Q2 2021

BMW INTELLIGENT PERSONAL ASSISTANT

BMW CONNECTED

APP REDESIGN

CD-60

OVERVIEW

As a part of the BMW Connected app redesign that **contextually supports users** and their interaction with BMW and their car, identify the ideal/scalable integration point(s) for the BMW Intelligent Personal Assistant voice and text chatbot.
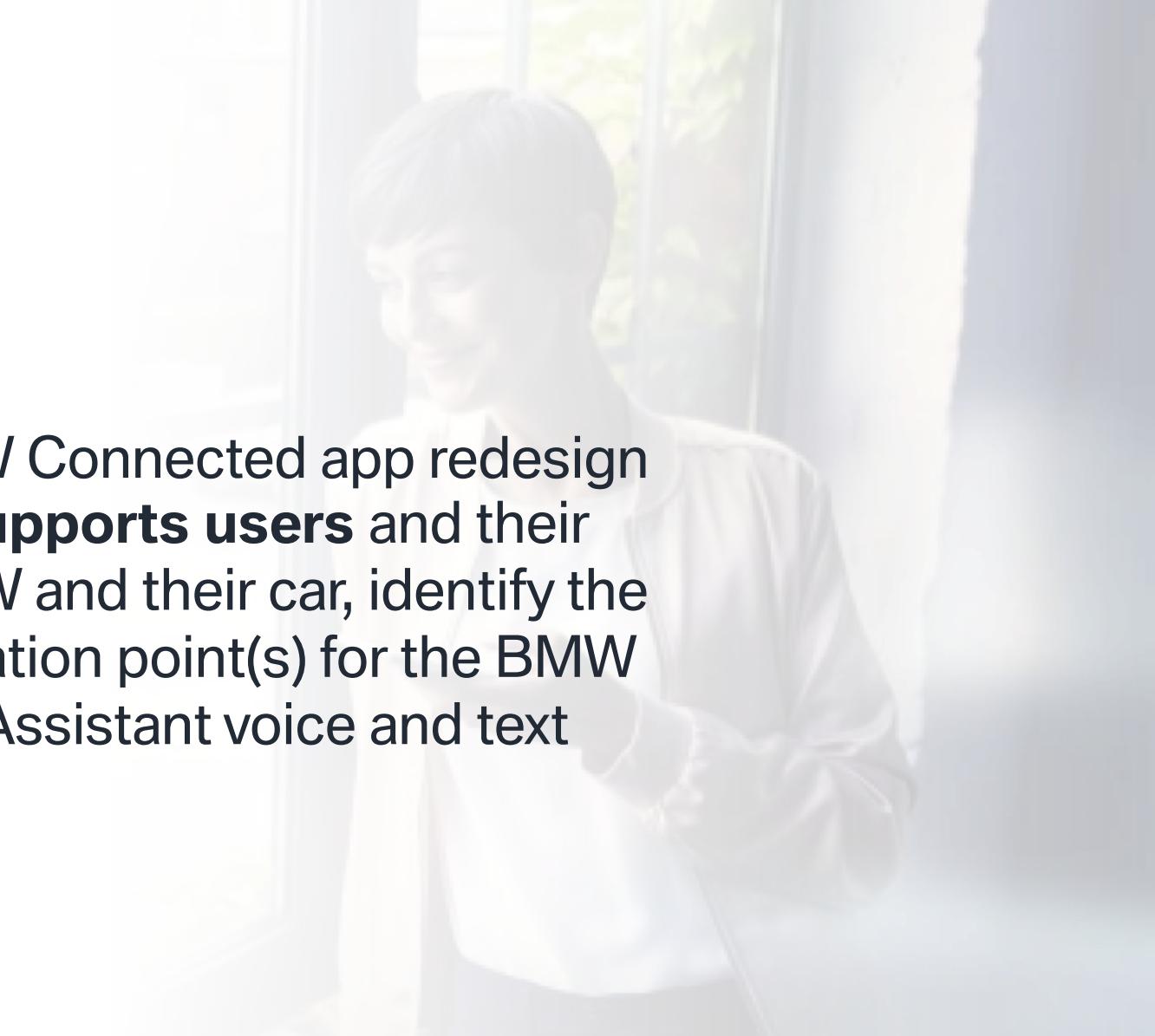
MY
ROLE

OVERVIEW

My responsibility as the **Lead Product Designer** was to lead the design of the integration of the BMW Intelligent Personal Assistant into the Connected App. I produced the following:

- I led Service Design workshops that included several **Crazy Eight** sessions.

- I led whiteboard sessions that turned into me wireframing and comping up concepts.

- I built functional prototypes to show concepts to stakeholders and for Usability Studies.

- I presented design concepts internally in design reviews, and to BMW executives, including service owners and product owners.

- I collaborated with the team to strategize and put together a test plan for our Usability Study at the end of June 2019.

MY TEAM

- Theo Williams / Product Design Intern

- Justin Clapper / Sr. Product Designer

- Jaemyoung An / Sr. Product Designer

- Adrian Kile / Product Owner

- LT4 Research (internal BMW researchers)

KEY QUESTIONS

Q1

What could the mental model for BMW IPA integration on the phone be, so that it is a valid extension of the in-car experience?

Q2

Should BMW IPA be accessible on the phone when connected to the car?

Q3

What is the best way to enable a continuation of an interrupted task on another BMW IPA channel?

ASSUMPTIONS

A1

A2

A3

Chat First

Mobile app interaction would be optimized for text chatbot interactions and fully enabled for voice interaction that is accessible anywhere with a "Hey BMW" or custom invocation.

Suggestion Chips

Suggestion Chips are a great way to engage the user into a chat conversation, by hinting at things the user can ask — for example, about reminders, schedule service appointment, or notifications.

Voice Platform

Our Technology Partner for the BMW IPA in the car was Microsoft Cortona, so the assumption we made (and later confirmed) is that the BMW IPA in the app will be built using the same technology.

RESEARCH SUMMARY

FULL DISCLOSURE

The study was done internally at BMW by a team we work with in Munich, Germany.

HOW WE USED THE DATA

My team and I studied the data and gleaned from it what we could and used it to inform our thinking, in terms of the concepts we came up with, which I expound on in the next few slides.

RESEARCH OBJECTIVE

- Requirements and needs towards BMW IPA
- Drivers and Barriers

RESEARCH HIGHLIGHTS

| | **If I speak,** the chatbot should speak back to me + provide me with a written response |

