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V3 of the VIMpay app

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Table of Content

1	Scope of this deliverable	7
2	Overview of new functionalities.....	7
3	Architecture overview	7
3.1	VIMpay on all devices	7
3.2	VIMpay Connect	8
4	Implementation of functionalities.....	10
4.1	VIMpay Valet	10
4.2	VIMpay chat.....	10
4.3	Trust model.....	11
4.4	Videoident	13
4.7	Kontowechsel service	16
4.8	Dynamisch versichert	18
4.9	VIMpay Connect	19
5	User interface changes	20
6	Availability	23
6.1	Android	23
6.2	iOS.....	23
7	References	23

Document Control

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Executive Summary

This document constitutes deliverable *D 1.3 V3 of the VIMpay app* of Work package 1 (WP1) of the VIMpay project.

While the deliverable itself is the third version of the demonstrator app of the VIMpay app, which can be downloaded online, this document describes the details of the implementation of the various functionalities and acts as a report on the application.

1 Scope of this deliverable

This deliverable describes the functionalities and implementation of them for version 3 of the VIMpay app.

2 Overview of new functionalities

Version 3 of the VIMpay app extends existing functionalities by integrating the Videoident service, which is an alternative way to legitimate a customer. There are also new functions to provide better customer support and increase the user experience.

The following table shows these functions and gives a short description of them.

Function	Description
VIMpay Valet	Provides now new analysis functionalities to fit needs of users
VIMpay chat	New way to get app support by using a real time chat
Trust model	Data synchronization between user devices
Videoident	Faster and easier way to provide full KYC by using real time video chat
Kontowechselservice	A service which helps the user to change his primary bank account to his VIMpay premium account
Dynamisch Versichert	A new service where the user is able to manage his insurance contracts
VIMpay Connect	A new service which helps the user to add his VIMpay card in several online shops like amazon or PayPal

3 Architecture overview

Description of the changed functions or extended existing architecture designs.

3.1 VIMpay on all devices

VIMpay on all devices extends the existing architecture design by adding a new component, the petaFuel cloud storage, to the app diagram. The user data is synchronized across several devices in order to be up to date at any time.

The following figure gives an overview of the extended app architecture diagram.

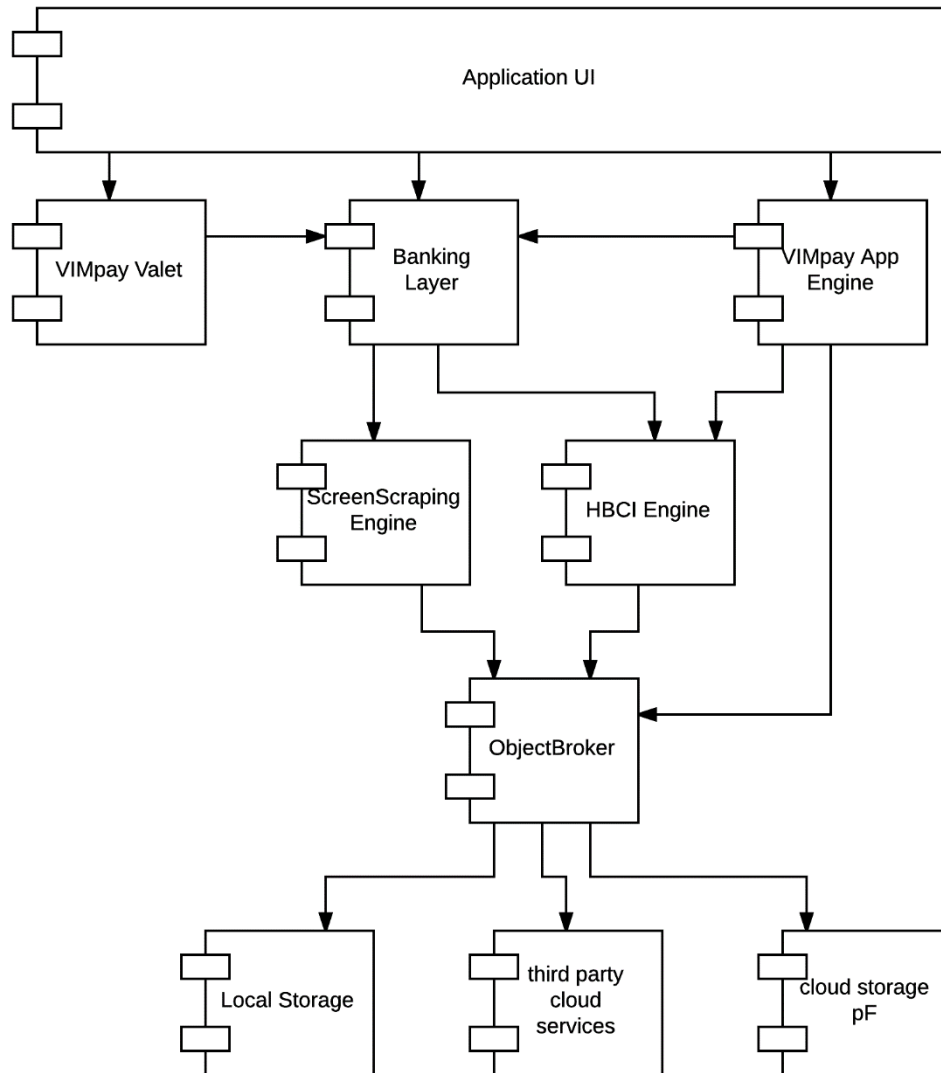


Figure 1 Extended app architecture

The ObjectBroker library described in [1] now extended to load data from local storage or from the petaFuel cloud storage.

When the local data is changed the cloud data is updated so that other devices are able to load it from the cloud storage and don't need to process the raw data, XML or MT940 revenues for example, again. This saves battery and reduces the network traffic.

3.2 VIMpay Connect

VIMpay connect is a service to add the VIMpay card in several online stores like amazon or PayPal and set it as the primary payment method. This goal is achieved using the already existing Screenscraping engine which is a Javascript based website parser. Javascript is used in order to publish updates for changed website scripts without the need to wait until a new app released is processed by Google or Apple.

