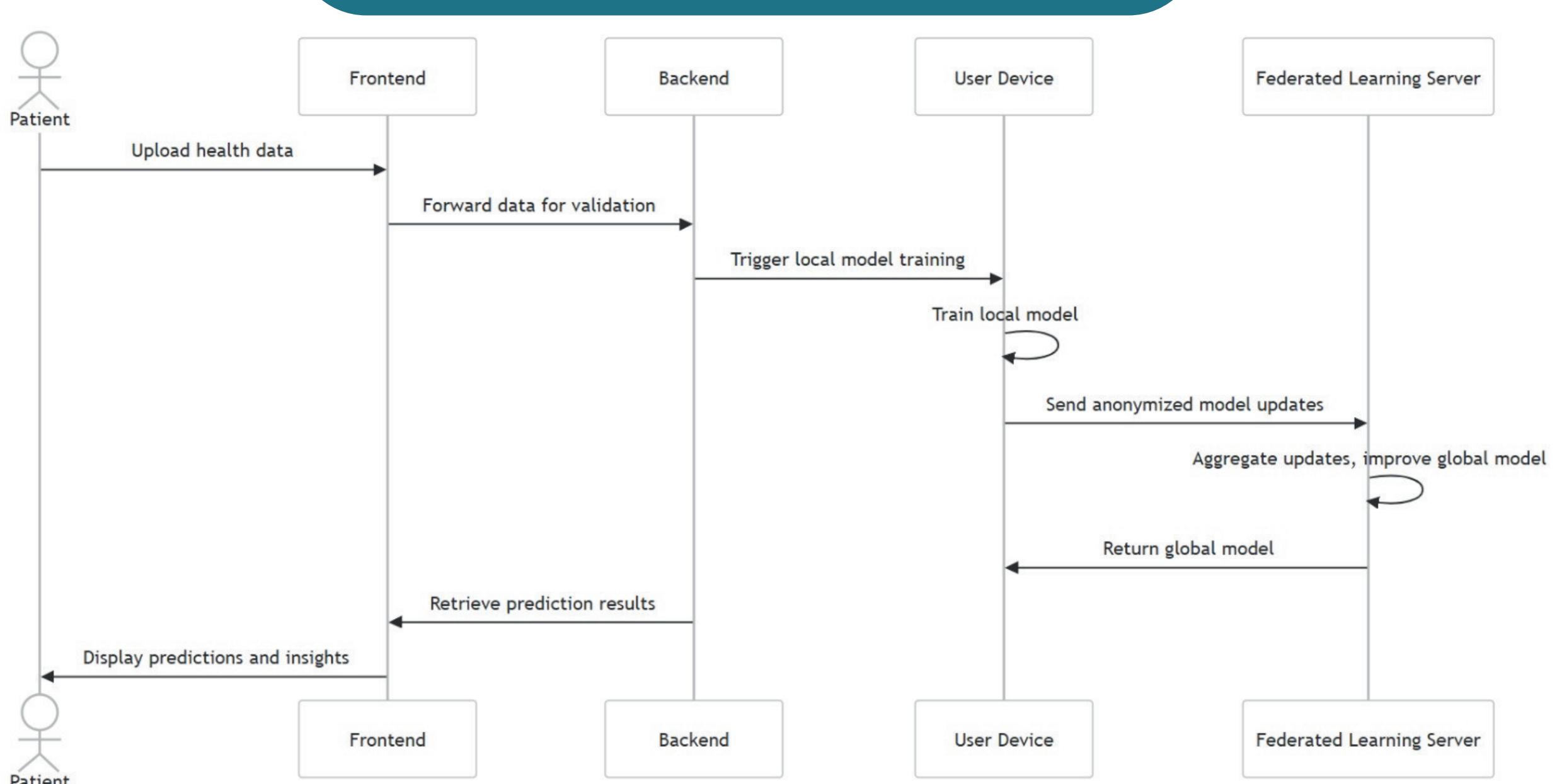
Tools



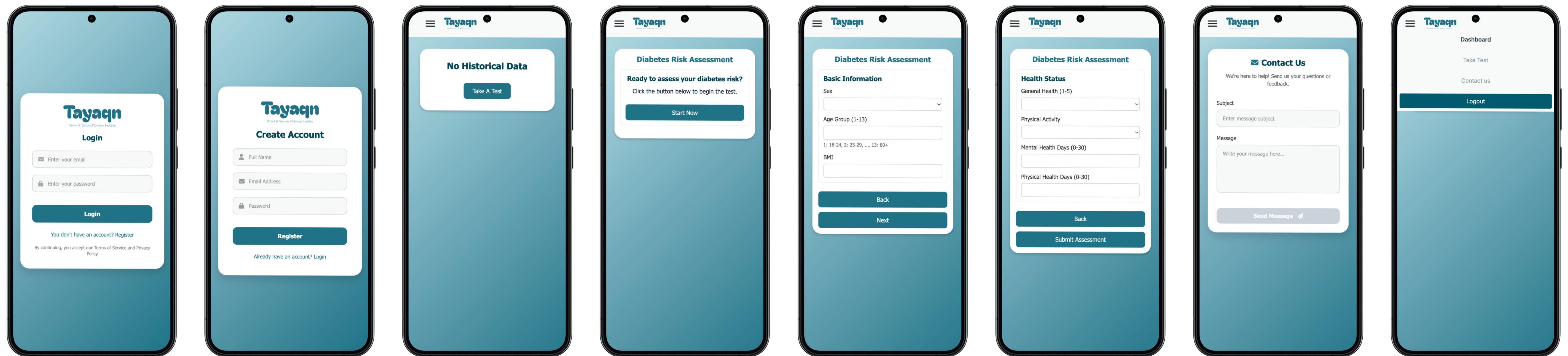
System Architecture



Sequence Diagram



User Interfaces



Results



Future Work

- Expand the system to a mobile app, making it more accessible to users on the go.
- Support Arabic language to reach a broader and more diverse user base.
- Incorporate Explainable AI techniques to provide transparent and understandable predictions, ensuring trust and accountability in the system.

Conclusion

This project demonstrates the potential of combining machine learning with federated learning to build a secure and accurate diabetes prediction system. By protecting user data privacy while ensuring high prediction accuracy, our approach contributes to safer, smarter healthcare solutions for the future.