| | **If I type,** the chatbot should only provide me with a written response |

HOW SHOULD THE CHATBOT RESPOND TO YOU?				
🇩🇪 N = 103	🇬🇧 N = 110	🇺🇸 N = 100	🇨🇳 N = 110	**Total** N = 423
If I speak, the chatbot should speak back to me + provide me with a written response.				
40%	37%	45%	60%	46%
If I speak, the chatbot should only provide me with a written response.				
20%	15%	26%	19%	20%
If I type, the chatbot should speak back to me + provide me with a written response.				
23%	29%	18%	46%	29%
If I type, the chatbot should only provide me with a written response.				
47%	34%	42%	31%	38%
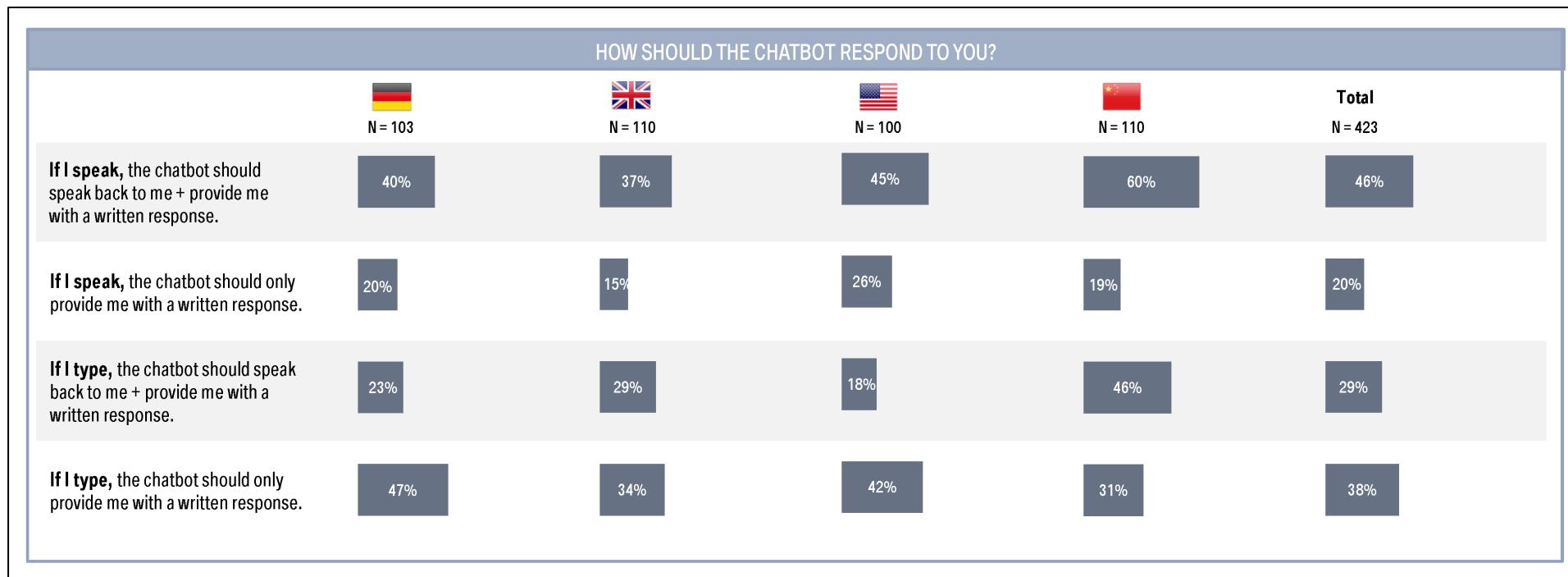
*In China respondents mainly expect the chatbot to always answer in a spoken and written way, regardless of the input modality

TOP CHATBOX CONTENT

The three pieces of useful content that stood out to us (that we felt was pertinent to our users in North America was:
Maintenance and car care, **My car and my preferences**, and **My car usage**.

USEFUL CONTENT OF A BMW CHATBOT

Financial
(information about my financial situation, submitting financial contracts, retrieve loan status)

BMW products and services
(pricing information on BMW products, purchasing BMW products, contracting a BMW)

Maintenance and car care
(scheduling tire changes, information on error messages)

Mobility services
(car rental, Drive Now registration, car booking)

My car and my preferences
(adjust climate and other car settings to personal preferences)

My car usage
(get information and data about your journey and usage, see how to improve it)

0%   20%   40%   60%   80%   100%

TOP CHATBOX CONTENT

The three pieces of top voice content that stood out to us (that we felt was pertinent to our users in North America was: **Data about my journey & usage**, **Check control message**, and **An interactive user manual**.

	🇩🇪	🇬🇧	🇺🇸	🇨🇳	Total
TOP 3-5 IPA FEATURES					
Top 1	60% Ask more about cc messages	63% Data about my journey & usage	47% Ask more about cc messages	59% Data about my journey & usage	55% Data about my journey & usage
Top 2	58% Data about my journey & usage	56% Interactive user manual	44% Interactive user manual	51% Efficiency trainer	52% Ask more about cc messages
Top 3	56% Interactive user manual	50% Ask more about cc messages	42% Proactive help	51% Ask more about cc messages	43% Interactive user manual
Top 4	47% Proactive help	44% Proactive help	40% Data about my journey & usage	45% IPA can get to know you	41% Proactive help
Top 5	29% Efficiency trainer	35% Efficiency trainer	33% Efficiency trainer	39% Vacation checklist	37% Efficiency trainer

IPA AND CHANNELS

About **three-fourths and nearly all users in the US** would switch channels while using BMW IPA. Predominantly, people would start using BMW IPA in the car.
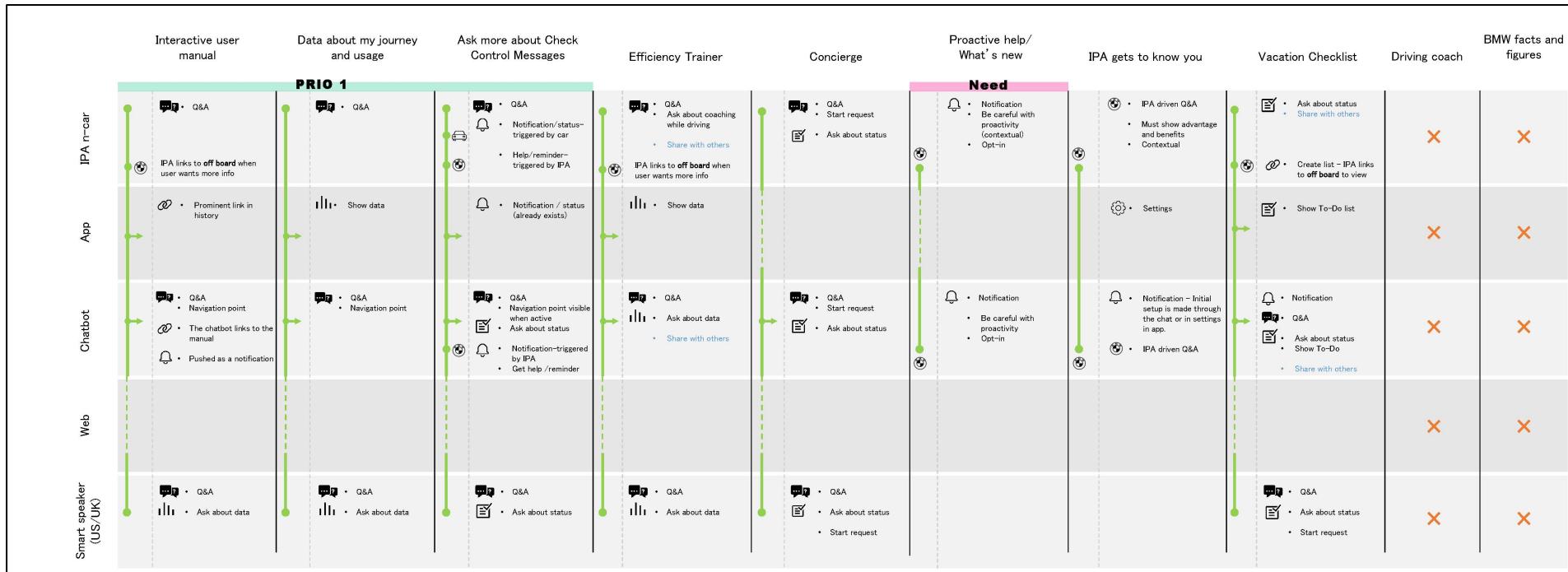
PARTICIPANT QUOTES

Q1

IPA should be only something to assist me, not take over my life. It's there for small reminders, but not a life partner or something I go to for advice.

— BMW driver / US

Q2

Passengers should not hear your personal information, that would be very embarrassing. I should be in control.

— BMW driver / China

Q3

It's awkward to talk to a robot. It's like a person was watching you all the time. That's creepy. IPA shouldn't initiate it.

— Millennial Target / US

SERVICE DESIGN

CRAZY EIGHTS

COMPETITIVE ANALYSIS

BMW IPA

Media/Radio
No active entertainment source.

Communication
...connected.

3 ◁× 🎤 🚶 🌐 09:57 am

08

🏠 Notifications

⚠ Left low beam malfunction.

ⓘ Check tire pressure at your convenience.

👤 Valet parking mode
Activate now

Here some examples:

"Play a classical music station."

"Call home."

"Is my engine oil level still OK?"

"Help"

Please sp...

