ARIELLE CERINI MFA PhD

Creative Problem Solver & Strategic Thinker

HEALS Health Application

[VIEW PORTFOLIO](#)

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HEALS
Health Advisor

RPI – IBM HEALS Program

Worked to develop a health application prototype with a team of researchers. Application designed for user testing and proof of concept. Developed and executed design research methodology to aid in UI/UX design development.
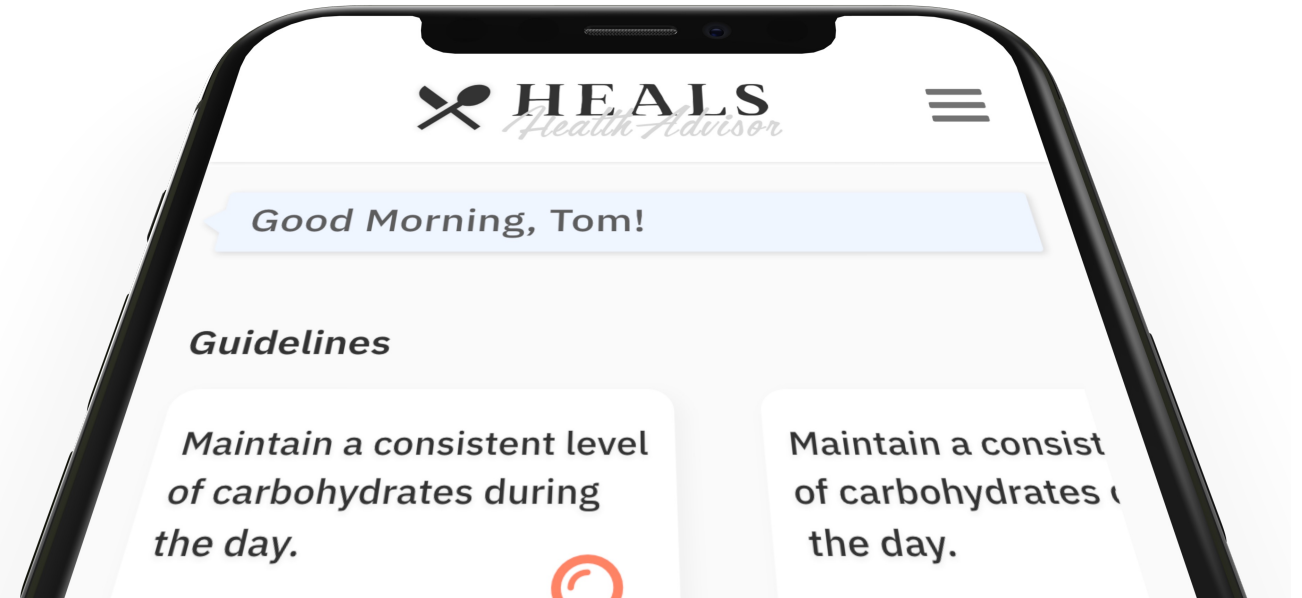
[VIEW PROTOTYPE]

Position
Design Research Assistantship

Role
UI/UX Designer & Front-end Developer

Tools & Technology
Adobe XD & Nuxt.JS

Team Composition

☐ **Project Lead**

☐ **UX Researcher**

☐ **UX Designer / Front-end Developer**

☐ **Back-end Developer**

☐ **Data Scientist**

☐ **Data Scientist**

☐ **IBM Employee**

☐ **RPI Employee/PhD Student**

We also worked directly with several other IBM employees and coordinated efforts with individuals who were working on projects to improve the AI.

During the design process, we consulted with a group of nutritionists that work directly with people with diabetes.

Design Problem

Individuals with diabetes are given guidelines to follow to help live a healthier lifestyle; however, those guidelines are often difficult to understand and are not accompanied by information regarding how to better adhere to them.

How do we help individuals with diabetes to lead a healthier lifestyle?

Assumptions:

Individuals with diabetes are not adhering to the necessary health guidelines.

Part of the reason why people do not follow the guidelines is that they do not know how.

If an individual with diabetes wants to receive custom guidance on better adhering to the necessary guidelines, they must go to a nutritionist or an expert.

People only do not go to nutritionists because of their high cost.

If people had custom guidance, they would follow it.

Solution

A health application that provides personalized advice for individuals with diabetes. The application should provide a detailed analysis of the individual's behaviors and use that knowledge to make suggestions about their diet. The application should be able to be fully integrated with a food logger system, and it should provide recommendations in the form of written advice or recipes.

Personalized information and advice will be provided to the individual by an AI Health Advisor. This information should be seen as most important and given the greatest weight within the end design. **The application will contain advice at varying levels of personalization.** For example, a user will be shown the guidelines that are most relevant to them; however, those guidelines come from a pre-defined list. The personal experience comes through in the 'why.' **The novelty of the application is the ability to provide the individual with the 'why.'**

Pre-involvement

User Testing

Prior to me joining the project, there was an initial proof of concept application built that was used for user testing.

Users felt…

- The design felt outdated.
- It didn't feel like a mobile app.
- It wasn't clear what the point of the application was.
- It was difficult to navigate through the platform

The majority of user's reported that they saw value in the technology but would not use it.

Pre-involvement

User Testing: Key Findings

Overall, the AI performed below expectations

Based on the feedback from the users, it was hypothesized that the reason why it performed below expectations was because of the user experience.

The project decided to invest additional time and resources into creating a new proof-of-concept application.

