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D 5.2 – Business requirements for version 2 of the VIMpay App

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Executive Summary

This deliverable constitutes deliverable *D 5.2 – Business requirements for version 2 of the VIMpay app* of work package 5 (WP5) of the VIMpay project.

The document defines the business requirements and use cases for version 2 of the VIMpay app. With version 2 the VIMpay app becomes fully functional with regards to the core payment requirements. It also introduces the VIMpay Premium model, which provides legitimated users with full account functionality. Furthermore version 2 enhances the user experience in critical areas.

1 Scope of this deliverable

This deliverable defines the business requirements and use cases for version 2 of the VIMpay app, the second release. As referenced in the proposal this version basically integrates full KYC, engaging full payment functionalities to the VIMpay users.

Additionally, this version defines multiple features that increase usability and payment safety as part of the core VIMpay functionality.

Therefore, new processes and requirements are added to expand the use cases and requirements for version 1. Furthermore, existing processes and requirements are specified and indicated.

2 Motivation for the use cases in version 2

The second VIMpay version mainly aims to further develop the existing VIMpay functionalities towards full-fledged VIMpay accounts. It is the goal of version 2 to be “function-complete” in terms of the payment functionalities and account provisioning for the German market. The user should be given the opportunity to choose between different version options in order to upgrade their VIMpay account to a desired level. Additionally, the full account functionalities and the ability to order a VIMpay plastic card for PoS terminal payments and for cash withdrawals at ATMs will be offered. The focus to this deliverable is on the required upgrade process and the corresponding documentation by the Escort Status.

Beyond that some new features will be introduced making VIMpay a customizable financial product. This includes giving the user access to the full SEPA payment functionalities in order to carry out transfers as well as any other transactions. The eligibility of the trust model provides a big step toward live-banking services and in real-time to the user. Additionally, Password Reset and Security Status of the card are features that make VIMpay mobile banking more secure.

2.1 New Requirements for Version 2

2.1.1 Full payment Premium

With this version of VIMpay, another upgrade will be made available. The VIMpay Premium Upgrade expands the possibilities of the map in the area of limits.

They can be increased as follows: The card limit is set at € 10,000, the annual turnover is no longer limited and upgrade amounts up to 500 € are available via instant replenishment. Instant replenishments that exceed this limit are not possible and are therefore converted into normal charges via bank transfer. For this upgrade, the plastic card order is required, as illustrated in section 2.1.2. Beyond the deposit, assigning a mobile phone number to receive a TAN is necessary as illustrated in [1]. The fee for this upgrade amounts to € 4.50 per month. The upgrade process will be accompanied and documented through the Escort Status.

2.1.2 Optional account functionalities – transfers, standing orders and advance orders

With VIMpay Premium, it is possible to book optional account functionalities. If the user orders these, his card account is equipped with the full account functionality as outlined in the proposal, including a SEPA compliant IBAN. Thus he can make regular SEPA credit transfers, standing orders and scheduled transfers. By upgrading to the Premium, the user can use his card like a normal bank account and also, for example, can receive his monthly salary on the account. As the card account can be addressed by the IBAN, each account has authorization to make transfers to the VIMpay card and not just from the reference account, which is the case with VIMpay cards without optional account functionalities.

The cost of these functionalities amounts to 5.00 € per month so that for a full VIMpay account the cost amounts to 9.50 € per month.

VIMpay Freemium Pricing Model			
	Basic	Plus	Premium
Elements			
Maximum Account Balance	300 €	2,500 €	10,000 €
Revenue Limit per Year	2,500 €	2,500 €	Unlimited
Instant Top-up Limit	15 €	500 €	500 €
Source of funds	ONLY reference bank account	ONLY reference bank account	From ANY account
Monthly Subscription	0 €	1,50 €	4,50 €
Additional Charges			
Plastic VIMpay Card	15 € (Optional)	15 € (Optional)	15 € (Required)
Plastic Card Personalisation	0 €	0 €	0 €
Flatrate for VIMpay account services: 1. Bank transfers (Max 15 / Month)* 2. Direct debits (unlimited)	(No VIMpay bank account)**	(No VIMpay bank account)**	5 € (optional)
(ATM Withdrawals) - per withdrawal	5 €	5 €	5 €
* An additional 0.15 € for each bank transfer over the 16th bank transfer			
** To make payments from a VIMpay bank account, the user has to upgrade to VIMpay Premium			

Figure 1 VIMpay pricing model

2.1.3 Escort Status

The so-called Escort Status will be used in VIMpay to guide the user after the registration. The use of an escort process comes whenever one or more actions from the user are needed, such as during an upgrade. Here the user must meet certain requirements in order to successfully upgrade their account. The Escort Status displays the necessary steps and helps the user in their successful execution. The Escort Status indicates what steps have already been completed and which are still open.