CURRENT CAR
MENTAL MODEL
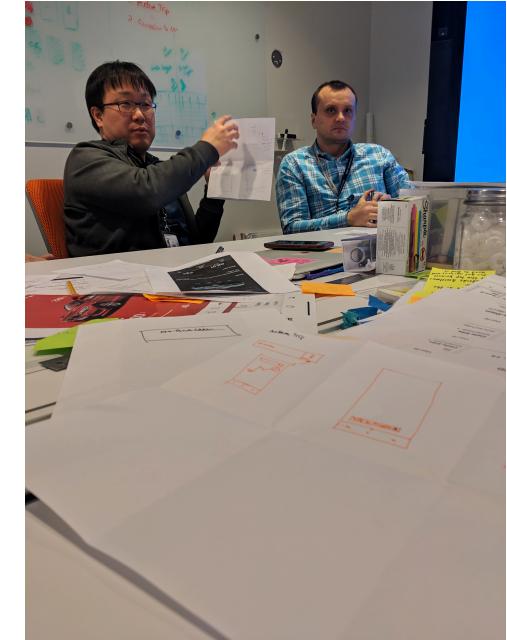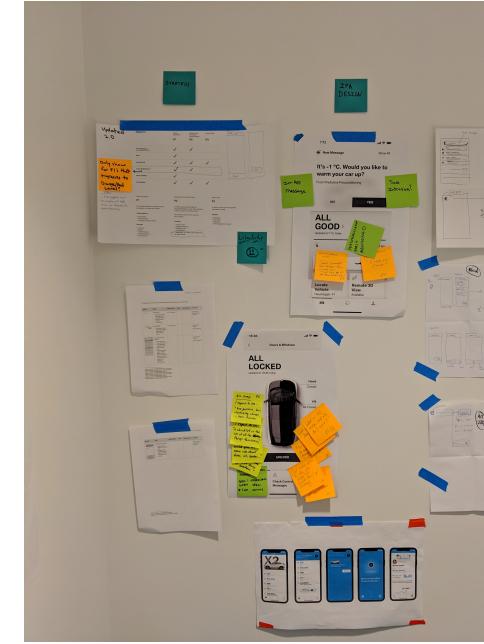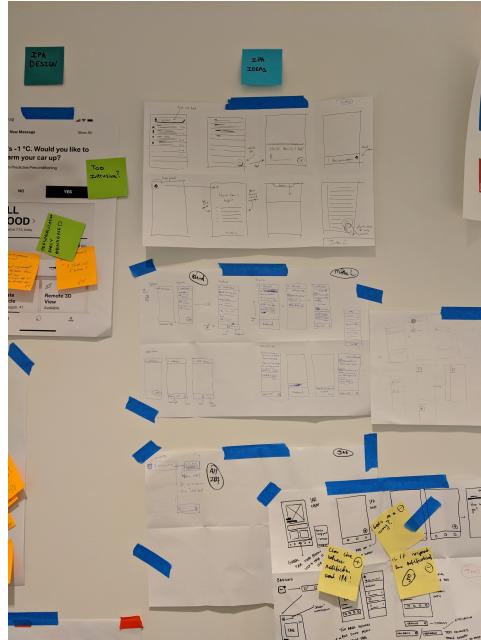