Livongo - Research and Design Case Study

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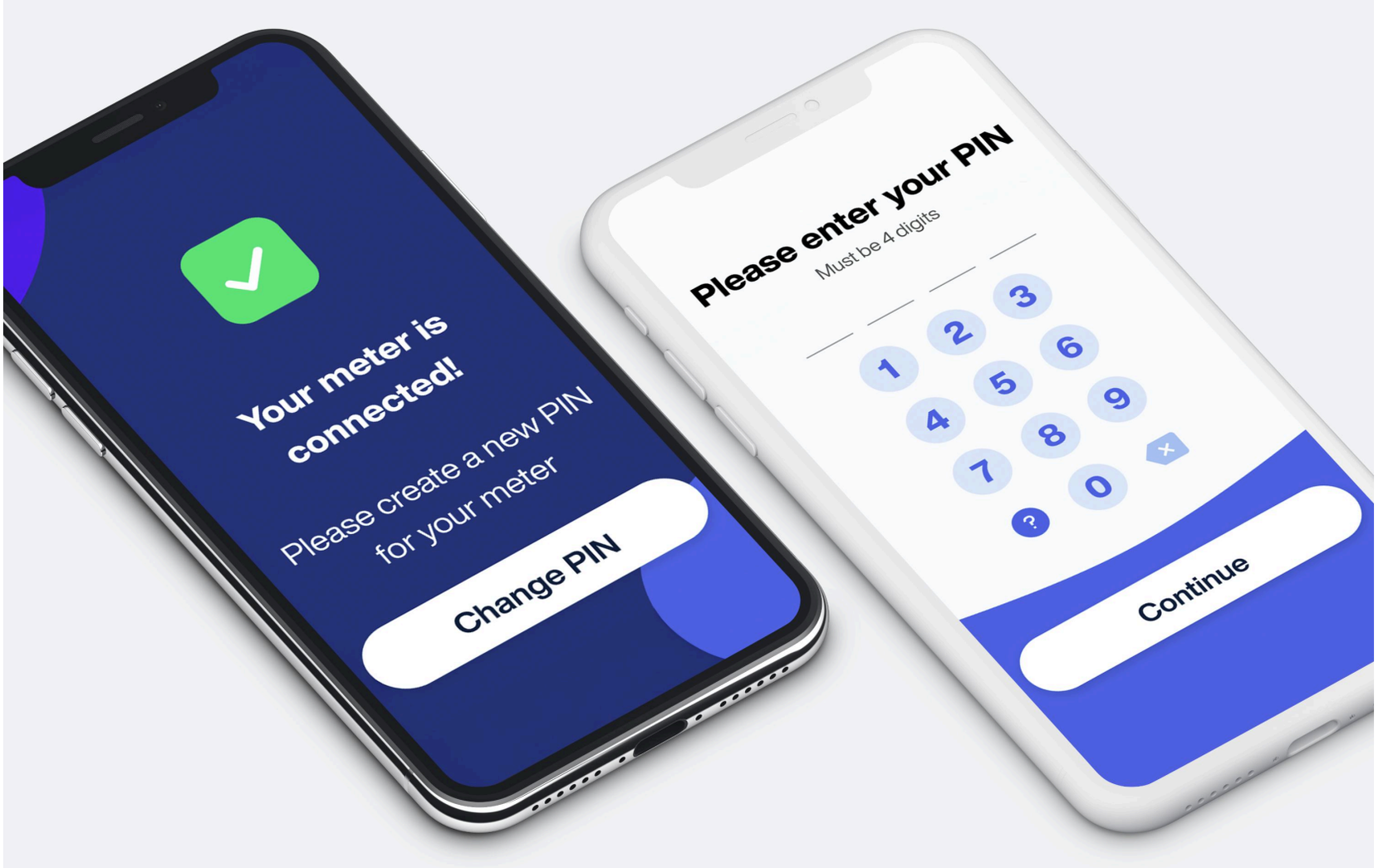


Goals

Business

The business goal of this project was to ensure that new users of Livongo's flagship glucose monitor could successfully onboard their new device without the need to use expensive customer support services.

User

The user goal was to conduct their first glucose level test with their new device and seamlessly pair it with their account, ensuring the reading was securely stored as part of their medical record.

Results

Business

The entire project, including research, journey mapping, interaction design, UI design, and iterations, only took me three weeks, allowing the Livongo team to stay on schedule, confident that the approach would meet the business and user goals.