Understanding the Technology

User's Personal Data Sources

| Health Data | Food Log | Dietary Restrictions | Preferences |

Understanding the Technology

Personalized Health Knowledge Graph
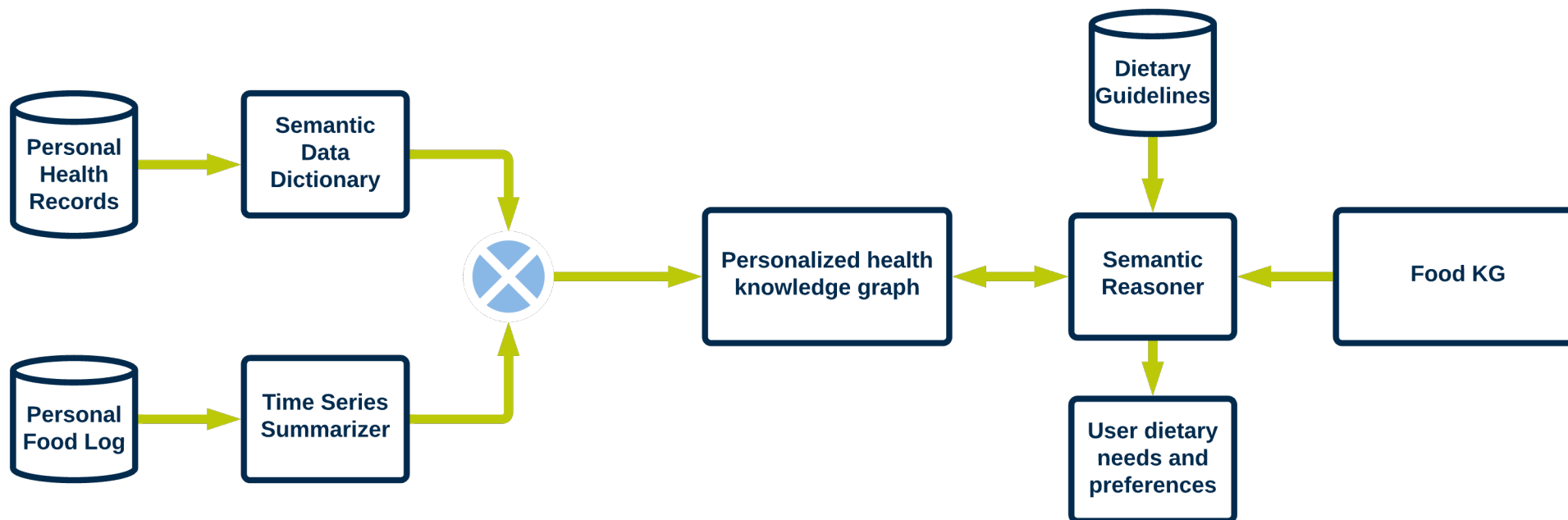
Understanding the Technology

Information Diagram
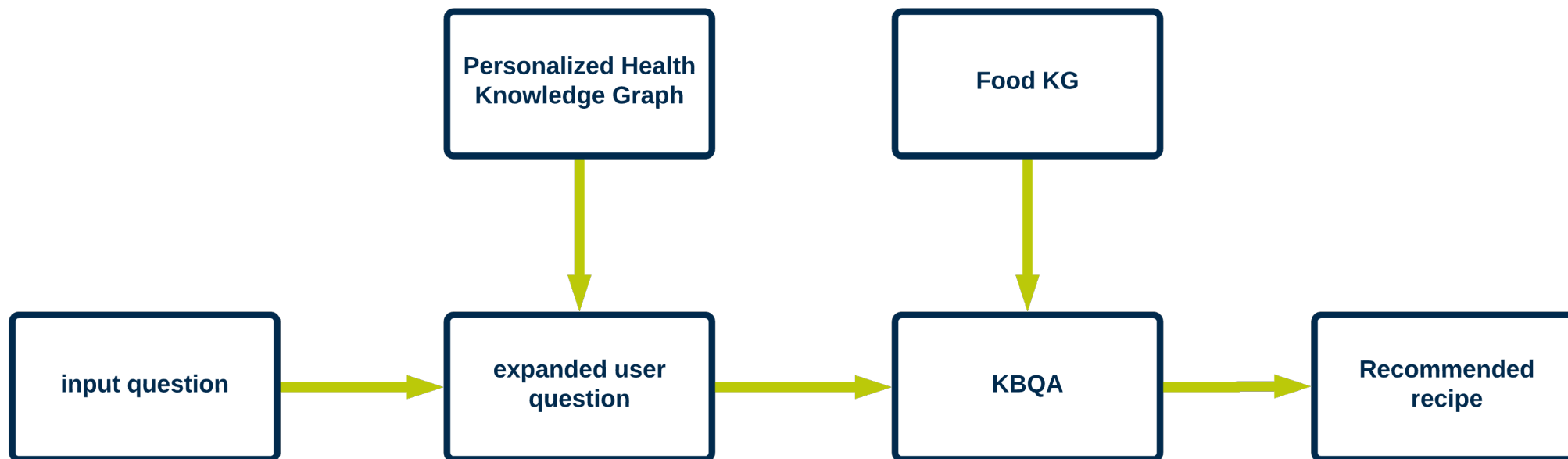
Current Design

Assessment

What it does well

- Central navigation that is easy to access
- Once in the different areas of the application, there is a lot of great information available for the user
- The sitemap is simple but breaks up the information into clear areas that make sense for the end-user.

Room for Improvement

- The application has no clear 'homepage' or landing page. To get information, the user must click into the different spaces.
- The chat feature is only accessible through the main menu
- While the designated spaces are well-organized, there is no easy way to jump between them.
- The information provided is detailed, but it lacks a clear hierarchy.

Design Considerations

How to differentiate the personalized content from the scripted/standard information?

UI/UX Should

- Communicate Authority

- Inform

- Build/Alter Behavior(s)

- Empower

- Promote a Healthier Lifestyle

- Encourage

Solution Requirements

Should differentiate the personalized content from the rest.

Not all personalized content should be considered equal—we want to highlight where the 'why' is provided.

When the why is being provided, it should be clear what it is about.

The end solution should be accessible.

Feedback should be positive and negative—when seeking to alter behaviors, it is just as important to tell people what they are doing that is correct.

Arielle Cerini, MFA, PhD

HEALS Health Application

Research Methods

Other research methods done, but not showcased here in this case study

Competitive analysis of similar software
Looked specifically at AI software and behavior-altering/habit-building software.

Visual research and frequency mapping for color palette
Curated a series of images related to the platform's key initiative and used them to construct a color palette based on the results from a frequency analysis.

Informal discussions with nutritionists
We conducted several informal interviews with a nutritionist to get their insight into how to make the application as useful to people with diabetes as possible.

Proposed Solutions

How to differentiate the personalized content from the scripted/standard information?