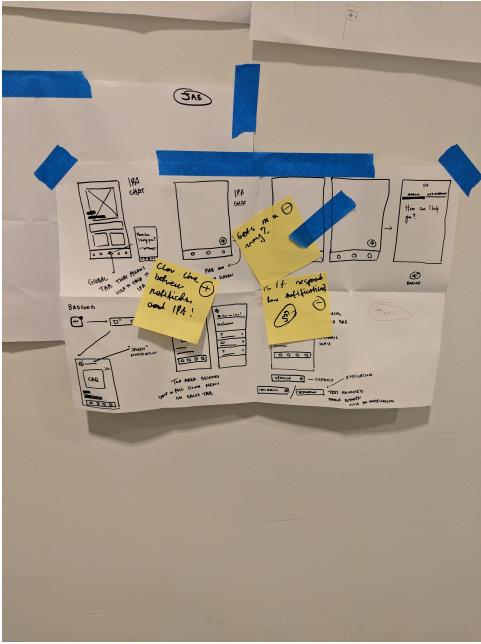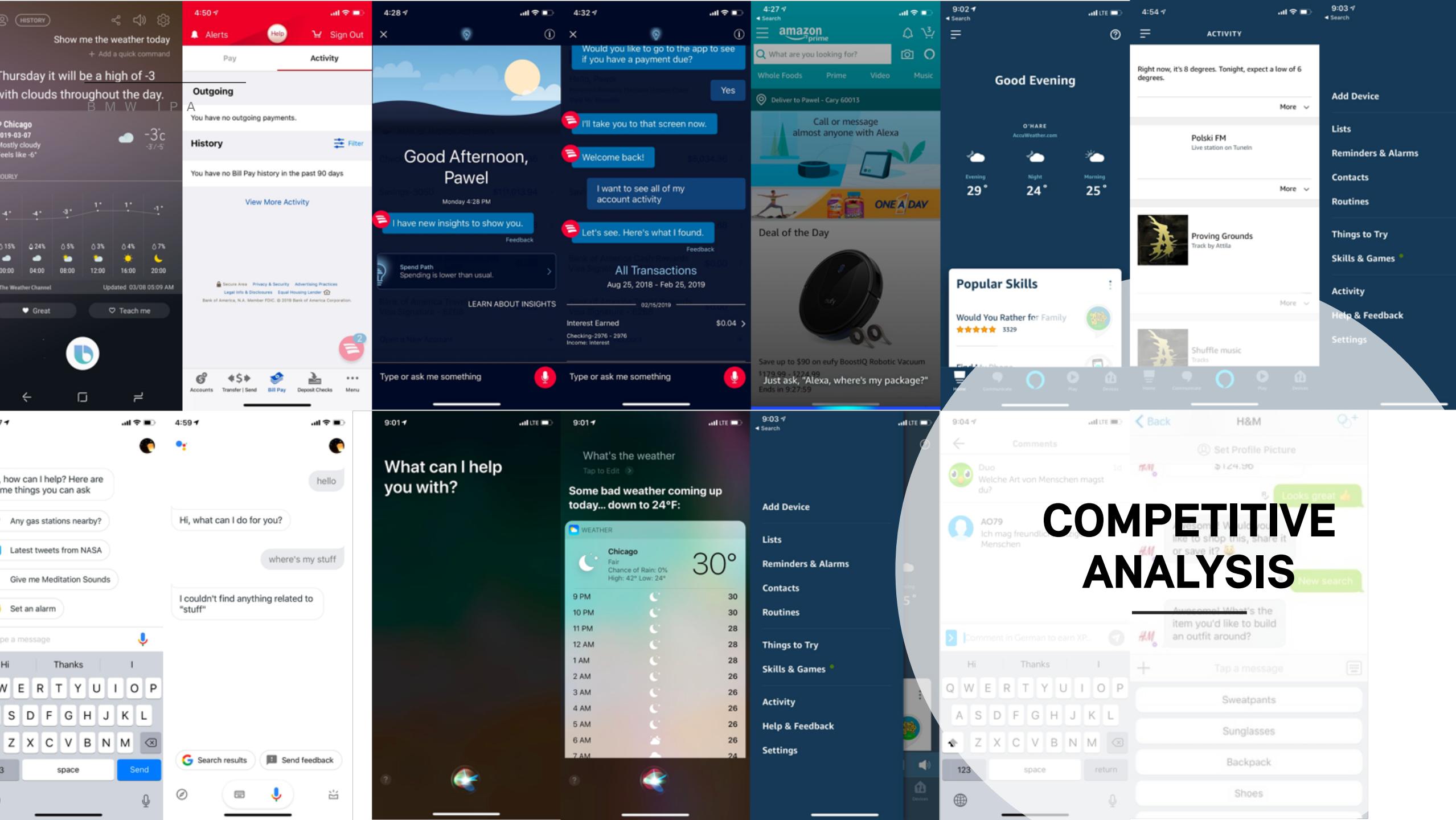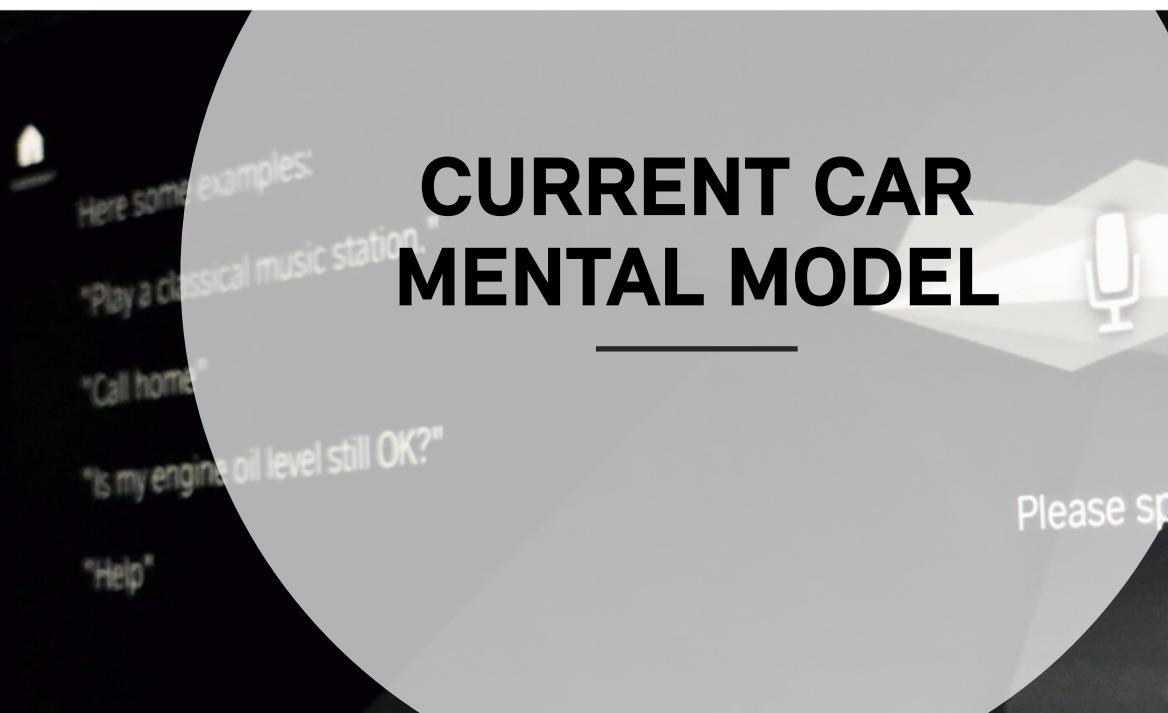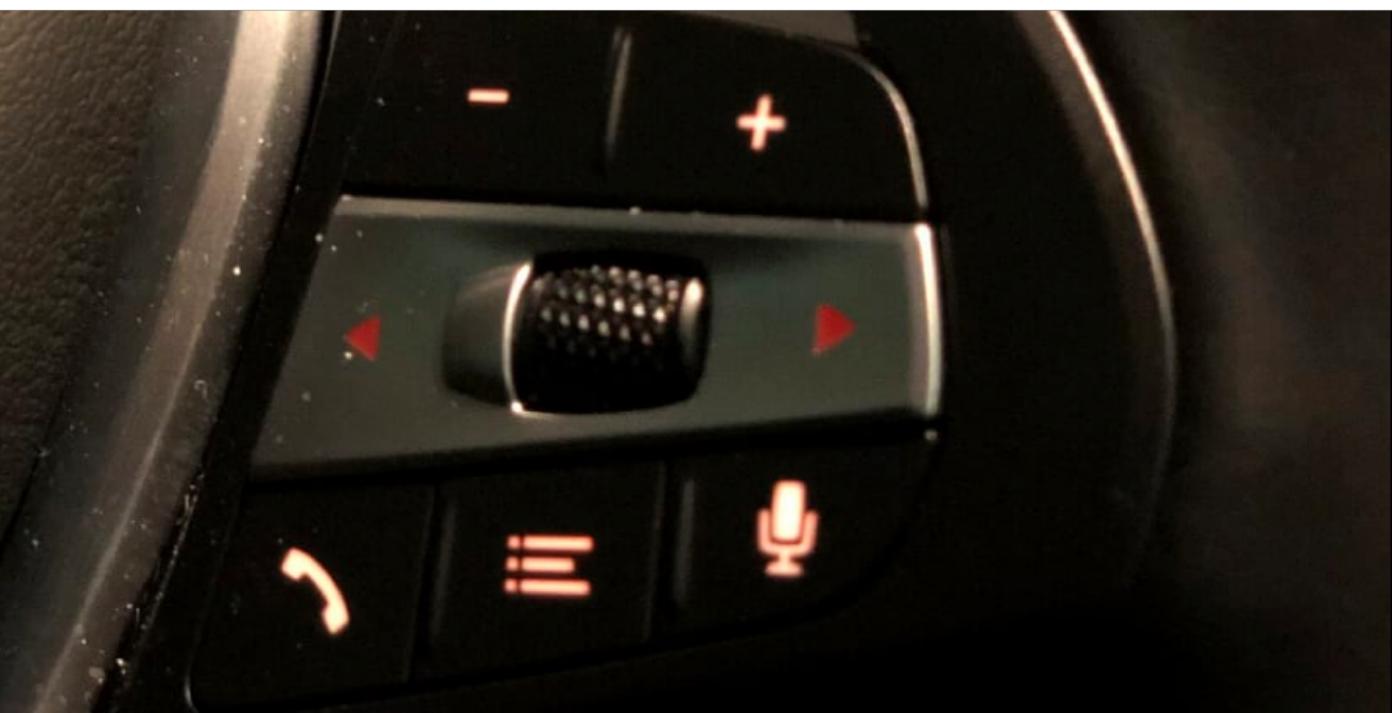
MENTAL MODEL

