

# DigiPay

DOCUMENTATION  
INSTRUCTIONS FOR USE

SOFTWARE ENGINEERING

Sarajevo, June 2023.

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# User profile

## Authentication

- The administrative application uses the JWT authentication mechanism to verify user credentials identity.
- Users are assigned roles based on their access level. • A strict password policy is enforced to ensure security. This includes the minimum password length, use of special characters and regular password expiration.
- An additional layer of security that can be applied is support for two-factor authentication (2FA). This requires an additional authentication factor such as a verification code sent to the user's mobile device or email.
- The application supports single sign-on (SSO), which allows users to access more application without re-entering login information.
- For added security, IP address whitelisting is applied to restrict access system only from certain IP addresses.
- The application has a policy of locking the user account after a certain number of failed login attempts to prevent brute force attacks.

## User management

- The application provides user management functionality, which allows administrators to create, edit and delete users. User roles are assigned when users are created or edited.
- All actions related to user management, such as creating, modifying and deleting users, are recorded for activity monitoring. • Role-based access control (RBAC) enables access management different features and functionalities based on user roles.
- For sensitive user management operations, such as deleting users, it is possible require additional authorization through multifactor authentication (MFA).
- A password reset policy ensures that users change their passwords regularly to prevent unauthorized access. • The application provides the possibility of temporarily suspending user accounts in cases of suspicious activity.

## Goals

### **User Login and Authentication**

The application provides user login functionality, allowing them to login using credentials such as email or phone number along with a password. Additionally, two-factor authentication is enabled through the authentication app to improve security.

After a successful login, all calls to the backend include a JWT (JSON Web Token) for authentication. These tokens are valid for 30 minutes. Each call to any backend API with a valid token extends its validity to allow the user to use the application smoothly.

### **User authentication and profile management**

Functionality of user authentication and profile management has been implemented. Users can log into the app using their email and password, phone number and password, or through connected service providers like Facebook or Google. Users can check their profile information and log out. Logging out invalidates the token and restricts access to the application.

A backend API is implemented to validate tokens and verify user privileges for certain actions. This ensures that only users with appropriate privileges can perform certain actions within the application.

### **Real-Time Notifications sa Socket.IO**

A real-time notification feature has been implemented that allows users to receive notifications on their phones for various events within the app. To achieve this functionality, the Socket.IO library is used to establish a real-time communication channel between the server and the client, which enables instant delivery of notifications.

Notifications are simulated for demonstration purposes. When a specific event occurs within the application, such as receiving a new message or updating some content, the client will be notified via the Socket.IO channel, and the notification will be displayed on the user's phone in real time. This feature provides users with a better experience using the app with instant notifications of relevant events.

### **API for generating notifications and creating accounts for B2C**

**users** It is possible for other groups or services to call the API for generating notifications in the application. This means that external groups or services can use the defined API to send notifications to users within the application. Users are also enabled to request account opening in one of the defined currencies. Each account created will have a description and account number associated with it. Users can provide the information and documents required to open an account, including the ability to submit PDF documents along with account creation requests. These functionalities provide users with greater flexibility and the ability to interact with the application through external services and facilitate the process of opening an account and providing the necessary information.

### **Voucher generation for administrators**

Administrators are given the ability to generate vouchers within the application. Each voucher will have a unique one-time code that is randomly generated and consists of 4x4 characters. Each voucher will be associated with a specific amount or currency. Vouchers will have different statuses, including "issued", "active", "redeemed" and "invalid". When the voucher is created, it will automatically be given the status "issued". When a voucher is sold to a person, its status will change to "active". When a person uses a voucher, it will be marked as "used". Administrators will have the authority to change the voucher status from "issued" or "active" to "invalid". Other voucher status changes will take place automatically. This functionality allows administrators to easily manage vouchers, monitor their status and control their validity.

### **Registration for electronic invoices (FE)**

User registration functionality for electronic accounts within the application is enabled.

Electronic invoices have predefined attributes that include payer's name/surname and address, reference, description, payee's account number, payee's name, payee's address, and amount and currency. The registration process for e-accounts is step-by-step so that users can easily register their accounts. Users can select the "e-account registration" option within the application. For B2B customers, there is a possibility to select a recipient (facilities company). Users enter the minimum necessary data for unique identification and create a registration request.

This functionality facilitates the registration process for electronic accounts within the application for users, providing them with flexibility and convenience in managing financial transactions.

## **User stories**

- As a user, I want to be able to log into the app using my email address or phone number with password.
- As a user, I want to improve the security of my account by enabling two-factor authentication authentication using an authentication application.
- As a developer, I need to ensure that all calls made to the backend API after logins include a JWT token for authentication.
- As a developer, I need to implement a mechanism whereby any call to any backend API with a valid token extends the token's validity. • As a user, I want the flexibility of logging into the app using my email and password, phone number and password, or connected service providers. • As a user, I want to be able to view and verify information about my profile within the application.
- As a user, I want the ability to log out, which will invalidate the token and restrict access to the application. • As a developer, I need to implement a back-end API that authenticates token and checks user privileges for certain actions.

- As a user, I want to receive notifications on my phone about various events that are happening within the application.
- As an external service, I want to be able to call an API to generate notifications in the application.
- As a B2C user, I want the ability to request to open an account in one of the defined ones currency
- As a B2C user, I want to provide a description and receive an account number when creating an account.
- As a B2C user, I want to be able to submit PDF documents with a request for account opening. • As an admin, I want the ability to generate vouchers in the app. • As an administrator, I want each voucher to have a unique one-time code and associated amount/currency.
- As an administrator, I want to be able to change the voucher status from "issued" or "active" to "invalid".
- As a system, I want the voucher status to change automatically based on certain events (eg sale or exploitation). • As a user, I want to be able to register electronic accounts in the application. • As a user, I want to provide the necessary information for an electronic invoice, including the name/surname of the payer, address, reference, description, account number of the recipient, name, address, amount and currency.
- As a user, I want the registration process for e-bills to be step-by-step. • As a user, I want to select a recipient (facilities company) for B2B clients during the e-invoice registration process.
- As a system, I want to create a registration request when the user completes the registration process e accounts.

## Implementation details

### User login

**To access the DigiWallet site, follow these steps:**

- In the browser, enter the appropriate link for the DigiWallet page. • Once the page opens, you will notice a login button located on the top right corner. • Click on that login button. • Opening the application will give you access to the fields for entering user data. • Enter your email address or phone number in the login field. • In the next field, enter your password.

- After entering all the required data, click the login button. • If the entered information is correct, you will be successfully logged in to the DigiWallet page and redirected to your account. In case your data is not correct or you do not have an account, you will receive the message "User not found" and you can log in again with the correct data.



Image: Layout of the home page

A screenshot of a login form titled "Login". It features two input fields: "E-mail or Phone number" and "Password", both with placeholder text. Below these is a "Log in with Google" button with the Google logo. Underneath is a "Log in with Facebook" button with the Facebook logo. At the bottom, there is a link "You are not registered? [Register](#)" and a prominent yellow "Login" button.

Image: Layout of the Login form

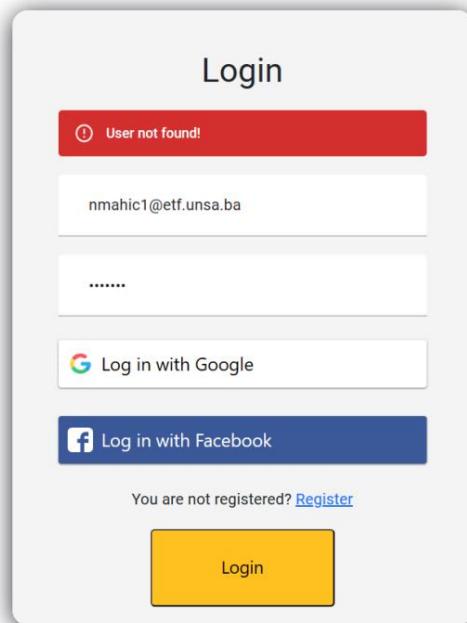


Image: Incorrect user information



Image: Two-factor authentication

**On the DigiWallet page, you have the option to choose and log in via Facebook or Google account. Here's how you can use that option:**

ÿ Opening the application will show you fields for entering user data. ÿ Instead of manually entering data, check out the social media login options.

ŷ Click on the corresponding button to log in via Facebook or Google account. ŷ You will be redirected to the login page via the selected social network. ŷ Enter your user information (such as email and password) for your Facebook or Google account. ŷ After entering the correct information, click on the login button. ŷ If the information entered is correct, you will be successfully logged into the DigiWallet page using your Facebook or Google account.