1. Usage of known visual indicators

2. Color-coded content

3. Saturation as personalization

4. Skeuomorphic vs. Flat

Proposed Solutions

Usage of known visual indicators

UI containers that contain personalized commentary on the recommended recipes or guidelines can allude to a 'chat bubble.' Chat bubbles are learned indicators for commentary or discussion.
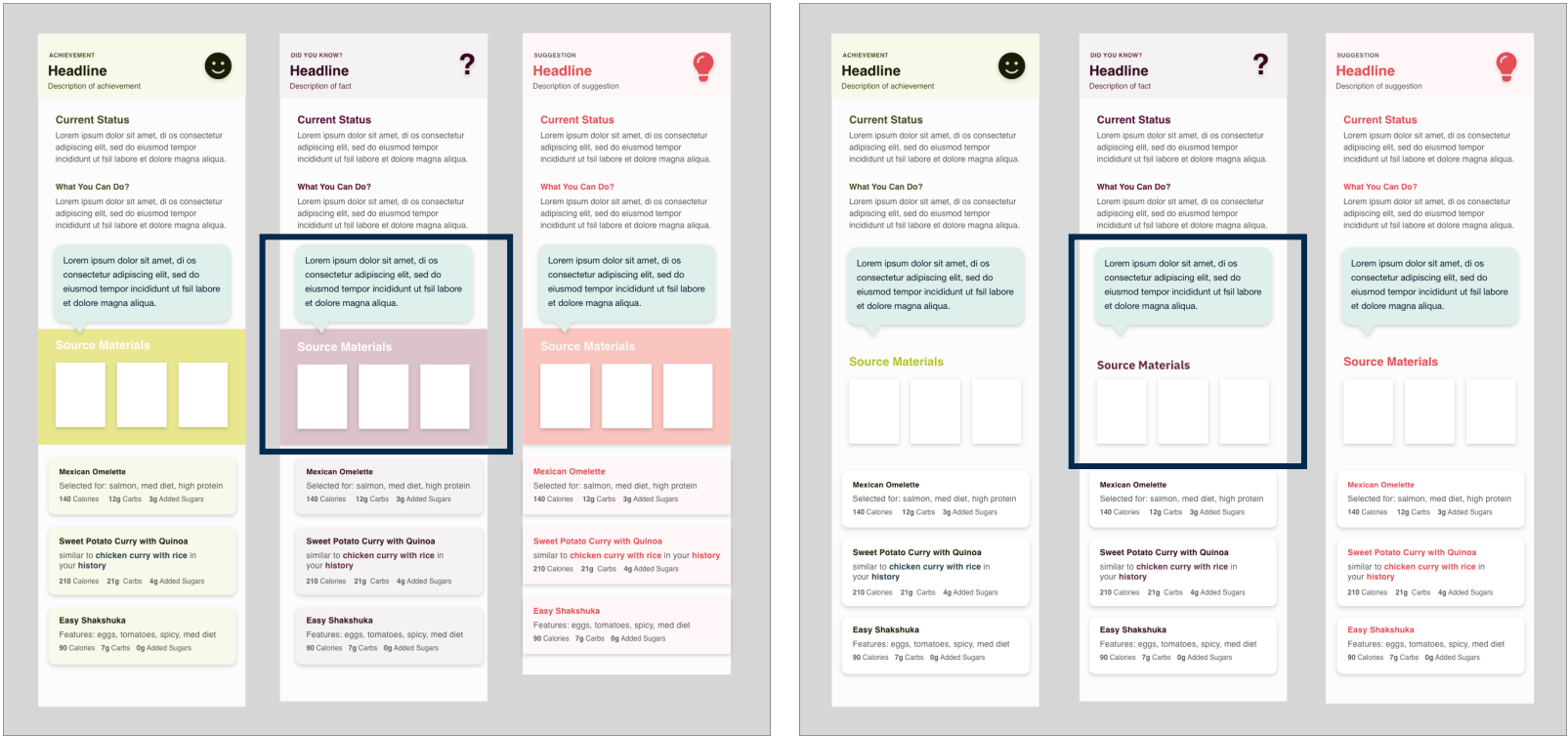
Assessment

The usage of the chat bubble container creates a clear distinction between the commentary and the standardized UI.

The chat indicator helps to communicate what the content is commenting on.

It does not provide an easy way for users to differentiate the varying levels of personalized content.

Proposed Solutions

Color-coded content

Use color to communicate whether the feedback is positive or negative (if you are or are not meeting the guideline) and deliver all AI feedback in a consistent color.

Assessment

Color-coding content makes it easier to understand where the AI is providing the why, but it is unclear what the information is in reference to.

It is a known fact within the field of HCI that the usage of color alone to differentiate types of information is ineffective because if is not accessible to individuals who are colorblind. Color can be used to encode information, but it should be done so in supportive of some other method.

