Soneso

Soneso GmbH

# ICO Payment

Lumenshine- „ICO Payment for arbitrary coins”– V. 1.2

## Table of Contents

## 1. Table of Changes

| Version | Description | Changed by | Changed on |
|---|---|---|---|
| 1.0 | First version | Christian Rogobete | 16.07.2018 |
| 1.1 | Update of general process | Christian Rogobete | 17.07.2018 |
| 1.2 | Refactoring for new logic | Christian Rogobete | 14.09.2018 |
| | | | |
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| | | | |
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# 2. Introduction

## 2.1 Purpose

This specification describes the payment process in an ICO by using the Lumenshine Tool Suite and Wallet.

## 2.2 Intended Audience

The intended audience for this document are Soneso & partner companies project managers, designers, server and client developers, product testers and documentation writers.

## 2.3 Scope

The application is used as a wallet based on the stellar network. In addition, ICO specific features can be displayed, so that the Lumenshine wallet can optionally be used for the sale of specific tokens. It allows users to register, create stellar accounts and use it for transactions. The wallet is supposed to offer the highest possible usability. For example, the user should not have to enter stellar account secrets for transactions, the wallet should persist over multiple devices, it should support the different tokens provided in the stellar network and offer other features such as the possibility to create shared accounts.

This document describes the functionality and the screens of the payment process including wallet and admin frontend as well as definition of the backend interfaces.

# 3. General idea

This chapter describes the general idea behind the payment process. The single use cases with the corresponding functionality are described in detail in further chapters.

The user must be logged in to be able to order ICO coins/assets/tokens. To do so she places an ICO coin order. When placing an order the user can select the currency she would like to use (such as BTC, ETH, XLM or FIAT) for purchasing the arbitrary tokens. As soon as the user placed an order, the deposit address is displayed to her.

The user must send the exact amount of currency displayed in the order to the deposit address. If the amount does not match, then the order is not filled and the user is informed. In this case, the received amount will automatically be refunded to the user (less any transaction costs). Each ICO Phase has a limited number of coins. After these are consumed, no further order can be filled. That's why the rule "First pay first serve" applies. If a user sends a payment that can no longer be accepted, it will be refunded less any transaction costs.

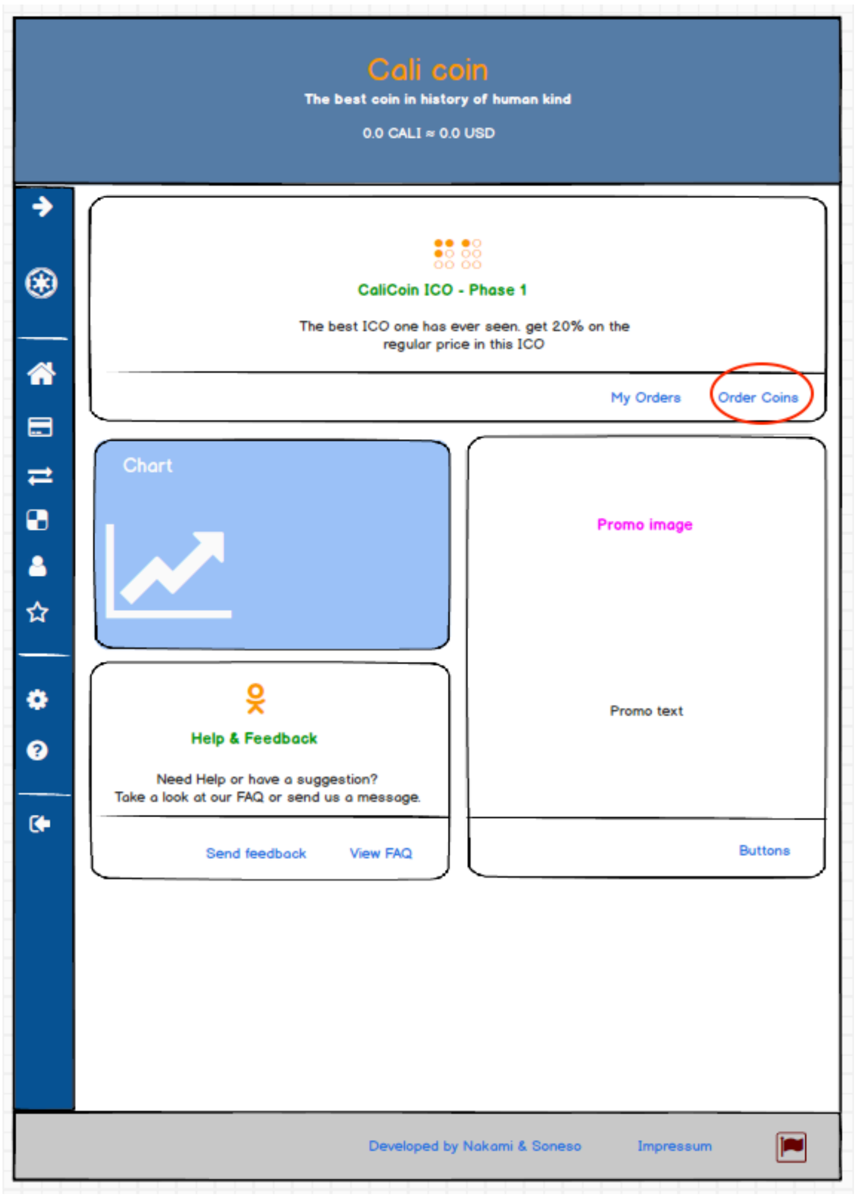
As soon as the payment has been received on the deposit address, the payment can be initiated. The user is informed and must enter his password, so that the wallet and the trustline to the arbitrary coin can be created. Since the wallet needs to be funded, the wallet and trustline is only creates after receiving the user's payment. If the user is logged out when informed, the wallet and trustline is created on next login.

As soon as the wallet and the trustline have been created, the ordered coins/assets will be transferred to the user and the order will be marked as filled. But even if the trustline exists, we still need the user interaction because sending the ordered coins implies the users signature. This is because we use the users stellar account as a channel to send the coins from the distribution account. For this, the client needs to request the payment transaction for signing after making sure that the account is created and the trustline exists. This means that the users password must be requested anyway, even if the account and trustline already exists (e.g. from previous ICO Phases). If this process is executed at login, there is no need for the client to request the password again, because it already has it from the login.

# 4. Placing a new order

## 4.1 Overview

To place a new order, the user presses the “Order coins” button of the ICO card displayed in his client.