As long as the user is in the escort process, the card remains active at the original level. The user will be informed in the app about their status and additionally gets the necessary information about which steps are still required.

The individual steps are specifically implemented as card properties with associated constraints. For required card properties, which constraints are fulfilled and which are not will be verified. For each constraint, there is a sub-item including an explanation of how the constraint is fulfilled. The required steps will be displayed as follows:

Sanity address check

After registration, the user has to enter his address. Our system checks if the address exists. This process is necessary to activate the card for orders. Once this process is completed, the user can replenish his card.

Add Mobile Phone Number

Should the user be registered via an e-mail address, it will be necessary for the phone number to be stored, since during the upgrade to Premium TAN messaging on the mobile number occurs. The user adds their mobile phone number and which must be confirmed by a code that is sent to the number.

KYC process

The users must authenticate themselves through a legitimization process as illustrated in the table below. Here they will have two options. The user can be legitimized via PostIdent. Here a form will be created, and the user must submit the form to a Deutsche Post AG branch and display his identity documentation. The newer method is performed through online video identification. The user shows his identification documentation and is thus legitimized.

VIMpay Decision Matrix							
Basic VIMpay KYC Structure							
VIMpay Version	Preset KYC Model	Instant top-up limit	Maximum Account Balance	Revenue Limit per year	KYC Requirements	VIMpay Functionalities	Additional Requirements
Premium Upgrade	Full KYC	500 €	10.000 €	Unlimited	1. PostIdent / Videoident 2. Mobile phone number verification via TAN	1. Plastic VIMpay card and ATM Cash withdrawals 2. Internet purchases 3. POS purchases 4. Mobile phone recharge 5. P2P payments (among VIMpay users) 6. Bank transfers (SEPA) 7. Bank account functionalities 8. VIMpay Valet 9. Recharge via Instant replenishment 10. Recharge via a normal bank account	
						11. Increasing the maximum account balance above the 10.000 € limit	Basic Full KYC + A telephone call to the VIMpay customer service number to review the customer account

Figure 2 Full KYC

Order a plastic card

For VIMpay premium ordering a plastic card is mandatory. In order to receive the plastic card a second level address verification is required which checks if the user is registered at the given postal address.

The following table shows the different validations and steps required during the Escort Status processing.

Validator	Cardproperty	Standard	Plus	Premium	satisfied by	User is allowed to...
User is active (UserActiveValidation)	VIRTUAL_CARD	✓	✓	✓	activation link confirmed / confirmation code entered and confirmed with password	-
Double-opt-in (DoubleOptinValidation)	VIRTUAL_CARD	✓	✓	✓	activation link confirmed / confirmation code entered and confirmed with password	logged in, card can be replenished, but orders are blocked
Address check sanity	VIRTUAL_CARD	✓	✓	✓	user has entered address and the system checks if the address exists	Standard/ Plus: orders are activated Premium: card orders are blocked. Wait for the Postident
Postident legitimization	ACCOUNT_REPLENISHMENT			✓	user legitimization via Postident	orders are activated
Videoident legitimization	ACCOUNT_REPLENISHMENT			✓	user legitimization via Videoident	
Leave phone number	ACCOUNT_REPLENISHMENT			✓	user leaves and confirms the phone number	card can receive TANs
Plastic card design	PLASTICCARD		✓	✓	user chooses the design of the plastic card	required for plastic card production
Address check verification	PLASTICCARD		✓	✓	user has entered an address and the system checks if the address is registered by the user	required for plastic card production

Figure 3 Necessary Escort Steps

2.1.4 Push Notifications

One of the core functionalities of this version of the VIMpay App will be the implementation of push notifications. Push notification means the user receives all important messages directly to his smartphone. These can then be presented in multiple ways, e.g. on the Notification Lock Screen, within the Notification Center or as a App-Bubble attached to the App-Icon.

The push service is provided by all major companies in the smartphone business and integrated into the operating system. To protect the user's privacy, we only send so-called silent push notification to the smartphone. When the smartphone receives one of these notifications the VIMpay app connects to the pfREST and retrieves the corresponding message.

