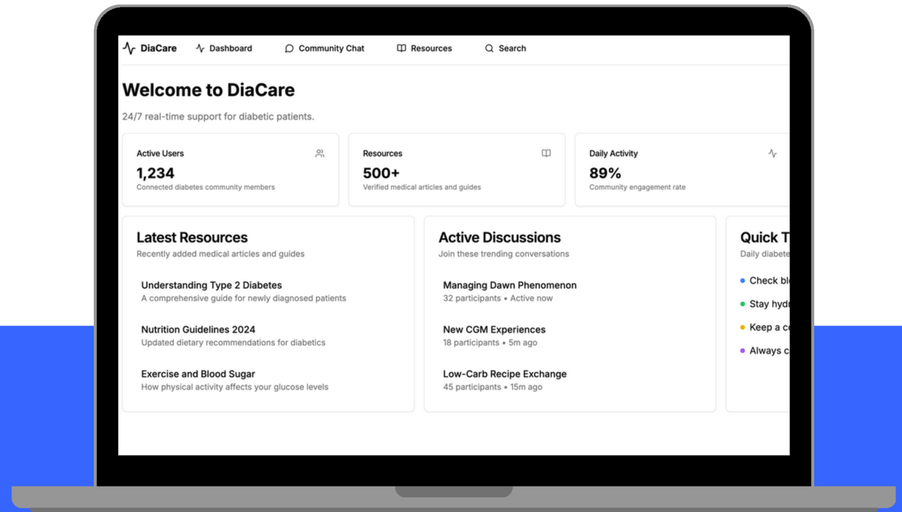
# DIACARE

DIABETIC SUPPORT FOR PATIENTS
AND TO THEIR RELATIVES




# Team

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Deep Learning

**Dipendra**
Deep Learning
Web Development

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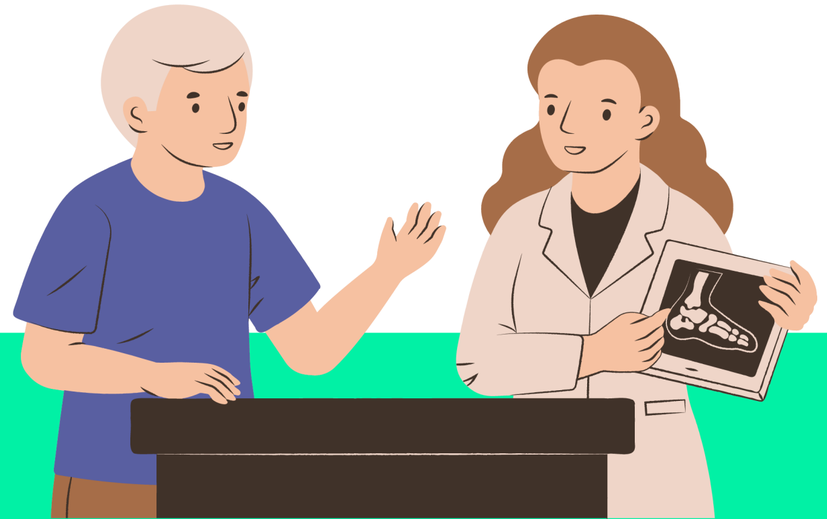
UX

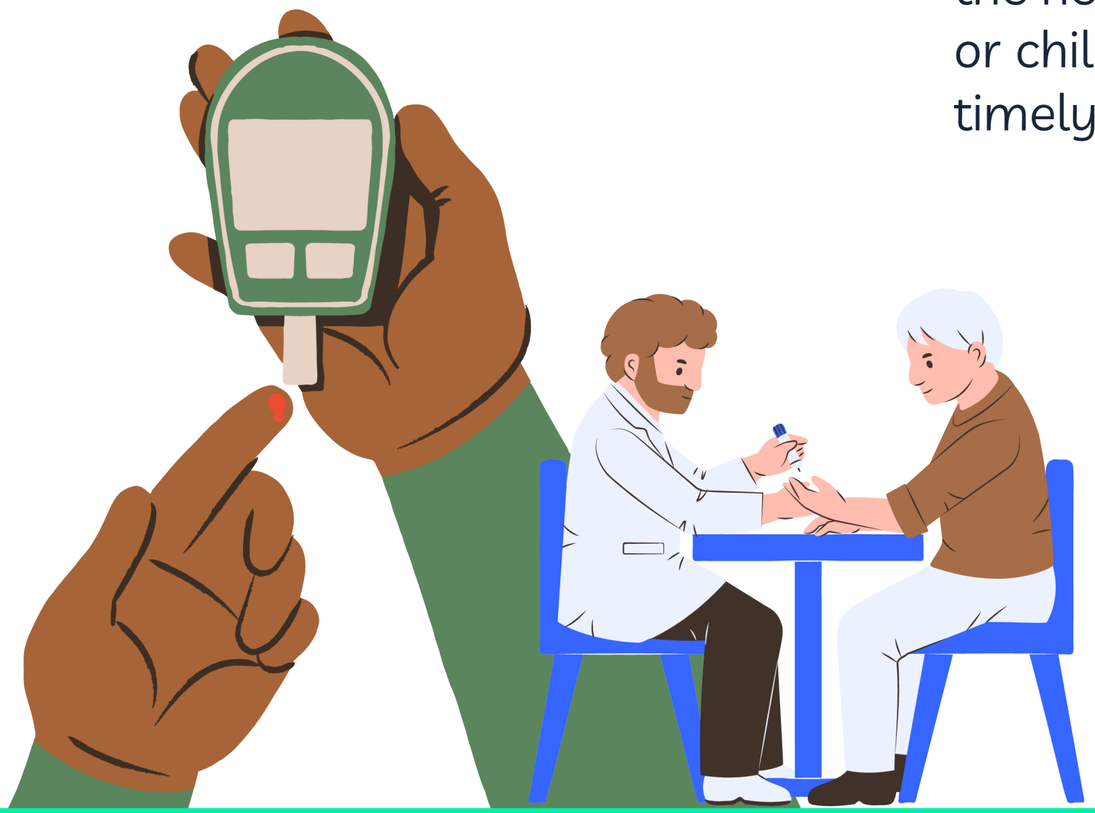


# Story of Brian and Sofie

# Agenda

1. Introduction
2. Problem Statement & Solution
3. Our Process & Methodology
4. Final Product and its features
5. Prediction Modeling and AI solution
6. Business Potential
7. Q & A