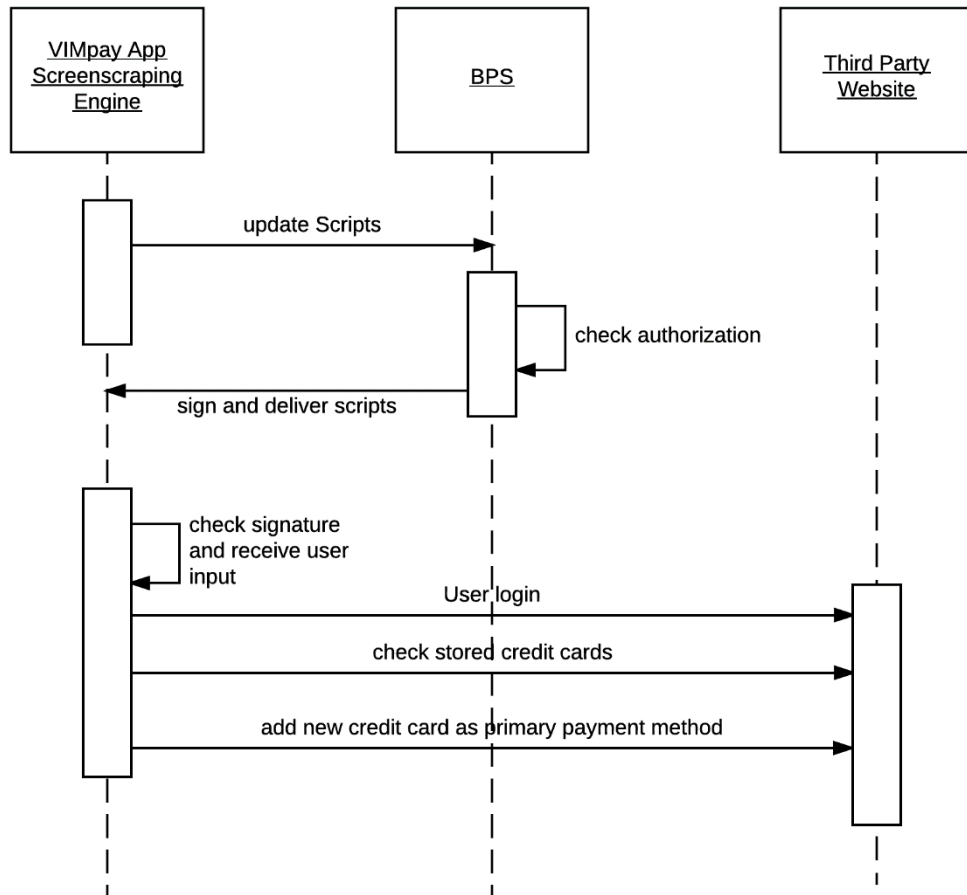


Figure 2 Execution flow for VIMpay connect

On execution of the Screenscraping Engine the script is checked for newer versions on the server using the petaFuel Bankparameter-service. The Bankparameter-service validates the client by checking the transmitted token and application-ID. When all checks are passed the scripts are signed and delivered to the client. On client side the script integrity is proven by checking the signature of it and afterwards the user login credentials are requested before execution.

When all necessary data is available the engine automatically log into the user account and adds the VIMpay card as primary payment method for the selected store.

4 Implementation of functionalities

4.1 VIMpay Valet

VIMpay Valet is a virtual personal assistant which helps the user by his daily usage of the VIMpay app. To engage a more personal relationship between the user and his virtual assistant the user is able to customize his Valet. So the user is now able to choose a name for his assistant or save an individual picture just like he would do for one of his phone contacts. After the user has setup his individual assistant an in-app tutorial will start which shows and explains the user the different functionalities the VIMpay app provides.

In the long run the VIMpay Valet supports the user by categorizing his bank account transactions so that the user can easily generate a pie chart for specific transactions. For example the user is now able to generate a chart which shows all his earnings for an individual time period.

The categorization functionality is accomplished by an automatic keyword filtering during the analysis of incoming revenues. After a revenue matches a certain keyword a database entry will be created which maps the new revenue to the existing keyword.

Category/Keyword overview

For a more readable comparison of expenses or earning we decided to display all different categories in a list. Due to this feature the user can see in which categories he spends or earns the most of his money. By swiping left or right the user is able to navigate to previous months and their calculated consumptions.

4.2 VIMpay chat

4.2.1 Support chat

The VIMpay chat is new way to get support for your VIMpay app. It's directly integrated in the app for best usability. The user doesn't need to write eMails or have to wait in queues. The chat is basically an embedded web view which uses a petaFuel php website to create support tickets.

4.2.2 VIMpay Valet chat

VIMpay valet chat is a bot integrated in the app where the user is able to create reminder and get FAQs answers based on keywords in the questions. When there is no suitable question in the FAQs the bot automatically creates a support ticket based on the question.

The bot is also able to receive transaction orders from the user and execute them. If the bot recognizes the keyword for creating a transaction and got all needed data such as creditor contact, transfer amount and purpose text he will show an overview of the transaction he has built. After the user confirms the transaction he will be directly navigated to the TAN input to verify his identity.

If the validation process has been finished successfully the transaction will be managed by his bank institute.

4.3 Trust model

The trust model explained in [2] is now extended to provide multiple ways to store the user data. Version 3 of the VIMpay app supports stage 2 and stage 3 of data storage features.

The table below shows the Trust model in a brief description.

	Storage	Access
Stage 1	Data complete stored on the device	Encrypted private key on device
Stage 2	Data stored on the devices but synched across several devices	Encrypted private key on petaFuel server
Stage 3	Data stored on petaFuel server	

Stage 2 of the data storage helps the user to be always up to date across several devices (see 1 data storage stage 2). This goal is achieved using separated versioned SQLite database files which will be transferred to the currently active device if there is a newer version on the server. The server side implementation described in [3] shows the available methods to get and set the current version of the database files.

Another planned feature is to support different third party cloud services like Google Drive, iCloud or Dropbox to be able to access the SQLite files.