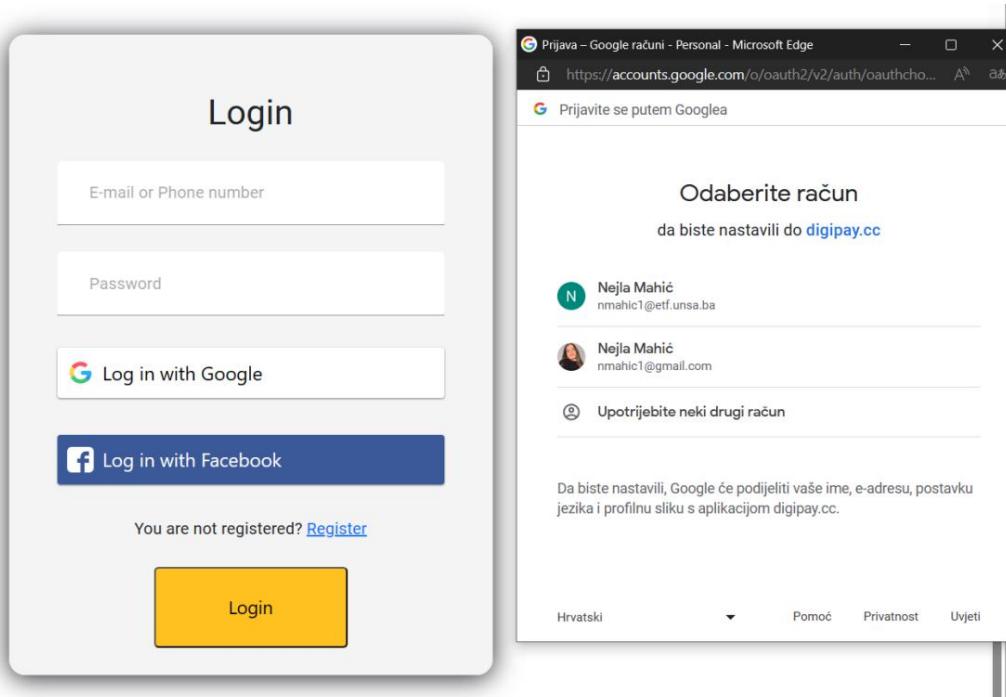


Image: Login with Google data

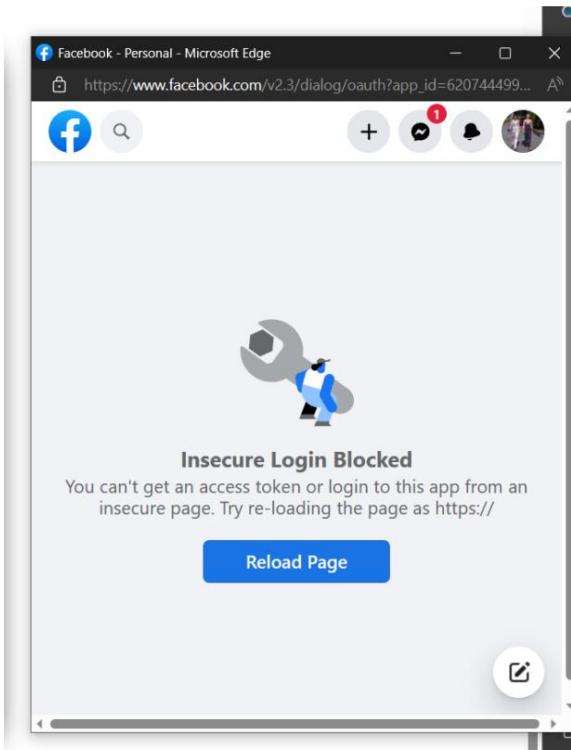


Image: Login with Facebook data

A screenshot of a user profile page on the Digipay platform. At the top, there's a yellow header bar with the brand name "Digipay" on the left and navigation links like "HOME", "VENDOR MANAGEMENT", "USER MANAGEMENT", "CURRENCIES", "VOUCHER", "TRANSACTIONS", and "INVOICES" on the right. Below the header is a large yellow gradient background featuring a circular profile picture of a man and the username "abruslic1". The main content area contains a table with user information:

First Name	Almina
Last Name	Bruslic
Email	abruslic1@etf.unsa.ba
Phone	11111
Two-Factor Authentication:	<a href="#">DISABLE</a>
2FA not set up!	<a href="#">SETUP</a>

At the bottom of the profile page, there are two buttons: "MY ACCOUNTS" and "SEND NOTIFICATION TO SUBSCRIBED USERS".

Image: User profile layout

## Voucher creation

### Find and select the "Vouchers" option

- After logging in, browse the navigation bar or menu to find the option "Vouchers".
- Click on that option to open the voucher management page.
- On the voucher management page, look for the option "Create Voucher"
- Click on that option to open the form to create a new voucher.
- In the voucher creation form, enter the name of the voucher in the appropriate field.
- Select the desired value and currency for the voucher from the drop-down list.
- After you have entered all the necessary data, click the "Save" button
- After saving, the voucher will automatically receive the status "issued".

Digipay

One-time code	Amount	Currency	Status
7w69-HwEE-JQ6X-6uW4	10	BAM	ACTIVE
2GJv-ld9R-gN31-mp2a	10	BAM	REDEEMED
PNbA-ruwi-R7HF-V4xO	10	BAM	ACTIVE
US1L-i33v-qq5F-J0y2	10	BAM	ISSUED
xNxP-eW9H-AbaB-Vhl1	10	BAM	ISSUED

CREATE VOUCHER +

Rows per page: 5 1-5 of 24 < >

Dense padding

Image: Layout of the voucher page

The screenshot shows a modal window titled "Create Voucher". Inside, there's a message: "Please fill out the form below to create a new voucher." Below this is a text input field labeled "Number of vouchers" containing the value "1". Underneath it is a dropdown menu labeled "Amount" set to "10". Another dropdown menu labeled "Currency" is set to "BAM". At the bottom right of the modal are two buttons: "CANCEL" and a larger orange "CREATE" button.

Image: Voucher creation

When a voucher is sold to a person, the administrator will change its status to "active".

When a person uses a voucher, the system will automatically mark the voucher as "used".

Only administrators have the authority to change the voucher status from "issued" or "active" to "invalid".

## Registration - EInvoice

- Browse the menu or navigation bar to find the "Invoices" option • Click on that option to open the e-invoice management page. • On the e-invoice management page, look for the option "Register for E-invoice" Click on that option to start the e-billing registration process. • Step 4: Select the recipient (facilities company) for B2B customers • If you are a B2B customer, you will be asked to select the recipient of the e-invoice (facilities company) from the available options.
- Browse the list of recipients and select the appropriate one. • In the e-account registration form, enter the minimum necessary data for a unique one identification.
- This usually includes the payer's first and last name, payer's address, reference, description, account number of the recipient, the name of the recipient and the address of the recipient.
- This data is required to ensure correct identification and connection with electronic account.
- When you have entered the necessary information, click on the "Create" button to create a request for registration.
- The system will process your request and inform you about the registration result • After you have sent the registration request, check the registration status • The system will inform you about the acceptance or rejection of the registration

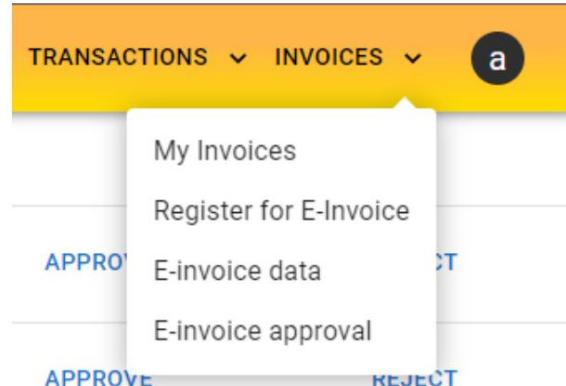


Image: Button layout



Image: Registration for e-invoice

## Registration page with confirmation of email address and phone number

The registration page with confirmation of email address and phone number allows users to access registration through the home page of the application. This page contains a form for entering user data and provides additional security measures through confirmation of email address and phone number.

### 1. Registration page

Users will be able to access the registration page via the home page of the application. On this page, a form for entering the user data required for registration will be displayed.

### 2. Data entry during registration

During registration, users will be asked to enter certain information in the appropriate fields. This includes email address, first name, last name, home address and phone number. Users will need to complete all fields to successfully complete the registration process.

### **3. Email address confirmation**

After entering the data, users will be redirected to the email address confirmation page. A unique code will be sent to their email address, which will need to be entered in the application to confirm that they are the owner of that email account. This measure serves to ensure that a correct and available email address is used during registration.

### **4. Phone number confirmation**

In addition to email address confirmation, users will also be able to confirm via phone number.

After entering the data, users will receive an SMS message with a specific code. They will have to enter that code in the corresponding field on the page to confirm that they are the owner of that phone number. This measure additionally ensures the user's identity and prevents the use of false or non-existent numbers during registration.

Together, these functionalities allow users a simple registration process on the web application. They will need to enter basic information and then confirm their email address and phone number to ensure the security and accuracy of the information entered.

## **Connecting your Google, Facebook, and Microsoft accounts and using them to sign in**

The ability to connect the user account with Google, Facebook and Microsoft accounts allows users to easily access the application without the need for special registrations. This documentation describes the process of linking accounts, using linked accounts to log in, and the ability to disconnect a linked account.

### **1. Connecting a Google, Facebook or Microsoft account**

During the registration process, users will be given the option to link their existing Google, Facebook or Microsoft accounts to their user profile in the application. This option allows users to use their pre-existing data from those accounts to log in to

application, rather than having to manually enter a username and password. This makes access easier and reduces the need to create a new user account.

## **2. One related order**

Each user will be able to link only one account with their user profile in the application. This means that it will not be possible to link multiple Google, Facebook or Microsoft accounts to the same user profile. This measure ensures unique user identification and facilitates the management of linked accounts.

## **3. Logout and disconnection from the connected account**

Users will be provided with the option of logging out of their linked accounts or disconnecting the application from their linked account. When a user chooses to log out or disconnect from an associated account, it will no longer be possible to access the application through that associated account. This functionality allows users to control their access to the application and allows them to disconnect from their associated accounts if they wish.

Through these functionalities, users are enabled to easily connect their Google, Facebook or Microsoft accounts to their user profile in the application, thus facilitating access and management of their data. Logging out and disconnecting gives users control over their access and the ability to disconnect from connected accounts if they so choose.

## **Management of currencies and exchange rates**

Users will be able to adjust currencies and exchange rates according to their needs.