# What is the problem?

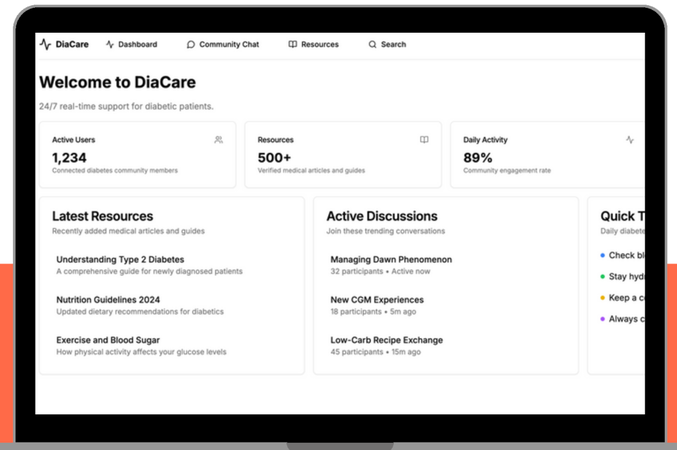


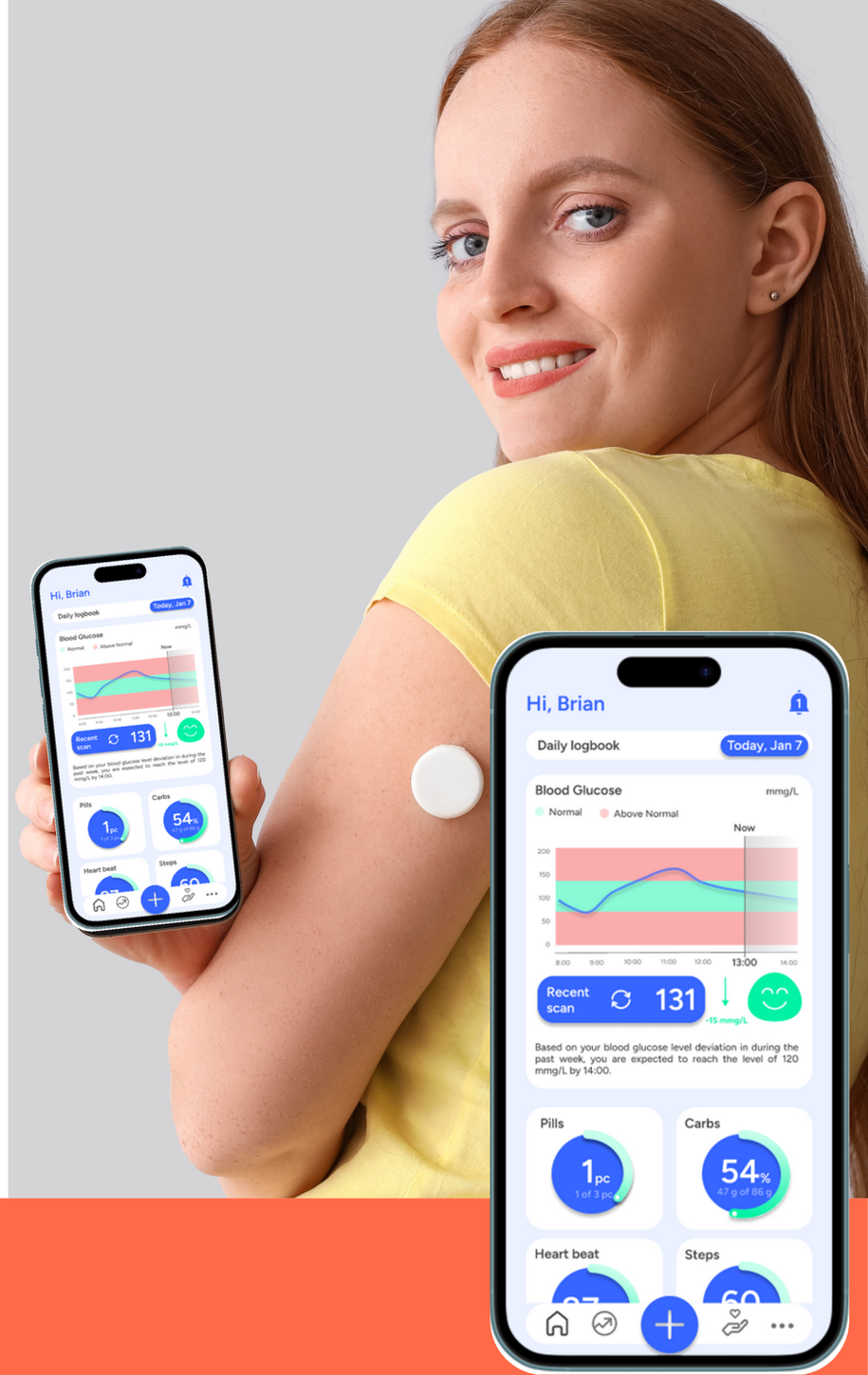
Families living apart often face challenges in staying updated on the health conditions of their loved ones, such as elderly relatives or children with diabetes. Managing diabetes effectively requires timely updates on health metrics like blood sugar levels.

**Diabetes management causes stress for both patients and their caregivers. Accurate health data sharing is necessary to prevent further health issues.**