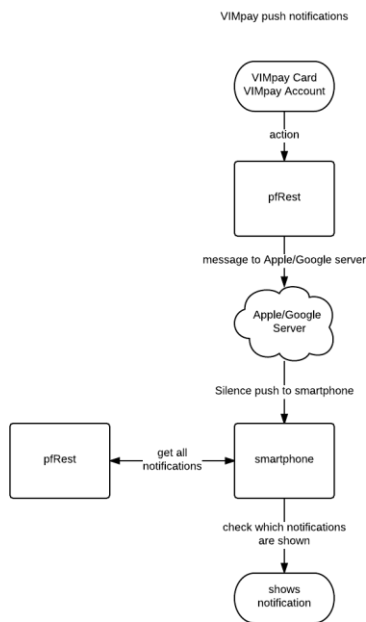
Using push notifications gives VIMpay the possibility to inform the costumer in real time about all changes or information regarding his/her VIMpay card account such as successful payments, unsuccessful payments due to exceeded VIMpay Card limits, new incoming transfers, etc. The user is always up to date. The possibilities in combination with the card are endless.

We can also simplify our new security status (as explained one step below) with the push notification. For example, when the user forgets to unblock his card, we can directly send a message to the customer.

However, we start with the following notifications:

Payment notification
VIMpay Card - Your yearly card limit is reached. The payment was not successful.
VIMpay Card - Your card balance is reached. The payment was not successful.
VIMpay Card - Your defined 24/h transaction limit is reached. The payment was not successful
VIMpay Card - Your defined max amount per transaction is exceeded. The payment was not successful.
VIMpay Card - Your defined max withdrawal amount is exceeded. The withdrawal was not successful.
VIMpay Card - Your defined 24/h max amount for all transaction is reached. The payment was not successful.
VIMpay Card - Your card is not unlocked for withdrawals. The withdrawal was not successful.
VIMpay Card - You paid successful at CompanyName 2,50€
VIMpay Card - Your withdrawal over 100€ was successful.
VIMpay Card - Your online payment over 0,89 € at CompanyName was successful.
VIMpay Card - Transaction Limit reached.
Replenishment
VIMpay Card - VIMpay Card was topped up
VIMpay Card - Your reached the card top up amount.

Figure 4 Initial notifications



2.1.5 Security Status

Another security feature of VIMpay is the security status which will be introduced with version 2. The user can define which status he wants to set his card to which will enhance the feeling of security. There are three security states SECURE, STANDBY, and OPEN which are distinguished by the automatic approval or decline of transactions. The user can change the security status in the app settings at any time. Should the card be in the SECURE status, no transactions are authorized. In the STANDBY status, transactions up to 15.00 € are always allowed, higher transaction will be blocked. In the OPEN status, all transactions are authorized within the cards standard transaction limits (defined by the users upgrade "model"). If the card is set to one of the two security states SECURE or STANDBY, the user has to unlock the card. This means for every transaction or in the STANDBY status every transaction which is higher than

15.00 € the user has to unblock the card manually. So the user can for example basically block his card for all transactions and manually only unlock if he wants to make a payment. Even in the worst case, if the card is lost or stolen, the user can be sure that no money can be stolen from the card since payment has to be explicitly enabled with their own smartphone. On the other hand, the user also has of course the possibility to use his card as a normal prepaid MasterCard, by selecting the open security status and the card thus does not need to be previously unlocked for transactions.

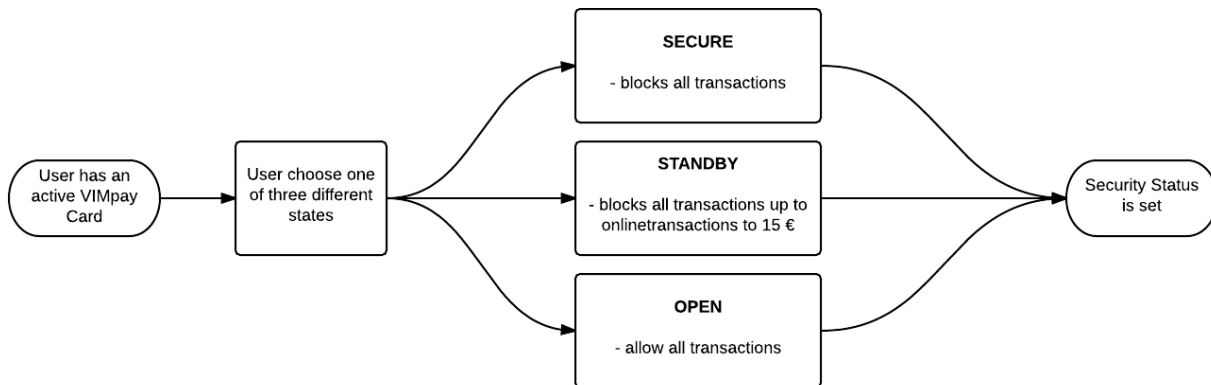


Figure 5 Security Status states

RESET-Events

When the card is unblocked, there are three reset events which will block the card again as illustrated in the graphic below.