### **1. Defining available currencies**

Users will be able to define the currencies that will be available in the system. This functionality provides the possibility of adapting the system to the specific needs of the user or organization. Whether they want to support a wide range of international currencies or only a limited set of local currencies, users will have the flexibility to define the available currencies according to their requirements.

### **2. Defining the conversion rate**

Users will be able to define the conversion rate between different currencies that will be available in the system. This functionality enables adapting the system to current market or organizational conditions. Users will be able to set their preferred currency conversion rate, whether it is a fixed rate or a rate that is automatically updated according to external sources.

### **3. Setting the conversion rate per period**

Users will be able to set the conversion rate for a specific period. This functionality provides the ability to define changes in the conversion rate over time. In this way, users can adjust exchange rates according to dynamic changes in the market or organizational needs. Whether it's periodically updating the exchange rate every day or defining specific changes at certain time intervals, users will have control over the conversion rate during different periods.

### **4. Historical conversion rate check**

Users will be able to check the historical conversion rate. This functionality provides users with access to historical exchange rate data. This enables analysis, tracking of changes and execution of retroactive conversions. Users will be able to view and download historical exchange rate data to gain insight into past currency values and use it for financial reporting, research or other purposes.

Through these functionalities, users are enabled to flexibly manage the available currencies, define the conversion rate according to their needs, set the exchange rate for a certain period and check historical exchange rates. This enables precise and accurate management of currency conversion in the system, adapted to user requirements and market dynamics.

## **Carrying out currency exchange transactions**

Users will be able to exchange currencies using accounts in different currencies, with a previously displayed and agreed exchange rate. This functionality is similar to performing standard payment transactions.

### **1. Execution of currency conversion transactions**

Users will be able to perform currency conversion transactions through an intuitive user interface. This functionality provides users with the ability to quickly and easily

converting your funds from one currency to another. Through several steps, users will be able to select the source and destination currency, enter the amount they want to convert and confirm the transaction.

## **2. Having accounts in different currencies**

In order for users to perform a currency conversion transaction, they must have accounts in different currencies. This functionality allows users to properly select their source and destination accounts for a transaction. Users will be able to view the available accounts in different currencies and select the ones relevant to their transaction.

## **3. Available funds**

When performing a currency conversion transaction, users must have sufficient funds available in their source account. This functionality ensures that users have sufficient funds to perform the desired conversion. If the user does not have enough funds, he will not be able to complete the transaction and will receive a corresponding notification.

## **4. Display and acceptance of the conversion rate**

When executing a currency conversion transaction, users will be shown the current conversion rate between the source and destination currencies. Through a clear and transparent display, users will be able to see how many funds will be converted and what amount will be calculated in the destination currency. Before finalizing the transaction, users will need to confirm acceptance of the conversion rate in order to be informed of the exact amount that will be converted.

Through these functionalities, users are provided with the ability to perform currency conversion transactions quickly, easily and accurately. By carefully selecting source and destination accounts, checking available funds and accepting the conversion rate, users can reliably and efficiently perform currency conversion according to their needs.

# **Carrying out voucher exchange transactions**

This documentation describes the user's options for performing voucher exchange transactions in the system. Users will be able to exchange vouchers for a certain amount of money, subject to certain conditions. When redeeming a voucher, the amount of the voucher will be added to the user's account and the status of the voucher will be changed from active to used.

## **1. Execution of voucher entry transactions**

Users will be able to enter vouchers through an intuitive user interface. This functionality allows users to enter a voucher and use its value in their transactions. Users will get a voucher entry field where they can enter the corresponding voucher code they own. After entering, the system will check the validity of the voucher and display its value.

## **2. Currency of user account and voucher**

In order for users to enter a voucher, they must have a currency in their user account that matches the currency of the voucher. This functionality ensures a match between the currency of the user's account and the vouchers that the user wants to enter. This ensures that users correctly use vouchers that are compatible with their account.

## **3. Voucher entry via code**

Users will be able to enter the voucher by entering the corresponding code in the provided field on the user interface. Entering the voucher through the code allows users to activate the voucher for further use. After entering the code, the system will check the validity of the voucher and display its value.

## **4. Redemption of active vouchers only**

Users will only be able to redeem vouchers that are currently active. This means that only unexpired or unused vouchers can be redeemed. This functionality ensures that users only enter vouchers that are still valid and available for entry.

## **5. Adding the value of the voucher to the user's account**

After successful redemption of the voucher, the value of the voucher will be added to the customer's account. This functionality allows users to use the voucher value for further transactions or activities. The value of the voucher will be displayed on the user's account as additional available funds.

## **6. Change of voucher status**

After the voucher is redeemed, its status will be changed from "active" to "used". This status change indicates that the voucher has been successfully redeemed and is no longer available for entry.

Changing the status helps users to clearly distinguish used vouchers from those that have not yet been used.

Through these functionalities, users can easily enter vouchers, check their validity, redeem their value and track the status of vouchers in their user accounts.

This allows users to take advantage of vouchers to obtain additional benefits or discounts within the system.

## Registration for electronic accounts

Users will be able to register to receive electronic bills instead of traditional paper bills. Electronic invoices will have pre-defined attributes that contain information about the originator, recipient, reference, description, amount and other relevant data.

### **1. Registration for electronic accounts**

Users will be able to register easily and conveniently to receive electronic invoices through the business interface. Instead of traditional paper invoices, users will be able to choose an electronic format to receive invoices. This functionality reduces the need for manual management of paper documents and facilitates the process of tracking and archiving invoices for users.

### **2. Predefined attributes of electronic accounts**

Electronic accounts have certain predefined attributes that users need to specify during registration. These attributes include key information needed to identify and classify invoices.

Examples of these attributes are payer's first and last name, payer's address, reference, description, payee's account number, payee's name, payee's address and bill amount. Specifying these attributes enables clear identification and processing of electronic invoices within the system.

### **3. Step-by-step registration**

Registration for electronic accounts is carried out step by step to provide users with a simple process. Below are detailed descriptions of the steps:

- The user accesses the user interface and selects the option "Register for electronic accounts".
- On the user interface, the user selects the desired recipient of electronic invoices, which usually means a company or service provider with whom the user has a business relationship. • After selecting the recipient, the user enters minimal data from the predefined attributes of electronic invoices in order to uniquely identify his user account. • After entering the data, the user sends a request for registration of electronic invoices, which then sends for processing and verification.
- After successful processing and approval of the request, the user will be registered to receive electronic invoices from the selected recipient.

Through these steps of the registration process, users are provided with a simple and quick registration for receiving electronic invoices. This improves efficiency and facilitates the administrative processes associated with receiving and managing invoices.

# User interface

## Carrying out currency exchange transactions

Input Currency	Output Currency	Rate	Start Date	End Date
BIH (BAM)	SWI (CHF)	0.5	2023-06-01T00:00:00	

Image: Display of the "Currencies" section

Image: Display of the screen after the user clicks on the "New exchange transaction" button