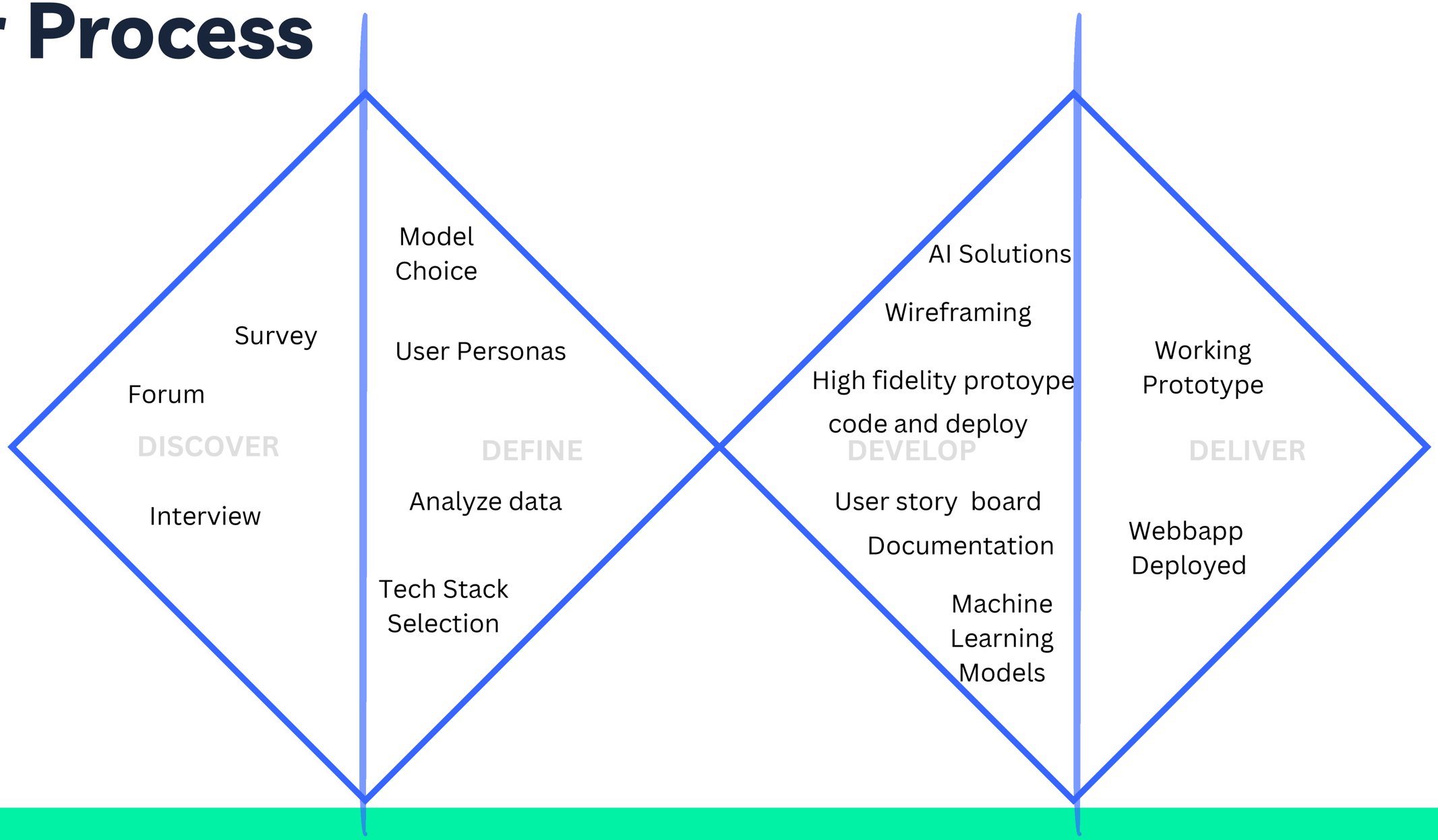
# Our Solution - DiaCare

- Simplify diabetes management integrated with continuous glucose monitoring devices (CGM).
- Real-time tracking, predictive insights, family-sharing features, and a community platform for collective learning.
- Bridging the gap between individual health tracking and collaborative family support



# Our Process


Survey
Forum
DISCOVER
Interview
Model Choice
User Personas
DEFINE
Analyze data
Tech Stack Selection
AI Solutions
Wireframing
High fidelity protoype
code and deploy
DEVELOP
User story board
Documentation
Machine Learning Models
Working Prototype
DELIVER
Webbapp Deployed

!

# Discover & Define

## User Personas

### Adult Children of Elderly Parents with Diabetes

1. Basic Information

**Name:** Sofie Larsen
**Age:** 36 years old
**Gender**: Female

**3. Health Profile**

Type of Diabetes: Type 2 Diabetes **(elderly parent)**
Time Since Diagnosis: Diagnosed 6 months ago
Comorbidities or Risk Factors: Elderly parent has high blood pressure and mobility issues

**4. Goals and Challenges**

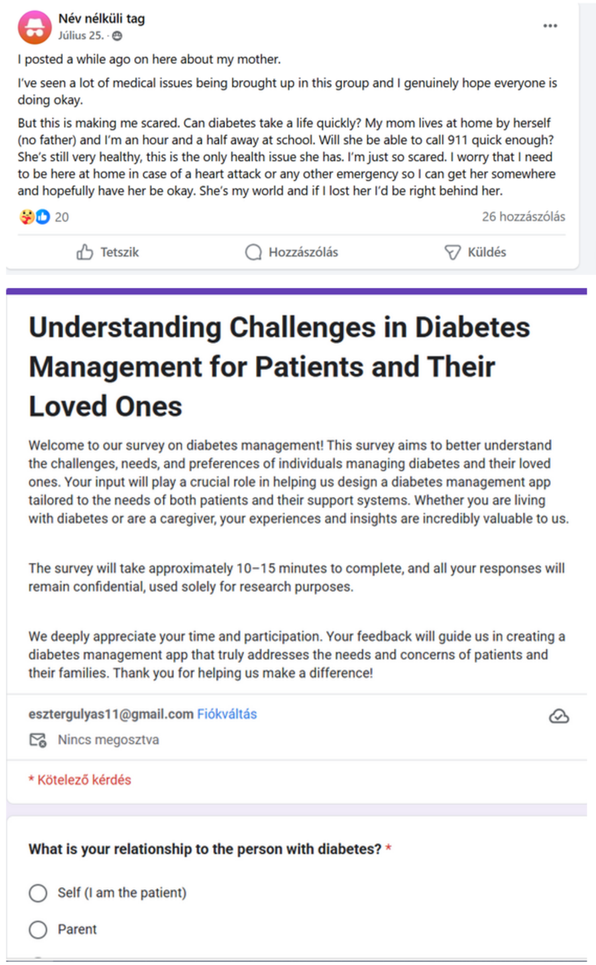
**Primary Health Goals:**

Ensure parent's blood sugar levels remain stable.
Avoid diabetes-related complications like neuropathy or cardiovascular issues.
Stay updated on parent's health trends without intruding on their independence.

**Challenges/Frustrations:**

Finding time to monitor parent's health while managing work commitments.
Worrying about missing signs of declining health due to living in a different city.
Difficulty explaining health metrics and treatment plans to parent in simple terms.