User

The initial user journey research and testing helped me identify that PIN verification required the least clicks to complete, is the most secure, and is the least error-prone solution, resulting in an easy-to-use interface for Livongo members.

My Roles

User Journey Mapping

Interaction Design

UI Design

Prototyping

"Kevin drove the research phase and proposed well-organized, highly visual options and competitive analyses that sped up our decision process."

Jamie Granskie
Content Strategist
Livongo

Strategies and Objectives

Strategy 1

Provide value to the user before requiring them to authenticate their new device.

Objective 1

Allow the user to conduct their first glucose reading before pairing the device with their Livongo account.

Objective 2

Provide educational content based on information provided during the initial glucose reading.

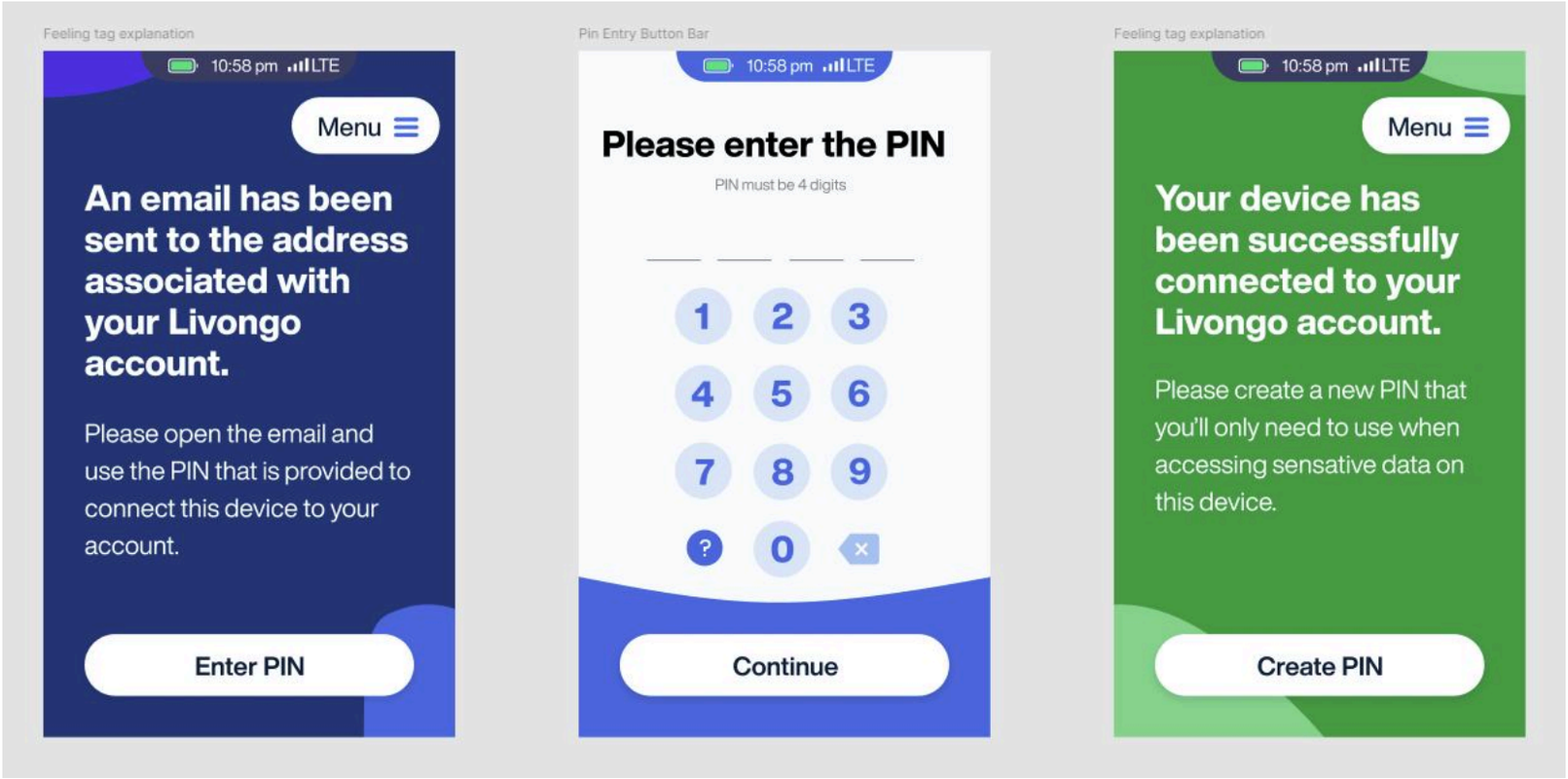
Strategy 2

Authenticate the device quickly and securely and pair it with the user account.