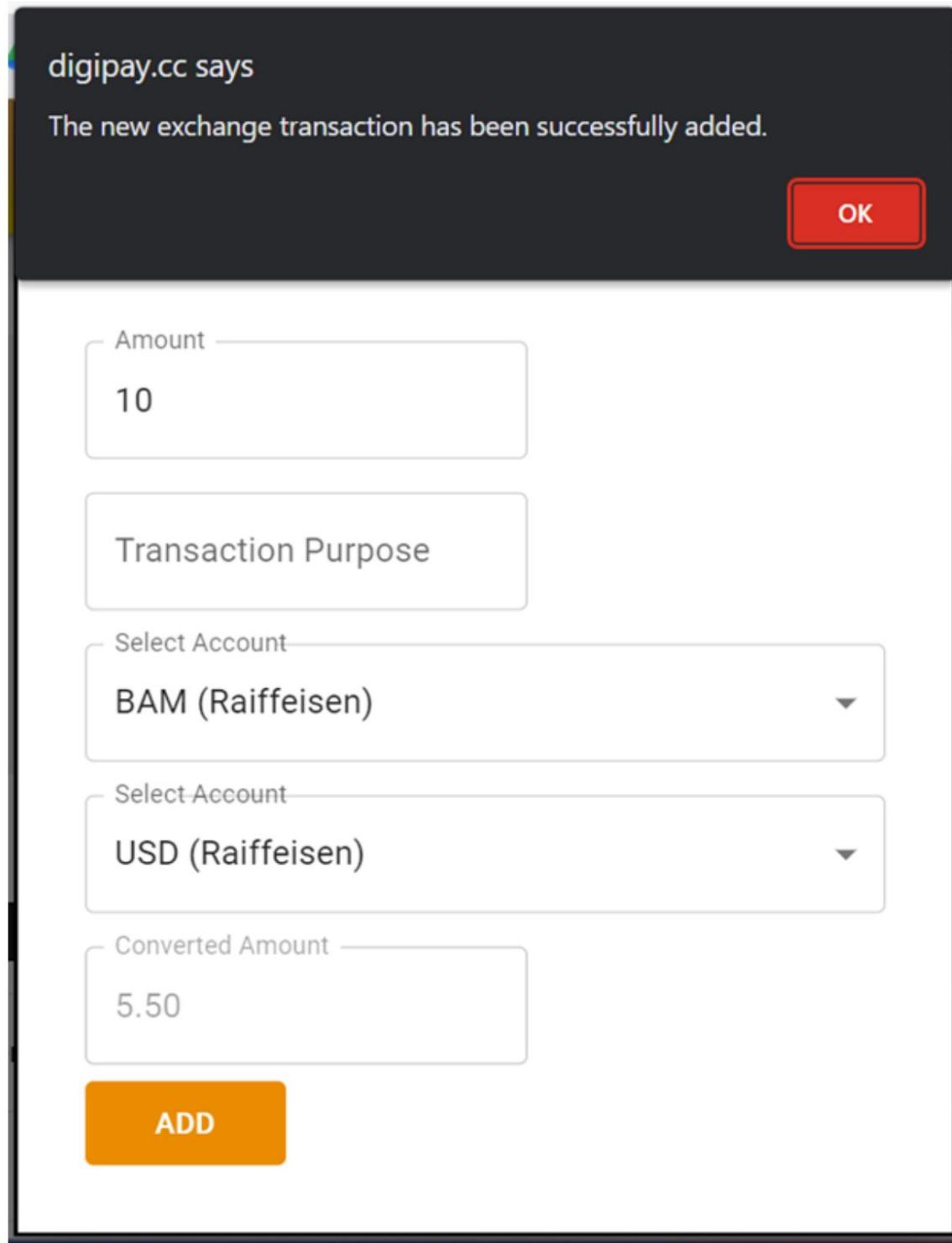


Image: Display of the message after a successful transaction

## Carrying out voucher exchange transactions

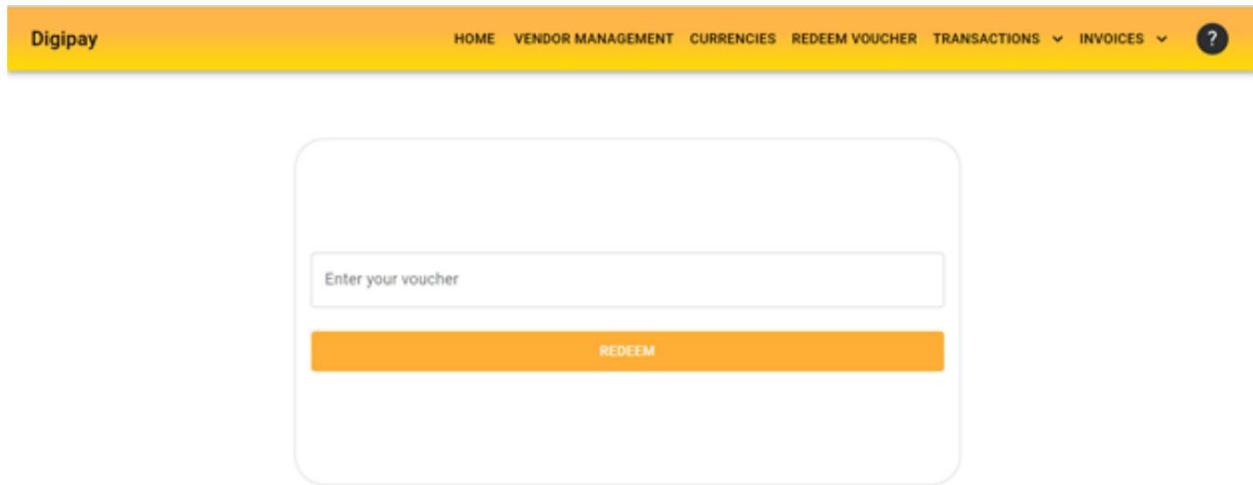


Image: Display of the "Redeem voucher" section

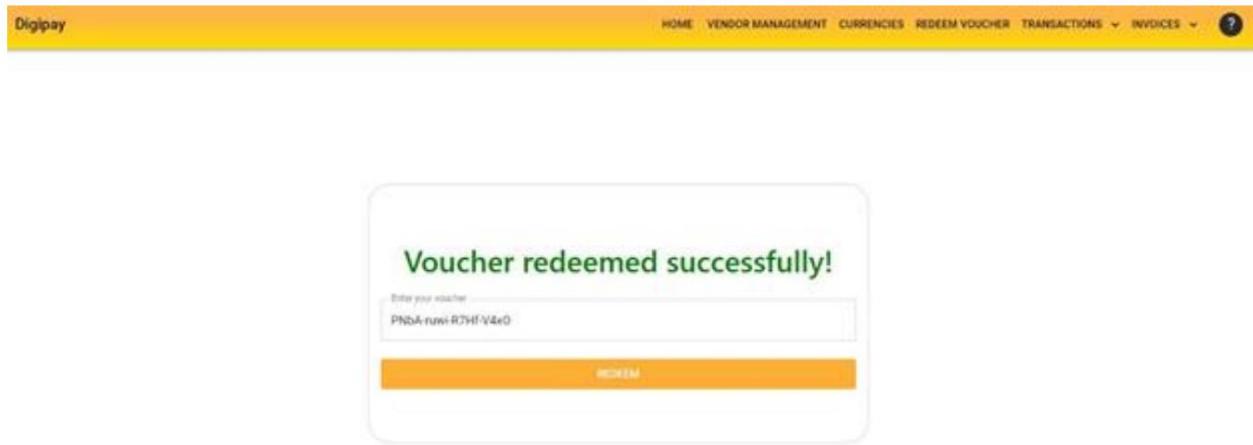


Image: Successful redemption of an active voucher

# Transactions

## Functionalities

Most of the work of team 3 on the development of this system was based on the "transaction" functionality.

The application must provide a transaction review feature that allows users with appropriate permissions to view transaction history. The transaction view should display relevant information about the transaction, such as transaction amount, date and time, vendor information, and status. Also, the application must provide the client with the payment of certain things through the system.

Transaction-related functionality should also provide the following:

Filtering and Sorting – The transaction view should allow users to filter and sort transactions based on various criteria, such as date, amount, transaction type, and vendor.

Search Functionality – The Transaction View should allow users to search for specific transactions using keywords, transaction IDs, or other relevant search terms.

Transaction Status – The transaction view should show the status of each transaction, such as pending, processing, success, or failure. Users should be able to filter transactions by status.

Transaction Details – The Transaction View should display relevant details for each transaction, such as Transaction ID, Transaction Date, Amount, Vendor and any other relevant details.

Transaction History – The Transaction View should maintain a history of all transactions, including successful and failed transactions. Users should be able to view transaction history for a specific period or filter transactions by date.

In agreement with the client, it was decided to use the following data as the basic information for displaying transactions:

- date, recipient, amount, currency, type of transaction.

As for the details of the transaction, the client decided on the following:

- date, recipient, amount, currency, sender, type of transaction, purpose of transaction.

This functionality was developed through three sprints (2, 3, 4).

Team 3 worked on the frontend part of this functionality.

In sprint 2, the client requested:

- display of transactions with basic data, • list of transactions must be auto-populating, • clicking on a transaction displays details related to that transaction.

In sprint 3, the client requested:

- filtering transactions by criteria: date, recipient, amount, currency, type of transaction, • sorting transactions by criteria: date, recipient, amount, currency, type of transaction, • creating a new transaction based on an old one (using a transaction template).

In sprint 4, the client requested:

- grouping transactions according to criteria selected by the development team. We chose to we group transactions by type and by currency.

As for the front-end part, team 3 participated in the development of another functionality called "electronic invoices".

Specifically, it was about sprint 7 where the client requested the following:

- Administrators will be able to define which data is required for which B2B customer for the unique identification of the B2C customer:

- Electronic invoices have predefined attributes:
    - i. Payer's name/surname ii.
    - Payer's address iii.
    - Reference
    - iv.
    - Description v. Account number of the payee
    - vi. Payee name vii. Payee address viii. Amount

- Registration for e-invoice is a step-by-step process:
    - and. The user selects the "registration for e-invoice" option. ii.
    - The user chooses the recipient (facilities company) - B2B clients iii. The user enters the minimum data from "a" required for unique identification iv.

The registration request has been  
created

- Administrators will be able to list all e-invoice registration requests and confirm/reject them:
  - Approved request becomes "e-invoice mapping"

All the client's requirements that he stated as user stories in the sprints have been fulfilled, as you will see in the user manual.

Team 3 also participated in the development of the backend part of the application with the following functionalities:

- currency exchange,
- purchase of vouchers.

The backend for the "currency exchange" functionality was worked on in sprint 5.

In sprint 5, the client required the following:

- Users will be able to perform exchange transactions:
  - A. the user must have accounts in different currencies,
  - B. the user must have available funds,
  - C. the exchange rate for the currency will be displayed and agreed upon,
  - D. it is similar to a regular payment.

The backend for the "voucher redemption" functionality was worked on in sprint 6.

In sprint 6, the client required the following:

- Users will be able to perform voucher redemption transactions
  - A. the user must have an account in the same currency as the voucher in order to activate the given voucher,
  - B. payment is made by entering a code,
  - C. only an active voucher can be used,
  - D. the voucher amount is then added to the customer's account,
  - E. the status of the voucher has been changed from active to used.

Now follows the presentation of the user manual for the functionalities that were made on the frontend part.

## Access to transactions

Note: Each step will be shown through images on which the steps will be marked in the form of a red rectangle or a circle with an ordinal number of steps. This applies to every section shown in this document. As for accessing transactions, it doesn't matter where we are in the application because the navigation bar is always available.

We click on the "Transactions" option located in the navigation bar.



**Figure 1:** The first step to access the list of transactions.



**Figure 2:** Display of the drop-down list with options after clicking on the "Transactions" option.

We click on the "Transaction list" option.