## Surveys interview, information gathering



Név nélküli tag
Július 25. ·

I posted a while ago on here about my mother.

I've seen a lot of medical issues being brought up in this group and I genuinely hope everyone is doing okay.

But this is making me scared. Can diabetes take a life quickly? My mom lives at home by herself (no father) and I'm an hour and a half away at school. Will she be able to call 911 quick enough? She's still very healthy, this is the only health issue she has. I'm just so scared. I worry that I need to be here at home in case of a heart attack or any other emergency so I can get her somewhere and hopefully have her be okay. She's my world and if I lost her I'd be right behind her.

20 26 hozzászólás

Tetszik Hozzászólás Küldés

**Understanding Challenges in Diabetes Management for Patients and Their Loved Ones**

Welcome to our survey on diabetes management! This survey aims to better understand the challenges, needs, and preferences of individuals managing diabetes and their loved ones. Your input will play a crucial role in helping us design a diabetes management app tailored to the needs of both patients and their support systems. Whether you are living with diabetes or are a caregiver, your experiences and insights are incredibly valuable to us.

The survey will take approximately 10–15 minutes to complete, and all your responses will remain confidential, used solely for research purposes.

We deeply appreciate your time and participation. Your feedback will guide us in creating a diabetes management app that truly addresses the needs and concerns of patients and their families. Thank you for helping us make a difference!

esztergulyas11@gmail.com Fiókváltás

Nincs megosztva

* Kötelező kérdés

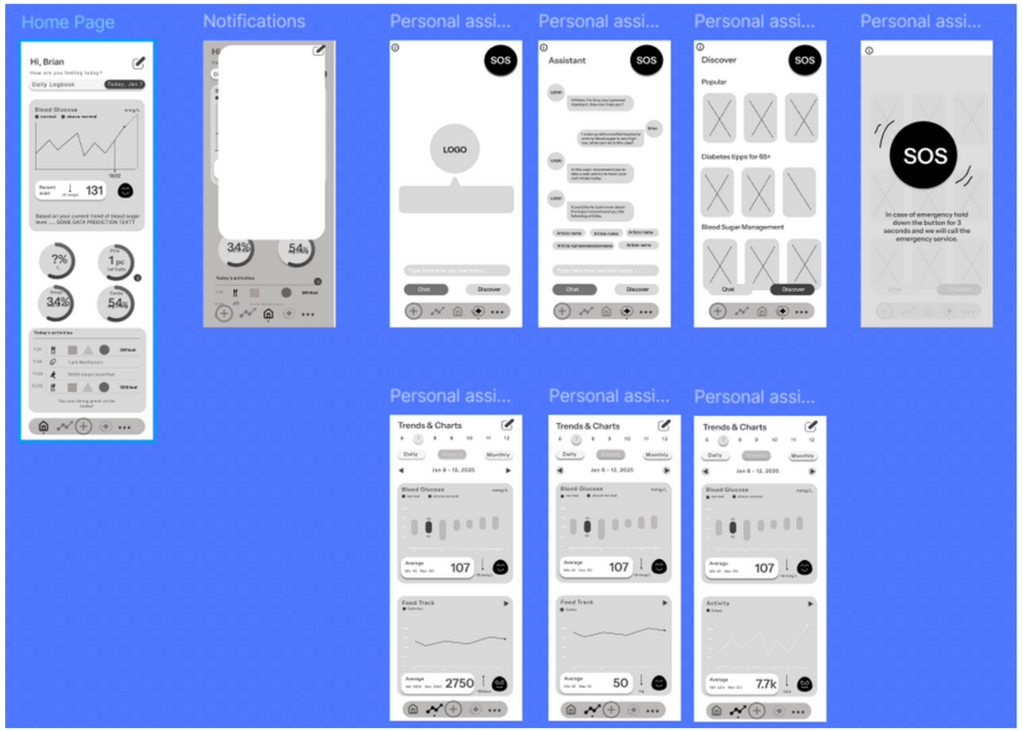
**What is your relationship to the person with diabetes?** *

Self (I am the patient)