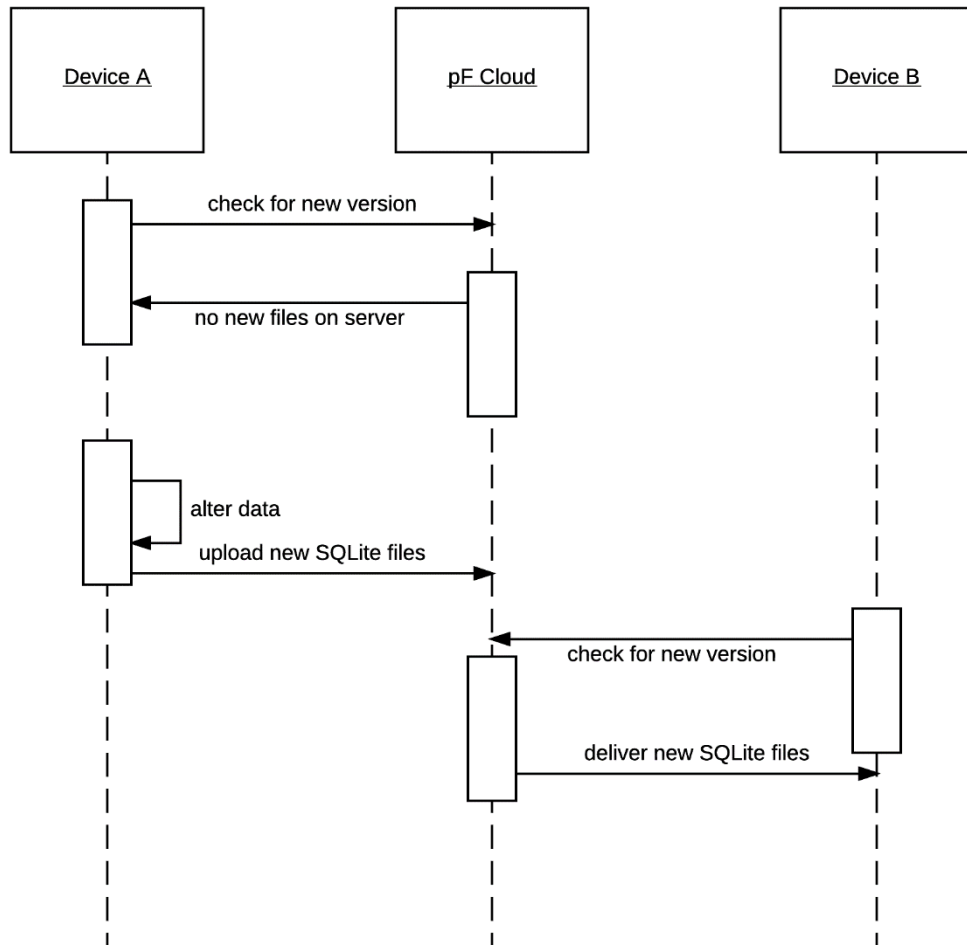


Figure 3 Data storage stage 2

One disadvantage of stage 2 is the data integrity. If more than device at the same time receive new data there are multiple versions of "actual data" which leads to conflicts because the binary SQLite files can't be merged. This problem is solved using stage 3 because all the data is stored in the petaFuel cloud and there is no possibility to create conflict versions as shown in 2 data storage stage 3.

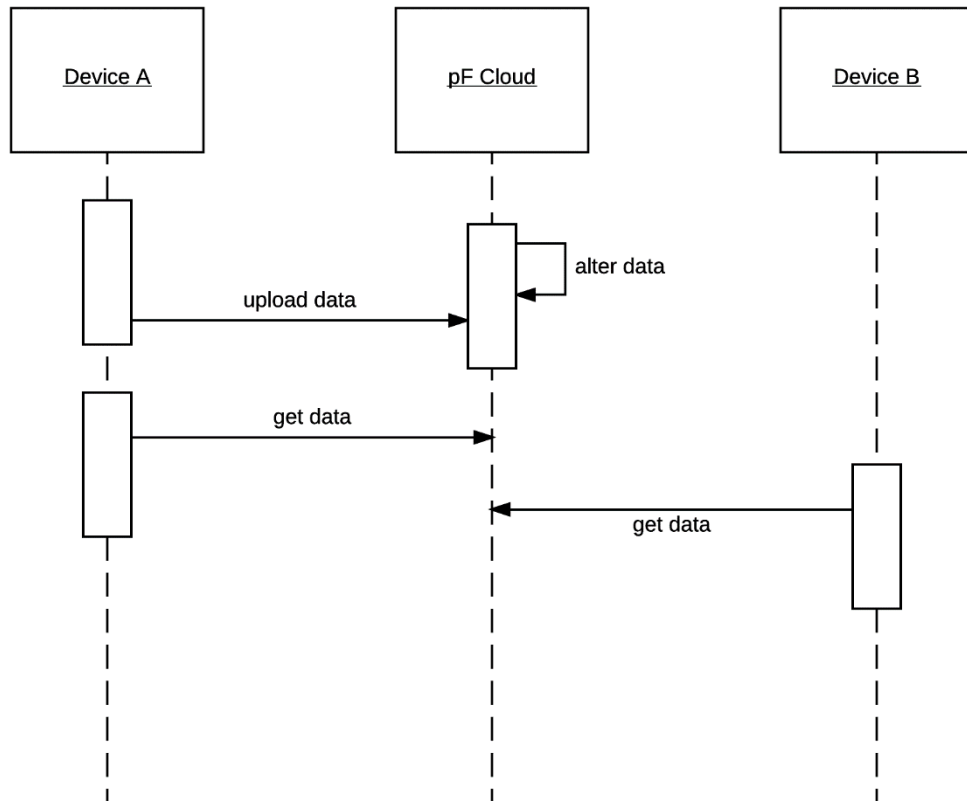


Figure 4 data storage stage 3

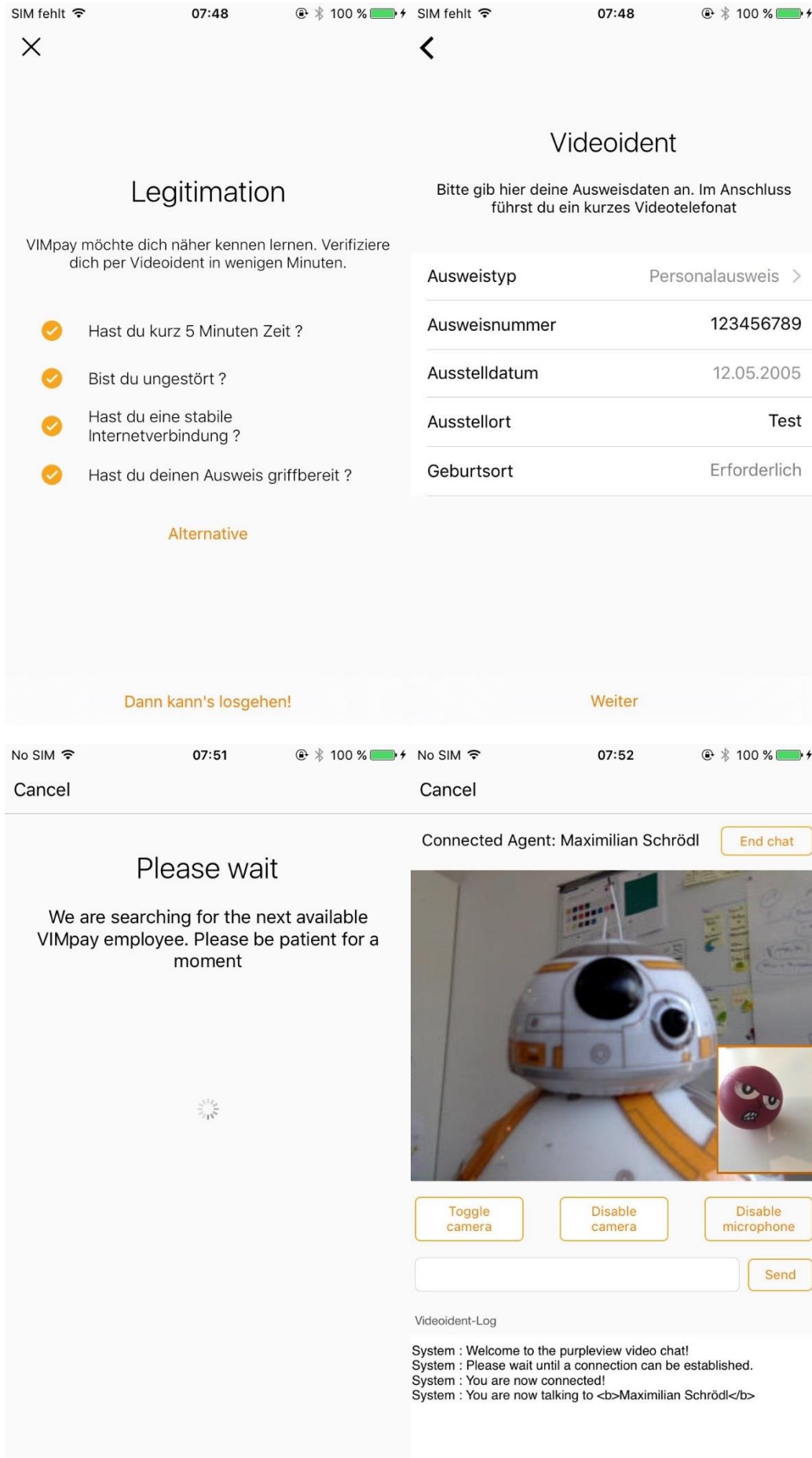
4.4 Videoident

Videoident is a new way to authorize a customer as full legitimated using real time video conversation. This service is a cooperation between arvato Bertelsmann and petaFuel GmbH.