Objective 1

Provide an interface allowing the user to enter a PIN number that is dynamically assigned to their account and linked to their new device from the factory to authenticate upon first use.

Objective 2 Provide an interface allowing users to create a new PIN to secure their device for future use.



Scenarios - Diabetic Member of Livongo

First Glucose Reading

Steve is a new Livongo member who just received his Glucose Monitor.

Because this is a medical device, Steve must have access to its diagnostic capabilities, even if he does not have time to pair it with his Livongo account.

Device Authentication

Once Steve has taken his first glucose reading using the device, he must authenticate and pair his new glucose monitor with his Livongo account.

Ongoing Usage

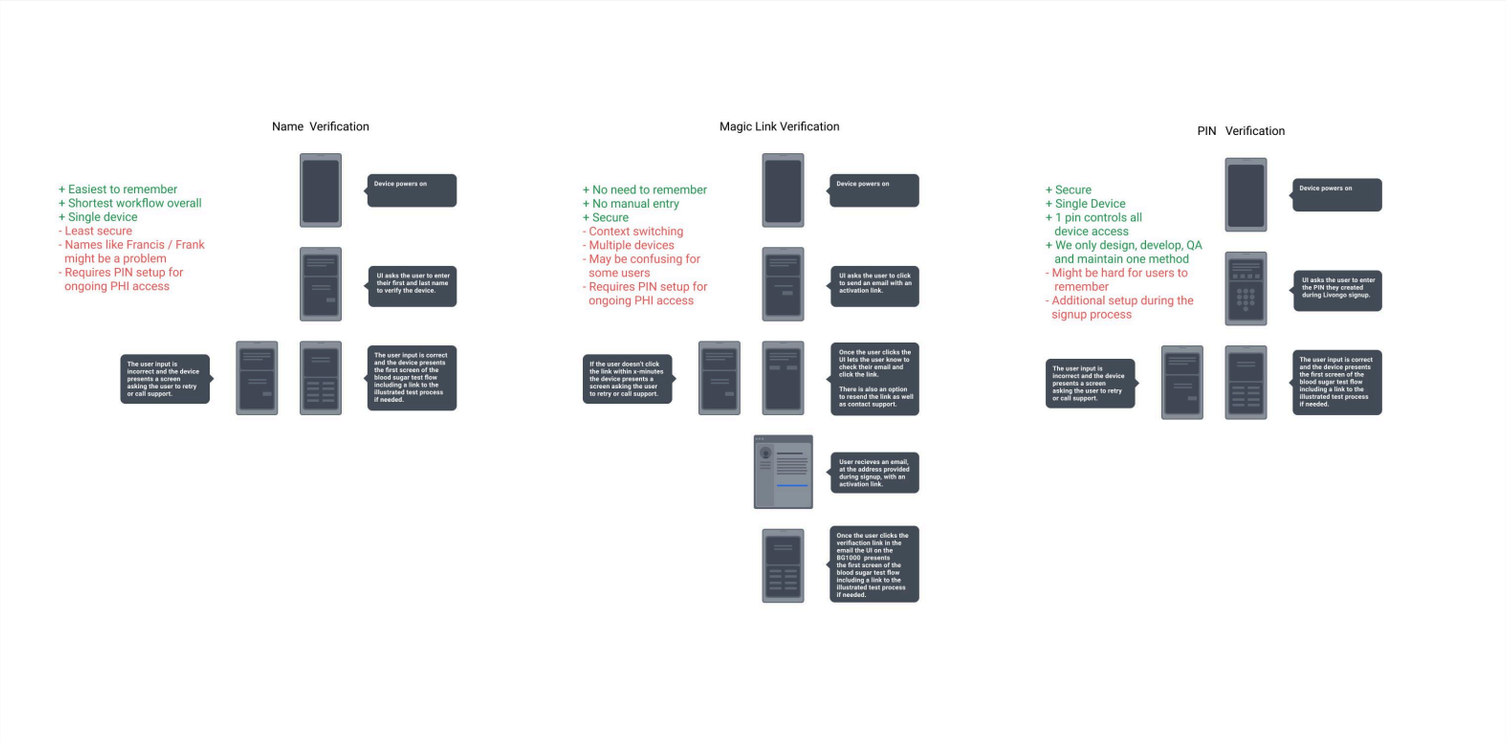
To keep Steve's medical information secure, he must authenticate each time he completes a glucose reading before the device adds the new reading to his medical record.