Parent

# Develop & Deliver

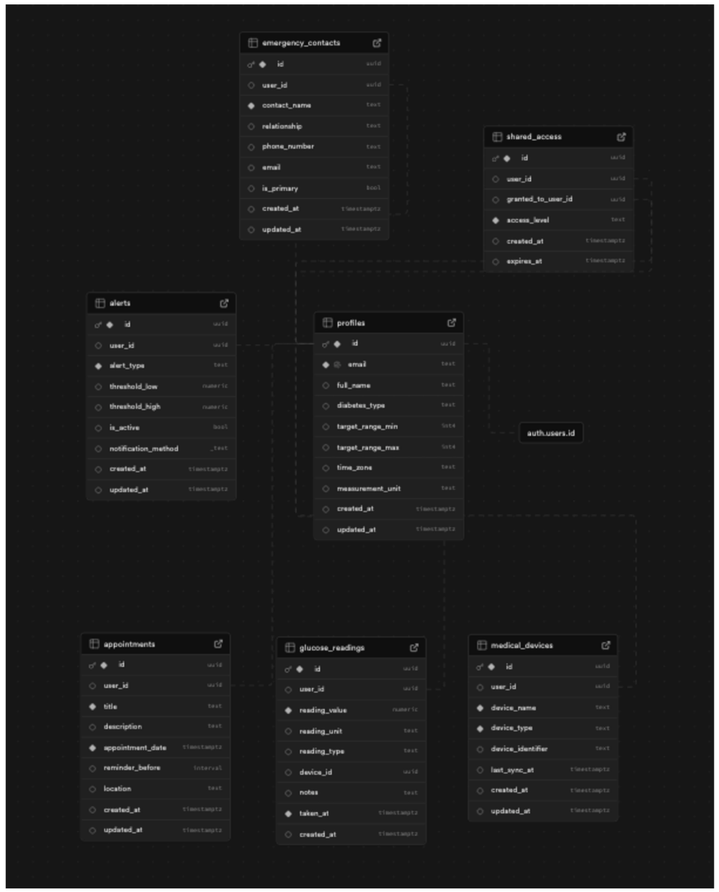
## From Wireframes



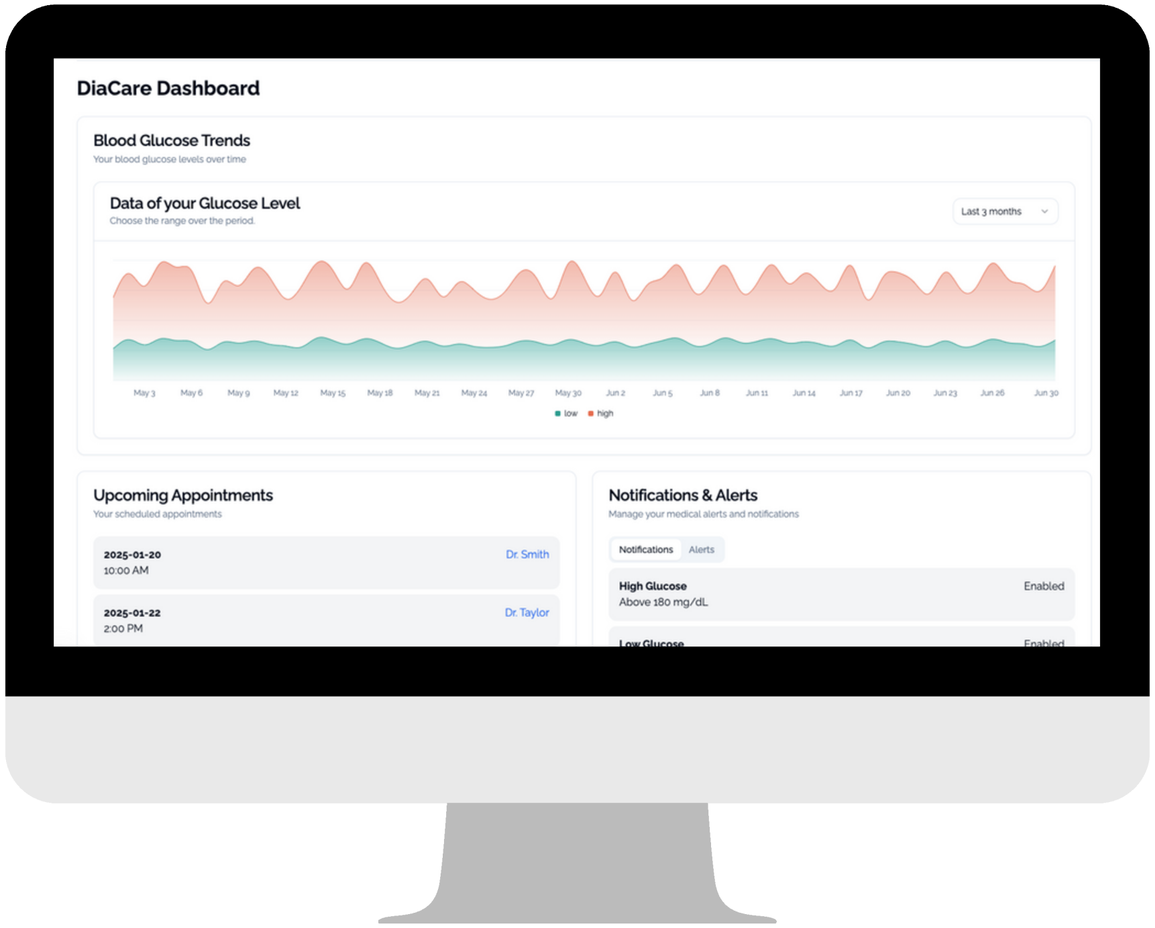

## To Prototype

# Develop & Deliver

## From Schema




## To Prototype



# The Product

Seamless Blood sugar Tracking & Logs

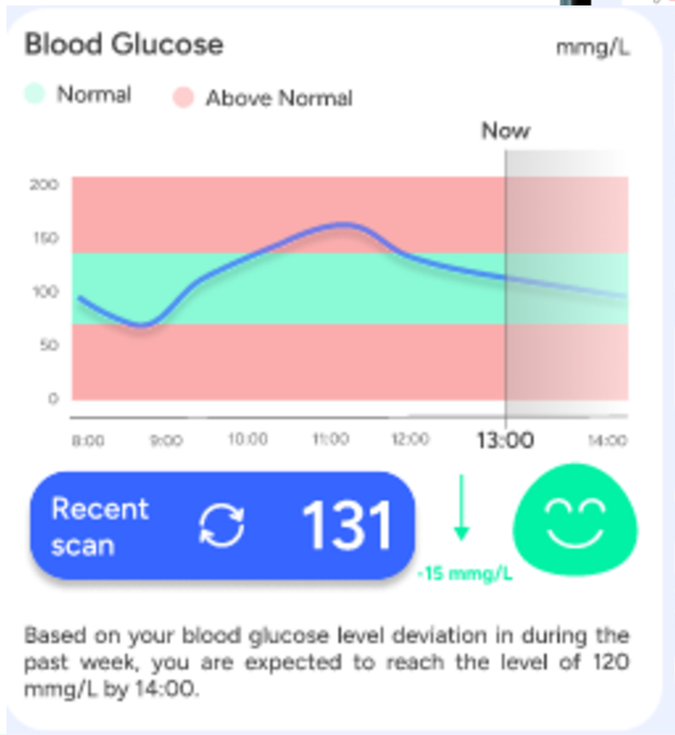
Emergency Assistant, Education


Data Visualization and Predictive Insights

Family Sharing

# Seamless Blood Sugar Tracking

- Data loaded from a CGM device or Manual Data Entry
- Integration of data from health apps (e.g., Apple Health)
- Advanced functions for user