Proposed Solutions

Saturation as personalization

The more saturated the content the more personalized it is
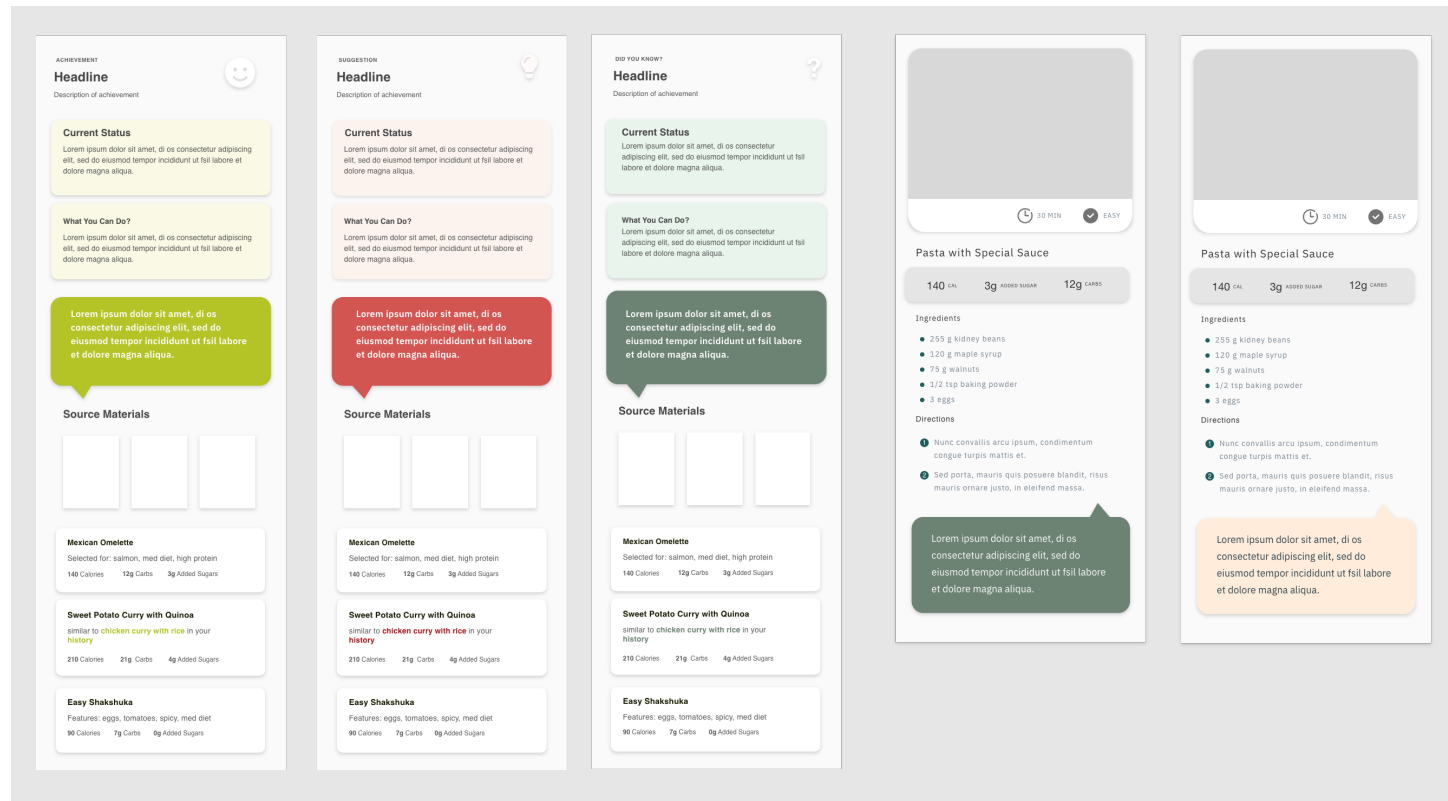
Assessment

People who are colorblind can see differences in saturation.

Provides a clear way to see how personalized the information provided is.

Would benefit from the inclusion of some of the previously explored methodologies.

Proposed Solutions

Skeuomorphic vs. flat

AI-provided content is skeuomorphic, and standardized content is flat.

Assessment

While there is a clear distinction between personalized and scripted/standard content, the end UI comes across as dated, and the skeuomorphism makes it challenging to focus on the flat content. While we want to highlight personalized content, the standard content is still essential.

When designing the UI and UX for informative content, it is recommended to lean more toward minimalism.

It could be beneficial to allow this exercise to inform the end design by using depth to communicate the priority of content. Should be done subtly.

Visual Solution

Saturation + Visual Indicator + Color-coded Content + Depth as Priority

Overall Assessment

Each of the explored solutions had its own positives and negatives. After analyzing the outputs of each design exercise, it is clear that none of the proposed solutions can effectively meet the needs of the given design problem. Therefore, it is recommended that the end solution implore them all.

Design Solution

Chat bubble containers should be used to contextualize what is being explained.

Saturation should be used to differentiate how personalized the information is. This will also help to create a visual hierarchy within the content, where the most personalized content is seen as the most important.

Color-coding content can be an effective way to differentiate achievements vs. suggestions but should be used in conjunction with some other visual indication, such as an icon.

While the combining of skeuomorphism and flat visual design methodologies impacted the legibility of the content, it is important to note that the exercise only made use of the methodologies at an extreme level. Additional visual experimentation and research should be done on how this might be implemented more subtly.

User Profiles

User Profiles were constructed for demoing the application.