1. Reset by user: First of all, the user can block the card manually.
2. Reset after preauth: Second the card will be automatically blocked after a successful transaction.

3. Reset after timeout: To improve the user-friendliness each unblock process has an active periode. After this periode the system automatically blocks the card again, if no transaction is received. By default this time is set to 10 minutes. The user can change the active time periode to 10 min, 20min, 30min and 1 hour.

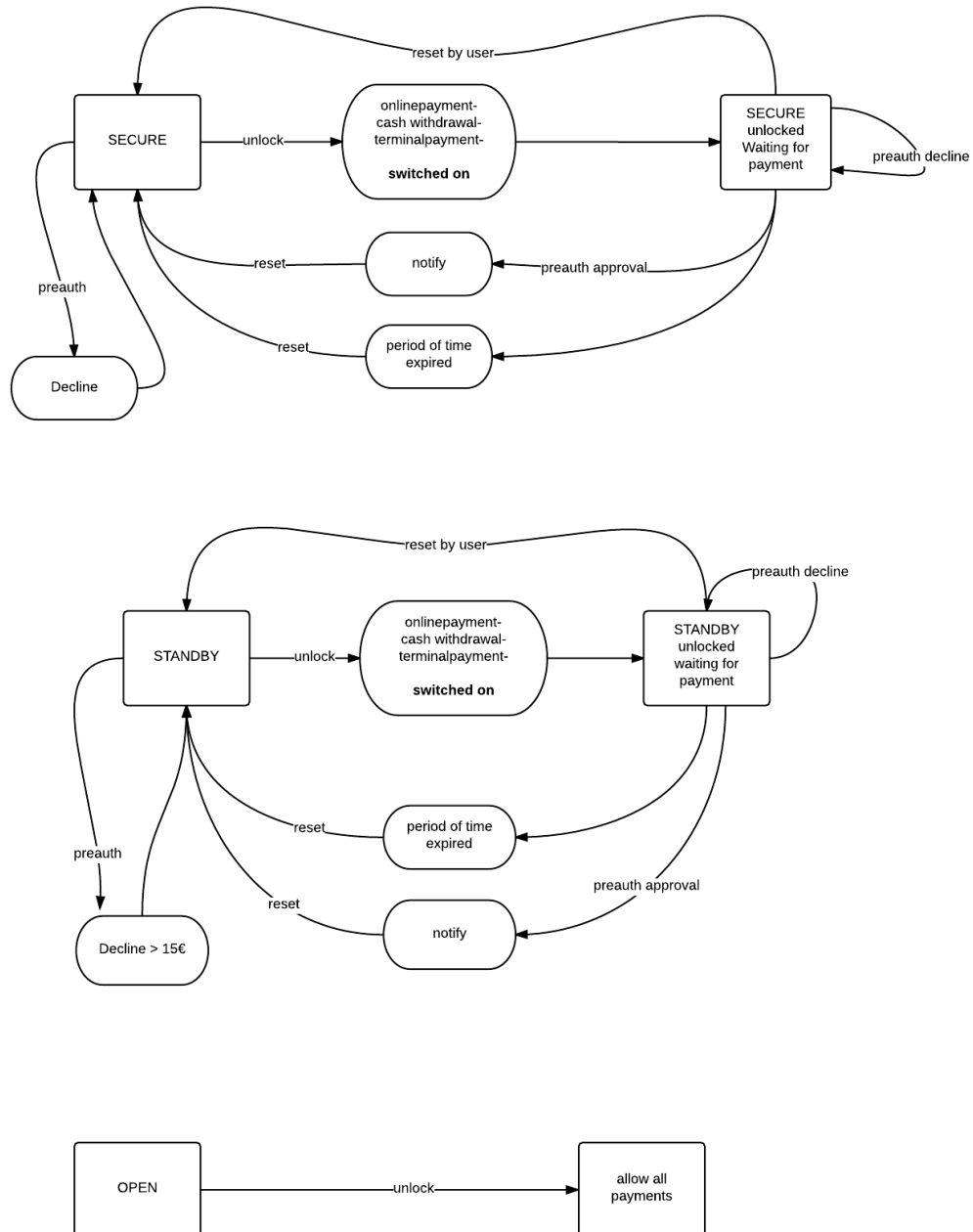


Figure 6 Transitions in security state

- 4.

2.1.6 Trust model and data synchronization

In order to improve, refine and individualize the protection of data privacy we have developed a trust model. This system will enhance the users control over his/her data and will give each user the opportunity to choose the data handling that best fits his/her individual feeling of security - while all options of course fulfill all data protection regulations. At any time each user can define his own combination between data access and data storage. At first they have to set an app pin to encrypt the encryption key on the device. The users can save and encrypt their local data and key on their smartphones. This is the data access and data storage stage 1.