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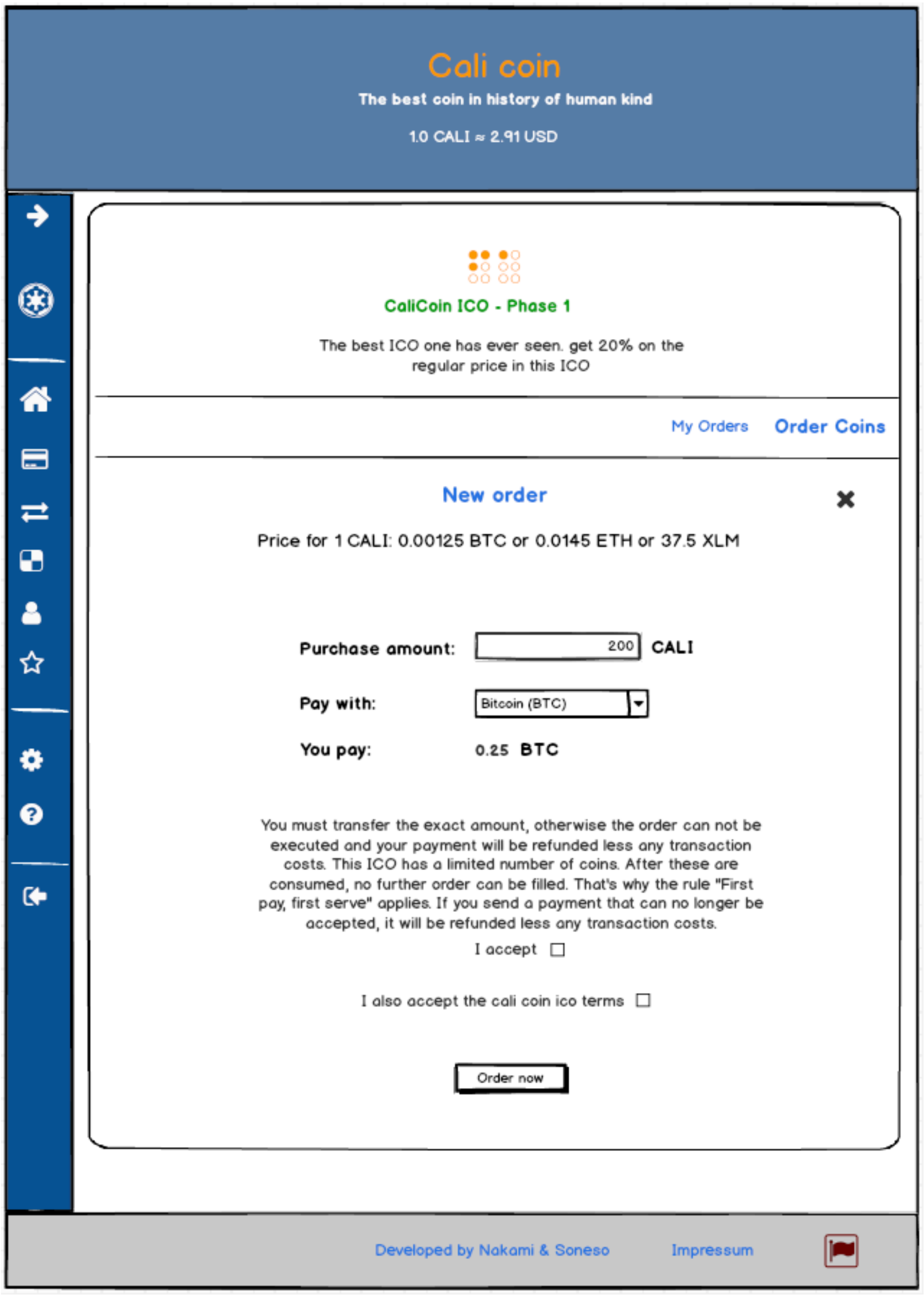
Need Help or have a suggestion?
Take a look at our FAQ or send us a message.

*Image 1 –Mockup of web client showing the ICO card and order button*

As soon as the user presses the “Order Coins” button, the “New order” form in the expanded area.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My Orders Order Coins

New order

Price for 1 CALI: 0.00125 BTC or 0.0145 ETH or 37.5 XLM

| | |
|---|---|
| Purchase amount: | 200 CALI |
| Pay with: | Bitcoin (BTC) |
| You pay: | 0.25 BTC |

You must transfer the exact amount, otherwise the order can not be executed and your payment will be refunded less any transaction costs. This ICO has a limited number of coins. After these are consumed, no further order can be filled. That's why the rule "First pay, first serve" applies. If you send a payment that can no longer be accepted, it will be refunded less any transaction costs.

I accept ☐

I also accept the cali coin ico terms ☐

Order now

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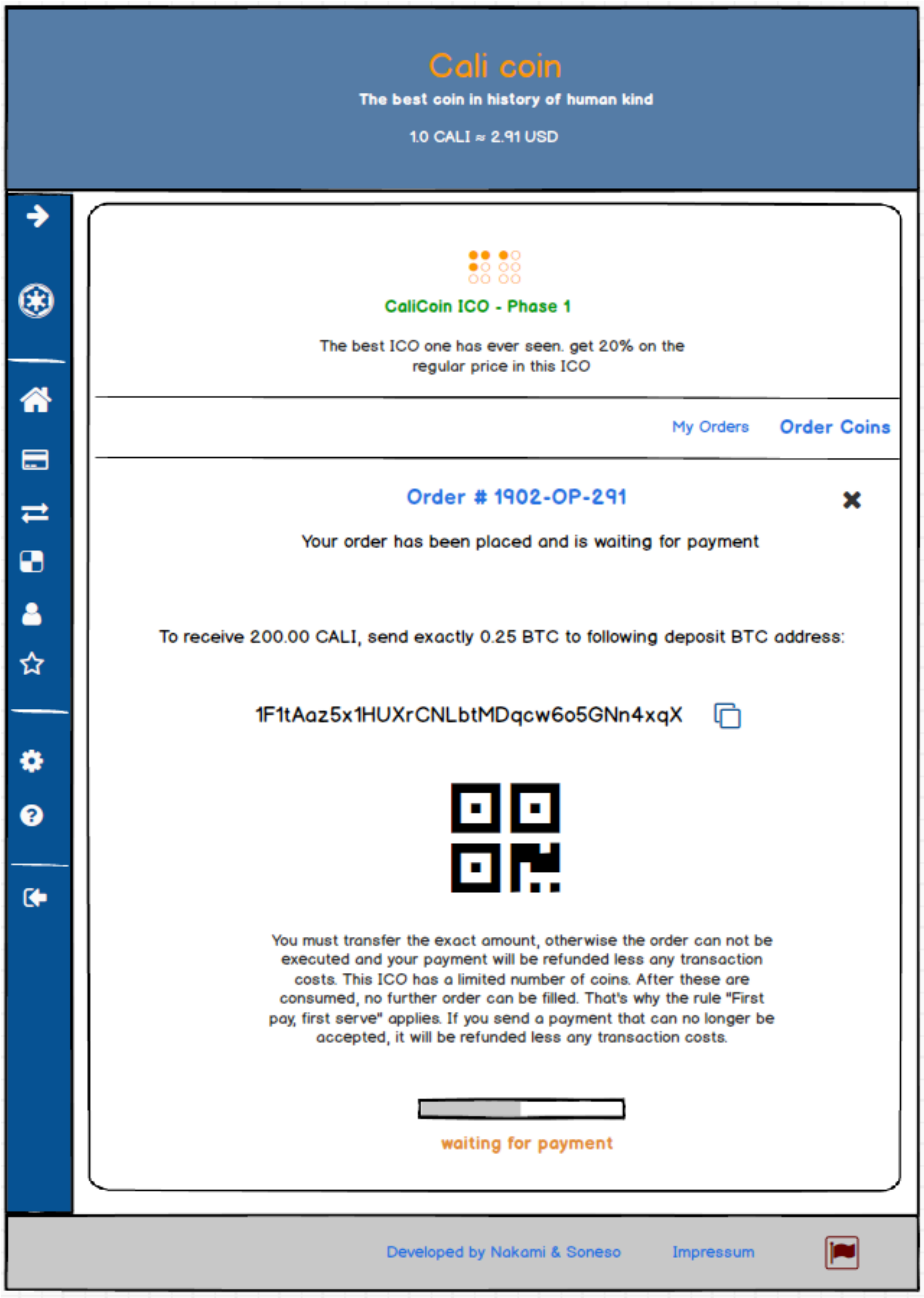
*Image 2 –Mockup of web client showing the expanded ICO card for a new order*

The view displays the price for one unit of the token in all available currencies. To load the needed data, the client uses the server interface described here.

Below of that, the user can choose how much of the arbitrary coins he would like to purchase. Then, she can select the currency that she would like to use to pay for the coins. Depending on the price per unit, the server automatically calculates how much of the selected currency the user needs to pay. To request the total price, the client uses the server interface described here.

Also, an info and accept checkboxes are displayed. As soon as the user filled the form, she can press the "Order now" button. By doing so, the order is placed. To place the order, the client uses the server interface described here.

When placing the order, the server returns the order object as a result. The client uses it to displays a screen with the summary of the order and deposit address for the payment.