He'll also need to authenticate if he wants to review his previous readings with his Doctor.

Research

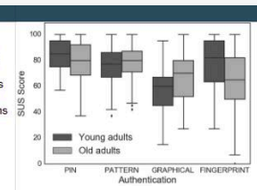
When I joined the project, the Livongo team was considering three types of authentication as candidates for getting users onboarded to their new device. They identified the "name verification," "magic link verification," and "PIN verification" methods as approaches they would like to explore, but they were unsure what solution would be best.

My initial approach was to quickly create task flows for each option to understand each option's pros and cons.



Next, I researched other methods of authentication to understand the options better. I observed from analysis of various studies that users performed best and most consistently using PIN-based authentication in terms of input speed and error rate.

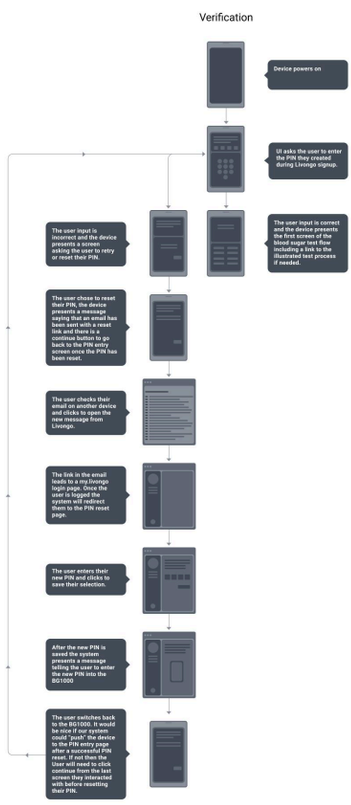
I then created and shared the report you see below of my findings with the Livongo team as part of the approval process for my approach.

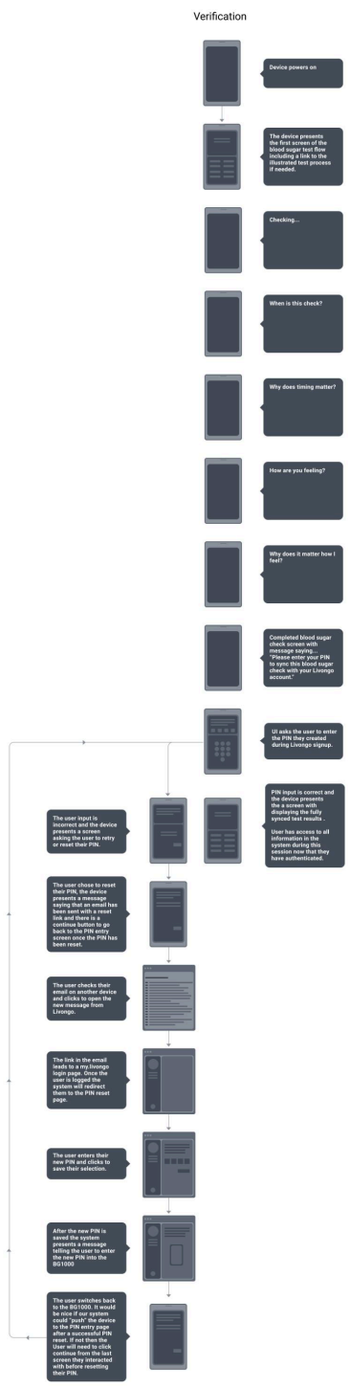
	Year	Title	Key Findings	Observations	Recommendations	
Grindrod, Khan, Hengartner, Ong, Logan, Vogel	2018	Evaluating authentication options for mobile health applications in younger and older adults https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5754080/#pone.0189048.ref021	PIN and pattern-lock outperformed graphical passwords and swipe-style fingerprints. All participants took longer to authenticate using the swipe-style fingerprint compared to other options. Older participants also took two to three seconds longer to authenticate using the PIN, pattern and graphical passwords though this did not appear to affect perceived usability.	In this later study fingerprint was the most "likable" solution for both age groups. This is likely do to this type of authentication being more widely used than it was in 2016 when the previous study was completed. Notably both studies (2016 and 2018) show similar results in that fingerprint authentication is significantly slower, especially for the older participants (20 seconds), and has a higher error rate than all other methods. Similarly, "An evaluation of PIN and pattern-lock schemes shows that the PIN outperforms the pattern-lock in terms of input speed and error rate, however, users favor pattern-lock and rate it better in terms of ease-of-use and likeability"	Based on this research I recommend the PIN method. Users may have preferred pattern when asked, but they performed best and most consistently using PIN. Pattern was close in terms of performance. An evaluation of PIN and pattern-lock schemes shows that the PIN outperforms the pattern-lock in terms of input speed and error rate, however, users favor pattern-lock and rate it better in terms of ease-of-use and likeability. Properly designed PIN requires less dexterity and that factors heavily in my decision.	
			PATTERN was the fastest option (3.44s)			
			PIN had the fewest errors per attempt (0.02)			
			PIN and PATTERN had higher SUS scores than FINGERPRINT and GRAPHICAL			
			An evaluation of PIN and pattern-lock schemes shows that the PIN outperforms the pattern-lock in terms of input speed and error rate, however, users favor pattern-lock and rate it better in terms of ease-of-use and likeability			