♀ **Jennifer Anisfeld**

Accountant

Age: 35   **Weight:** 135   **Height:** 5ft 5in

Status: Diabetic, Fixed Insulin Dosing

Goal: Maintain

Likes: Cheese, Bread, Chocolate, Coconut

Dislikes: Brussel Sprouts

Restrictions: Peanut Allergy

♂ **Robert Walden**

CEO

Age: 58   **Weight:** 285   **Height:** 5ft 10in

Status: Pre-diabetic

Goal: Lose Weight

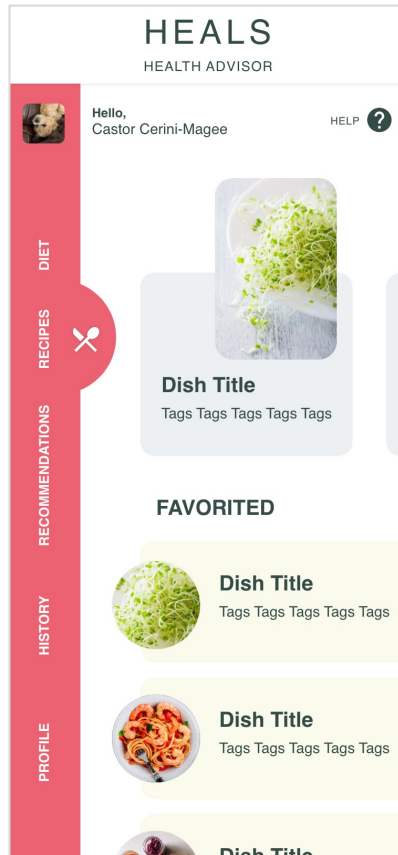**Likes:** Milk, Apple, Pasta, Pizza

Dislikes: Bread, Tomatoes

**Restrictions:** None

Design Solution

Option 1

Recipe Catalog Page

A catalog of recipes for the user. The top section showcases recommended recipes that have been identified by the AI using the individual's food preference profile, their current active guidelines, the time of day, and their previously favorited recipes.
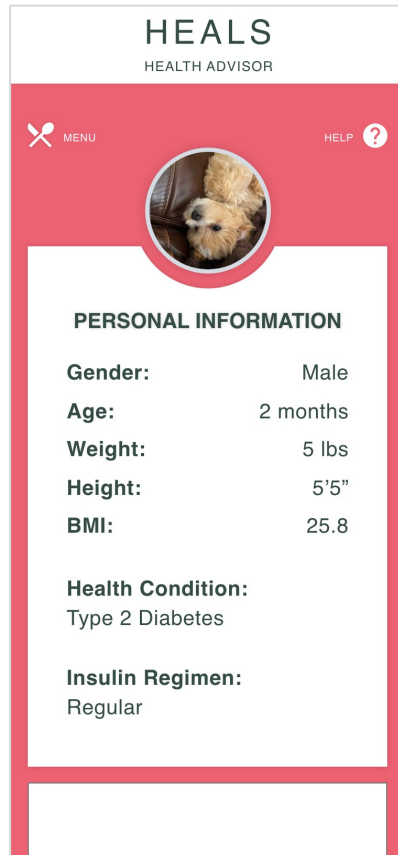
Recipe Page

Should include the following: what the dish is, how to make it, why it was recommended, and what its nutritional information is.
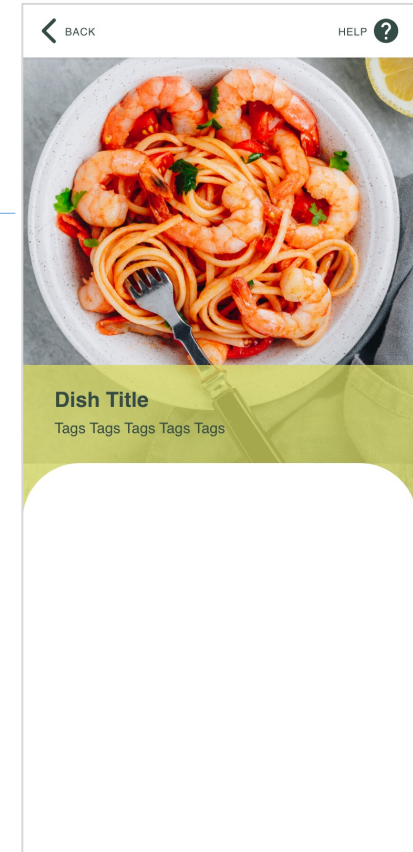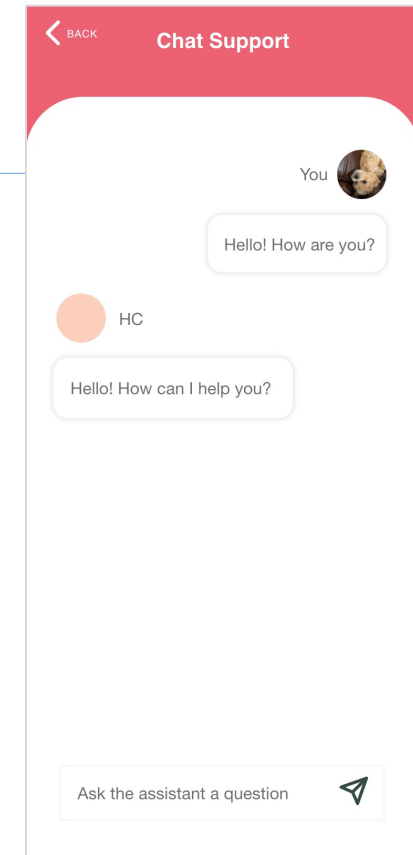
Design Solution

Option 1

Profile Page

Where the user can view their information, update their details, and link up to any integrations.

Health Advisor Chat
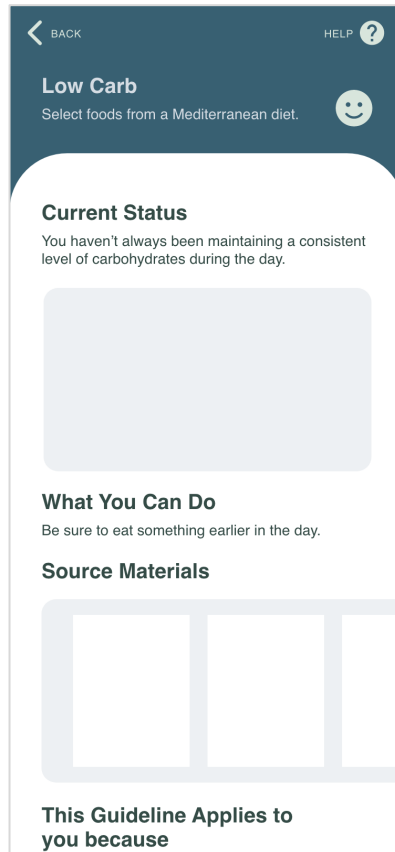
Area of the application where the user can ask the AI questions and get recommendations

Design Solution

Option 1

BACK   HELP ?

Low Carb
Select foods from a Mediterranean diet.

Current Status
You haven't always been maintaining a consistent level of carbohydrates during the day.

What You Can Do
Be sure to eat something earlier in the day.

Source Materials
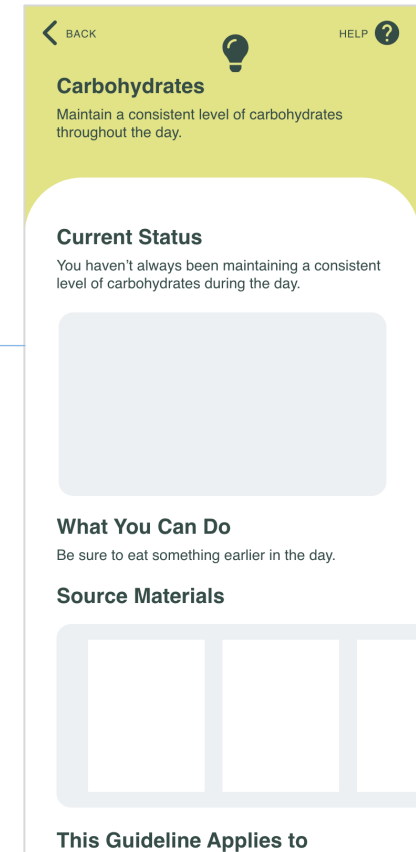
This Guideline Applies to you because