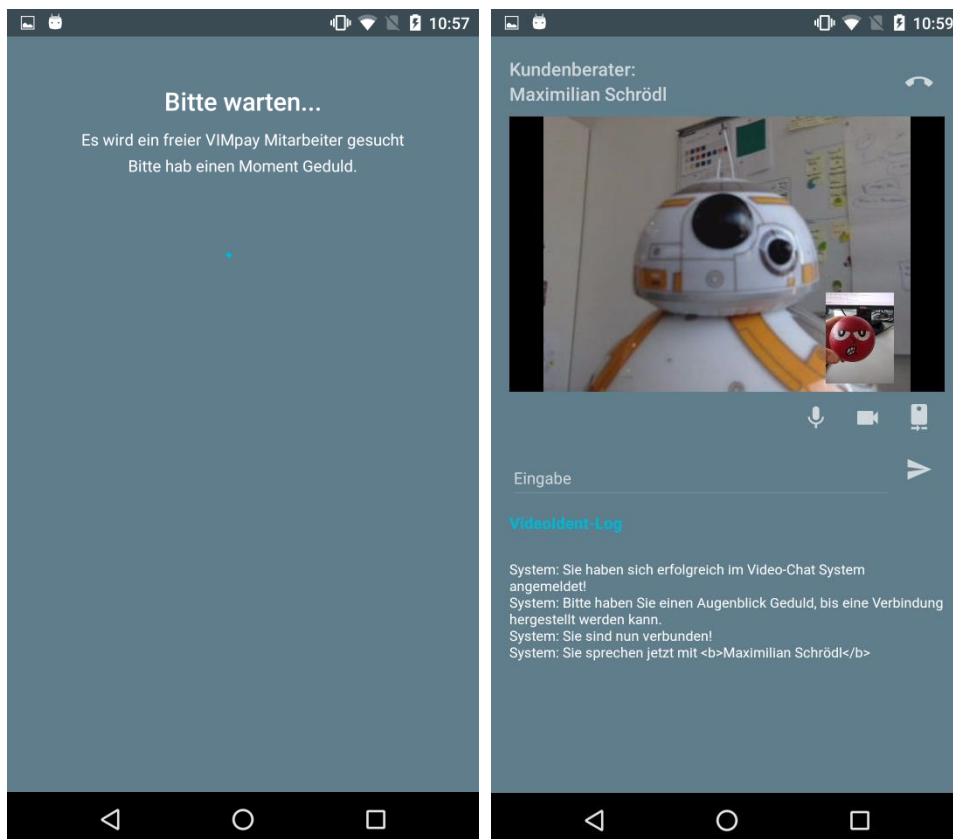
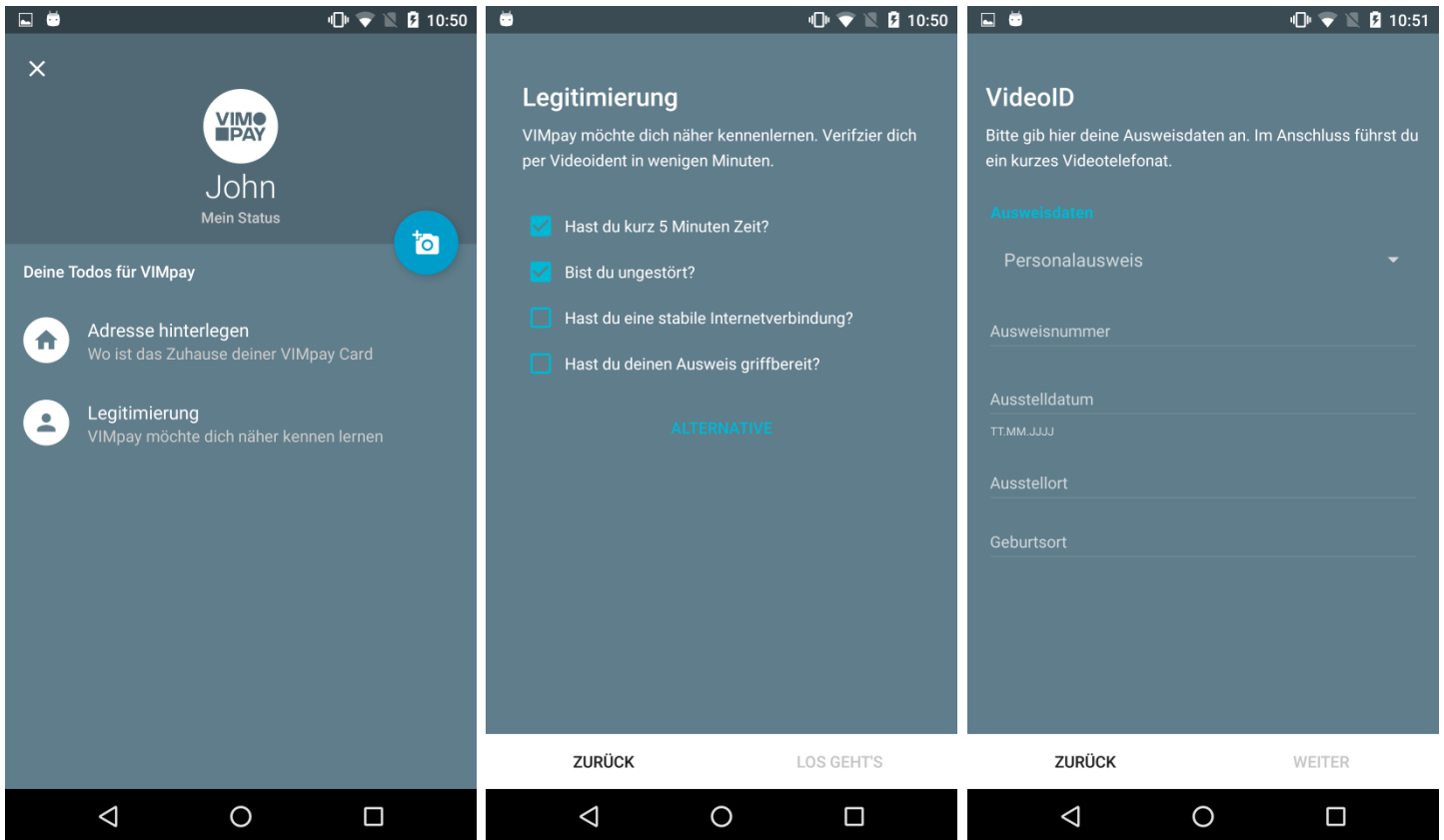
On both systems the Empathy SDK [4] is used and is provided by arvato Bertelsmann which is the license owner. The SDK transfers the video via the WebRTC protocol. The functions on both systems (Android and iOS) are the same but the UI is aligned to fit best for the specific system.