Users who do not completely trust their smartphone's integrity, have the option to encrypt the data through the smartphone and store the encryption key on the petaFuel servers. To decrypt the local data the device has to load the key from the servers. Another reason for storing the key on the pF servers are potential background functionalities, that allows the VIMpay app to activate background services, as automatic bank account broadcasting. The advantage of this process is a user account which is always up to date. The possibilities are endless. This scenario defines the data access stage 2 und data store stage 1 as illustrated on the diagram below. The data storage stage 2 and 3 will be developed in VIMpay as soon as possible.

To simplify the trust model process, the user will have the opportunity to activate the "VIMpay Valet". The

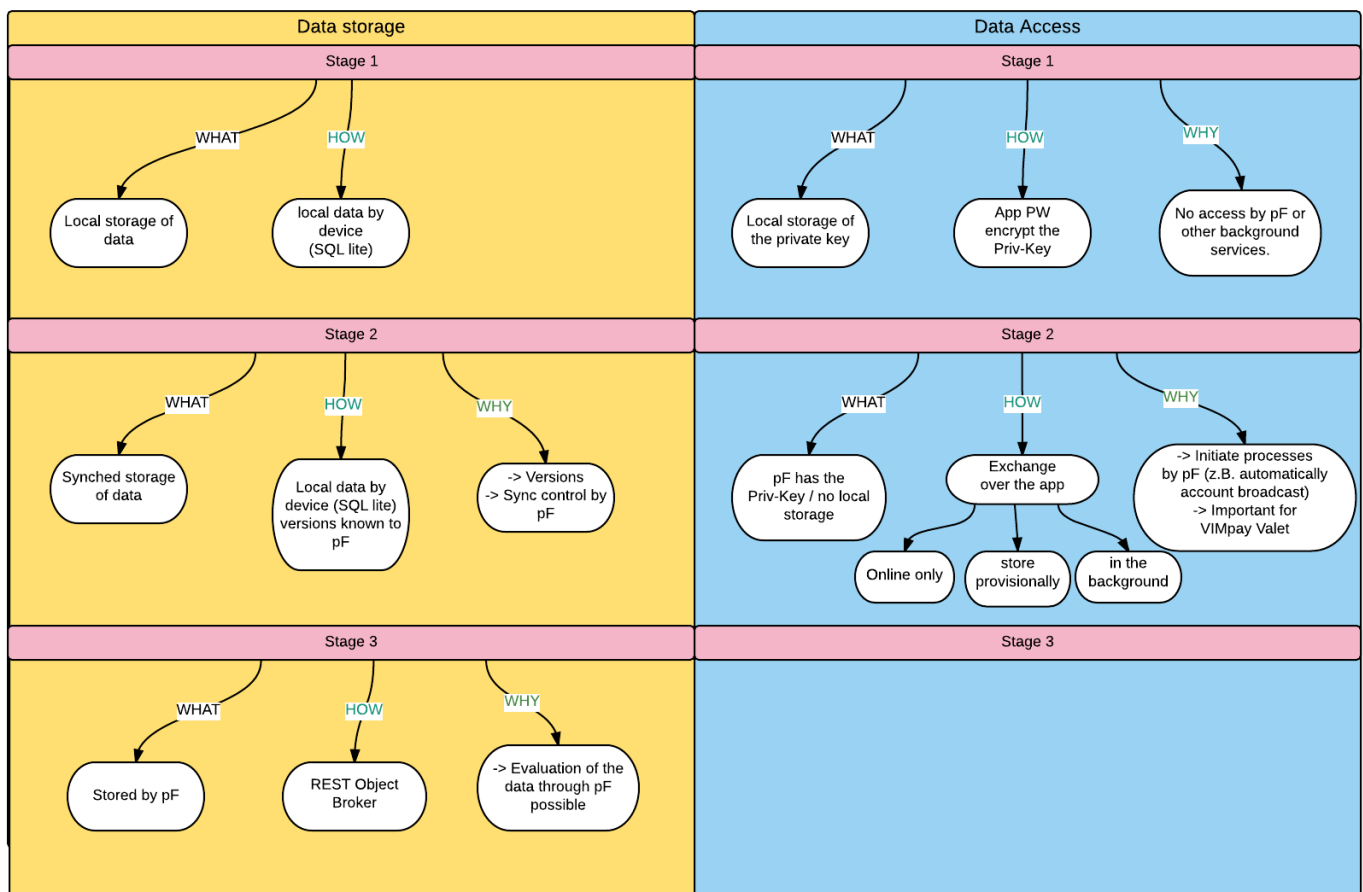


Figure 7 VIMpay trust model

VIMpay Valet will be the personal assistant and helps the users to define the right settings.