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My Orders Order Coins

Order # 1902-OP-291

Your order has been placed and is waiting for payment

To receive 200.00 CALI, send exactly 0.25 BTC to following deposit BTC address:

1F1tAaz5x1HUXrCNLbtMDqcw6o5GNn4xqX

You must transfer the exact amount, otherwise the order can not be executed and your payment will be refunded less any transaction costs. This ICO has a limited number of coins. After these are consumed, no further order can be filled. That's why the rule "First pay, first serve" applies. If you send a payment that can no longer be accepted, it will be refunded less any transaction costs.

waiting for payment

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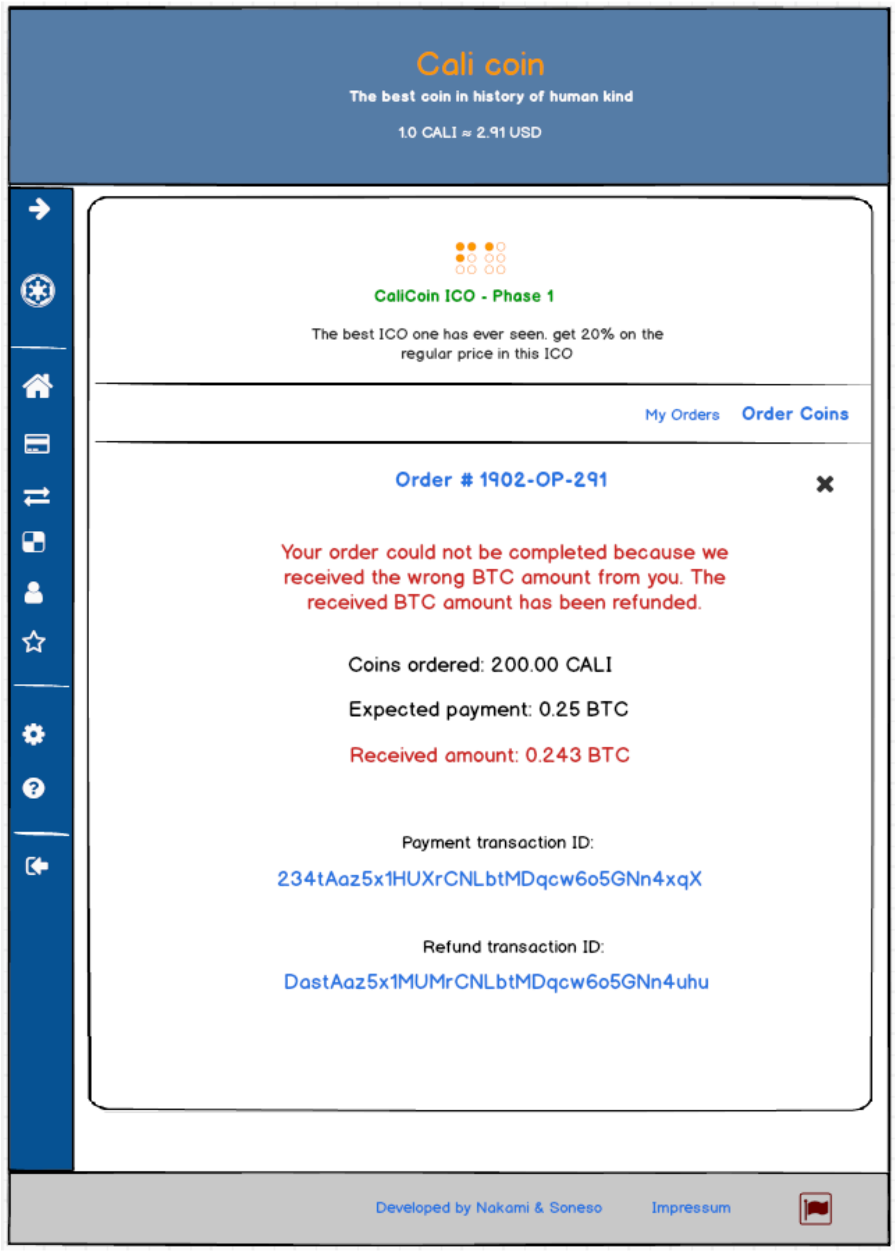
*Image 3 –Mockup of web client showing the deposit address for a placed order*

It shows the order number in the title and informs the user how to proceed. In the lower part of the screen, a progress bar is displayed, informing the user that the system is waiting for her payment. Here the client must poll the server interface described here to find out if the status of the order has changed (e.g. because the user transferred the payment, or some error occurred).

If the user sends the payment, the server will find out that the payment has been received on the deposit address. It will validate the received amount by comparing it to the amount from the order. If the amounts do not match, the server changes the status of the order, than the client receives the new status and related data in the next poll. The client then stops polling and informs the user that the order could not be completed and the received amount has been refunded.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My Orders
Order Coins

Order # 1902-OP-291

Your order could not be completed because we received the wrong BTC amount from you. The received BTC amount has been refunded.

Coins ordered: 200.00 CALI

Expected payment: 0.25 BTC

Received amount: 0.243 BTC

Payment transaction ID:
234tAaz5x1HUXrCNLbtMDqcw6o5GNn4xqX

Refund transaction ID:
DastAaz5x1MUMrCNLbtMDqcw6o5GNn4uhu

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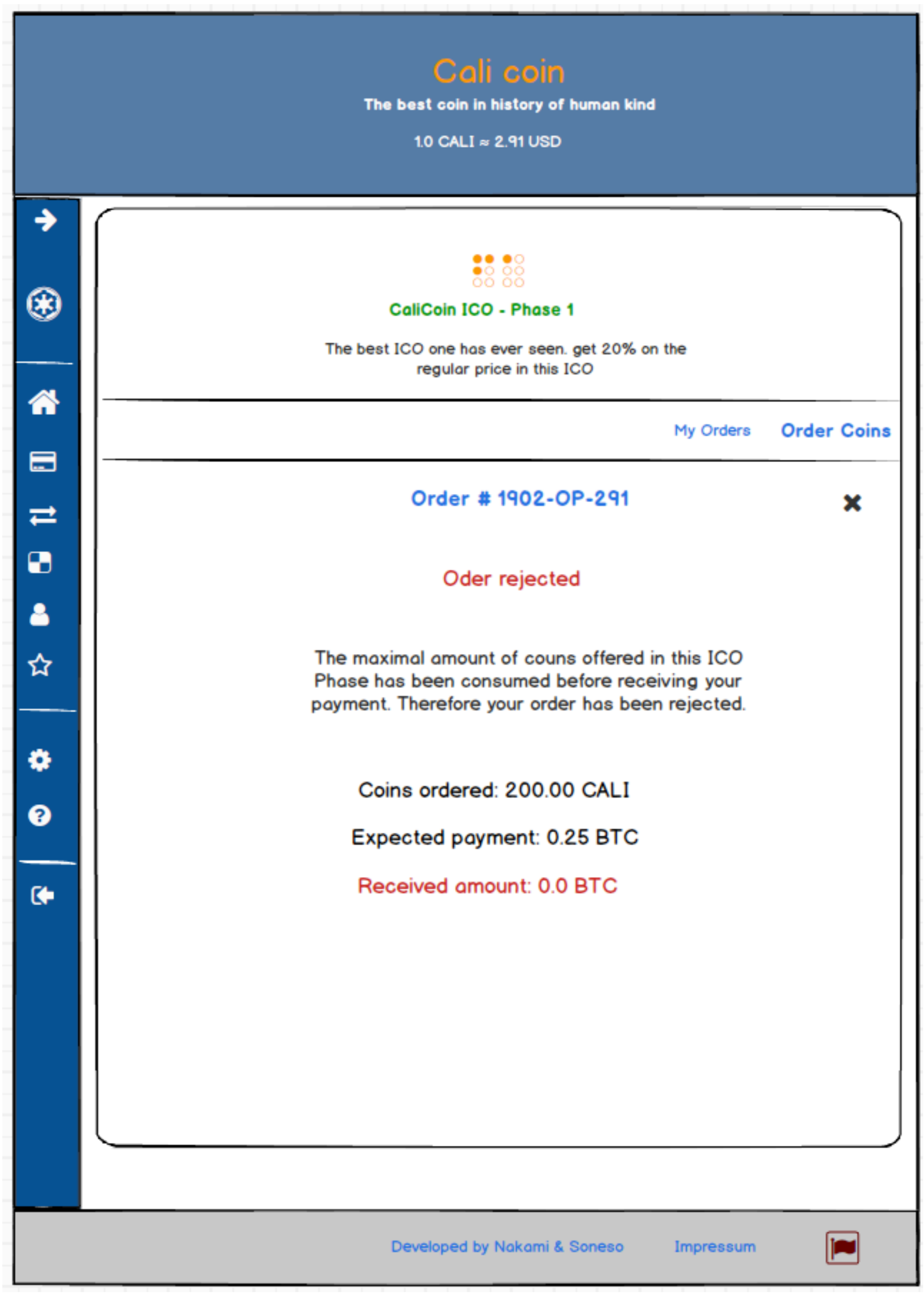
Impressum

*Image 4 –Mockup of web client showing the deposit address for a placed order*

The client displays the transaction IDs of the payment and refund as a link, so that the user see the error and refund in the corresponding blockchain.