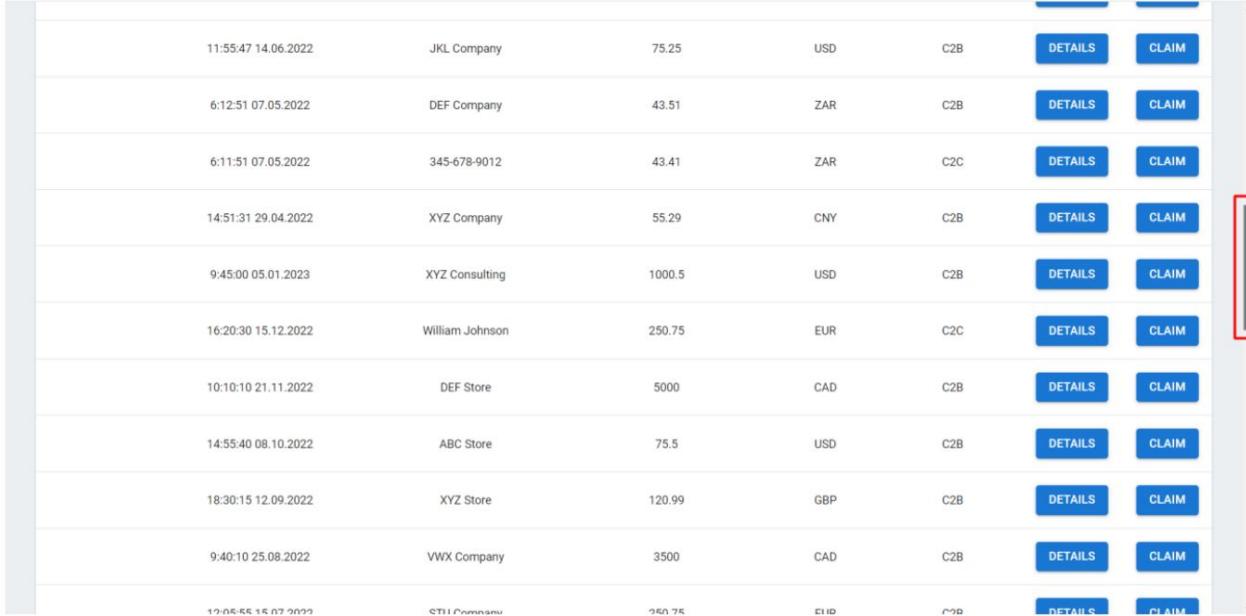
**Figure 3:** Second step to access the list of transactions.

TRANSACTIONS LIST							MY CLAIMS
Group by	Date ↓	Recipient ↑	Amount ↑	Currency ↑	Type ↑		
None	Start <input type="button" value="calendar icon"/> End <input type="button" value="calendar icon"/>	<input type="text"/>	Min <input type="button"/>	Max <input type="button"/>	None <input type="button"/>	None <input type="button"/>	<input type="button" value="FILTER"/> <input type="button" value="RESTART"/>
14:10:55 05.12.2022		XYZ Company	200.5	USD	C2B	<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>
18:22:10 28.11.2022		DEF Company	150.75	GBP	C2B	<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>
9:30:40 15.10.2022		GHI Company	75.99	EUR	C2B	<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>
15:20:30 10.10.2022		Sophia Davis	50	CAD	C2C	<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>
16:45:20 25.09.2022		PQR Company	500.25	CAD	C2B	<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>

**Figure 4:** Display of the transaction list after clicking on the "Transaction list" option.

## Automatic filling of the list

The owner of the software requested that it be possible to move through the list in such a way that when scrolling the list is automatically filled with transactions.



A screenshot of a web-based application showing a list of transactions. The list consists of 12 rows, each containing a timestamp, company name, amount, currency, category, and two blue buttons labeled 'DETAILS' and 'CLAIM'. A vertical scroll bar is visible on the right side of the list area. A red rectangular box highlights the scroll bar, indicating its presence even when the list is fully visible.

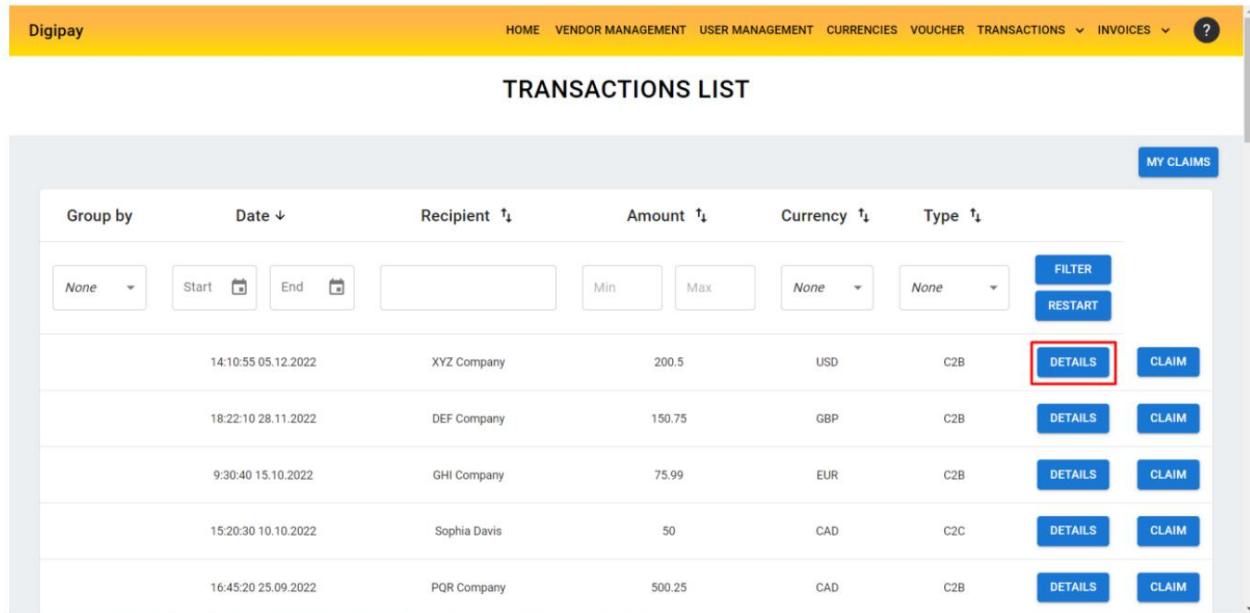
11:55:47 14.06.2022	JKL Company	75.25	USD	C2B	<a href="#">DETAILS</a>	<a href="#">CLAIM</a>
6:12:51 07.05.2022	DEF Company	43.51	ZAR	C2B	<a href="#">DETAILS</a>	<a href="#">CLAIM</a>
6:11:51 07.05.2022	345-678-9012	43.41	ZAR	C2C	<a href="#">DETAILS</a>	<a href="#">CLAIM</a>
14:51:31 29.04.2022	XYZ Company	55.29	CNY	C2B	<a href="#">DETAILS</a>	<a href="#">CLAIM</a>
9:45:00 05.01.2023	XYZ Consulting	1000.5	USD	C2B	<a href="#">DETAILS</a>	<a href="#">CLAIM</a>
16:20:30 15.12.2022	William Johnson	250.75	EUR	C2C	<a href="#">DETAILS</a>	<a href="#">CLAIM</a>
10:10:10 21.11.2022	DEF Store	5000	CAD	C2B	<a href="#">DETAILS</a>	<a href="#">CLAIM</a>
14:55:40 08.10.2022	ABC Store	75.5	USD	C2B	<a href="#">DETAILS</a>	<a href="#">CLAIM</a>
18:30:15 12.09.2022	XYZ Store	120.99	GBP	C2B	<a href="#">DETAILS</a>	<a href="#">CLAIM</a>
9:40:10 25.08.2022	VWX Company	3500	CAD	C2B	<a href="#">DETAILS</a>	<a href="#">CLAIM</a>
19:04:55 16.07.2022	STU Company	250.75	CAD	C2B	<a href="#">DETAILS</a>	<a href="#">CLAIM</a>

Figure 5: Display of automatic filling of lists with transactions.

## View transaction details

If you want to see the details of a transaction, you need to do the steps from chapter 1 and then the steps that we will show below.

Select the desired transaction and click on the button called "Details".

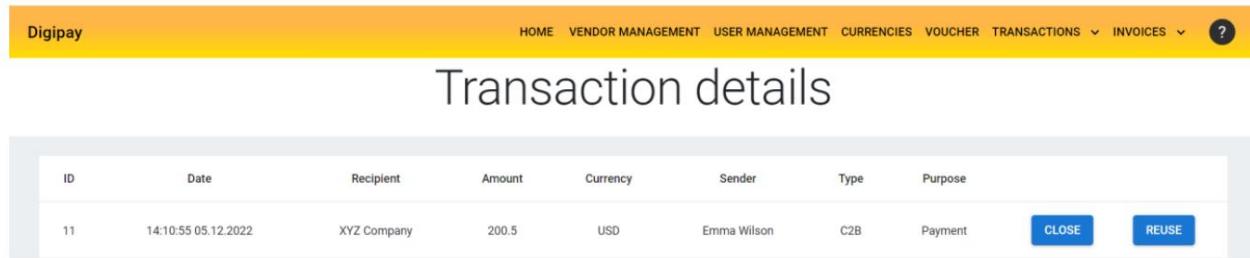


The screenshot shows the 'TRANSACTIONS LIST' page of the Digipay application. At the top, there is a navigation bar with links: HOME, VENDOR MANAGEMENT, USER MANAGEMENT, CURRENCIES, VOUCHER, TRANSACTIONS, and INVOICES. Below the navigation bar is a search/filter section with fields for Group by, Date, Recipient, Amount, Currency, Type, and buttons for FILTER and RESTART. The main area displays a table of transactions with the following data:

Date	Recipient	Amount	Currency	Type	Actions
14:10:55 05.12.2022	XYZ Company	200.5	USD	C2B	<b>DETAILS</b> (button highlighted with a red box)
18:22:10 28.11.2022	DEF Company	150.75	GBP	C2B	DETAILS CLAIM
9:30:40 15.10.2022	GHI Company	75.99	EUR	C2B	DETAILS CLAIM
15:20:30 10.10.2022	Sophia Davis	50	CAD	C2C	DETAILS CLAIM
16:45:20 25.09.2022	PQR Company	500.25	CAD	C2B	DETAILS CLAIM

**Figure 6:** Step leading to view transaction details.

After the given step, the application displays the details of the selected transaction.