2.1.7 Password Reset

The Password Reset function allows the user to reset his VIMpay password should he has forgotten. For this, the input of the phone number or email address is needed. The data will be verified to see if this user exists. When this verification is positive, the user must answer his security question in the second step. The security question will ask for the IBAN of the reference account which is set by default. With the upgrade on VIMpay Premium the security question will set to the passport/id card number from the user. After that the user can specify his new password. If the security question is answered correctly, an SMS code or a confirmation email is sent to the user. This can be manually requested again by the user. If he performs this confirmation (by clicking the link in the email or entering the SMS code) he is finally logged in. If the confirmation is not successful, the user himself must contact customer support.

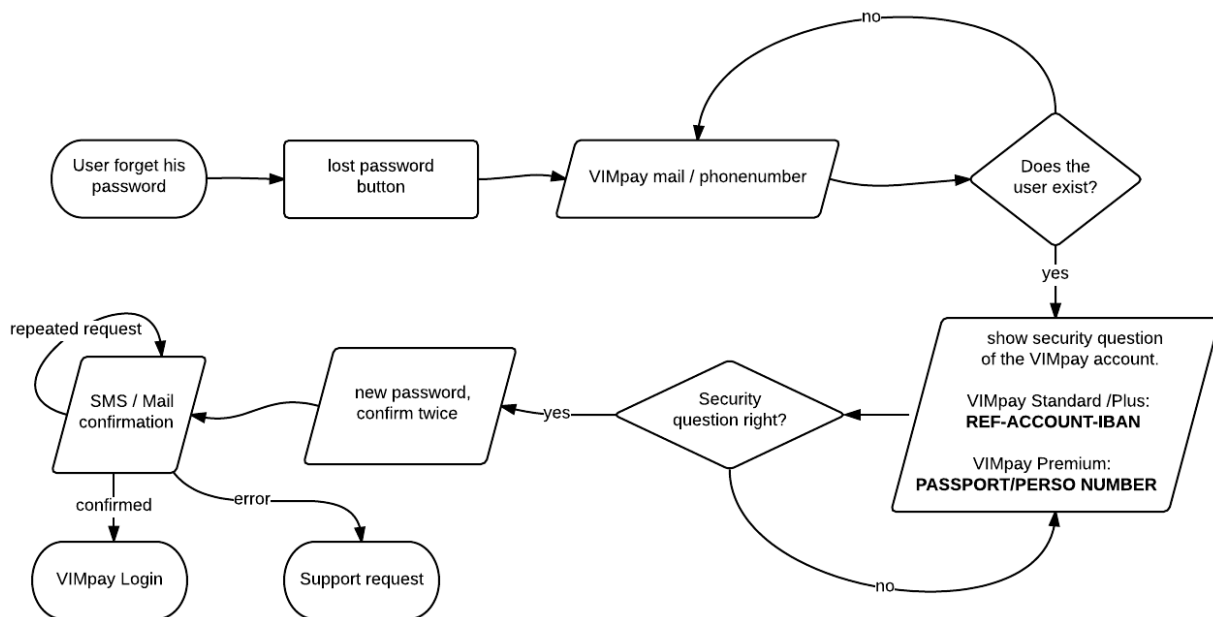


Figure 8 Password reset flow

2.2 Overall description of the new functionalities

With this VIMpay version, the different upgrade steps will be completed. That is why it is now possible to use VIMpay as a fully-fledged account, and perform functions such as account transfers and standing orders directly from the card. Furthermore, the VIMpay security standards in this section will uniquely raise because of the innovative security features. The possibility of data synchronization provides a variety of direct applications for users who can now be comfortably informed in real time by push notification on card transactions and SEPA transactions. At this point cornerstone is for the user to be informed in the future specifically of revenues such as salary deposits.

3 Use case descriptions for Version 2 of the VIMpay App

3.1 Upgrade process VIMpay Premium

3.1.1 Use Case 1: Upgrade from existing VIMpay account

USE CASE NAME	Upgrade from an existing VIMpay account	
Precondition	User has already a VIMpay account	
Post-condition	User has successfully upgraded his VIMpay account	
Regular Steps / Description	<ol style="list-style-type: none"> 1. Costumer choose the Upgrade to VIMpay Premium 2. Screen for optional bank account function 3. User is guided by the Escort Status 	2. The pFREST sends all data which is necessary from the user to complete the upgrade.