Guideline Page (Achievement)

Page showcasing an achievement that the user has completed. This is a specific guideline that the user is adhering to that they previously weren't or that is frequently not met by individuals with their condition.
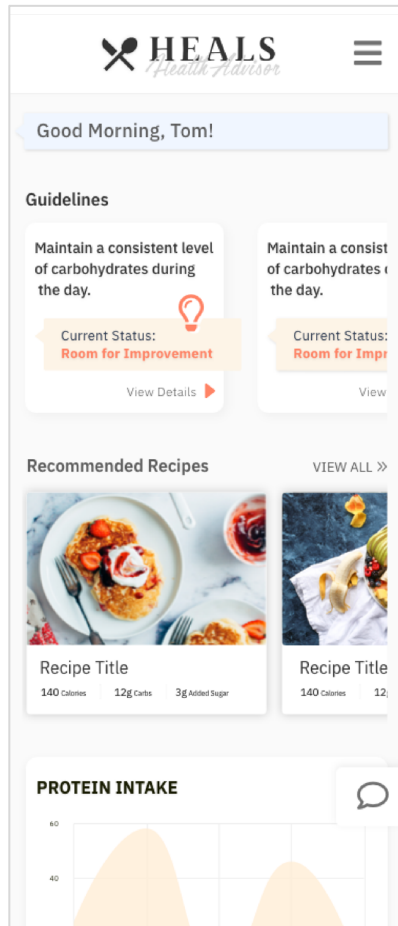
Guideline Page (Suggestion)

Page showcasing a suggestion that the AI identified for the user based on a guideline that they are currently not meeting.

BACK   HELP ?

Carbohydrates
Maintain a consistent level of carbohydrates throughout the day.

Current Status
You haven't always been maintaining a consistent level of carbohydrates during the day.

What You Can Do
Be sure to eat something earlier in the day.

Source Materials

This Guideline Applies to
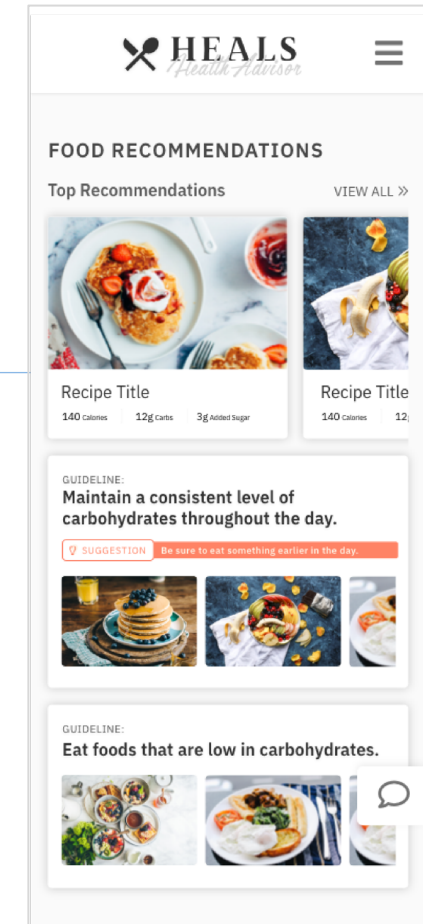
Design Solution

Option 2

Application Homepage

The top of the page features a chat message from the advisor to the user. The message will contain a personalized message for the user that could be a reminder, fact, or suggestion. The rest of the page features a series of sliders that are representative of the different sections of the application.
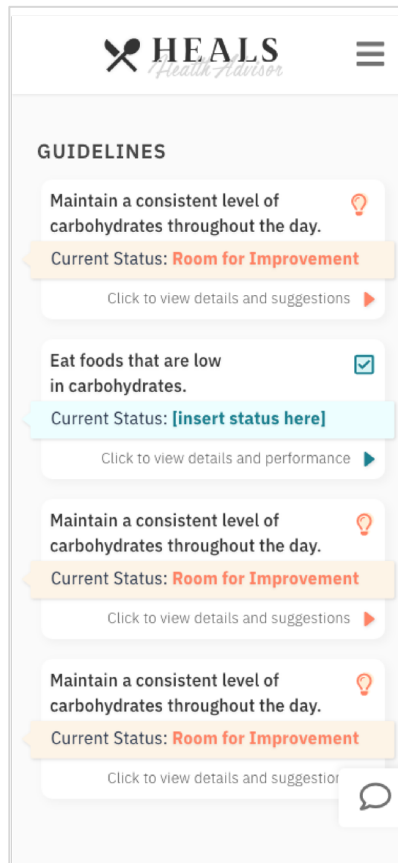
Recipe Catalog Page

Recipes are shown to the user based on their active recommendations. As the user scrolls through the page, they are presented with recommended recipes based on their user food and dietary profile.

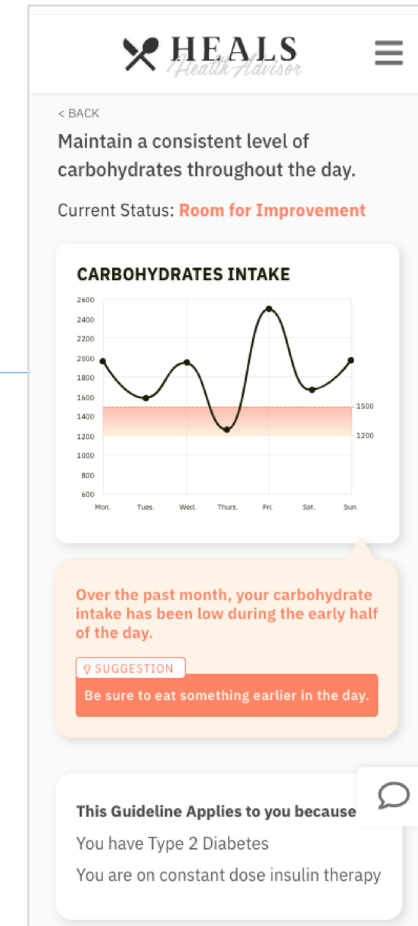**Design Solution**

Option 2

Guidelines Page

A list of the dietary guidelines for the individual's condition and how they are currently performing. When the user clicks on the card, they will be navigated to the guideline overview page where they can get additional information on their performance and how to better adhere to the guideline.