The legitimation process is triggered by the escort status of the user. This allows the dynamic control of the legitimation requirements so a Premium user needs full KYC and a basic user doesn't.

4.4.1 iOS



4.4.2 Android

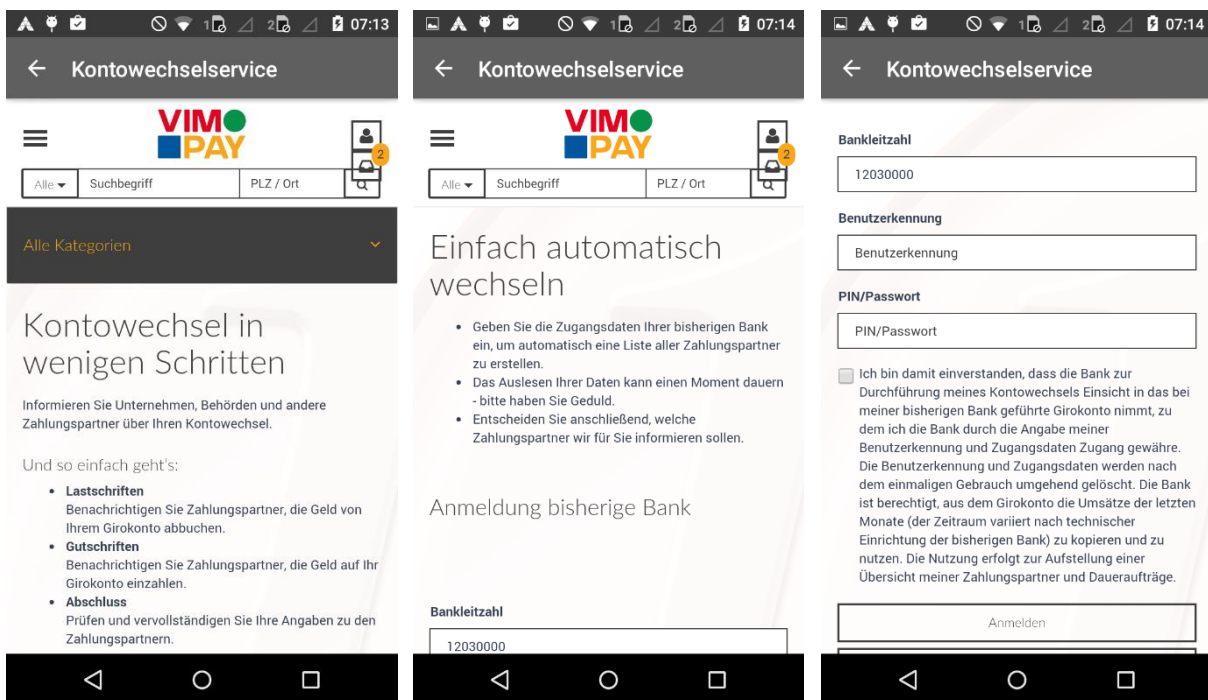


4.5 Kontowechselservice

To use the Kontowechselservice the user needs to have a VIMpay Premium account. The user is now able to change his old bank account completely to the new VIMpay Premium account. This feature is implemented in cooperation with arvato bertelsmann.

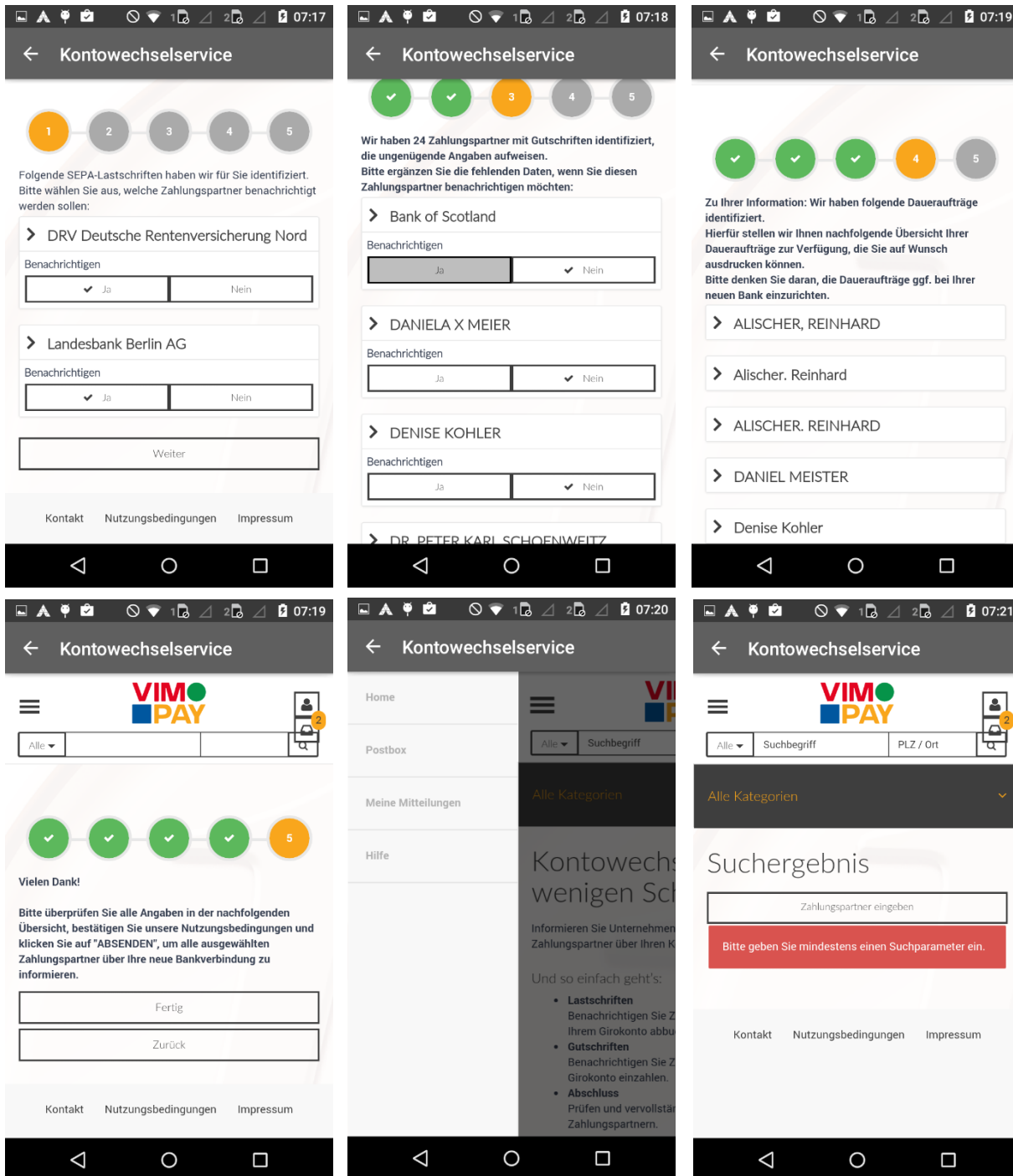
The app receives the required data over pFREST and transfers them directly to the arvato SSO site. This data contains information about the new VIMpay Premium account like IBAN and user name. The SSO side is embedded into VIMpay using a standard system web view.