If the order cannot be filled because all coins to distribute have already been consumed before the user sent his payment, the server changes the status of the order and the client receives the information in the next poll. The client stops polling and informs the user about the rejected order.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My Orders Order Coins

Order # 1902-OP-291

Oder rejected

The maximal amount of couns offered in this ICO Phase has been consumed before receiving your payment. Therefore your order has been rejected.

Coins ordered: 200.00 CALI

Expected payment: 0.25 BTC

Received amount: 0.0 BTC

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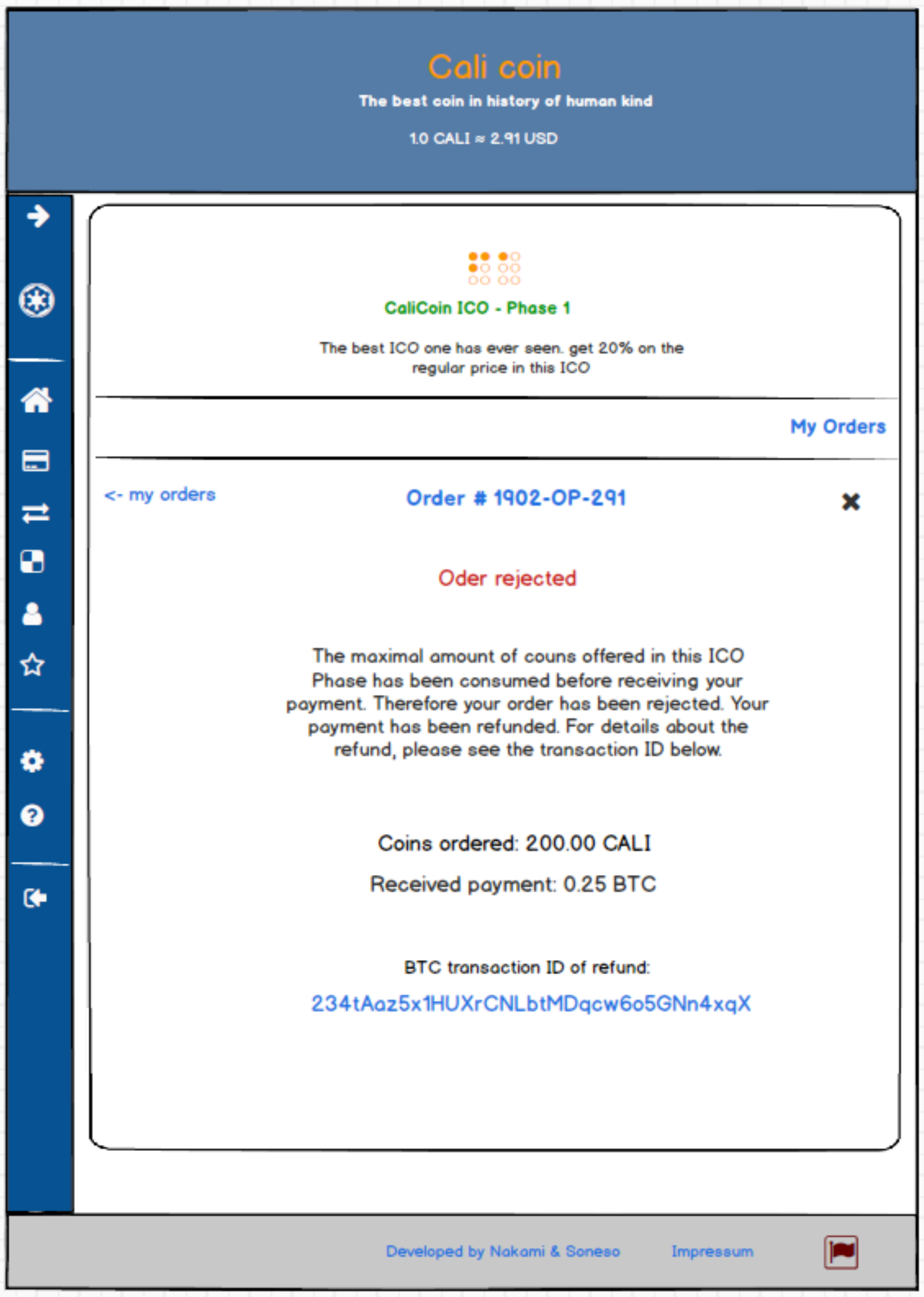
*Image 5 –Mockup of web client showing the unpaid order rejected*

There is also the case, that the payment has been received, but the server could not complete the order because all coins to distribute have already been consumed. In this case, the server returns corresponding data at the next client poll, so that the client can display the refund transaction.



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My Orders

<- my orders

Order # 1902-OP-291

Oder rejected

The maximal amount of couns offered in this ICO Phase has been consumed before receiving your payment. Therefore your order has been rejected. Your payment has been refunded. For details about the refund, please see the transaction ID below.

Coins ordered: 200.00 CALI

Received payment: 0.25 BTC

BTC transaction ID of refund:

234tAaz5x1HUXrCNLbtMDqcw6o5GNn4xqX

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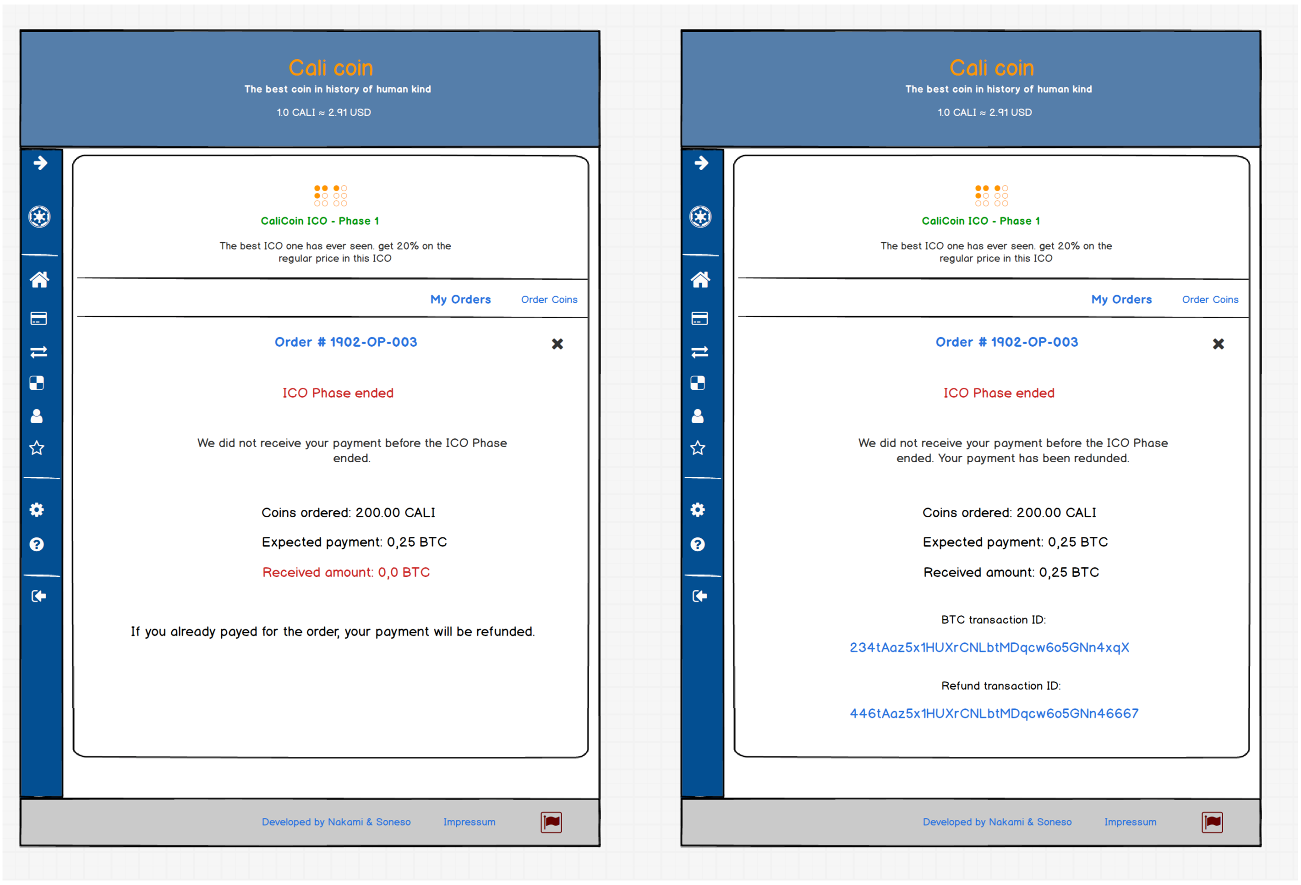
*Image 6 –Mockup of web client showing the payed order rejected*

The next possible error case is that the ICO Phase ended before receiving the payment from the user.