SERVICE DESIGN RESULTS

After a few crazy eight sessions, we started to piece together some mental models.

HOW WE USED THE DATA

I factored in the competitive analysis, current car experience, and took the mental models and sketched out concepts, that I then wireframed, comped up, and prototype.

FEEDBACK & REVISIONS

We went through several rounds of revisions, based on internal reviews and testing with users. For the sake of space, I'm only showing the current revisions.

MY SKETCHES
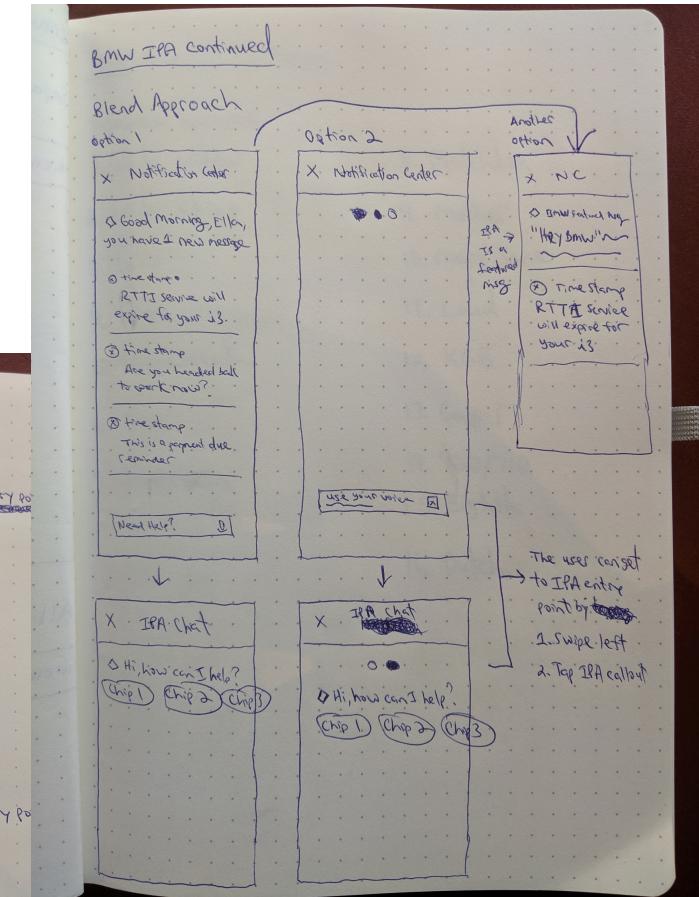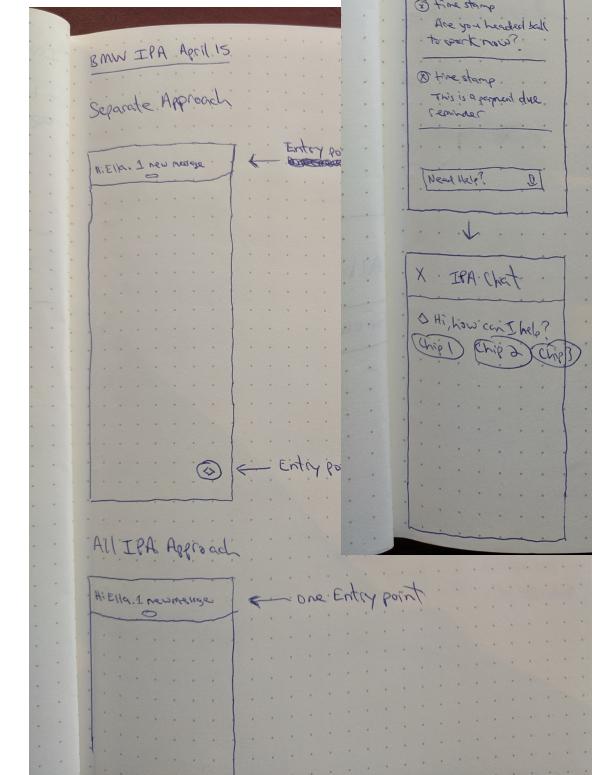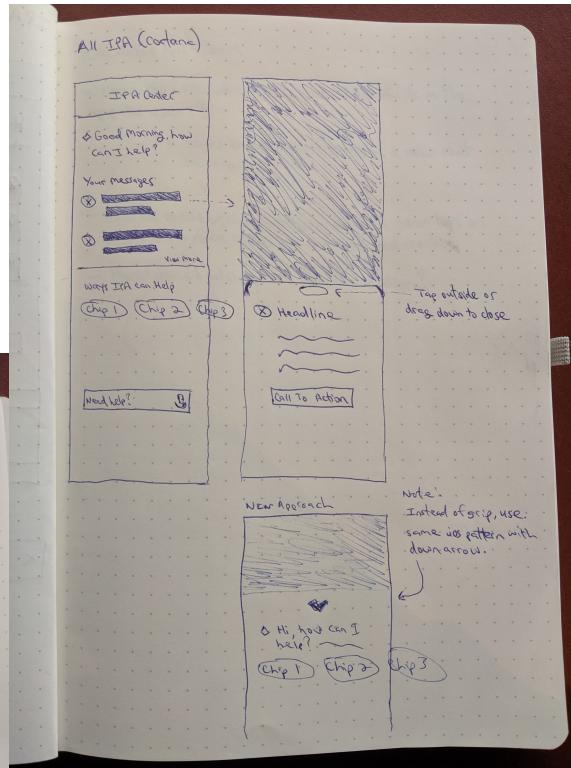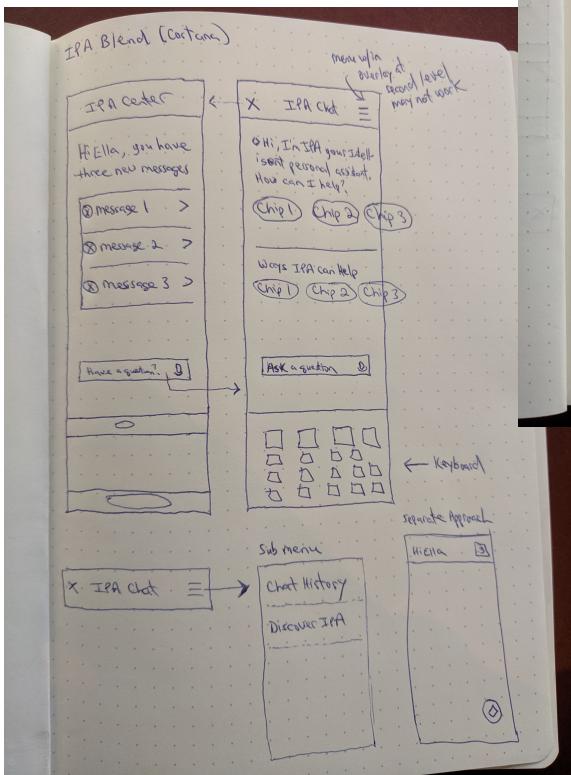
EARLY CONCEPTS

DESIGN IDEAS

Separate

8:15

Hi, Ella

i3 ›

ALL
GOOD ›
Updated at 8:00, today

68 %   178 km

Locate Vehicle
Heusteigstr. 41

Remote 3D View
Available

All IPA

7:12

IPA

◆ Good Morning, Ella, you have two new messages.

🔔 19:25, 5 min ago
This is a reminder that the payment for your account ending in x2751 is due soon.

Make a payment   View my account

Scroll down

7:50, yesterday
Climatising Complete with Remote

Ways IPA can Help

Show all messages   Climatize   When is

Need help? Ask me a question..

Combined Fab

7:12

IPA

Good Afternoon, you have one new critical message

19:24, yesterday ●
RTTI service will expire on 20 Dec 2018 for your i3.
From ConnectedDrive Store

NO   YES

7:50, yesterday
Climatising Complete with Remote

19:25, 15 Dec
Vehicle Locked with Remote

Combine Floating

7:12

IPA

19:24, yesterday ●
RTTI service will expire on 20 Dec 2018 for your i3.
From ConnectedDrive Store

NO   YES

7:50, yesterday
Climatising Complete with Remote

5 mins ago
Are you heading back to work now?
From Suggested Destinations

NO   YES

19:25, 15 Dec
Vehicle Locked with Remote

Need help? Ask me a question..

IPA Tab

7:12

BMW IPA

Hi, I'm IPA, your Intelligent Personal Assistant.

◆ About IPA ›

TRY ASKING IPA   View All

"Hey IPA, what is my vehicle's range?"

"Hey IPA, climatize my vehicle"

Preferences ›

Chat History ›

Your Chat history includes chat and voice conversations done in the car and via the app

Detailed Voice Response
Better for driving or when you can't see the screen

Notifcation Center

7:12

Notification Center   History

Hi Ella, travel to work is currently 43 minutes. You have 2 new notifications.

Need help? Ask me a question..

NOTIFICATIONS

19:24, just now ●
RTTI service will expire on 20 Dec 2018 for your i3.
From ConnectedDrive Store

NO   YES

5 mins ago
Climatising Complete with Remote

7:50, yesterday
Are you heading back to work now?

MENTAL MODELS

SEPARATE

The separate approach means that the Notifications and access to the Chat/Voice part of IPA are independent of each other in the app.

This approach is the closest to the in-car IPA experience. The physical button on the steering wheel initiates Voice IPA. The in-car notification center can be accessed by tapping the top header.

BLEND

The blend approach means that the Notifications and access to the Chat/Voice part of IPA are always accessible on every tab in the notification center.

IPA is passive, but could also be proactive as well, informing the user of new messages (when applicable) while waiting passively for the user to trigger it with a question.

ALL IPA

With this approach all notifications are delivered by IPA and replace the traditional notification center.

Some examples of this approach at a high-level would be Cortana, Google Assistant, and Bank of America's personal assistant "Erica."

SEPARATE APPROACH

# SEPARATE APPROACH

## SEPARATE ENTRY POINTS TO NOTIFICATIONS & IPA

To access the Notification Center, the user can tap the header or pull down on the "grip" to open notification center drawer.

Within IPA, the user can ask IPA a question or access their chat history (where applicable) via a suggestion chip.