After transmitting the data to the SSO side the user has to enter the online banking login information in order to collect the data from the server. When all necessary data is available the old bank account is canceled and the old standing orders are adopted to the VIMpay Premium account.



In the next step the user is able to choose which debit notes and standing orders should be adopted to the VIMpay premium account.

In some cases the user has to provide additional information (screen 2).





4.6 Dynamisch versichert

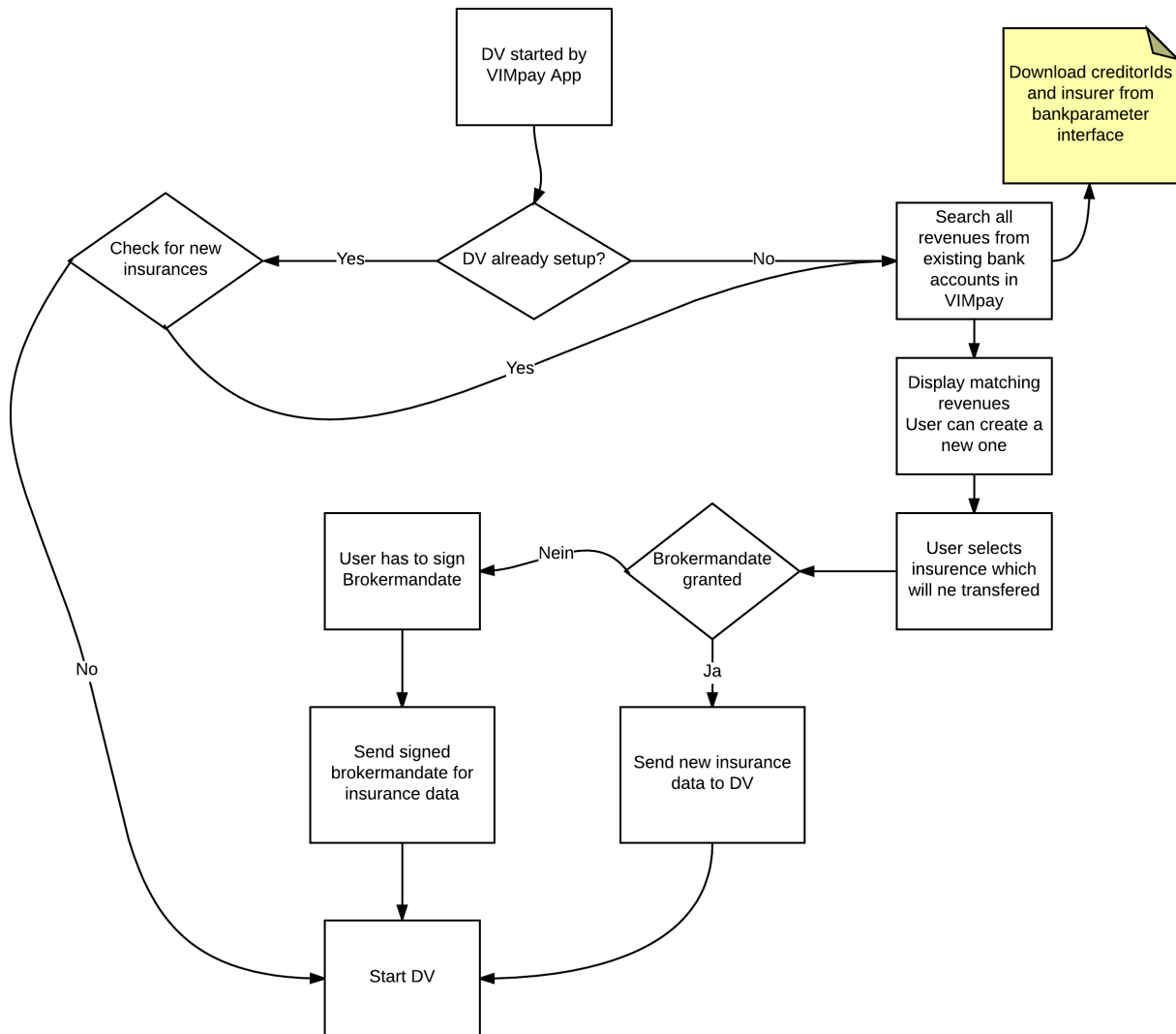
Dynamisch Versichert provides an easy way to manage all your insurance contracts in one application. The user is able to add a new insurance manually or the app analyzes the revenues for common insurance payments. This helps the user to have a general summary of his insurances.

It is also possible to compare your existing insurance contracts with new one based on specific providers.

When the user manually add an existing insurance contract it is possible to scan your documents with your smartphone using the device camera. The camera takes a picture of the documents and creates PDF files from them.

The app uses new pFREST methods listed below.

Method	Description
POST /dynamischversichert/insurance	allows the user to manually add a insurance
GET /dynamischversichert/insurance	returns a list of all managed insurances
GET /dynamischversichert/mandateform	gets a pdf form which has to be signed by the insurant person
POST /dynamischversichert/mandateform	Submit the signed document
PUT /dynamischversichert/insurance	Update specific data of an adapted insurance



4.7 VIMpay Connect

With VIMpay Connect there is a new service for VIMpay Users to store their payment data in several stores like Amazon, PayPal, Apple App Store or Google Play Store. The user selects one or more stores where he would like to pay with his VIMpay card. After he has chosen a store he will be asked for his login credentials for this store. When he has entered his login data an automatic process starts which uses screen scraping to add his payment data in the selected store for the given account.

The simplified process is shown in the following diagram.