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My Orders Order Coins

Order # 1902-OP-003

ICO Phase ended

We did not receive your payment before the ICO Phase ended.

Coins ordered: 200.00 CALI
Expected payment: 0,25 BTC
Received amount: 0,0 BTC

If you already payed for the order, your payment will be refunded.

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My Orders Order Coins

Order # 1902-OP-003

ICO Phase ended

We did not receive your payment before the ICO Phase ended. Your payment has been redunded.

Coins ordered: 200.00 CALI
Expected payment: 0,25 BTC
Received amount: 0,25 BTC

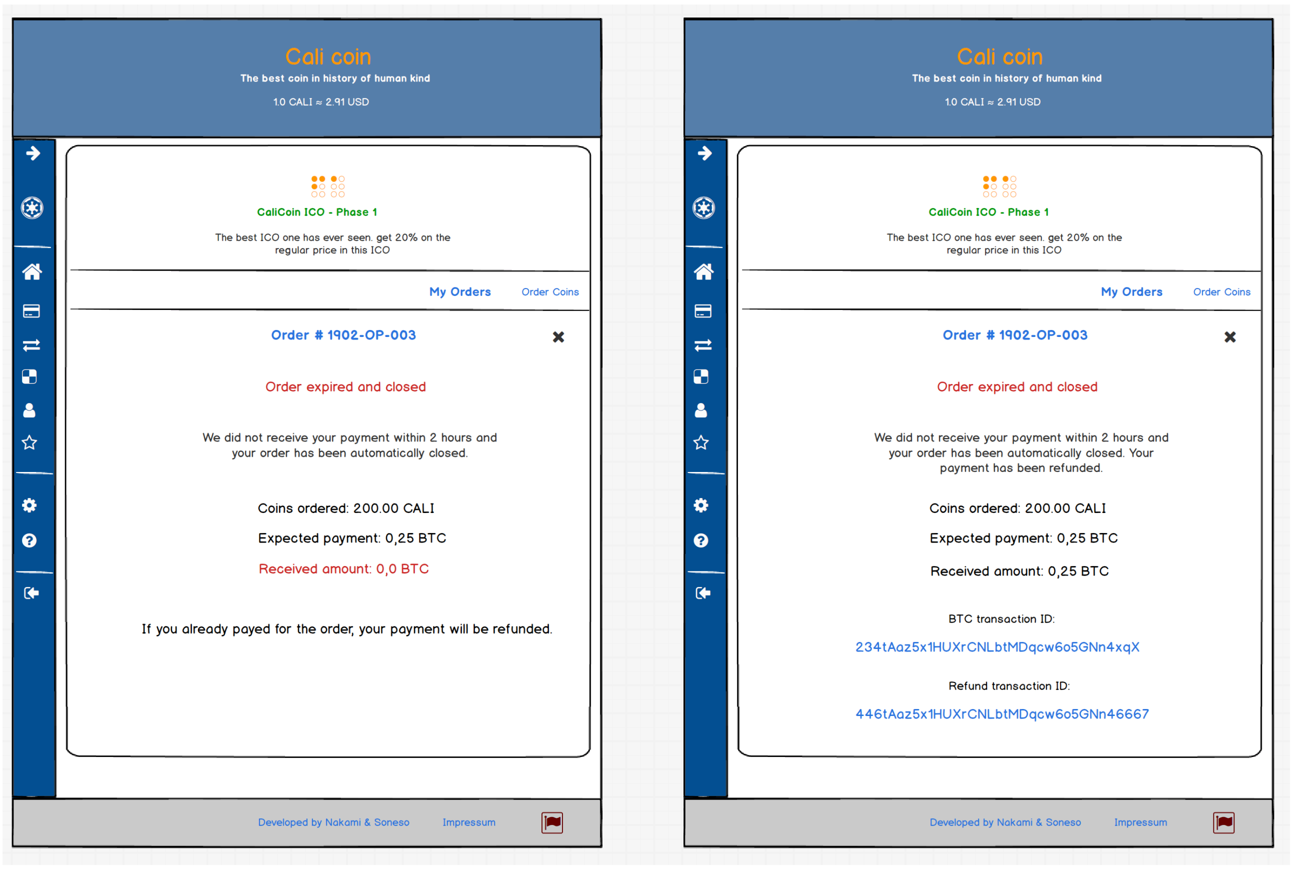
BTC transaction ID:
234tAaz5x1HUXrCNLbtMDqcw6o5GNn4xqX

Refund transaction ID:
446tAaz5x1HUXrCNLbtMDqcw6o5GNn46667

Developed by Nakami & Soneso Impressum

*Image 7 –Mockup of web client showing the ICO Phase ended*

If the payment from the user has not been received within 2 hours after the order has been placed, the server closes the order and sets the status “expired”.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My Orders Order Coins

Order # 1902-OP-003

Order expired and closed

We did not receive your payment within 2 hours and your order has been automatically closed.

Coins ordered: 200.00 CALI

Expected payment: 0,25 BTC

Received amount: 0,0 BTC

If you already payed for the order, your payment will be refunded.

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My Orders Order Coins

Order # 1902-OP-003

Order expired and closed

We did not receive your payment within 2 hours and your order has been automatically closed. Your payment has been refunded.

Coins ordered: 200.00 CALI

Expected payment: 0,25 BTC

Received amount: 0,25 BTC

BTC transaction ID:
234tAaz5x1HUXrCNLbtMDqcw6o5GNn4xqX

Refund transaction ID:
446tAaz5x1HUXrCNLbtMDqcw6o5GNn46667

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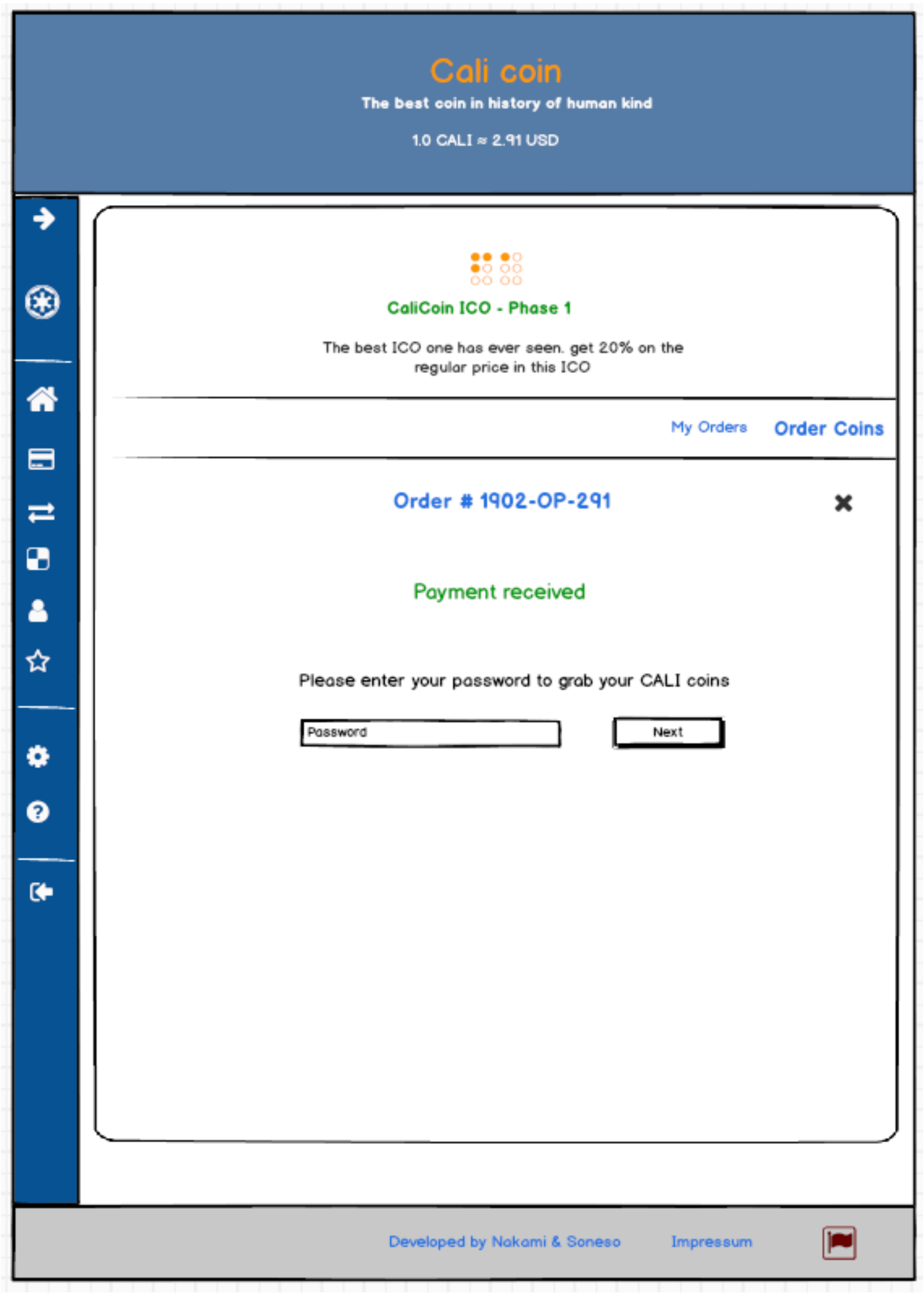
*Image 8 –Mockup of web client order expired before payment received*