PROTOTYPE

URL:
https://pasteapp.com/p/zxIYE2CwrDo/s/yWVgY
6XR7ng?view=yQWCGOmabUm
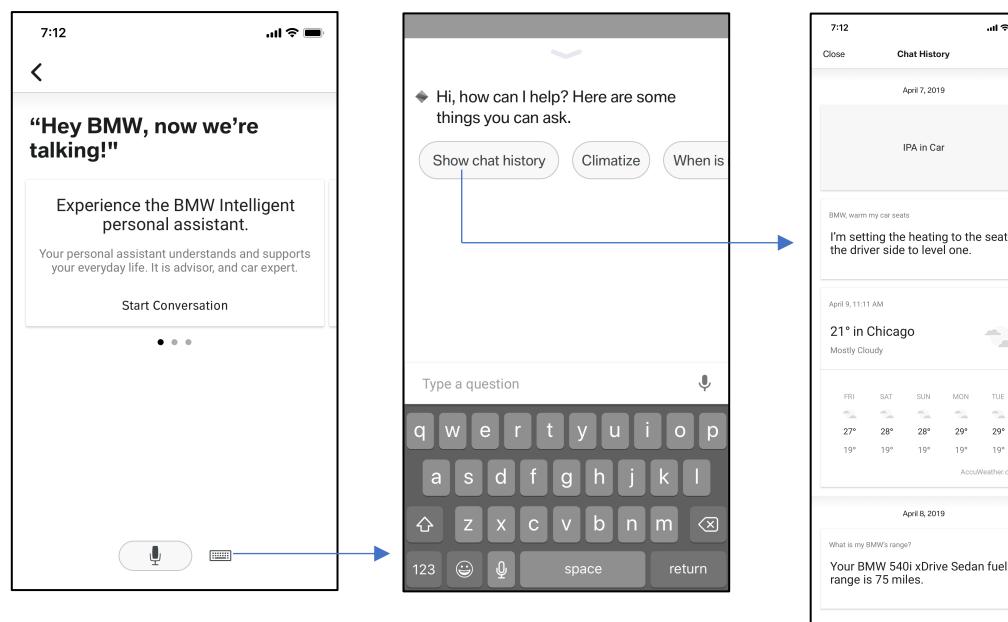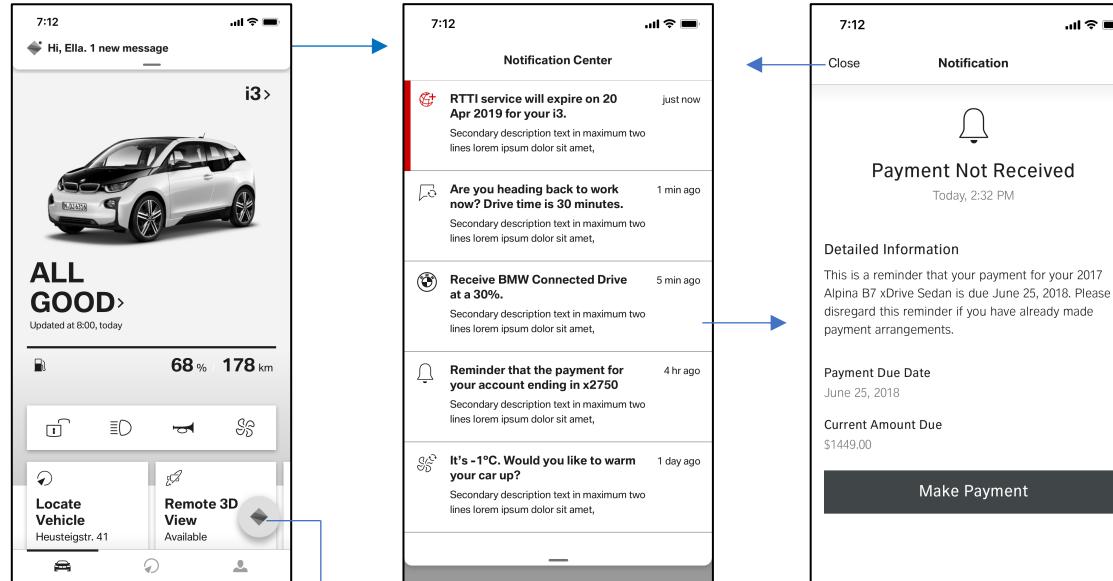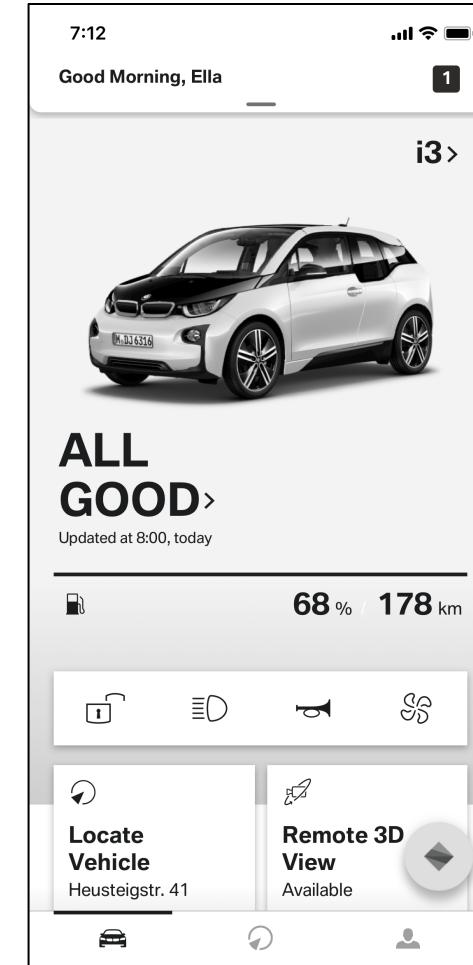
ALL IPA APPROACH

ALL IPA APPROACH

FORWARD THINKING APPROACH TO MESSAGING IN BMW CONNECTED

Notifications and IPA is visually treated like a dashboard. On this dashboard the user can interact with cards, list items, and suggestion chips.

Very similar to Cortona and Google Assistant, when the user request their messages, IPA presents them as list items that either will open up detail screens or route the user to another area of the app.

PROTOTYPE

URL:
https://pasteapp.com/p/zxIYE2CwrDo/s/yWVgY6XR7ng?view=yQWCGOmabUm
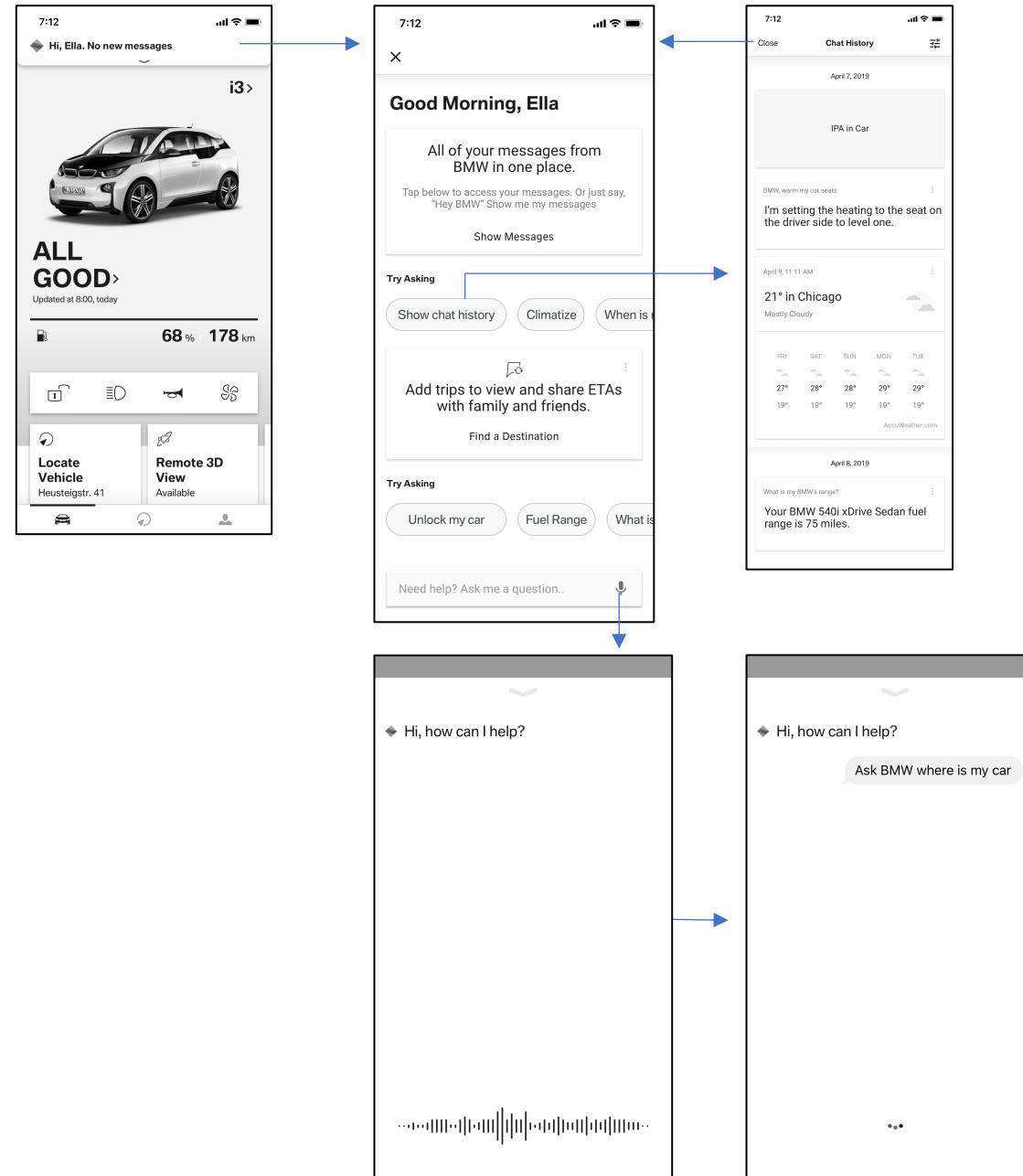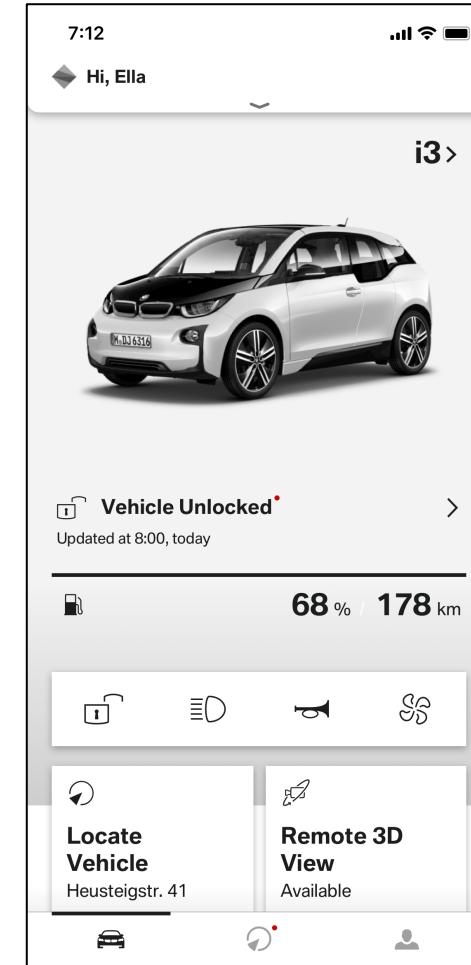
BLEND APPROACH