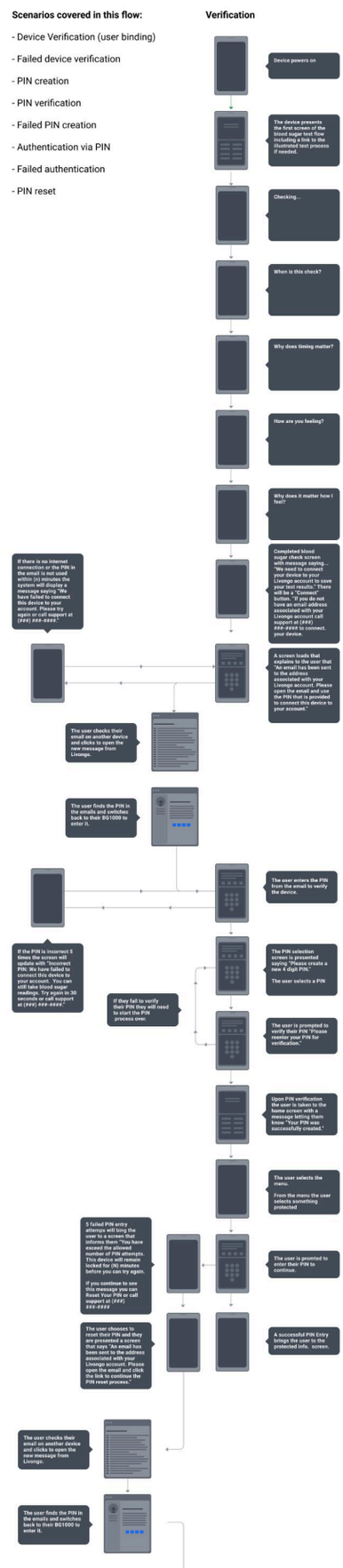
User Journey Mapping

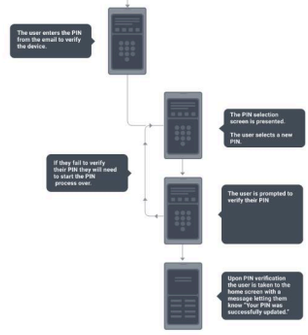
Once we selected the PIN authentication method, I began mapping the end-to-end user journey to share with the content and development teams to ensure we accounted for all key elements of the experience before moving on to designing the screens. Ultimately, it took three iterations for the team to define the comprehensive solution seen in the journey below on the right.

This process significantly reduced the time required to design the overall solution because we focused on getting the journey right before designing the screens.