3.1.2 Use Case 2: Order VIMpay Premium without an account with a phone number

USE CASE NAME	Order VIMpay Premium	
Precondition	User has no VIMpay account	
Post-condition	User has a VIMpay Premium account	
Regular Steps / Description	<ol style="list-style-type: none"> 1. User must do a PostIdent, to confirm his personal data 2. User has to order the plastic card. An alternative shipping address is possible. 	<ol style="list-style-type: none"> 1. PostIdent is on hold to confirm. 2. Address check verification

3.1.3 Use Case 3: Order VIMpay Premium without account with mail address

USE CASE NAME	Order VIMpay Premium	
Precondition	User has no VIMpay account	
Post-condition	User has a VIMpay Premium account	
Regular Steps / Description	<ol style="list-style-type: none"> 1. User must do a PostIdent, to confirm his personal data 2. User has to order the plastic card. An alternative shipping address is possible. 3. User must specify a phone number to receive TAN messages 	<ol style="list-style-type: none"> 1. PostIdent is on hold to confirm. 2. Address check verification 3. Phone number confirms with a code

3.2 Escort Status

3.2.1 Use Case 1: Escort Status action of user is necessary

USE CASE NAME	Escort Status action of user is necessary	
Precondition	User has not complied with one of the Escort Status	
Post-condition	User has updated his Escort Status	
Regular Steps / Description	<ol style="list-style-type: none"> 1. - 2. User sees the Escort Status banner 3. User updates the necessary data 	<ol style="list-style-type: none"> 1. pFREST delivers necessary parameters of the Escort Status 2. - 3. updated data delivered to pFREST

3.2.2 Use Case 2: Escort Status appearance

USE CASE NAME	Escort Status appearance	
Precondition	User has not complied with one of the Escort Status	
Post-condition	User has updated his Escort Status	
Regular Steps / Description	<ol style="list-style-type: none"> 1. If the user orders a VIMpay Card or if he upgrades to VIMpay Plus or Premium 2. The Escort Status should help the user to finish the progress 3. For each procedure the Escort Status guides the user through 	

3.3 Push notifications

3.3.1 Use Case 1: App receives push notification

USE CASE NAME	App receives push notification	
Precondition	There are relevant push incident for the user	
Post-condition	App has received a silent push notification	
Regular Steps / Description	<ol style="list-style-type: none"> 1. If there is a new information for the user 2. Silence Notification by Apple/Google is received by the smartphone 	<ol style="list-style-type: none"> 1. pfRest triggers a silent notification to an Apple/Google server 2. App connects to the pfREST and gets all new information
Extensions / Error Handling	1. If there is no network connection	1. User receives the push notification only when the network connection is restored

3.3.2 Use Case 2: User retrieves push notification

USE CASE NAME	User retrieves push notification	
Precondition	Silence Notification by Apple/Google is received by the smartphone	
Post-condition	User has received a push notification	
Regular Steps / Description	<ol style="list-style-type: none"> App connects to the pfREST User receives the push notification 	1.pFREST sends all new information to the app
Extensions / Error Handling	1. If there is no network connection	2. User receives the push notification only when the network connection is restored

3.4 Security Status & Unblock

3.4.1 Use Case 1: User unblocks the card to make an ATM withdrawal

USE CASE NAME	User unblocks the card to make an ATM withdrawal	
Precondition	User has a full registered and verified VIMpay Account including a plastic card	
Post-condition	User has unblocked his card for an ATM withdrawal	
Regular Steps / Description	<ol style="list-style-type: none"> Pressed on the ATM withdrawals button on the VIMpay Board User can block the card at any time 	<ol style="list-style-type: none"> Card is immediately unblocked for ATM withdrawals and the user comes to the ATM Screen. Additional a timer is display on the board After that, no ATM transaction will be accepted

3.4.2 Use Case 2: User unblocks the card to pay online

USE CASE NAME	User unblocks the card to pay online	
Precondition	User has a registered and verified VIMpay account	
Post-condition	User has unblocked his card for payment in an online store	
Regular Steps / Description	<ol style="list-style-type: none"> Pressed on the online payment button on the VIMpay Board User can block the card at any time 	<ol style="list-style-type: none"> Card is unblocked for online payments and the user comes to the online payment screen. Additional a timer is displayed on the board After that, no online transaction will be accepted

3.4.3 Use Case 3: User unblocks the card to make payments in a shop

USE CASE NAME	User unblocks the card to make payments in a shop	
Precondition	User has a full registered and verified VIMpay Account including a plastic card	
Post-condition	User has unblocked his card for payment in a store	
Regular Steps / Description	<ol style="list-style-type: none"> Pressed on the shop payment button on the VIMpay Board User can block the card at any time 	<ol style="list-style-type: none"> Card is unblocked for terminal payments and the user comes to the terminal payments screen. Additionally, a timer is displayed on the board. After that, no transaction will be accepted