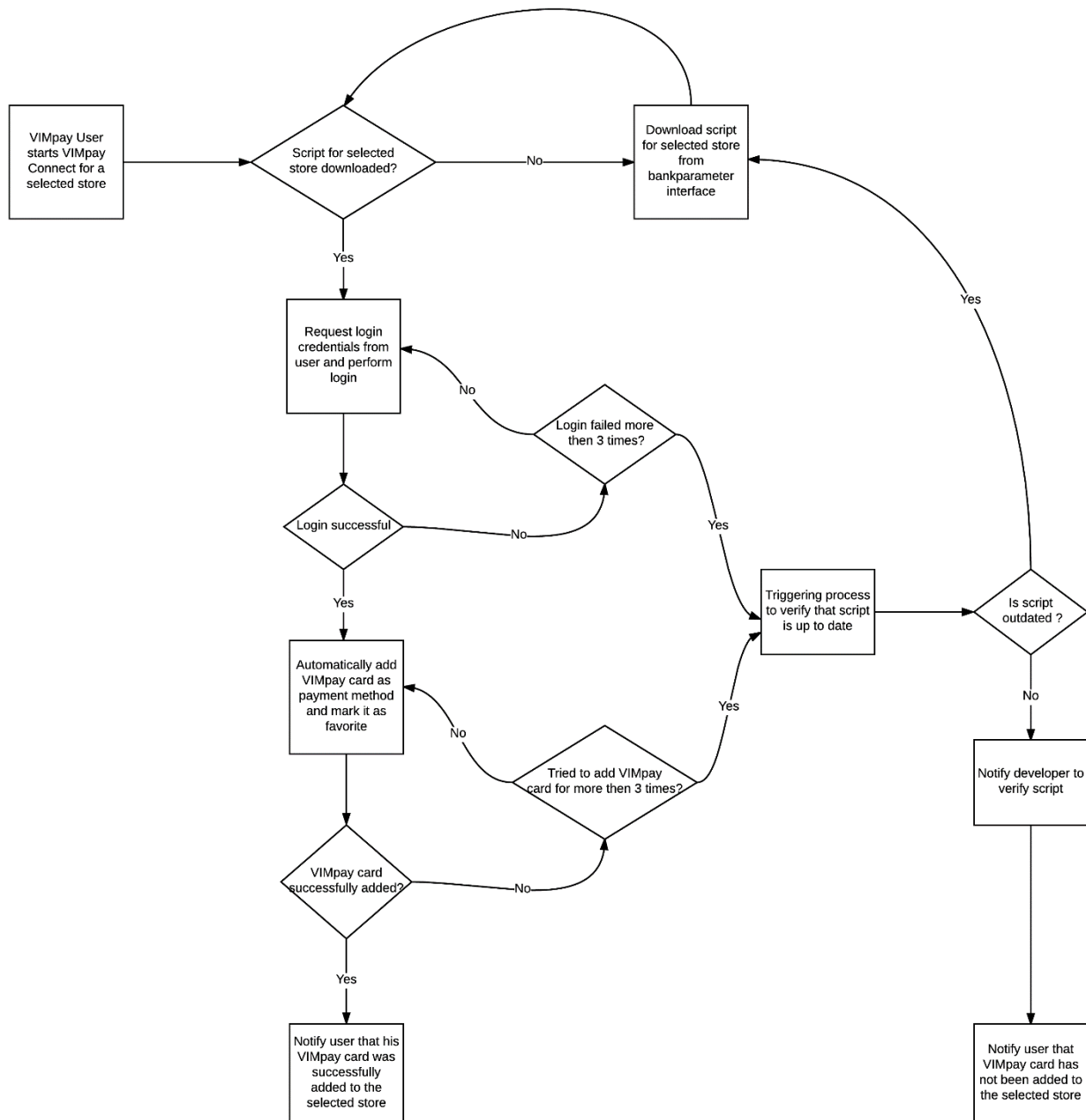
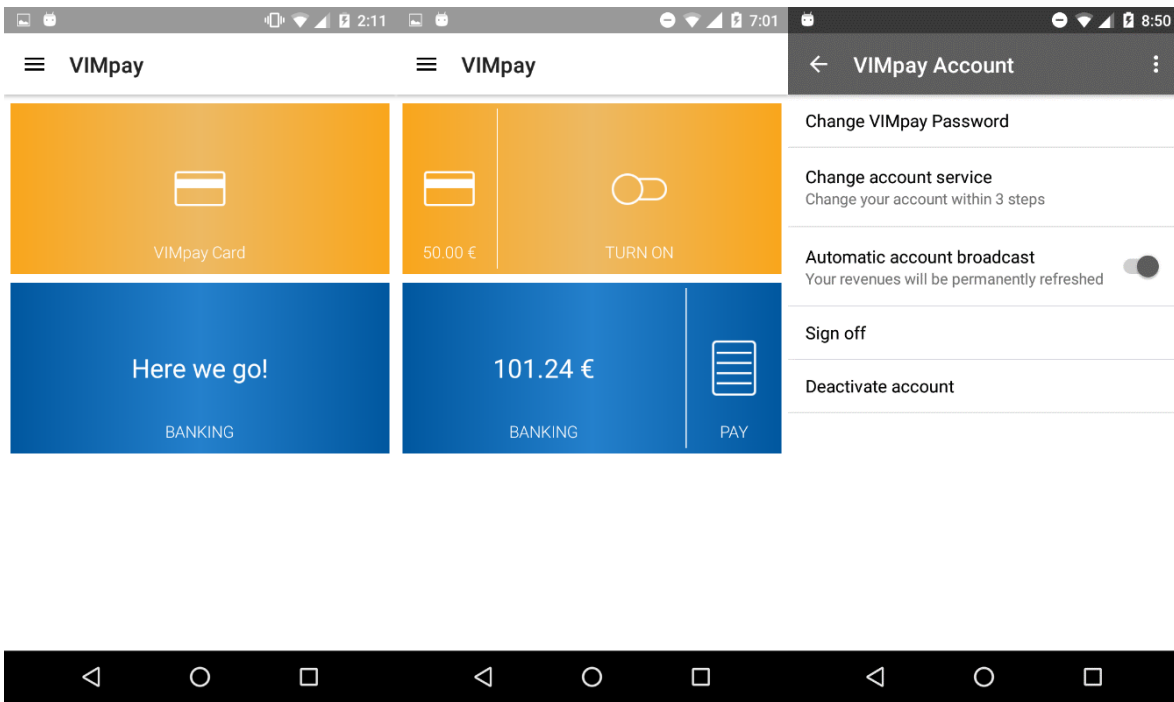