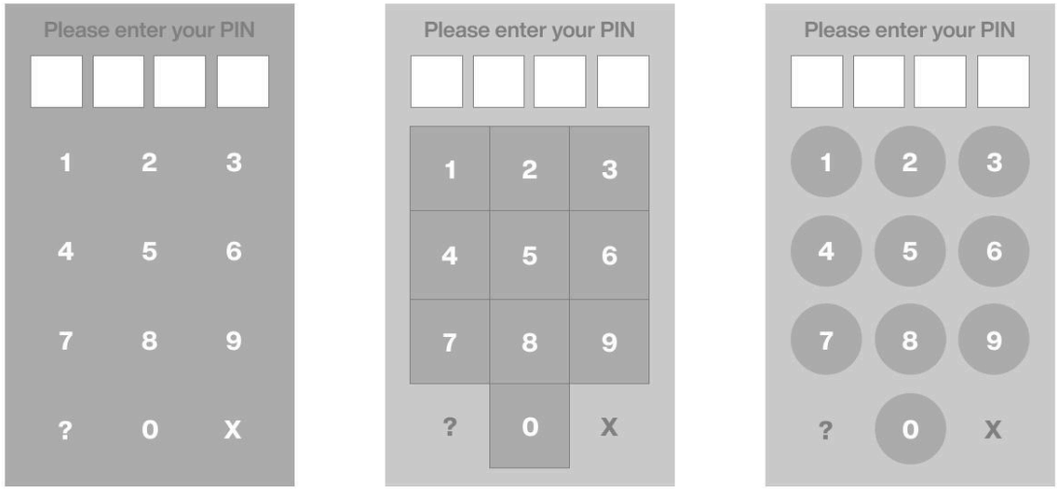






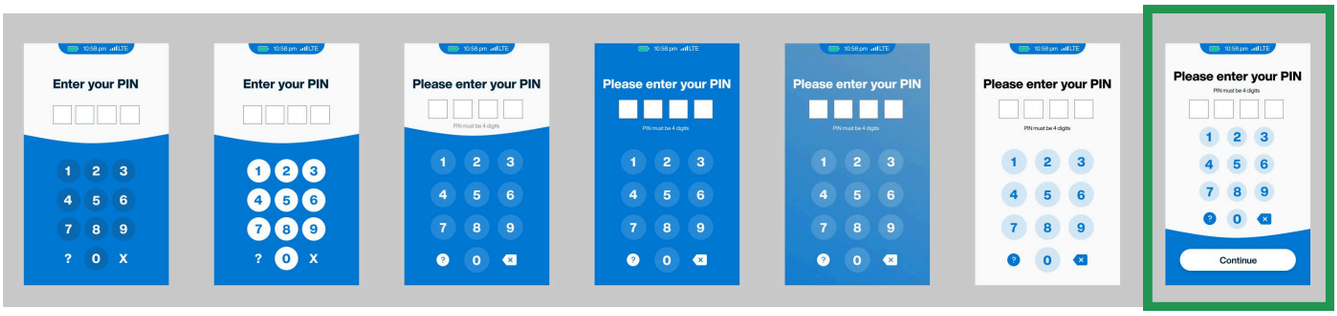
Wireframing

Once the user journey was mapped, I designed the primary PIN entry screen. Below, you will see some of the options I explored. I like to work in grayscale initially because it helps me ensure that the visual hierarchy and contrast will be strong enough to support users as they scan, read, and comprehend the interface. The option on the right below was selected because the team perceived it as the most visually appealing and modern.



