

1 Introduction

During this second mission, we have generated a test suite to check our model for a smart messaging app. Thanks to this test suite, some anomalies were found. As a result, we have updated our model and designed a detailed class diagram for a valid configuration.

2 Design testing

2.1 Test suite

The core contexts always active are 'Context', 'Language', 'ConversationType', 'UserLocation', and 'UserPreferences'.

The core features always active are 'RemoveContact', 'TypeOfKeyboard', 'ContactList', 'TypeOfMessage', 'Notifications', 'Forward', 'Feature', 'AddContact', 'Receive', 'Inputs', 'ReactToMessages', 'CreateAGroup', 'PredefinedMessages', 'Reply', 'Textual', and 'Send'.

test	added contexts	deleted contexts	added features	deleted features
1	UserLocation, French, UserPreferences, Group, Context, Meeting, Language, ConversationType		FromAGroup, RemoveContact, TypeOfKeyboard, ContactList, BEPO, TypeOfMessage, Notifications, GroupOfContacts, Forward, Feature, AddContact, Receive, Text, Inputs, ReactToMessages, CreateAGroup, PredefinedMessages, Reply, Video, Keyboard, Textual, Send, Photo	
2	Night, Latin	French	DarkMode, AZERTY	BEPO
3	Library	Meeting	Vibrate	
4	Germanic, Car	Library, Latin	Call, Sound, QWERTY, Audio, Voice	AZERTY, Text, Video, Keyboard, Photo
5	Library, Individual, PrivateContact	Car, Group	FromAContact, Emoji, Contact, Text, Video, Keyboard, Photo	FromAGroup, Call, Sound, GroupOfContacts, Audio, Voice
6	Meeting	Library		Vibrate
7	Blind, Latin	Germanic, Night	AZERTY, Call, Vibrate, VocalAssist, Audio, Voice	DarkMode, QWERTY
8	Car	Blind, Meeting	Sound	Text, VocalAssist, Video, Keyboard, Photo
9	French	Latin	BEPO	AZERTY
10	Blind, Library	Car	Text, VocalAssist, Video, Keyboard, Photo	Sound
11	Casual, Night	Library, PrivateContact	DarkMode, Sound	Emoji
12	Latin	French, Blind, Night	AZERTY	DarkMode, BEPO, VocalAssist
13	Car, Blind, Group, PrivateContact	Casual, Individual	FromAGroup, Emoji, GroupOfContacts, VocalAssist	FromAContact, Contact, Video, Keyboard, Photo
14	Casual, Germanic	Car, Latin	QWERTY, Video, Keyboard, Photo	AZERTY

Table 1: Test suite

2.2 Usage scenarios

1	Benoit speaks French and is then happy using his BEPO keyboard. He is in a meeting with Pierre and Kim, and gets a text notification. He has received a message from his Club INFO group conversation. He sends discretely a funny meme with a funny joke back to that conversation. That reminds him of a funny video he took of a racing car and he sends it too.
2	The meeting is incredibly long that day and night has fallen. Benoit can now enjoy his messaging app in a dark mode less aggressive to the eye. Benoit is bored by the meeting and he thinks about the Spanish PhD students he met the other day. Trying his best to remember his Spanish classes, Benoit switches his preferences to an AZERTY keyboard to type faster in Spanish.
3	The meeting has finally ended. Because of that very long meeting, Benoit is late on his schedule. He really needed to return some books to the library to avoid a fine. Benoit rushes to the library. While he is there, his phones vibrates and a text notification appears. He has just received a message from the Spanish PhD students who propose to meet in the bar next door! Tequila here he comes!
4	Benoit leaves the library and jumps in the car when suddenly his phone rings. He gets a call while he is driving from his Dutch teachers. Benoit is in a good mood and tries to discuss in Dutch. As a result, the app now switches to a QWERTY keyboard. After the call has ended, Benoit receives a textual message that he cannot read. He then sends a voice message to his teachers explaining that he cannot read the message now.
5	During the call, Benoit has glanced at his bag next to him and he saw that he forgot a book in his bag! As he really wants to avoid a fine, he makes a U-turn and goes back to the library before it closes. As he is handing this last book, his phone vibrates in his pocket. He expects a message from the Spanish PhD students but it is a message from his German Tinder match to whom he gave his smart messaging contact! She asks how he is doing. He sends a picture of the library. She replies with a video of a bar full of people and asks him to join. He reacts with a fire emoji and start going back to his car. . . when suddenly an emergency occurs.
6	He has to attend an emergency meeting right now. He keeps exchanging discretely messages with the German Tinder match with text notifications only, disappointed to not be able to join the party.
7	The night ends. The sun rises and the light is so strong that Benoit goes blind due to lack of sleep. The dark mode is now disabled but Benoit can't see it anyway. He feels bad about standing the Spanish students up so he asks the vocal assistant to go the individual conversation of one of his friend who happens to be part of the Spanish PhD students group. Benoit sends a voice message to apologize. His friend calls him to tell about the party in Spanish. The meeting is very annoyed by all the noise that Benoit makes.
8	While Benoit is slowly retrieving his sight, the meeting ends. He goes into his car, his phone rings and his Spanish friend call him back to keep talking about the party he missed. The call ends and he gets a sound notification. Benoit's mom has sent a voice message to know what he wants to eat. As Benoit is speaking French again, the keyboard switches to the BEPO layout.