BLEND
APPROACH 1

IPA ENTRY POINT FLOATS BELOW NOTIFICATIONS

In this approach, the IPA entry point floats passively at the bottom, but could also be proactive by informing the user of new or urgent messages.
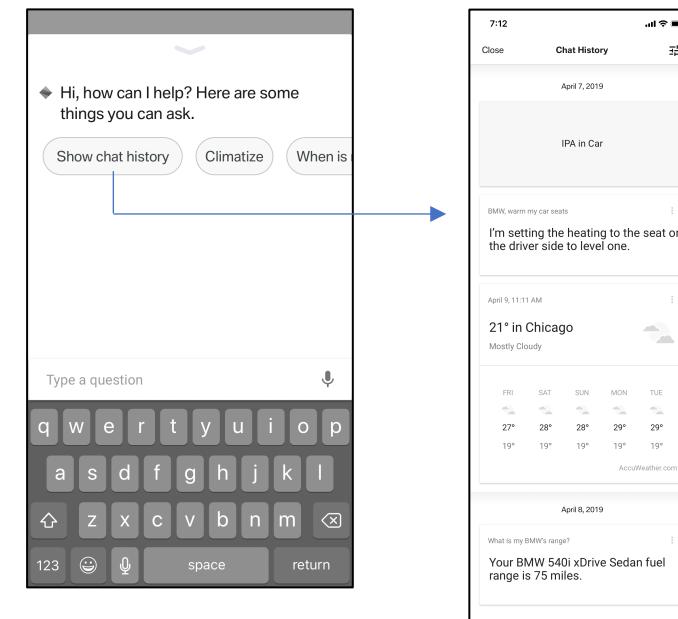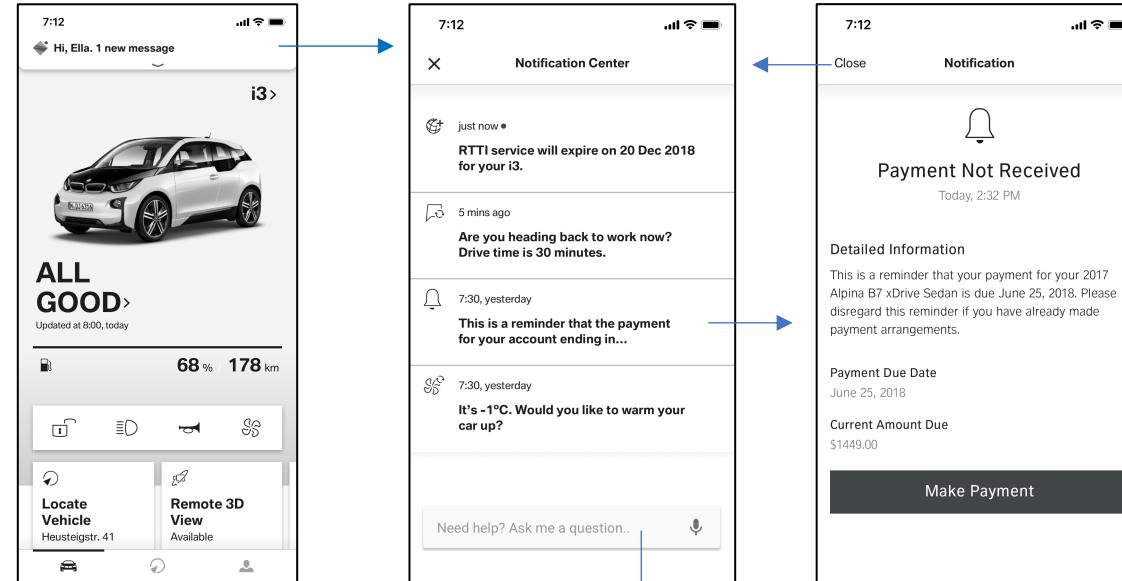
BLEND APPROACH 2

IPA ENTRY POINT IS ACCESSIBLE VIA CARD OR SWIPE GESTURE

This approach takes some inspiration from the Mobile 1.0 Activity Tab, which is where the coupling of messages with the card at the bottom comes from. Think the 'Import Calendar & Get Alerts' card as an example of this approach.