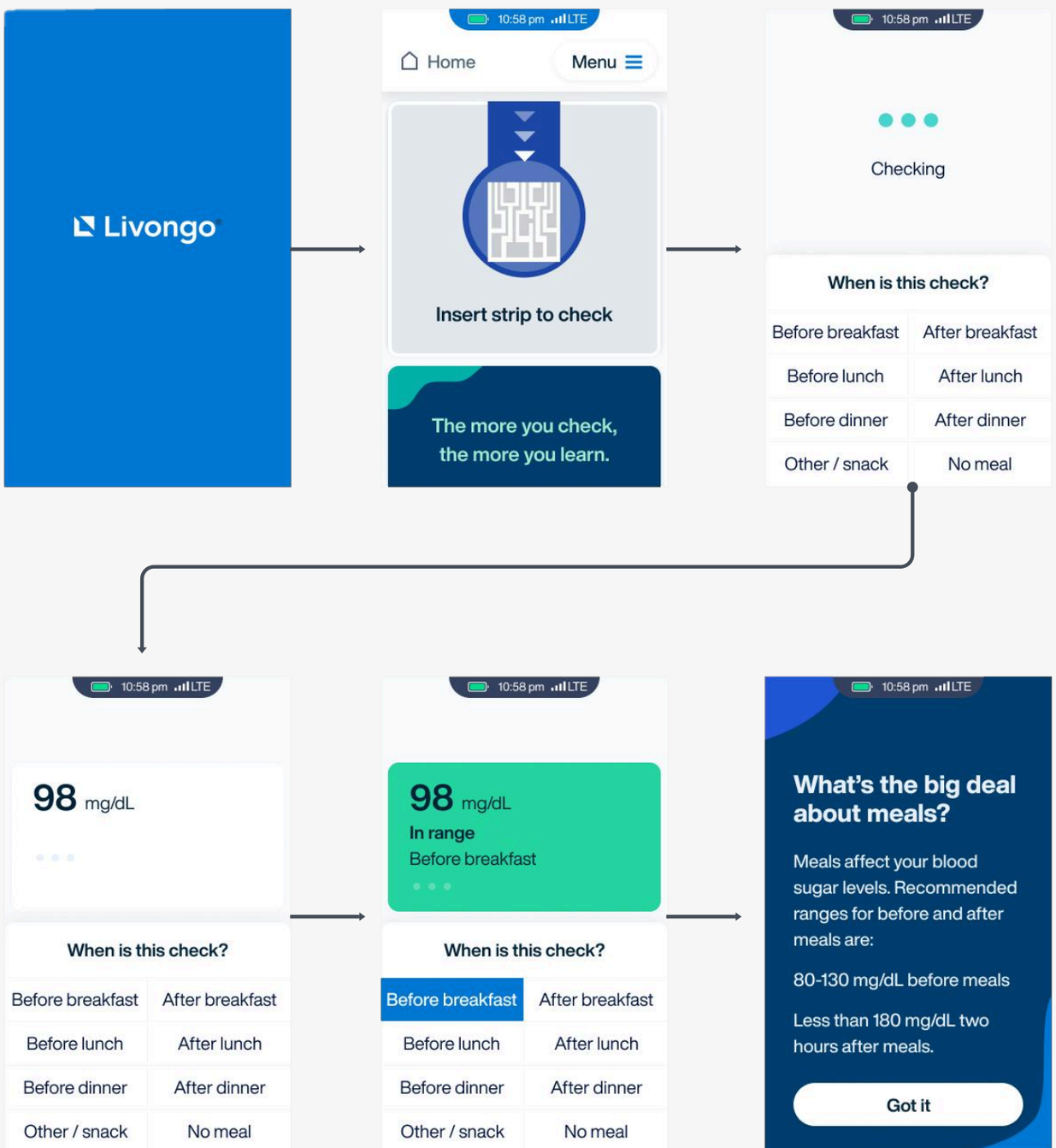
UI Design and Testing

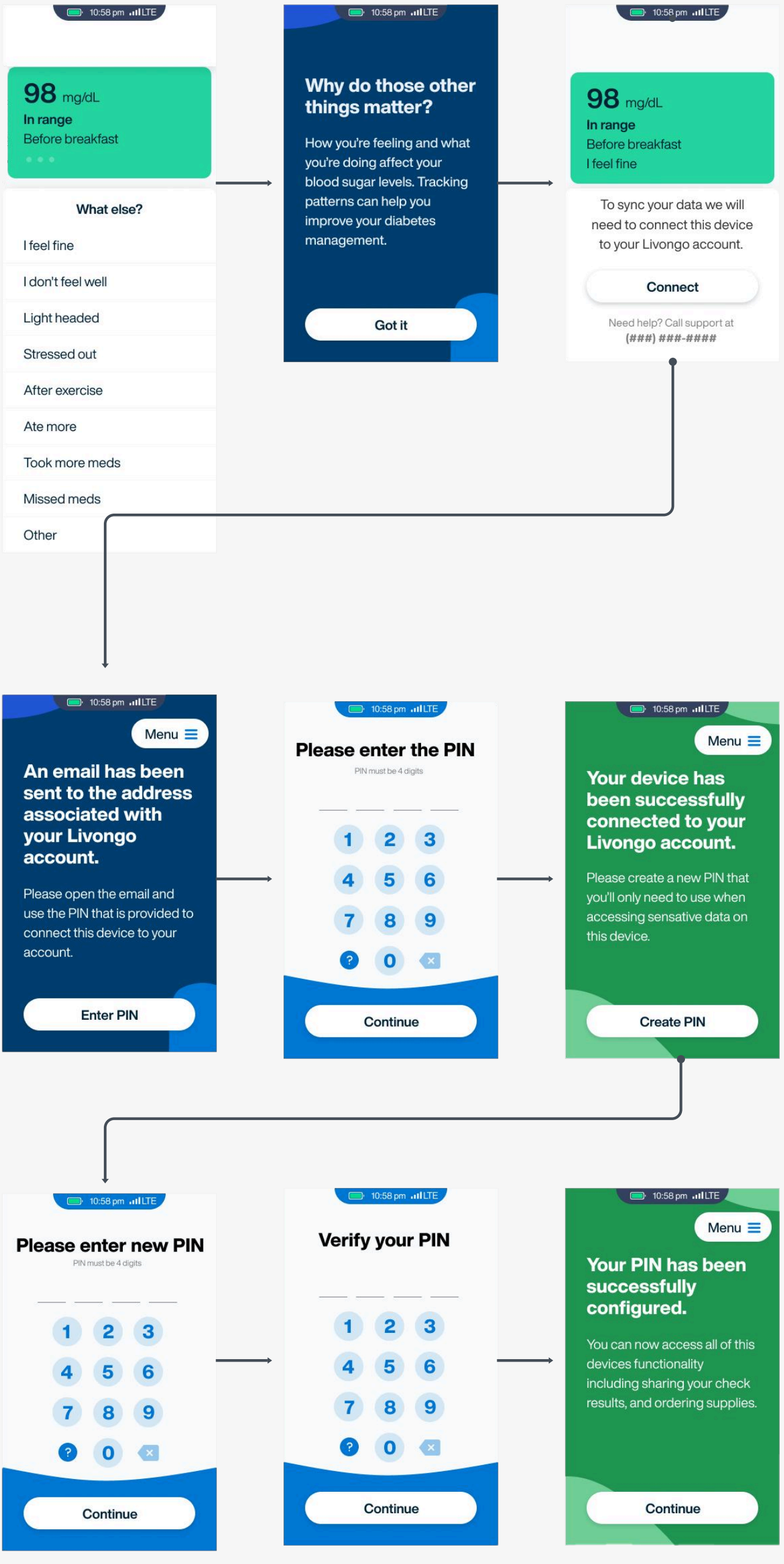
I knew that Livongo members would use their devices in all lighting conditions. I was unsure how various designs might impact the users' ability to read and interact with the interface. My first step was to design a wide range of options and then test them in various lighting. The option below on the far right had the highest contrast levels and was easiest to use in all lighting.



Interaction Design and Prototyping

Below, I've included some key screens from the final prototype to illustrate the core user journey from the moment a user powers the device on to their first glucose reading and finishes when the user successfully configures their PIN.




10:58 pm LTE
98 mg/dL
In range
Before breakfast
What else?
I feel fine
I don't feel well
Light headed
Stressed out
After exercise
Ate more
Took more meds
Missed meds
Other
10:58 pm LTE
Why do those other things matter?
How you're feeling and what you're doing affect your blood sugar levels. Tracking patterns can help you improve your diabetes management.
Got it
10:58 pm LTE
98 mg/dL
In range
Before breakfast
I feel fine
To sync your data we will need to connect this device to your Livongo account.
Connect
Need help? Call support at
(###) ###-####
10:58 pm LTE
Menu
An email has been sent to the address associated with your Livongo account.
Please open the email and use the PIN that is provided to connect this device to your account.
Enter PIN
10:58 pm LTE
Please enter the PIN
PIN must be 4 digits
1 2 3
4 5 6
7 8 9
? 0
Continue
10:58 pm LTE
Menu
Your device has been successfully connected to your Livongo account.
Please create a new PIN that you'll only need to use when accessing sensative data on this device.
Create PIN
10:58 pm LTE
Please enter new PIN
PIN must be 4 digits
1 2 3
4 5 6
7 8 9
? 0
Continue
10:58 pm LTE
Verify your PIN
1 2 3
4 5 6
7 8 9
? 0
Continue
10:58 pm LTE
Menu
Your PIN has been successfully configured.
You can now access all of this devices functionality including sharing your check results, and ordering supplies.
Continue