If the user transferred the correct amount, the server will first change the status to "payment received" and is going to prepare the order for the next steps. In this case the client must continue to poll until the next status update occurs.

After preparing the order, the server changes the status to "waiting for user transaction". The client stops polling and verifies the users stellar account. The stellar account must be prepared for the next step. Meaning that it must be funded, it must have a trustline to the token and issuing account. If the account is not funded, the client must first call the server interface "fund_account" to let the server fund the account. The interface is described here. If the account is funded, the client next checks if the trustline already exists. If the trustline does not exists, the client must check if the account has enough funding to be able to create the trustline. If not enough funding is available, the client must call the "fund_account" interface so that the required funding is provided by the server (problem: hack- multiple fund_account calls). As soon as the funding for the trustline is available the client shows the "payment received" screen and requests the password of the user to be able to create the needed trustline. If the trustline already existed, the client calls the "get_payment_transaction" server interface to receive the payment transaction for signing. The interface is described here. After receiving the transaction, the client shows the "payment received" screen, so that the user can insert his password and the client can sign the transaction and send back to the server.

By the payment received screen, the client inform the user about the status and requests his password needed for the next step.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My Orders
Order Coins
Order # 1902-OP-291
Payment received
Please enter your password to grab your CALI coins
Password
Next
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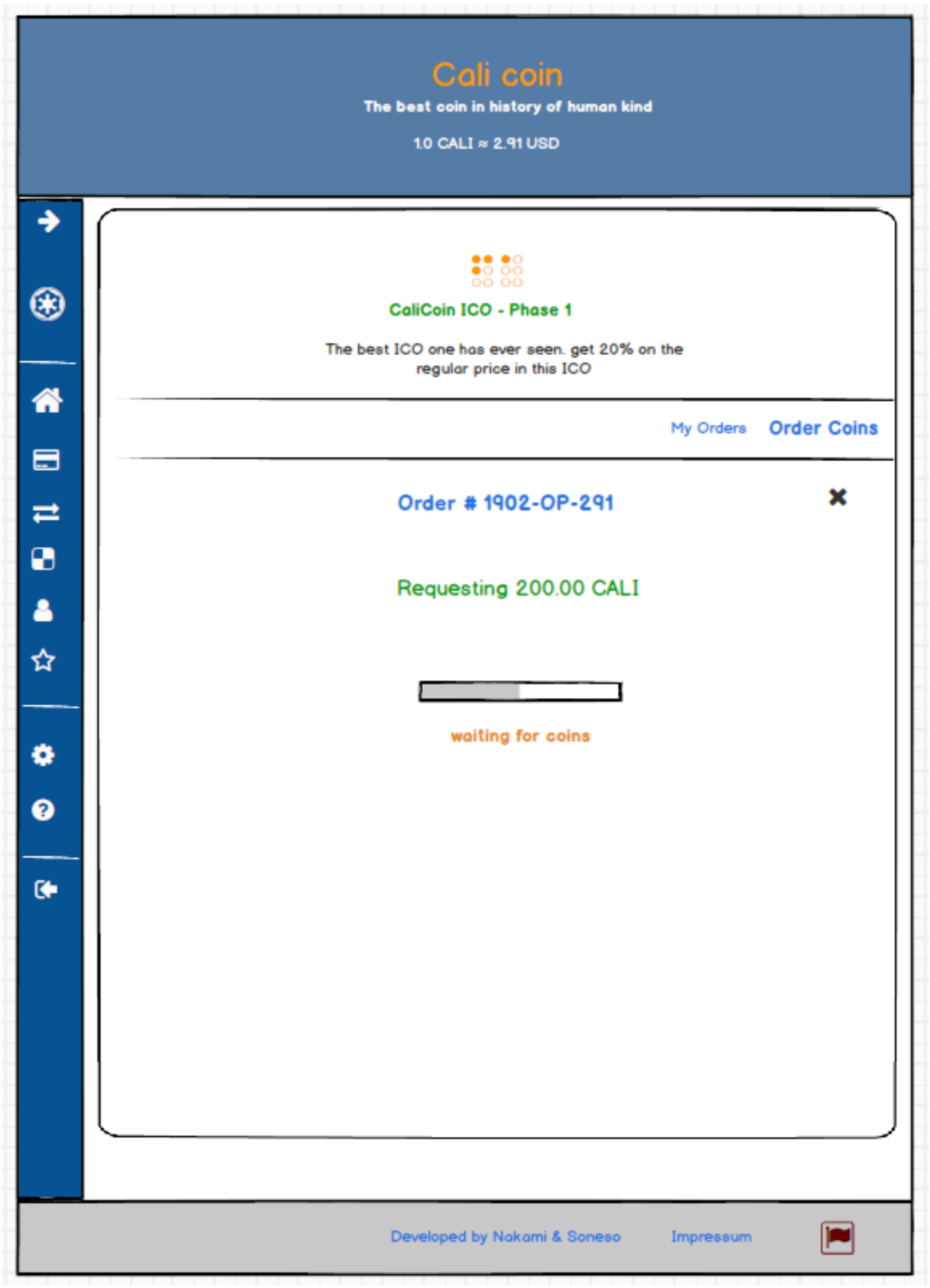
*Image 9 –Mockup of web client showing the payment received screen*