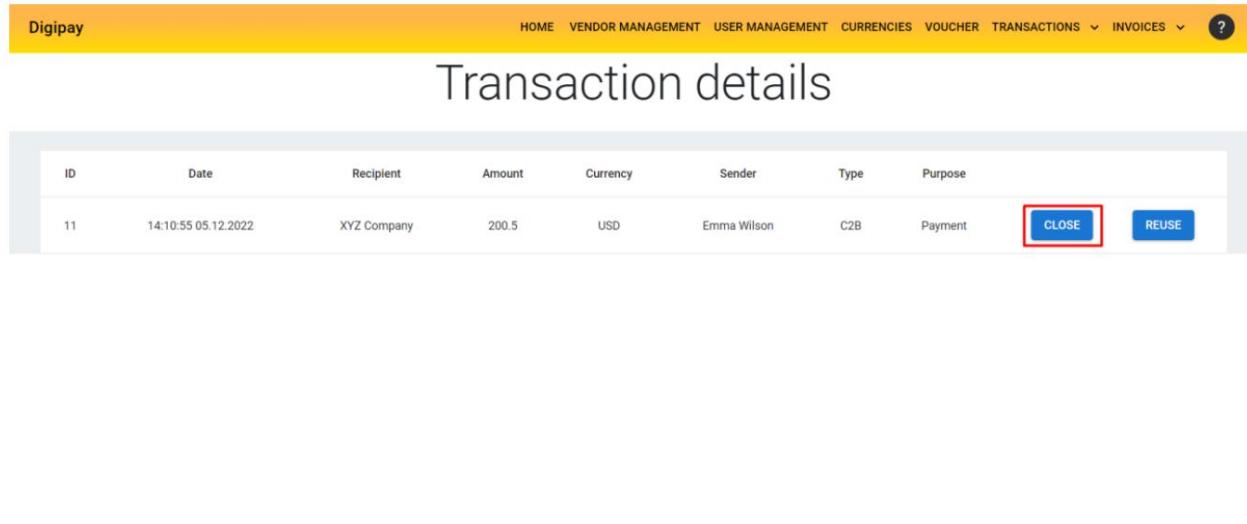


The screenshot shows the 'Transaction details' page of the Digipay application. At the top, there is a navigation bar with links: HOME, VENDOR MANAGEMENT, USER MANAGEMENT, CURRENCIES, VOUCHER, TRANSACTIONS, and INVOICES. The main area displays a table with the following data:

ID	Date	Recipient	Amount	Currency	Sender	Type	Purpose	Actions
11	14:10:55 05.12.2022	XYZ Company	200.5	USD	Emma Wilson	C2B	Payment	CLOSE REUSE

**Figure 7:** Display of details for the selected transaction.

If the user wants to return to the list of transactions, he must click on the button called "Close".



**Figure 8:** Returning from the transaction details back to the transaction list.

## Transaction filtering

The owner of the software requested to be able to filter transactions by the following criteria:

- ÿ datum,
- ÿ recipient,
- ÿ amount,
- ÿ currency,
- ÿ sender
- ÿ transaction type,
- ÿ the purpose of the transaction.

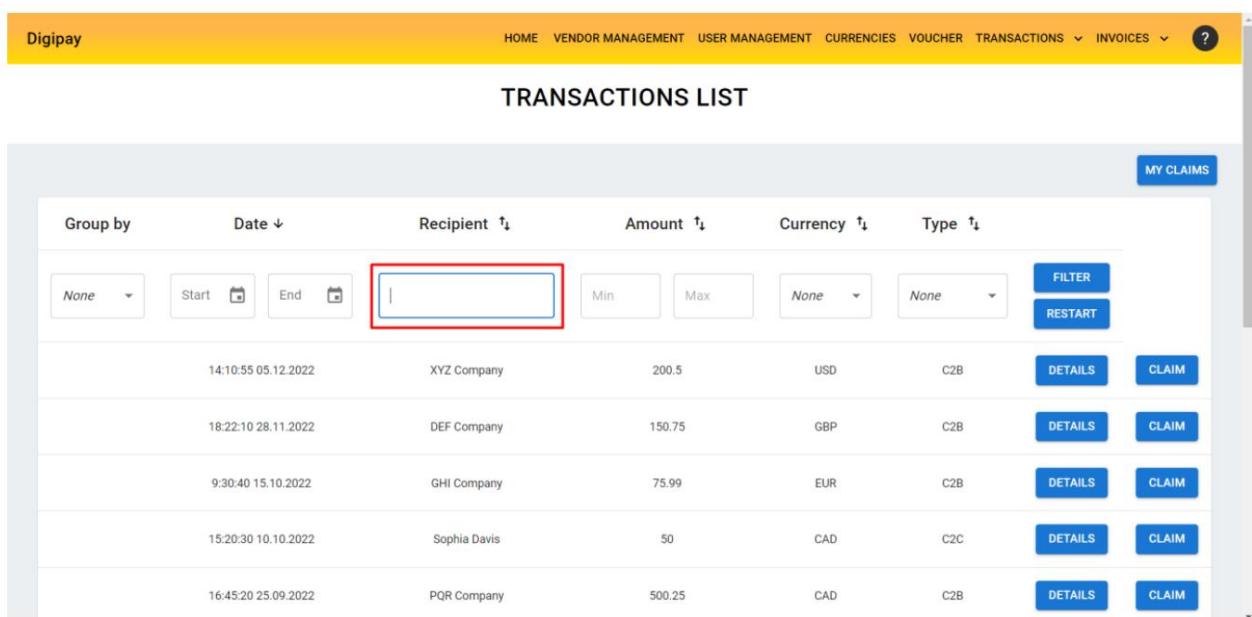
In this tutorial, uniform and combined filtering will be demonstrated.

Before starting the filtering, it is necessary to perform the steps from chapter 1.

## Uniform filtering

Filtering by recipient is taken for demonstration.

Click on the text input field located under the name of the column "Recipient", i.e. the second row and third column of the table.



The screenshot shows the 'TRANSACTIONS LIST' page from the Digipay platform. At the top, there is a yellow header bar with the 'Digipay' logo and navigation links for HOME, VENDOR MANAGEMENT, USER MANAGEMENT, CURRENCIES, VOUCHER, TRANSACTIONS, and INVOICES. Below the header, the title 'TRANSACTIONS LIST' is centered. The main area contains a table of transaction data with columns: Group by, Date, Recipient, Amount, Currency, and Type. Above the table, there is a filter section with dropdowns for 'Group by', 'Date', 'Recipient' (which has a red box around it), 'Amount', 'Currency', and 'Type'. There are also 'FILTER' and 'RESTART' buttons. The table lists five transactions:

	Date	Recipient	Amount	Currency	Type	DETAILS	CLAIM
	14:10:55 05.12.2022	XYZ Company	200.5	USD	C2B	<button>DETAILS</button>	<button>CLAIM</button>
	18:22:10 28.11.2022	DEF Company	150.75	GBP	C2B	<button>DETAILS</button>	<button>CLAIM</button>
	9:30:40 15.10.2022	GHI Company	75.99	EUR	C2B	<button>DETAILS</button>	<button>CLAIM</button>
	15:20:30 10.10.2022	Sophia Davis	50	CAD	C2C	<button>DETAILS</button>	<button>CLAIM</button>
	16:45:20 25.09.2022	PQR Company	500.25	CAD	C2B	<button>DETAILS</button>	<button>CLAIM</button>

**Figure 9:** The first step towards filtering transactions.

Enter the name of the recipient for whom you want to see the given transactions.

The screenshot shows the 'TRANSACTIONS LIST' page. At the top, there are navigation links: HOME, VENDOR MANAGEMENT, USER MANAGEMENT, CURRENCIES, VOUCHER, TRANSACTIONS, and INVOICES. Below the navigation is a search bar with the placeholder 'XYZ Company'. To the right of the search bar are buttons for 'FILTER' and 'RESTART'. The main area displays a table of transactions with columns: Date, Recipient, Amount, Currency, Type, and two action buttons (DETAILS and CLAIM) for each row. The transactions listed are:

Date	Recipient	Amount	Currency	Type	DETAILS	CLAIM
14:10:55 05.12.2022	XYZ Company	200.5	USD	C2B	<button>DETAILS</button>	<button>CLAIM</button>
18:22:10 28.11.2022	DEF Company	150.75	GBP	C2B	<button>DETAILS</button>	<button>CLAIM</button>
9:30:40 15.10.2022	GHI Company	75.99	EUR	C2B	<button>DETAILS</button>	<button>CLAIM</button>
15:20:30 10.10.2022	Sophia Davis	50	CAD	C2C	<button>DETAILS</button>	<button>CLAIM</button>
16:45:20 25.09.2022	PQR Company	500.25	CAD	C2B	<button>DETAILS</button>	<button>CLAIM</button>

**Figure 10:** The second step towards filtering transactions.

After entering the name of the recipient, click on the button called “Filter”

The screenshot shows the 'TRANSACTIONS LIST' page after the 'FILTER' button has been clicked. The 'Recipient' search input field still contains 'XYZ Company'. The 'FILTER' button is now highlighted in blue, while the 'RESTART' button is in its original state. The transaction table remains the same as in Figure 10.