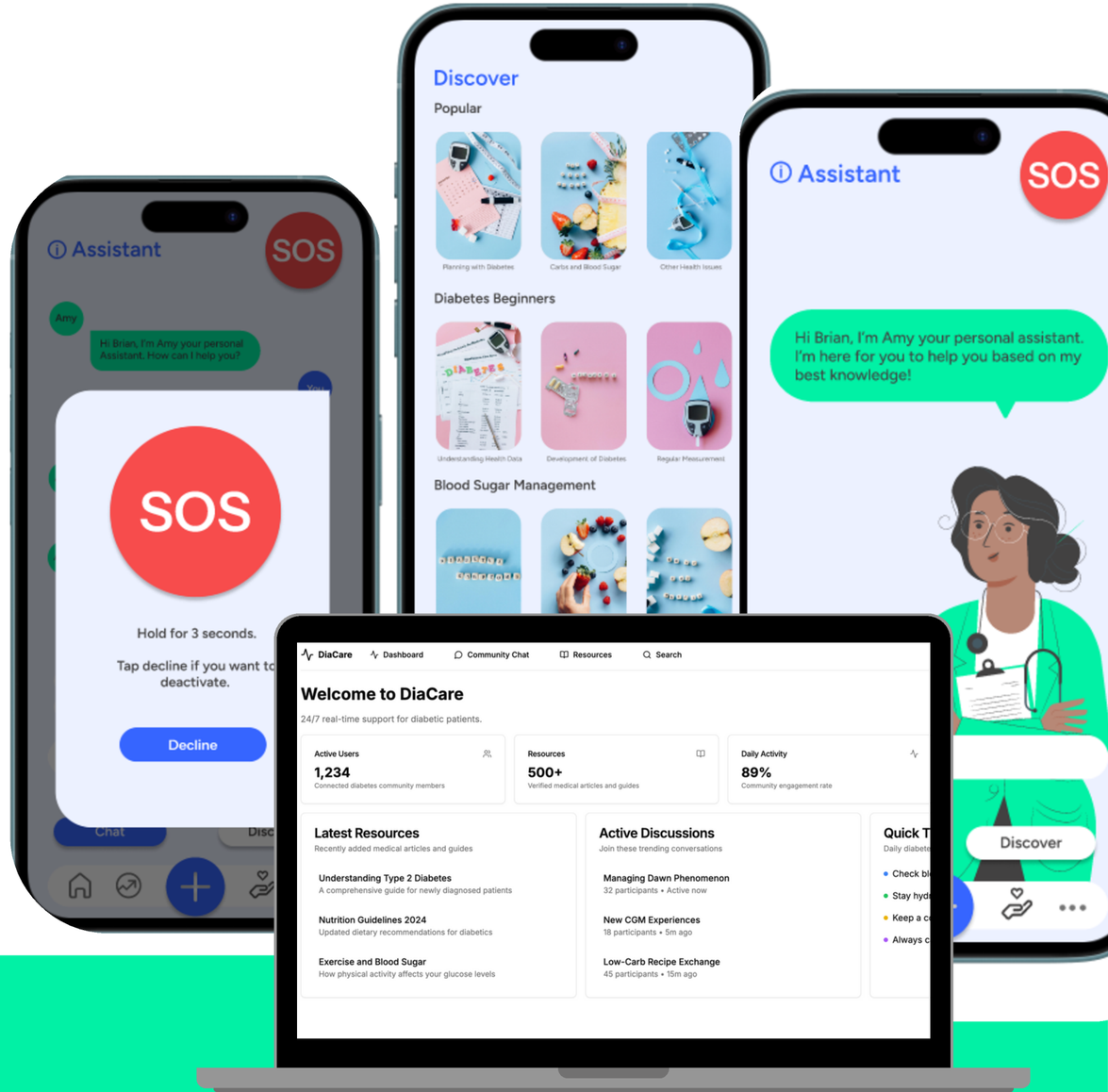



# Family Sharing, Dual Access

- Editable log from care giver and patient side
- Notification when information added (both caregivers and patient
- Notifying when Blood Glucose reach an incorrect

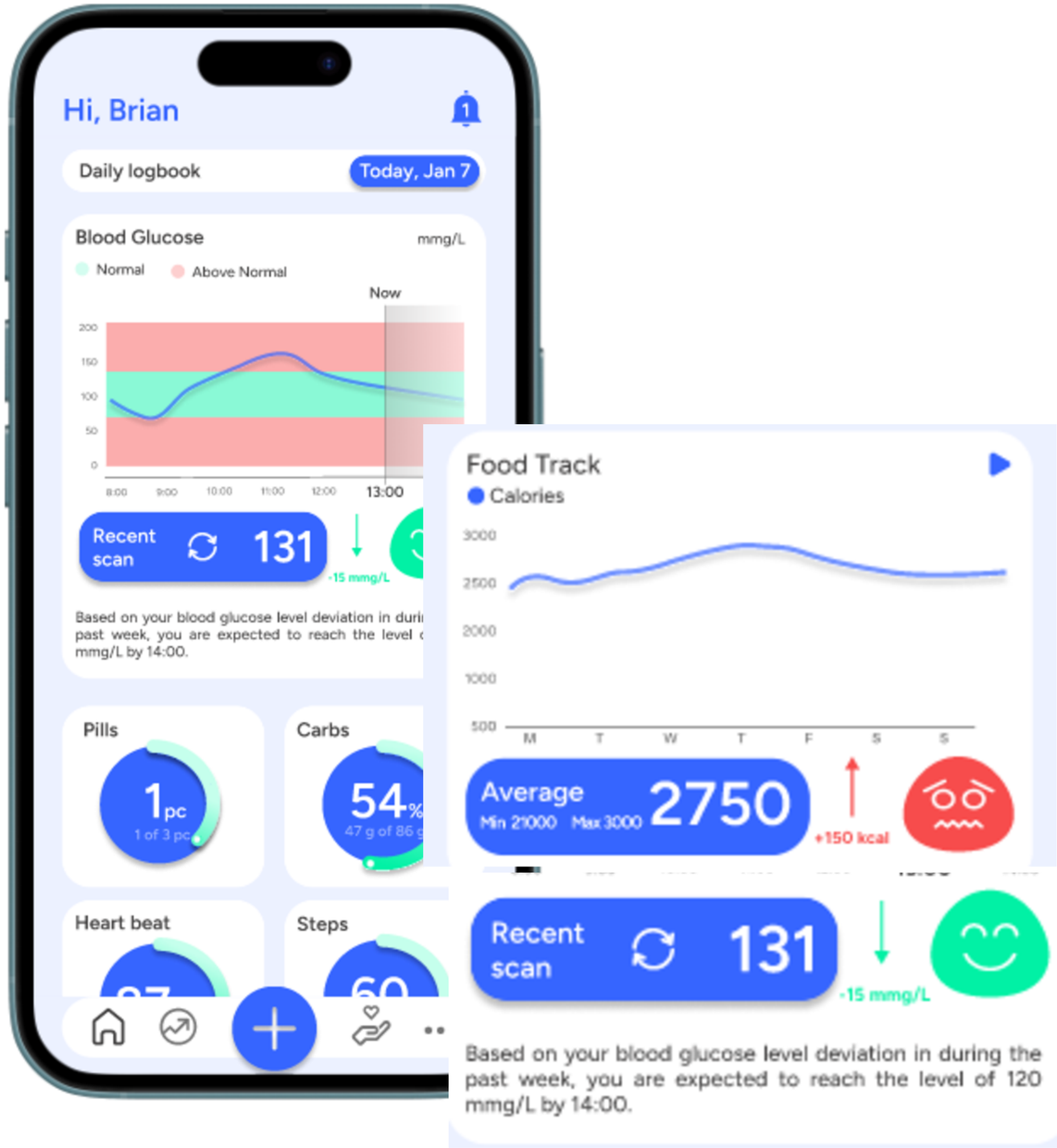
# Emergency Assistant, Education

- Integrated AI assistant
- Panick Putton
- Discore articles for further education
- Webapp