As soon as the user enters his password and presses the "Next" button, the client checks if the trustline exist. If the trustline does not exist, the client creates it. After creating it, the client requests the payment transaction from the server by using the interface "get_payment_transaction". Now the client can sign the payment transaction and send it back to the server by using the interface “execute_payment_transaction”. The interface is described here. Before doing so it displays the “Requesting” screen.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My Orders
Order Coins
Order # 1902-OP-291
Requesting 200.00 CALI
waiting for coins
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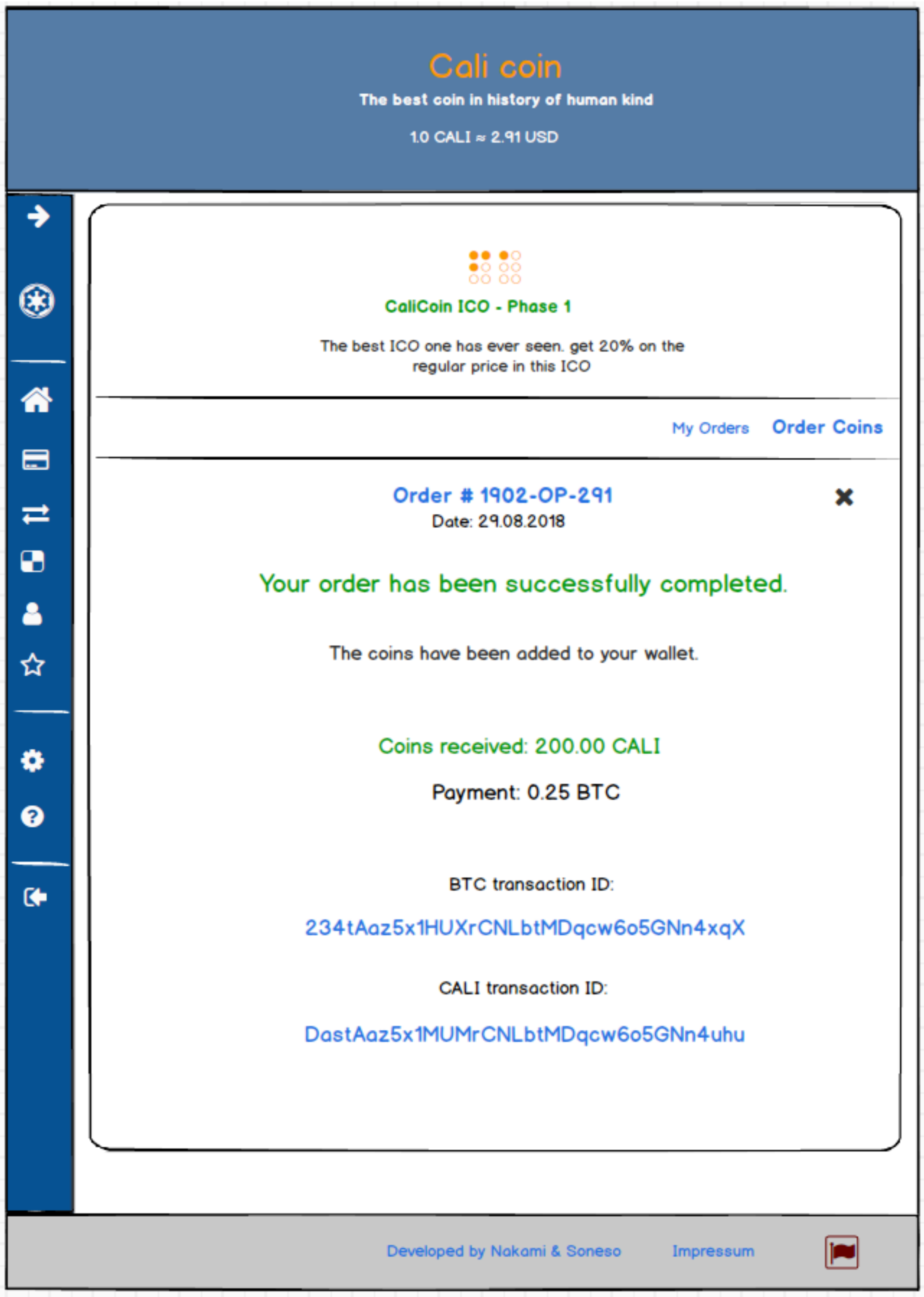
*Image 10 –Mockup of web client showing the requesting coins screen*

The server in turn will validate the transaction and send it to the stellar network. It responds with success, returns the order object that now has the status “completed”. (what about the validation error case?). The client next checks the balance of the account and as soon as the coins are available it displays the order successfully completed screen.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Order # 1902-OP-291
Date: 29.08.2018

Your order has been successfully completed.

The coins have been added to your wallet.

Coins received: 200.00 CALI

Payment: 0.25 BTC

BTC transaction ID:
234tAaz5x1HUXrCNLbtMDqcw6o5GNn4xqX

CALI transaction ID:
DastAaz5x1MUMrCNLbtMDqcw6o5GNn4uhu

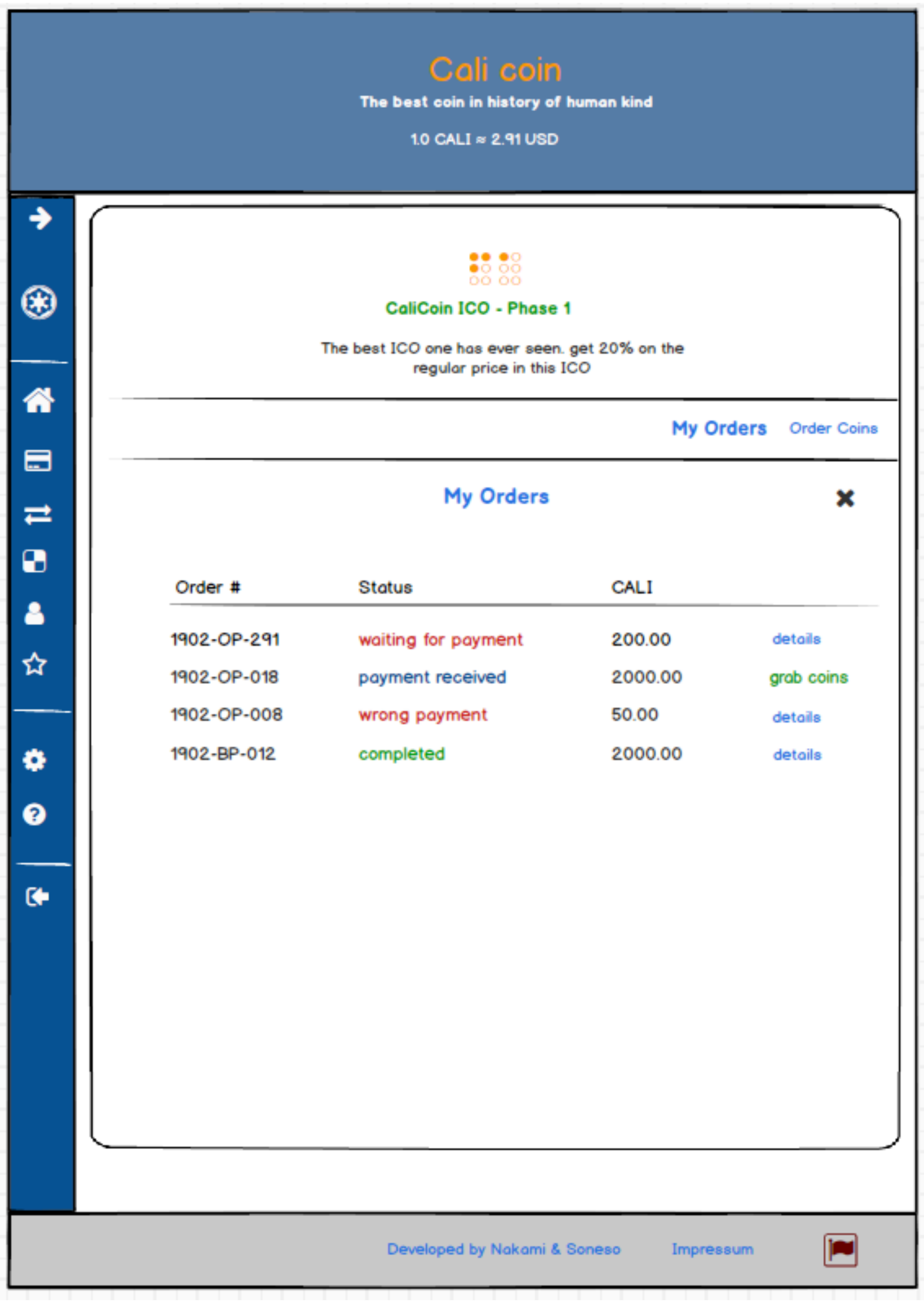
*Image 11 –Mockup of web client showing the order completed screen*

The client displays the order details including the transaction ids as links so that the user can always see them in the corresponding blockchain.