Guideline Overview Page

An overview of an individual guideline and how the individual is performing against that guideline. The page contains an overview of the user's performance with information explaining it. In addition, there is additional literature where the user can go to find out more about the guideline and why it is essential, as well as a list of recommended recipes.
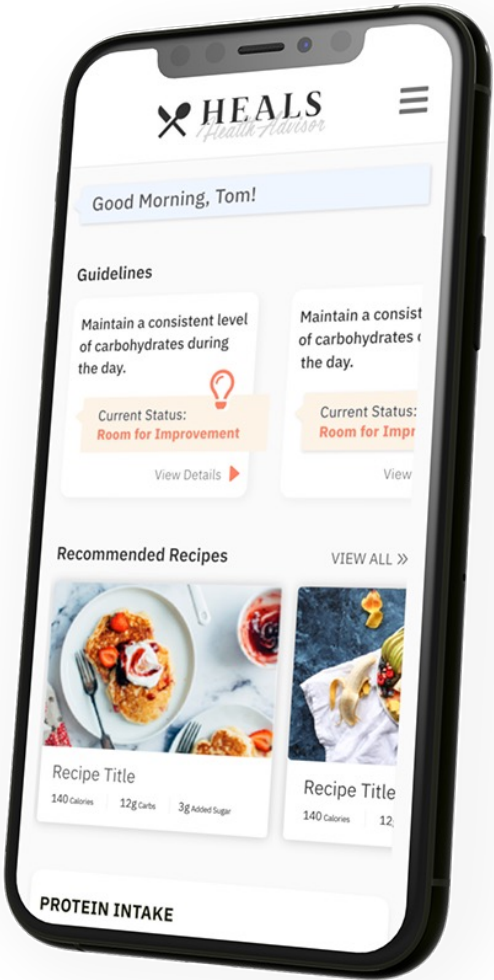
Final Design

# Implemented Solution

User Flow:

View User Flow

Prototype

View Prototype

2023 Design Revamp

View Prototype

Screen 1

HEALS

Good Morning Tom,

Checkout this curated list of breakfast recipes that I have created for you based on your dietary preferences and health profile.

10:20 am

Guidelines   View All

Maintain a consistent level of carbohydrates during the day.

Current Status:
Room for Improvement

View Details ▶

Maintain a consistent of carbohydrates the day.

Current Status
Room for Imp

Food Recommendations   View All
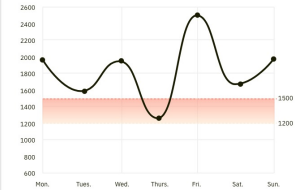
Recipe Title
140 Calories   12g Carbs   3g Added Sugar

Recipe Titl
140 Calories

Performance Summary   View All

Carbohydrates Intake

2600
2400
2200
2000
1800   1500
1600
1400   1200
1200
1000
800
600
Mon. Tues. Wed. Thurs. Fri. Sat. Sun.

Over the past month, your carbohydrate intake has been low during the early half of the day.

💡 Be sure to eat something earlier in the day

Screen 2

HEALS

Performance Summary
10/01 - 10/31/2020

Carbohydrates Intake

2600
2400
2200
2000
1800
1600   1500
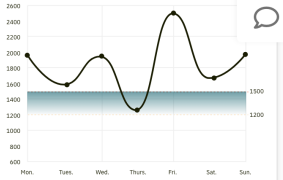1400
1200   1200
1000
800
600
Mon. Tues. Wed. Thurs. Fri. Sat. Sun.

Over the past month, your carbohydrate intake has been low during the early half of the day.
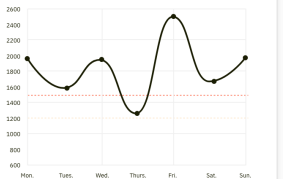
💡 Be sure to eat something earlier in the day

Protein Intake

2600
2400
2200
2000
1800
1600   1500
1400
1200   1200
1000
800
600
Mon. Tues. Wed. Thurs. Fri. Sat. Sun.

Over the past month, your carbohydrate intake has been low during the early half of the day.

✓ You have done a great job eating foods that are low in carbohydrates, which has helped you to be healthier.
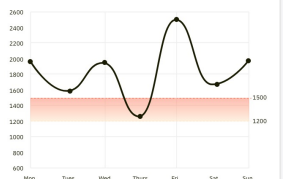
Fat Intake

2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
Mon. Tues. Wed. Thurs. Fri. Sat. Sun.

Screen 3

← Carbohydrate Intake

Maintain a consistent level of carbohydrates throughout the day.

Current Status: **Room for Improvement**

Carbohydrates Intake

2600
2400
2200
2000
1800
1600   1500
1400
1200   1200
1000
800
600
Mon. Tues. Wed. Thurs. Fri. Sat. Sun.

Over the past month, your carbohydrate intake has been low during the early half of the day.

💡 Be sure to eat something earlier in the day

This Guideline Applies to you because
• **You have Type 2 Diabetes**
• **You are on constant dose insulin therapy**

Sources

ADA Dietary Guidelines, Chapter 5, Guideline 12: "Patients with Type 1 and Type 2 Diabetes on a constant level of insulin therapy are advised to maintain a consistent level of carbohydrates throughout the day."

RECOMMENDED RECIPES

Screen 4

HEALS

Food Recommendations

Recipe Recommendations   View All

Recipe Title
140 Calories   12g Carbs   3g Added Sugar

Recipe Titl
140 Calories

GUIDELINE: **Maintain a consistent level of carbohydrates throughout the day.**

💡 Be sure to eat something earlier in the day

GUIDELINE: **Eat foods that are low in carbohydrates.**

Screen 5

← Mexican Omelette

140   3g   12g
CALORIES   ADDED SUGAR   CARBS

INGREDIENTS   DIRECTIONS   **BENEFITS**

Maintain a consistent level of carbohydrates throughout the day.