Figure 5 VIMpay connect flow

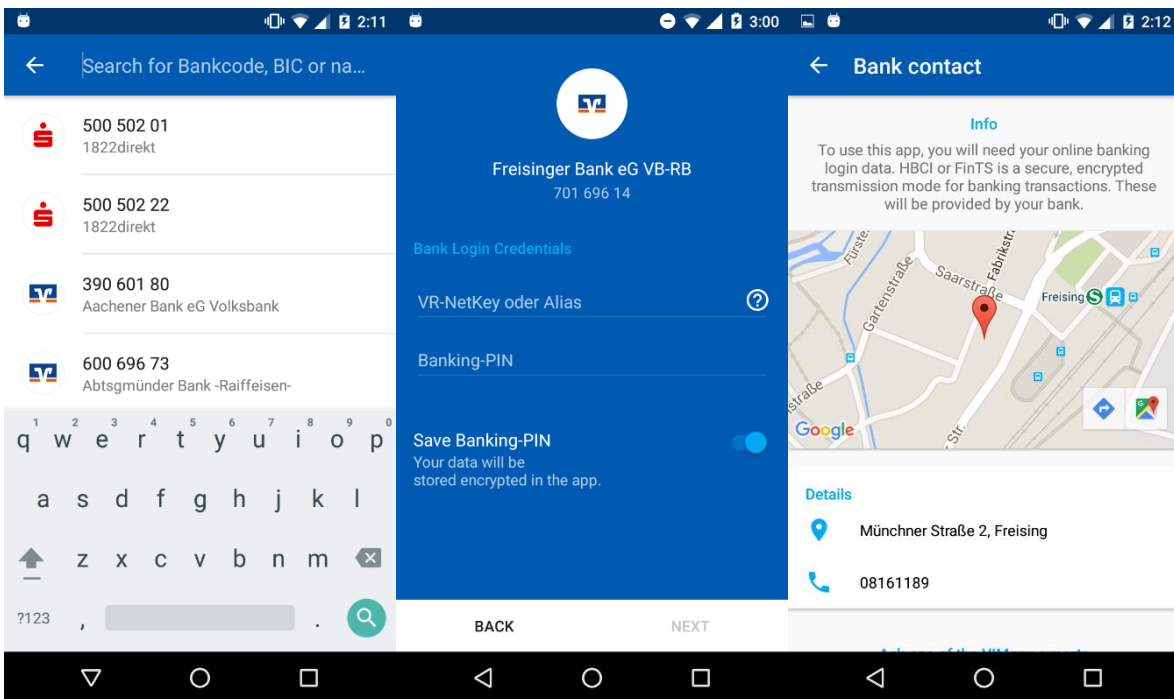
5 User interface changes

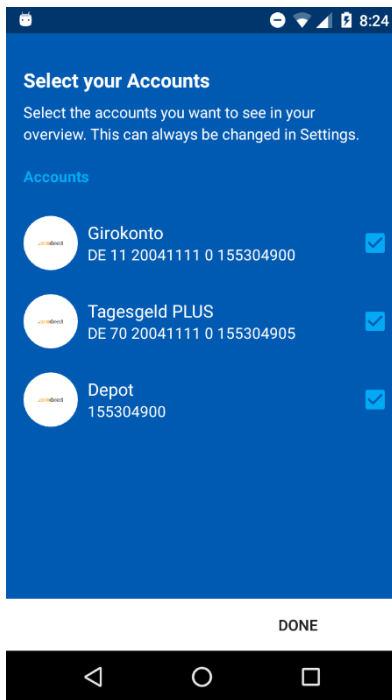
The new simplified VIMpay Board shows the user only applicable functions in order to provide an easier interaction on first usage of the app. The Transaction segments and VIMpay Valet (former Finance Buttler) are completely removed on first app start (left screenshot).

After the setup of the app the VIMpay board is still in a simplified version, Transactions can be accessed via the Pay Segment and the VIMpay Valet Segment is removed because it is always active when the user has a VIMpay Card. VIMpay Valet can be deactivated in settings, see right screenshot "Automatic account broadcast".



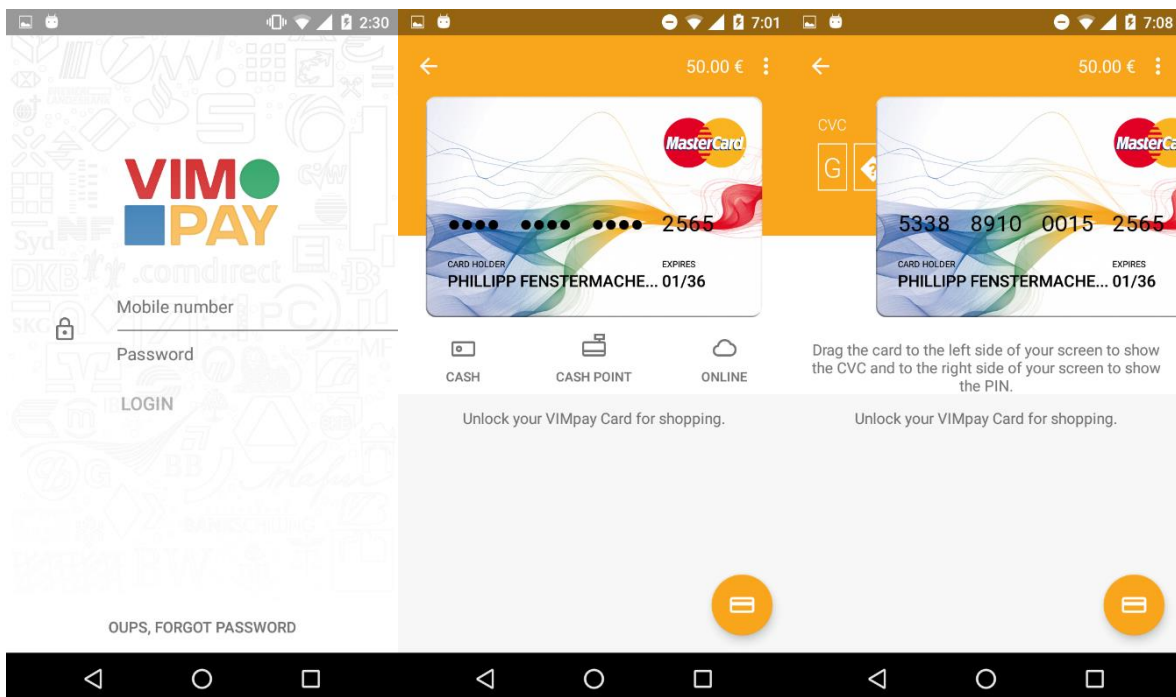
The bank account setup is also in a new easier version available. The bank entries contains the logo of it and the search is optimized, for example multiple search queries can be entered like "Sparkasse 200", both features helps the user to setup his bank accounts faster and simpler (first screen). The screen for bank account credential input is also optimized, the reminder was removed and the bank info / help screen is accessible via the question mark on the right (second screen). The new Bank info screen gives the user more information about his bank and provides an embedded map view to help finding it (third screen). After a successfully login in the bank account the available accounts are shown and the user is able to select which account should be visible in the banking overview (forth screen).





The VIMpay account login screen is renewed, only mobile login and registration is possible. After login the card data and revenues as well as the balance is loaded.

The VIMpay card details screen now combines the online, POS and withdraw unlock functionalities. Also the user is able to start an instant replenishment using the button on right bottom corner. By dragging the card to left the card PIN is shown and by dragging to the right the CVC is visible. The PAN will become visible too the by touching the card.



The instant replenishment and transaction screens comes in a new look too. The TAN method picker is more clearly and the TAN input screen highlights essential keywords like mobile phone numbers.

6 Availability

6.1 Android

Version 3 of the VIMpay app Android is available on the VIMpay BETA Community on Google Play.

6.2 iOS

Version 3 of the VIMpay app iOS is available on the App Store.

7 References

[1 petaFuel GmbH, „D 1.1 Version 1 of the VIMpay App,“ 2015.
]

[2 petaFuel GmbH, „D 1.2 Version 2 of the VIMpay App,“ 2016.
]

[3 petaFuel GmbH, „D 2.3 Backend support for Version 3 of the VIMpay app,“ 2016.
]

[4 Purpleview GmbH, „Empathy SDK,“ [Online]. Available:
] <http://www.purpleview.de/de/solutions/empathy-suite>.

[5 petaFuel GmbH, „VIMpay App on Android Playstore (closed beta),“ [Online]. Available:
] <https://play.google.com/store/apps/details?id=net.petafuel.mobile.vimpay&ah=trIxUns4btC3AqPV9UxyCbDyxcs&hl=de>.