# Data Visualization and Predictive Insights

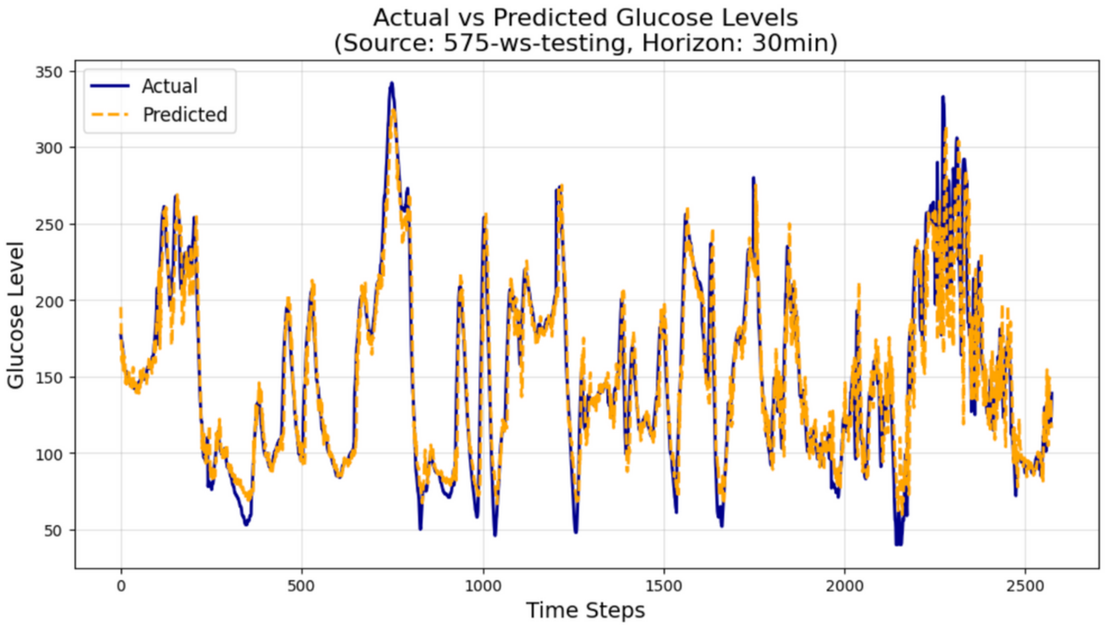
- Future prediction about the Blood Glucose
- Data report sharing with family and doctos
- Personalized predictive insights



# Prediction model performace

Data source: OhioT1DM dataset
Model: Gated Recurrent Unit (GRU)-based model
Predict BG values in 15, 30, and 60 min prediction horizons (PHs)

| Metrics | PH: 15MIN | PH: 30MIN | PH: 60MIN |
|---|---|---|---|
| RMSE | 12.8 | 20.5 | 34.8 |
| R2 score | 0.96 | 0.89 | 0.68 |
| Classification Accuracy | 95.7% | 92.9% | 88.8% |



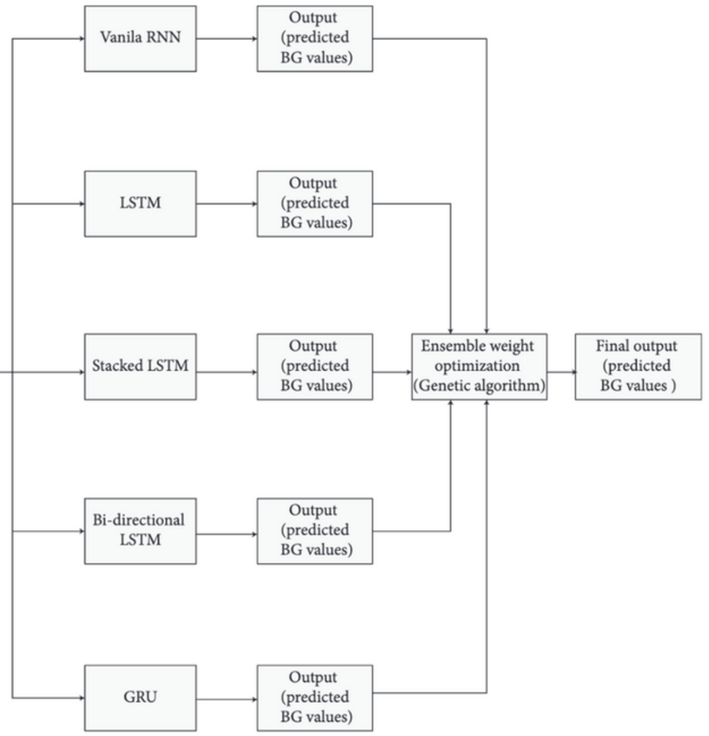

Reference:
1. Kim, D. Y., Choi, D. S., Kang, A. R., Woo, J., Han, Y., Chun, S. W., & Kim, J. (2022). Intelligent ensemble deep learning system for blood glucose prediction using genetic algorithms. Complexity, 2022(1), 7902418.
2. Butunoi, B. P., Stolojescu-Crisan, C., & Negru, V. (2024). Short-term glucose prediction in Type 1 Diabetes. Procedia Computer Science, 238, 41-48.