💡 Eating earlier in the day can jumpstart your metabolism and help you to maintain a consistent level of carbohydrates.
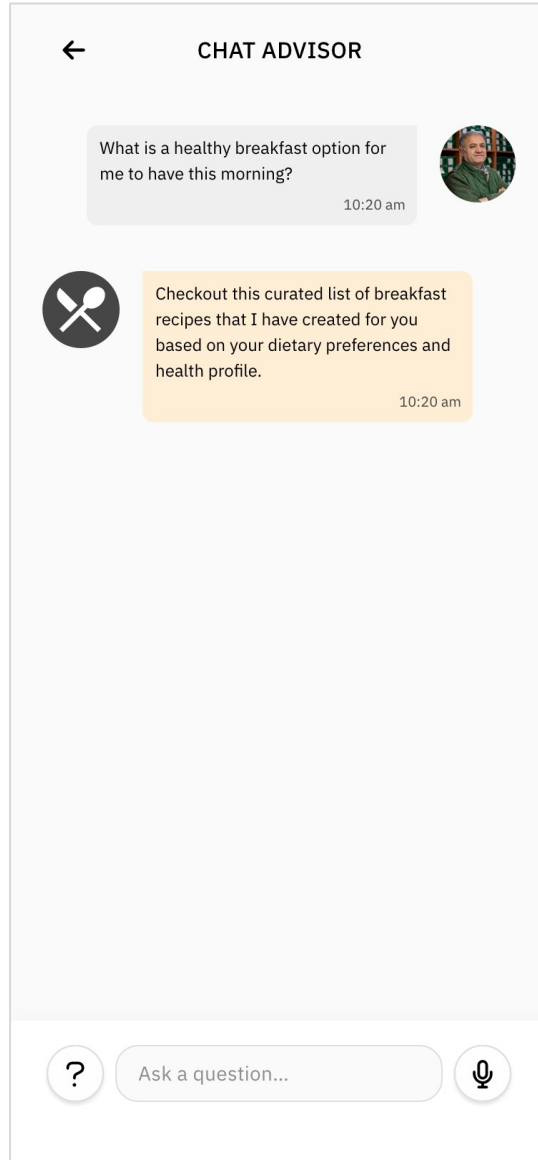
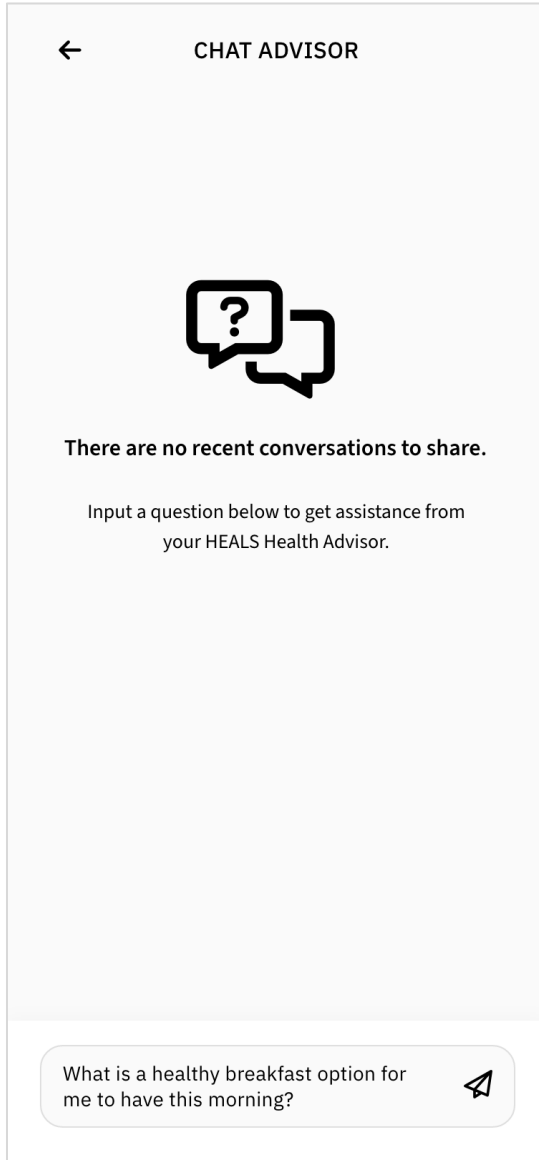Eat foods that are lower in carbohydrates.

✓ You have done a great job eating foods that are low in carbohydrates, which has helped you to be healthier.

RECIPE RATING
★★★☆☆

SIMILAR RECIPES

CHAT ADVISOR

There are no recent conversations to share.

Input a question below to get assistance from your HEALS Health Advisor.

What is a healthy breakfast option for me to have this morning?

CHAT ADVISOR

What is a healthy breakfast option for me to have this morning?

10:20 am

Checkout this curated list of breakfast recipes that I have created for you based on your dietary preferences and health profile.

10:20 am

Ask a question...

HEALS

Robert Walden

Gender: Assigned at Birth	Male
Age:	55 years
Weight:	285 lbs
Height:	5' 10"
BMI:	40.9

Edit

Health Condition:	Type 2 Diabetes
Insulin Regimen:	Regular

Edit

Likes: **Fish, Chocolate, Ginger**

Dislikes: **Mustard, Peas**

Restrictions/Allergies: **Gluten, Dairy, Oats**

Guilty Pleasure: **Coconut Cream Pie**

Edit

HEALS

HOME

GUIDELINES

PERFORMANCE SUMMARY

RECIPES

CHAT WITH ADVISOR

⚙ Settings   >

? Help & Support   >

↦ Logout   >

Take-A-Ways

Importance of properly set expectations/definitions of done:

At every meeting, new requirements were being added to the software, and changes to decisions that were previously agreed upon. In addition, it wasn't easy to get people to provide me with content/information. Through this process, I learned that it is extremely important to document decisions and request information as early as possible.

Clear definitions of what features currently exist in the software:

Throughout the development process, it was difficult to determine what features existed within the AI software and what the team wanted it to do. This information upfront can help prioritize and remove any inefficiencies in the development process.

The value of working with a team of people:

For most of this project, I worked by myself. Having someone to help solve problems and learn with would have made things go a lot faster and led to better end solutions.