**Figure 11:** The third step to filtering transactions.

After the given steps, the filtered transactions are displayed and this can be seen in Figure 12.

The screenshot shows the 'TRANSACTIONS LIST' page of the Digipay application. At the top, there is a yellow header bar with the 'Digipay' logo and navigation links for HOME, VENDOR MANAGEMENT, USER MANAGEMENT, CURRENCIES, VOUCHER, TRANSACTIONS, and INVOICES. A question mark icon is also present in the top right corner.

The main area is titled 'TRANSACTIONS LIST'. It features a table with the following columns: Group by, Date, Recipient, Amount, Currency, and Type. The 'Recipient' column is currently sorted by name. Below the table are several filter buttons: 'Group by' (None), 'Date' (Start and End date pickers), 'Recipient' (input field containing 'XYZ Company'), 'Amount' (Min and Max input fields), 'Currency' (None), and 'Type' (None). There are also 'FILTER' and 'RESTART' buttons. The table displays three transaction rows:

	Date	Recipient	Amount	Currency	Type	DETAILS	CLAIM
	14:10:55 05.12.2022	XYZ Company	200.5	USD	C2B	<button>DETAILS</button>	<button>CLAIM</button>
	14:10:55 05.09.2022	XYZ Company	200.5	USD	C2B	<button>DETAILS</button>	<button>CLAIM</button>
	14:51:31 29.04.2022	XYZ Company	55.29	CNY	C2B	<button>DETAILS</button>	<button>CLAIM</button>

**Figure 12:** Filtered transactions by recipient.

## Combined filtering

For the demonstration, filtering by recipient and amount was taken (it is possible to take more criteria).

Click on the text input field located under the name of the column "Recipient", i.e. the second row and third column of the table.

The screenshot shows the 'TRANSACTIONS LIST' page. At the top, there are navigation links: HOME, VENDOR MANAGEMENT, USER MANAGEMENT, CURRENCIES, VOUCHER, TRANSACTIONS, and INVOICES. A 'MY CLAIMS' button is also present. Below the header, there is a search bar with a placeholder 'Recipient'. To the right of the search bar are dropdowns for 'Group by', 'Date', 'Amount', 'Currency', and 'Type', each with a 'None' option. There are also 'MIN' and 'MAX' buttons. On the far right of the search bar are 'FILTER' and 'RESTART' buttons. The main area displays a table of transactions with columns: Date, Recipient, Amount, Currency, Type, and two buttons per row: 'DETAILS' and 'CLAIM'. The first transaction in the list is for 'XYZ Company'.

Date	Recipient	Amount	Currency	Type	DETAILS	CLAIM
14:10:55 05.12.2022	XYZ Company	200.5	USD	C2B	<button>DETAILS</button>	<button>CLAIM</button>
18:22:10 28.11.2022	DEF Company	150.75	GBP	C2B	<button>DETAILS</button>	<button>CLAIM</button>
9:30:40 15.10.2022	GHI Company	75.99	EUR	C2B	<button>DETAILS</button>	<button>CLAIM</button>
15:20:30 10.10.2022	Sophia Davis	50	CAD	C2C	<button>DETAILS</button>	<button>CLAIM</button>
16:45:20 25.09.2022	PQR Company	500.25	CAD	C2B	<button>DETAILS</button>	<button>CLAIM</button>

Figure 13: The first step towards filtering transactions.

Enter the name of the recipient for whom you want to see the given transactions.

This screenshot shows the same 'TRANSACTIONS LIST' page as Figure 13, but with the 'Recipient' search field populated with 'XYZ Company'. The rest of the interface and data table remain identical to Figure 13.

Date	Recipient	Amount	Currency	Type	DETAILS	CLAIM
14:10:55 05.12.2022	XYZ Company	200.5	USD	C2B	<button>DETAILS</button>	<button>CLAIM</button>
18:22:10 28.11.2022	DEF Company	150.75	GBP	C2B	<button>DETAILS</button>	<button>CLAIM</button>
9:30:40 15.10.2022	GHI Company	75.99	EUR	C2B	<button>DETAILS</button>	<button>CLAIM</button>
15:20:30 10.10.2022	Sophia Davis	50	CAD	C2C	<button>DETAILS</button>	<button>CLAIM</button>
16:45:20 25.09.2022	PQR Company	500.25	CAD	C2B	<button>DETAILS</button>	<button>CLAIM</button>

Figure 14: The second step towards filtering transactions.

STEP 3: Enter the minimum and maximum value for the transaction amount.

**TRANSACTIONS LIST**

Group by	Date ↓	Recipient ↑	Amount ↑	Currency ↑	Type ↑	MY CLAIMS	
<input type="button" value="None"/>	<input type="button" value="Start"/> <input type="button" value="End"/>	XYZ Company	100 <input type="text" value="250"/>	<input type="button" value="None"/>	<input type="button" value="None"/>	<input type="button" value="FILTER"/>	<input type="button" value="RESTART"/>
						<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>
	14:10:55 05.12.2022	XYZ Company	200.5	USD	C2B	<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>
	18:22:10 28.11.2022	DEF Company	150.75	GBP	C2B	<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>
	9:30:40 15.10.2022	GHI Company	75.99	EUR	C2B	<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>
	15:20:30 10.10.2022	Sophia Davis	50	CAD	C2C	<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>
	16:45:20 25.09.2022	PQR Company	500.25	CAD	C2B	<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>

**Figure 15:** The third step to filtering transactions.

Click on the button called "Filter".

**TRANSACTIONS LIST**

Group by	Date ↓	Recipient ↑	Amount ↑	Currency ↑	Type ↑	MY CLAIMS	
<input type="button" value="None"/>	<input type="button" value="Start"/> <input type="button" value="End"/>	XYZ Company	Min <input type="text" value="100"/> Max <input type="text" value="250"/>	<input type="button" value="None"/>	<input type="button" value="None"/>	<input type="button" value="FILTER"/>	<input type="button" value="RESTART"/>
						<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>
	14:10:55 05.12.2022	XYZ Company	200.5	USD	C2B	<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>
	18:22:10 28.11.2022	DEF Company	150.75	GBP	C2B	<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>
	9:30:40 15.10.2022	GHI Company	75.99	EUR	C2B	<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>
	15:20:30 10.10.2022	Sophia Davis	50	CAD	C2C	<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>
	16:45:20 25.09.2022	PQR Company	500.25	CAD	C2B	<input type="button" value="DETAILS"/>	<input type="button" value="CLAIM"/>

**Figure 16:** The fourth step to filtering transactions

After the given steps, the filtered transactions are displayed and this can be seen in Figure 17.

The screenshot shows the 'TRANSACTIONS LIST' page from the Digipay application. At the top, there is a navigation bar with links: HOME, VENDOR MANAGEMENT, USER MANAGEMENT, CURRENCIES, VOUCHER, TRANSACTIONS, and INVOICES. Below the navigation bar is a search/filter section with the following fields:

- Group by:** None
- Date:** Start: 05.12.2022, End: 05.09.2022
- Recipient:** XYZ Company
- Amount:** 100 to 250
- Currency:** None
- Type:** None

Below the filter section, two transaction records are listed:

Date	Recipient	Amount	Currency	Type	Details	Claim
14:10:55 05.12.2022	XYZ Company	200.5	USD	C2B	DETAILS	CLAIM
14:10:55 05.09.2022	XYZ Company	200.5	USD	C2B	DETAILS	CLAIM

At the top right of the page, there is a 'MY CLAIMS' button.

**Figure 17:** Filtered transactions by recipient and amount.

To reset the filtering and display the default transactions, click on the button called "Restart".

This screenshot is identical to Figure 17, showing the 'TRANSACTIONS LIST' page with the same filtered results. However, the 'RESTART' button in the filter section is highlighted with a red box to indicate it has been clicked.

**Figure 18:** Restarting transaction filtering.

After clicking on the "Restart" button, the application looks like in Figure 19.

The screenshot shows the 'TRANSACTIONS LIST' page on the Digipay platform. At the top, there is a yellow header bar with the 'Digipay' logo and navigation links for HOME, VENDOR MANAGEMENT, USER MANAGEMENT, CURRENCIES, VOUCHER, TRANSACTIONS, and INVOICES. A question mark icon is also present in the top right corner.

The main area is titled 'TRANSACTIONS LIST' and contains a table with the following columns: Group by, Date ↓, Recipient ↑, Amount ↑, Currency ↑, Type ↑, and two buttons on the far right: 'MY CLAIMS' and 'FILTER'. Below these are two additional buttons: 'RESTART' and 'DETAILS'.