# Prediction model - upgrade proposal

Ready made data: OhioT1DM dataset

Real-world user data

Data columns: data retrieved/self-reported time, Blood glucose level, Fasting or After Meals




Fine Tuning

Kim et al. (2022)

Classifier I (Fasting Blood Sugar (FBS))

Hypoglycemia: Below 70 mg/dL
Normal Range: 70-99 mg/dL
Prediabetes/Diabetes: Higher than 100 mg/dL

Classifier II (Postprandial Blood Sugar (PPBS) or After Meals)

Hypoglycemia: Below 70 mg/dL
Normal Range: 70-140 mg/dL
Risky: Higher than 140 mg/dL

Data Entry

Data Preprocess

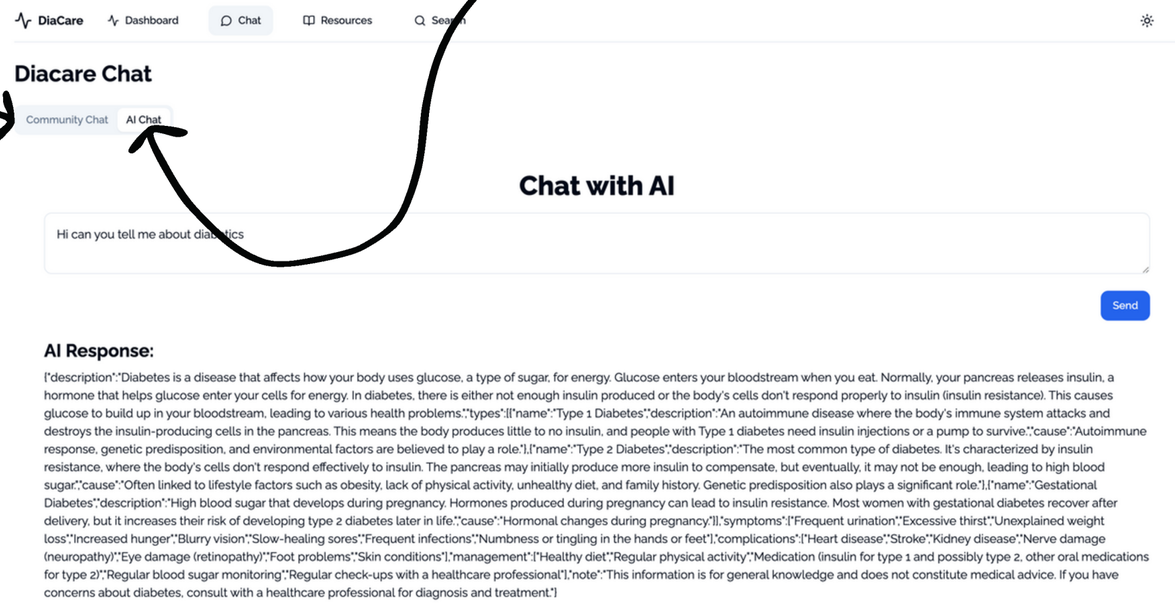
Proposed Prediction Model

Classifier

# Proposed AI solutions

- Integration of AI for the chat response
- AI + RAG used for the report generation via app data
- Sharable data with improved and organized reports.
- Sentiment analysis and contextual chat features.
- Recommender System.

AI chat




Community Chat

# Business Potentials

- Freemium Model
- platform to act as mediator between patients and stake holders.

## Key partners

What are your key partners to get competitive advantage?

- In the first place:
  - Medical device companies ( insulin pumps, blood glucose meters)
    - who want to integrate their product
    - Potential for sponsorship and co-marketing opportunities
  - Both private and public insurers who could promote the app to their customers or integrate it into their health management services
  - Diabetes Communities and Non-Profit Organizations
    - that support people with diabetes and can help promote the app.

## Key activities

Which are the key steps to move ahead to your customers?

Our product aims to solve the issue coming up due to the physical and emotional barriers between diabetic patients and caretakers.

- **Real time tracking**
- **emergency service** consisting of an AI assistance and a panick button
- **Articles, tipps**
- **data-prediction, analytics and customization**
- **enabling editable features, customization**

**Later:**

- quick access to healthcare professional (not only AI but real assistance too)
- Forum or integrated social media platform that allows community building among patients

## Key propositions

How will you make your customers' life happier?

Our product aims to solve the issue coming up due to the physical and emotional barriers between diabetic patients and caretakers.

- **Real time tracking** allows care tackers to be updated any time of the day.
- Diabetics can feel safe even when being distant from their caretakers which is further supported by an integrated **emergency service** consisting of an AI assistance and a panick button
- Provides **data prediction** for the future to prevent major health issues beforehand
- Reduces conflicts and stress regarding health management in relationship by providing providing a communication platform, by **enabling editable features from both sides** such as notes and reminder

## Customer relationships

How often will you interact with your customers?

- User friendly interface relying on strong visualization for understanding data through colors and forms
- Personalized support depending on if the end user is a caretaker or diabetic: through AI algorithm customized article recommandation depending on the customer's profile and their current health status
- Future C2C support through blogs and community building

## Customer segments

Who are your customers? Describe your target audience in a couple of words.

Primarily:

- Diabetics: for easier personal management
- Caretakers: staying up to date and give more accurate support to their loved one

Secondarily:

- later on bringing in business customers in after growing a strong customers base:
  - for customers: provide access aside from AI assistance to real healthcare professionals
  - for businesses: Bringing more customers to private healthcare providers

## Key resources

What resources do you need to make your idea work?

- continuous development of platform and services
- staying up to date with the current technology on on the diabetic devices
- medical professionals to consult
- HR: developers, designers

## Channels

How are you going to reach your customers?

Main channel is a mobile app integrating the services
Web application for updates and social blogs.

## Cost Structure

How much are you planning to spend on the product development and marketing for a certain period?

- At the beginning the project is more resource heavy, but after carefully building out the product and service can generate a great ROI
- Licensing and partnerships could initially mean extra cost??
- High cost of entering the market with the model development and initial design
- Costs are arising from human resources mainly, no physical product need: we are an interdisciplinary team having knowledge in design, business, marketing software development – In-house production lowers the high initial cost structure

## Revenue Streams

How much are you planning to earn in a certain period?
Compare your costs and revenues:

- Freemium plan: providing basic services for free, but extra features are becoming costly eg:
  - adding more member to the caretaker that can have access the data
  - subscription to more personalized prediction and getting a personalized medical advice based on that
  - Charge on report generation and sharing above the provided limit via AI
- Later on:
  - marketing fees of healthcare professionals
  - additional fees that healthcare professionals need to work to use our platform to provide medical support

# Demo
# &
# Q & A

# Thank you!