Table 2: Usage Scenarios

9 -10	Benoit has forgotten his jacket in the library so he goes back. But while getting out of the car, he bumps his head so hard that he goes blind again. His phone vibrates. He asks the vocal assistant to read the message for him. Bpost is telling him that he can follow the arrival of his delivery by clicking that link.
11	As he could not see anything, he took so much time looking for his jacket in the library that when he leaves the library, the night had already fallen on the city. But Benoit has no clue that his phone has activated the dark mode. His phone makes a sound. It is a text message from his colleague that he asks the vocal assistant to read. She asks where he is. He answers that he can't see anything and that he might use her help to go home.
12	When he wakes up the next morning, he can see again. He sends a message to explain in Italian the previous day to an Italian colleague to apologize not showing up to work.
13	In order to go to work, Benoit takes his car when suddenly at a red light, he goes blind again. Maybe he should go to a doctor. He sends a voice message to his family group crying for help. He can't stand it anymore. His brother reacts with a turtle emoji.
14	Benoit can't stand it anymore and leave the car in the middle of the road, hoping he is going to survive the walk to the pavement (where is the pavement?). He gets a sound notification and asks the vocal assistant to read it out loud. That is his German Tinder Match sending a video about a funny racing cars. Benoit has to reply in German that he can't see it, through a text message dictated to the vocal assistant.

Table 3: Usage Scenarios [suite]

2.3 Anomalies

- During the scenario 4, we realized that Benoit cannot read a textual message that he has received while in the car. We then thought that it would be great to activate the vocal assistant while in the car and not only when Benoit is blind. We changed the model so that the context 'Car' also activates 'Vocal assist'.
- During the scenario 7, blind Benoit makes a call during a meeting and it annoys everybody. Why can it happen? Because we link the context 'Blind' to the features 'Audio', 'Text', 'Call', 'Vibrate', and 'Voice'. However, 'Call' and the 'Type of message' should only depend on the 'User location'. We changed the model so that the context 'Blind' only activates the 'Vocal assist'.
- During the scenario 13, Benoit ends up blind and in the car. At first, it seemed odd but we decided to allow it as the app cannot decide where Benoit is.

- Overall while writing these scenarios, we realized that it would be clearer and smarter to add a mandatory feature 'Chat' that allows to store and browse the messages of a particular conversations. Otherwise the message would instantly disappear once read.
- While thinking about how to browse the conversations, we also decided to update the definition of 'Contact list' where it is not only a list of contacts but also the list of conversations. By clicking on a contact, the user reaches his conversation with them.
- The feature 'Predefined messages' is in the core features list which means that it is always active. The predefined messages should then always be able to be sent and received. However a predefined message is in the category 'Text' message and this category is not active in the car as seen in the scenario 4. If this feature 'Predefined messages' is always active, the feature 'Text' should be always active as well. These should then become mandatory features and we changed the model accordingly. They can then no longer be activated by a context as they are always active.

3 Updated models

3.1 Lexicon

3.1.1 Set of application features

- Inputs: tools to write a message via a keyboard, voice (dictation), or predefined messages (ready-to-send stored messages)
- Vocal assist: feature that helps navigate in the messaging app by voice. It reads text messages aloud for instance. [UPDATED]
- Notifications: a notification is first textual then it can make more or less noise with vibrate and sound.
- Predefined messages: those are little text messages that the user can create in advance to use them when he is busy. [UPDATED]
- Chat: core feature that allows to store and browse messages of a conversation. [UPDATED]
- Contact list: list of contacts through which the user can reach his conversations. [UPDATED]

3.1.2 Contexts

- Private contact: the discussion partner is not a professional contact.
- User location: the type of location where the user is. It can be his car, a meeting, a library or a "casual" place where the user is free to make noise.
- Blind: The user is visually impaired or blind.
- Latin language: The user speaks a latin language and thus uses an AZ-ERTY keyboard
- Germanic language: The user speaks a Germanic language and this uses an QWERTY keyboard
- Casual: The casual location encompasses every location that is not one of the other.

4 Context, feature and mapping model