3.4.4 Use Case 4: User wants to change the activated time period

USE CASE NAME	User wants to change the activated time period	
Precondition	User has a registered and verified VIMpay account	
Post-condition	User has changed the activated time period	
Regular Steps / Description	<ol style="list-style-type: none"> 1. User clicks on security in the settings screen from the app 2. User clicks on Activated Period 3. Selection is made: There are 10min, 20min, 30min, 1h, then the dialog closes 	<ol style="list-style-type: none"> 1. Security Settings screen opens 2. Dialog "Activated Period" opens 3. The time is set to x min. The Dialog closes. Security settings screen can be seen again (in the foreground)

3.4.5 Use Case 5: Card is active but no transaction received within activation time

USE CASE NAME	Card is active but no transaction is received within activation time	
Precondition	User has successful unblocked the card for one of the tree payments	
Post-condition	App blocks the card automatically after the time period	
Regular Steps / Description	<ol style="list-style-type: none"> 1. Card has been activated for the activation time 	<ol style="list-style-type: none"> 1. Card is waiting for a transaction 2. After the activated time period, the card will be automatically blocked again

3.4.6 Use Case 6: Change security state

USE CASE NAME	Card is active but no transaction is received within activation time	
Precondition	User has a registered and verified VIMpay account	
Post-condition	Security state changed successfully	
Regular Steps / Description	<ol style="list-style-type: none"> 1. Costumer can change the security status in the settings screen 2. User can see which status is active 	<ol style="list-style-type: none"> 1. Costumer change the card status and the app sends it to the pFREST

3.5 Trust Model

3.5.1 Use Case 1: Activate VIMpay Valet

USE CASE NAME	Activate VIMpay Valet	
Precondition	User has a VIMpay account	
Post-condition	User has activated VIMpay Valet	
Regular Steps / Description	<ol style="list-style-type: none"> 1. User selects VIMpay Valet and sees all the advantages on a Screen 2. User can inform themselves about „learn more" on the encryption and storage of Keys 3. User activates VIMpay Valet 4. User is asked whether they want to continue to use app PIN as an access barrier 	<ol style="list-style-type: none"> 1. Check if user has a VIMpay account 2. Data will encrypt and the key will be transferred to the pF servers
Extensions	<ol style="list-style-type: none"> 1. If a VIMpay Account is not setup -> Start VIMpay Registration / VIMpay Login 	

3.6 Password Reset

3.6.1 Use Case 1: User wants to reset his VIMpay account password

USE CASE NAME	User wants to reset his VIMpay account password	
Precondition	User has a VIMpay account; he is logged out of the app and sees the login screen; he has forgotten his password	
Post-condition	User has set a new password for his account	
Regular Steps / Description	<ol style="list-style-type: none"> 1. User presses “Forgot Password” 2. User input <ol style="list-style-type: none"> 1. VIMpay email or mobile phone number 3. Security Question Screen is shown 4. Password Screen 5. SMS code or eMail Link is confirmed 	<ol style="list-style-type: none"> 1. Forgotten password screen opens 2. Show security question (VIMpay standard/plus = IBAN from the referenc account; VIMpay premium = passport/perso number) 3. Enter security question 4. Set new password 5. Confirmation message / SMS 6. Check Confirmation and set new password active
Extensions / Error Handling		

3.7 Card closure

3.7.1 Use Case 1: User wants to cancel the card

USE CASE NAME	User wants to cancel the card	
Precondition	User has a VIMpay account	
Post-condition	User has cancelled the VIMpay Card	
Regular Steps / Description	<ol style="list-style-type: none"> 1. In settings user can cancel his card 2. He needs to indicate the reason for deactivating the card 3. After the closure the user can still see all his transactions but cannot do any new transactions 	<ol style="list-style-type: none"> 2. After a few hours the VIMpay Support confirms the card closure
Extensions / Error Handling		

3.8 Card details

3.8.1 Use Case 1: VIMpay card details

USE CASE NAME	VIMpay card details	
Precondition	User wants to see his card details	
Post-condition	User has seen the VIMpay card details	
Regular Steps / Description	<ol style="list-style-type: none"> 1. To pay online with the card the user needs to see his card details 2. The data could not save on the device because of the PCI requirements 3. The User needs the card number, cvc, expiry date and cardholder name 	2. The app gets the user specific data from the pfRest
Extensions / Error Handling		

4 References

[1] petaFuel GmbH, „D 4.1 Decision matrix and process definitions,“ 2015.

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