A more subtle entry point is the use of pagination dots, that allows the user to seamlessly swipe between notifications and IPA chat/voice.
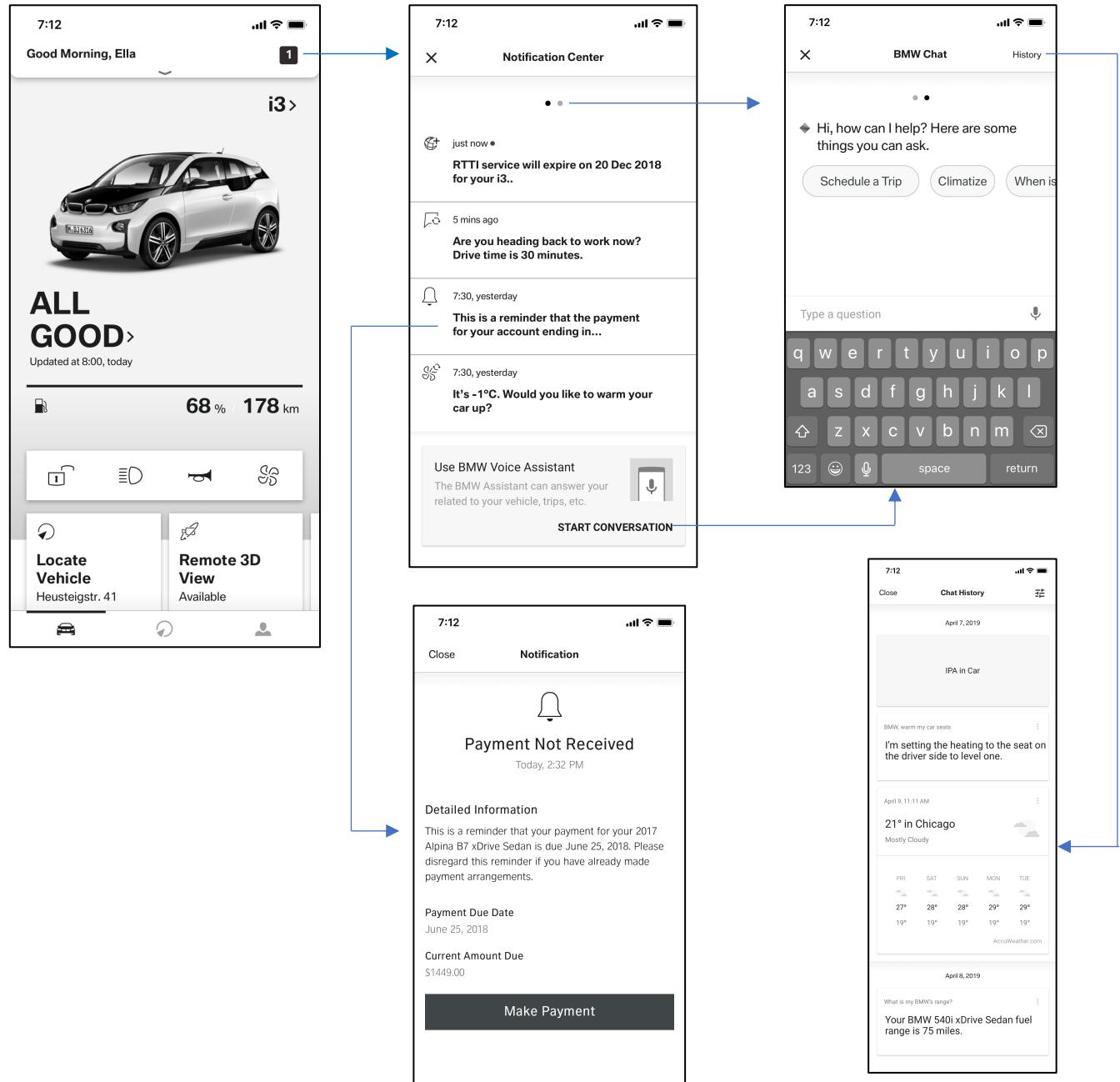
BLEND APPROACH 3

IPA ENTRY POINT APPEARS AS A MESSAGE

In this approach the entry point to IPA appears as a "featured message" for FTU. However, after the FTU, it may feel weird to users to continue to access IPA from a message fixed to the top of the Notification Center.

We are not saying that it couldn't work, it's just not the current mental model users have from using chatbots in other apps.
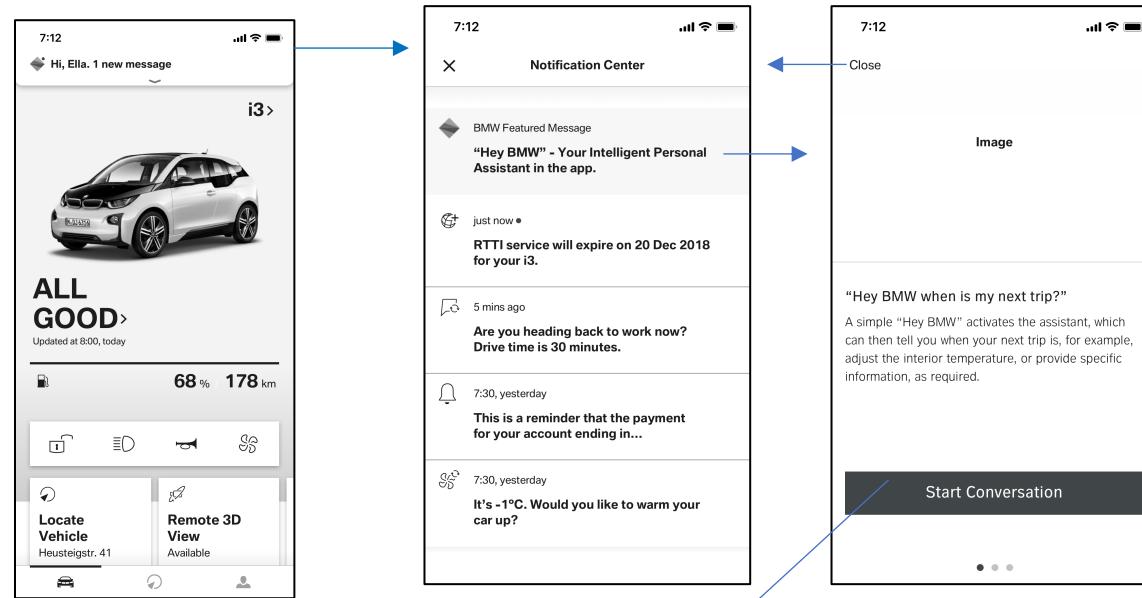
IPA FTU detailed screen. Each subsequent time would immediately take the user into the chat/voice conversation

BLEND 3

PROTOTYPE

URL:
https://pasteapp.com/p/zxlYE2CwrDo/s/yWVgY
6XR7ng?view=yQWCGOmabUm
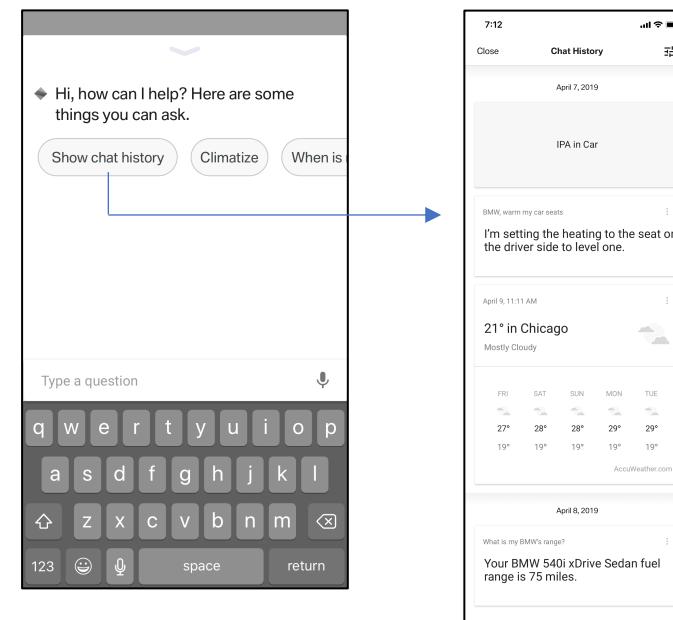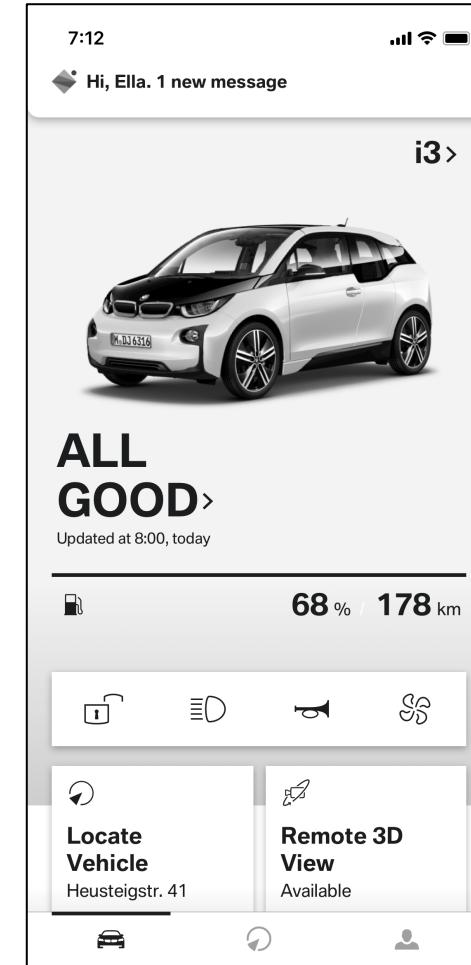
RESULTS

RESULTS

We're in the process of preparing a Usability Study for the end of June to validate which mental model performs the best with users.

Our assumption is the "Separate Approach" will test the best because it's the closest to the in-car experience that customers are accustomed to experiencing. However, we're prepared to be surprised!