## 5. Viewing existing orders

### 5.1 Overview

The user can always see his orders by pressing the “My Orders” button in the ICO wallet card. As soon as pressed, the ICO card will expand and will show the list of orders placed by the user. The client receives the data from the interface described here.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My Orders
Order Coins
My Orders
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| Order # | Status | CALI | |
|---|---|---|---|
| 1902-OP-291 | waiting for payment | 200.00 | details |
| 1902-OP-018 | payment received | 2000.00 | grab coins |
| 1902-OP-008 | wrong payment | 50.00 | details |
| 1902-BP-012 | completed | 2000.00 | details |

*Image 12 –Mockup of web client showing my orders screen*

The table shows all orders, displays their status, amount of coins ordered and an action button in each row. Following status are possible to be shown to the user:

- Waiting for payment (order status: waiting for payment or payment received)
- Payment received (order status: waiting for user transaction)
- Wrong payment (order status: wrong amount received)
- Completed (order status: completed)
- Rejected (order status: order rejected – phase ended/coins consumed before payment)
-

The client displays a “details” action button in each row, expect when the status of the row is “Payment received”. In this case, it displays a “grab coins” action button.

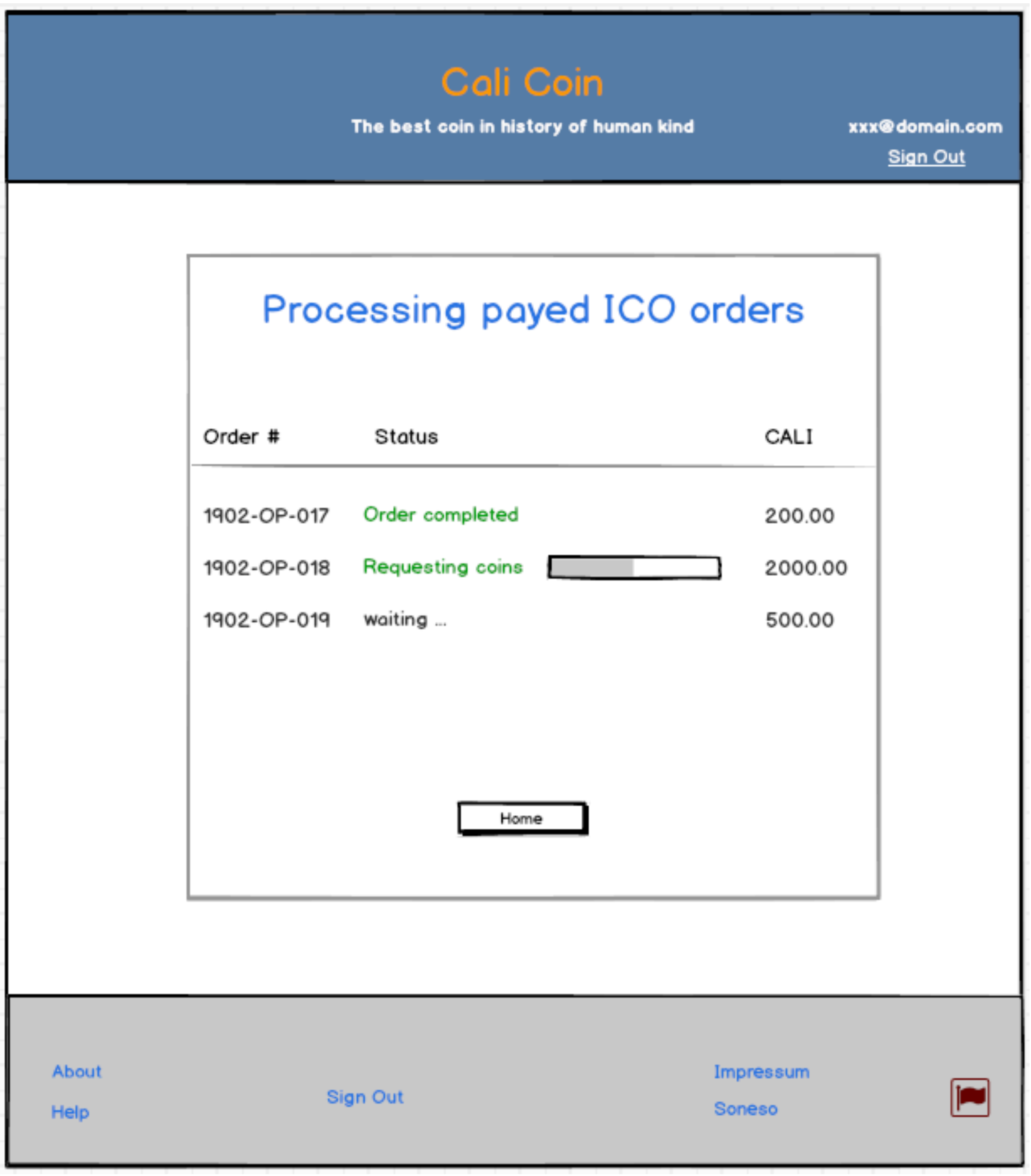
If the user presses the “details” button, the details of the order will be displayed in a popup (see screens above).

If the user presses the “grab coins” action button, the client displays the “payment received” screen in a popup (see above) and applies the logic described above to grab the users coins.

If the user presses no button, the client polls the server interface for the order list to be able to update the status of the orders if something changed.

## 6. Processing orders at login

When the user loges in, the client checks the field “payment_state” in the user profile. If the payment state is set to open, the client request the list of orders with the status “waiting for user transaction” from the server. It uses the server interface for the order list described above to do so (+ parameter order status). If the returned list is empty, the user will be redirected to the dashboard. Otherwise, If the list is not empty the client will display a processing screen (like wallet setup) and will immediately start processing each order from the list (logic as described above, client already has user password from login). The client will process the orders sequentially, showing following screen:



Processing payed ICO orders

| Order # | Status | CALI |
|---|---|---|
| 1902-OP-017 | Order completed | 200.00 |
| 1902-OP-018 | Requesting coins | 2000.00 |
| 1902-OP-019 | waiting ... | 500.00 |

*Image 13 –Mockup of web client showing the details of an order with status "completed"*

As soon as an order is completed it will mark it as completed. While waiting to be processed the orders in the list are marked as "waiting …". As soon as the system finished processing all orders from the list it will automatically redirect the user to the dashboard. If the user doesn't want to wait for the client to process the orders, she can press the "Home" button. The client will interrupt the process and redirect the user to the dashboard.

# 7. Server Interfaces

## 7.1 Details for ICO Phase

parameter: ico_phase_id

return:

- list of activated currencies for this ico phase including price per token

-- exchange_currency_id, asset_code, price_per_token,

## 7.2 Calculated payment sum

parameter: ico_phase_id, amount, exchange_currency_id

## 7.3 Create Order

parameter: ico_phase_id, amount ico token, exchange_currency_id, total_price (received from 2)

return: order_id, status of order, amount of tokens ordered, asset code of token,

total price in exchange currency,

asset code of exchange currency, exchange_currency_type,

deposit_pk, qr_code (only for crypto), bank data (only for fiat)

## 7.4 Poll order payment status

4. poll_order_payment_status

parameter: order_id

returns: order_status,

4.a) status: wrong amount received,

- amount of tokens ordered

- asset code of token

- exchange currency type
- asset code of exchange currency
- expected payment sum in exchange currency
- received payment amount in exchange currency
- user payment transaction id
- refund transaction id

4.b) status: order rejected

- case 1: phase ended before payment

like 4a) + date of payment, + end date of ico phase

- case 2: coins consumed before payment (no coins fucking left)

like 4 a) + date of payment

4 c) status: waiting for payment

- order_id, status of order, amount of tokens ordered, asset code of token,

total price in exchange currency,

asset code of exchange currency, exchange_currency_type,

deposit_pk, qr_code (only for crypto), bank data (only for fiat)

4 d) status payment received:

- continue polling

4 e) waiting for user transaction

-> client: shows to user payment received view

-> client checks if user account exists and is funded with enough lumen to add trustline

if account exists and trustline exists than no need to see if enough lumens

-> NO: client calls interface "fund_account"

-> YES: if trustline does not exist => request pwd from user to add trustline, create trustline

if trustline exists (or after created):

-> client: request user transaction from server interface: "get_payment_transaction"

### 7.5 Fund account

parameter: public key of user account

server: if account does not exist => create account

if account exists => add xlm so that the client can add trustline

returns: error/success

### 7.6 Get payment transaction

parameter: order_id

return: transaction

-> client (request pwd - if not already) sign transaction received from server

-> send back to server using interface: "execute_payment_transaction"

### 7.7 Execute payment transaction

parameter: signed transaction

return: success (+ order details, status is now "completed" + stellar ico token transaction id)

### 7.8 Get orders

param optional ico_phase, order_status

to get the order details call the poll interface

## 8. Images