The table lists five transactions:

Group by	Date ↓	Recipient ↑	Amount ↑	Currency ↑	Type ↑	Actions
None	Start <input type="button" value="calendar icon"/> End <input type="button" value="calendar icon"/>	XYZ Company	200.5	USD	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
		DEF Company	150.75	GBP	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
		GHI Company	75.99	EUR	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
		Sophia Davis	50	CAD	C2C	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
		PQR Company	500.25	CAD	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>

**Figure 19:** Display of transactions after clicking on the "Restart" button.

# Sort transactions

The software owner requested to be able to sort transactions by the following criteria:

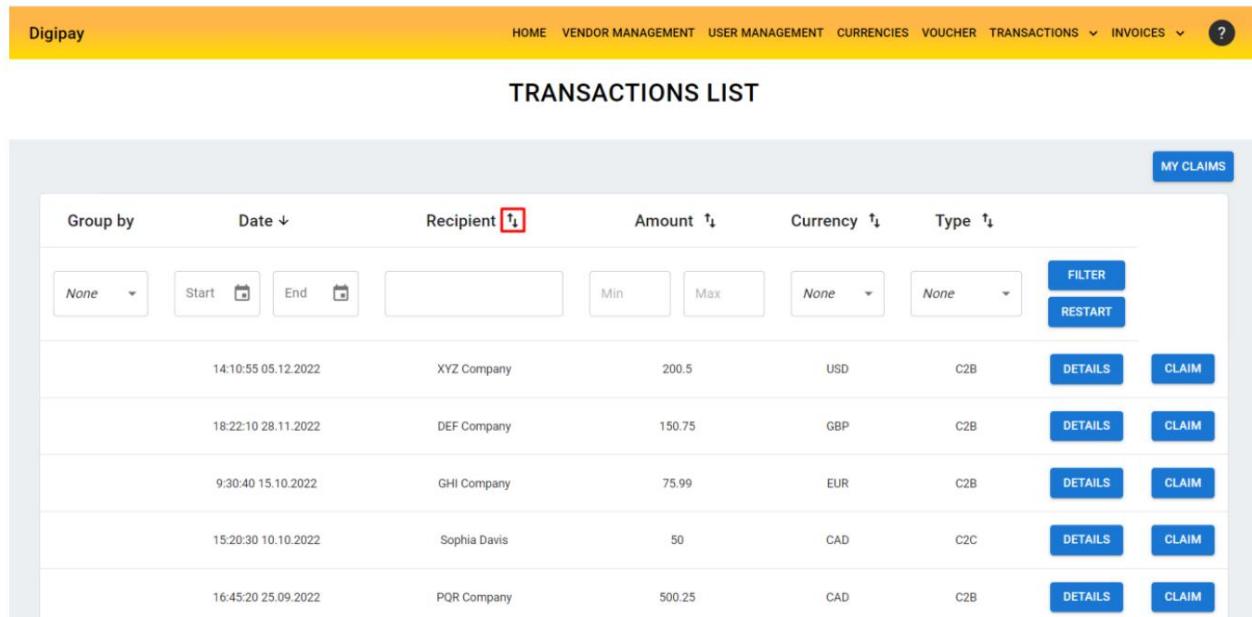
- þ datum,
- þ recipient,
- þ amount,
- þ currency,
- þ sender
- þ transaction type,
- þ the purpose of the transaction.

In this guide, sorting in descending and ascending order according to one criterion (e.g. recipient) will be shown - the same applies to the others.

Before starting the sorting, it is necessary to perform the steps from chapter 1.

## Sorting in ascending order

We click on the icon marked with a red rectangle in Figure 20.



The screenshot shows the 'TRANSACTIONS LIST' page of the Digipay application. At the top, there is a navigation bar with links: HOME, VENDOR MANAGEMENT, USER MANAGEMENT, CURRENCIES, VOUCHER, TRANSACTIONS, and INVOICES. A red rectangle highlights the 'Recipient' column header, which has a downward-pointing arrow indicating it can be sorted. Below the header is a search and filter section with dropdowns for 'Group by', date range ('Start' and 'End'), and dropdowns for 'Min' and 'Max' values, 'Currency', and 'Type'. There are also 'FILTER' and 'RESTART' buttons. The main area displays a table of transactions with the following data:

Date	Recipient	Amount	Currency	Type	Actions
14:10:55 05.12.2022	XYZ Company	200.5	USD	C2B	<b>DETAILS</b> <b>CLAIM</b>
18:22:10 28.11.2022	DEF Company	150.75	GBP	C2B	<b>DETAILS</b> <b>CLAIM</b>
9:30:40 15.10.2022	GHI Company	75.99	EUR	C2B	<b>DETAILS</b> <b>CLAIM</b>
15:20:30 10.10.2022	Sophia Davis	50	CAD	C2C	<b>DETAILS</b> <b>CLAIM</b>
16:45:20 25.09.2022	PQR Company	500.25	CAD	C2B	<b>DETAILS</b> <b>CLAIM</b>

**Figure 20:** Step to sort transactions in ascending order by recipient.

The appearance of the application, i.e. the list of transactions after sorting in ascending order by recipient, can be seen in Figure 21.

The screenshot shows the 'TRANSACTIONS LIST' page of the Digipay application. At the top, there is a navigation bar with links: HOME, VENDOR MANAGEMENT, USER MANAGEMENT, CURRENCIES, VOUCHER, TRANSACTIONS ▾, INVOICES ▾, and a help icon. Below the navigation bar is a search bar labeled 'TRANSACTIONS LIST'. The main area contains a table with the following columns: Group by, Date ↑, Recipient ↓, Amount ↑, Currency ↑, and Type ↑. The table displays five transaction records:

Group by	Date ↑	Recipient ↓	Amount ↑	Currency ↑	Type ↑	MY CLAIMS
<input type="button" value="None"/>	<input type="button" value="Start"/>	<input type="button" value="End"/>	<input type="text"/>	<input type="button" value="Min"/>	<input type="button" value="Max"/>	<input type="button" value="None"/>
	14:30:45 18.02.2023	ABC Consulting	500.25	GBP	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
	9:10:30 30.07.2026	ABC Corporation	2000.7	JPY	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
	11:05:40 20.01.2026	ABC Corporation	1500.3	JPY	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
	14:30:10 12.10.2023	ABC Corporation	200.25	JPY	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
	14:45:00 05.04.2023	ABC Corporation	750.25	EUR	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>

**Figure 21:** Sorted transactions in ascending order by recipient.



## Sorting in descending order

We click on the icon marked with a red rectangle in Figure 22. Note: Prior to this, the transactions must be sorted in ascending order.

**Digipay**

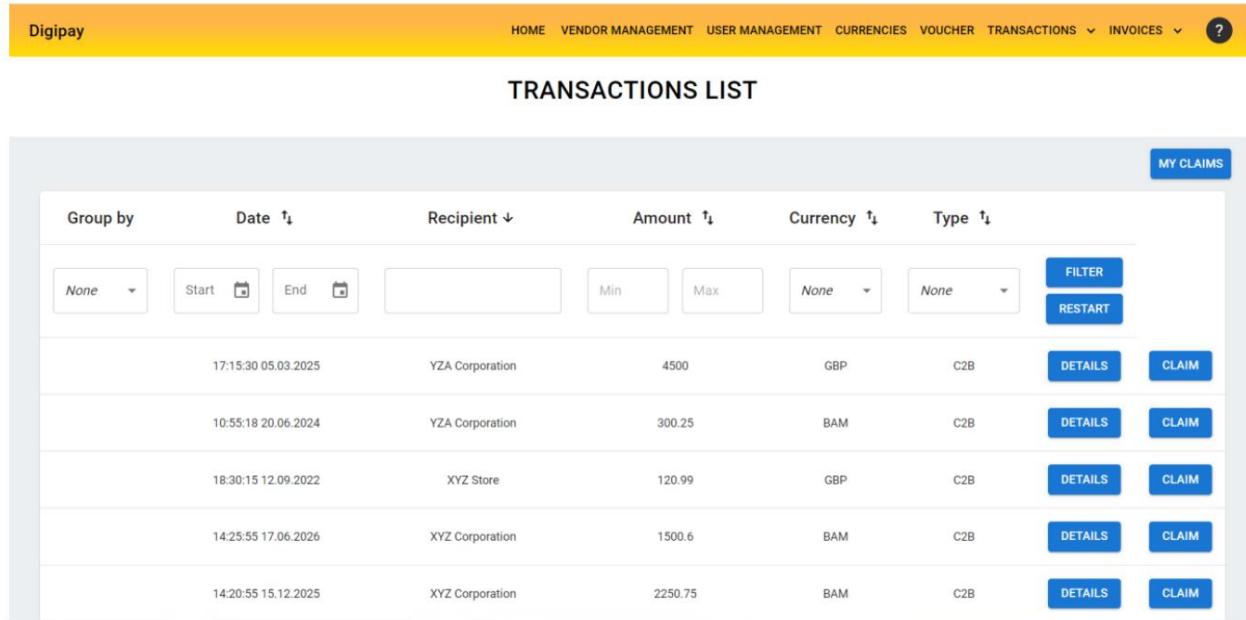
HOME VENDOR MANAGEMENT USER MANAGEMENT CURRENCIES VOUCHER TRANSACTIONS ▾ INVOICES ▾ ?

### TRANSACTIONS LIST

Group by	Date ↑	Recipient ↓	Amount ↑	Currency ↑	Type ↑	MY CLAIMS
<input type="button" value="None"/>	<input type="button" value="Start"/> <input type="button" value="End"/>	<input type="text"/>	<input type="button" value="Min"/> <input type="button" value="Max"/>	<input type="button" value="None"/>	<input type="button" value="None"/>	<input type="button" value="FILTER"/> <input type="button" value="RESTART"/>
14:30:45 18.02.2023		ABC Consulting	500.25	GBP	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
9:10:30 30.07.2026		ABC Corporation	2000.7	JPY	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
11:05:40 20.01.2026		ABC Corporation	1500.3	JPY	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
14:30:10 12.10.2023		ABC Corporation	200.25	JPY	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
14:45:00 05.04.2023		ABC Corporation	750.25	EUR	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>

**Figure 22:** Step to sort transactions in descending order by recipient.

The layout of the application, i.e. the list of transactions after sorting in descending order by recipient, can be seen in Figure 23.

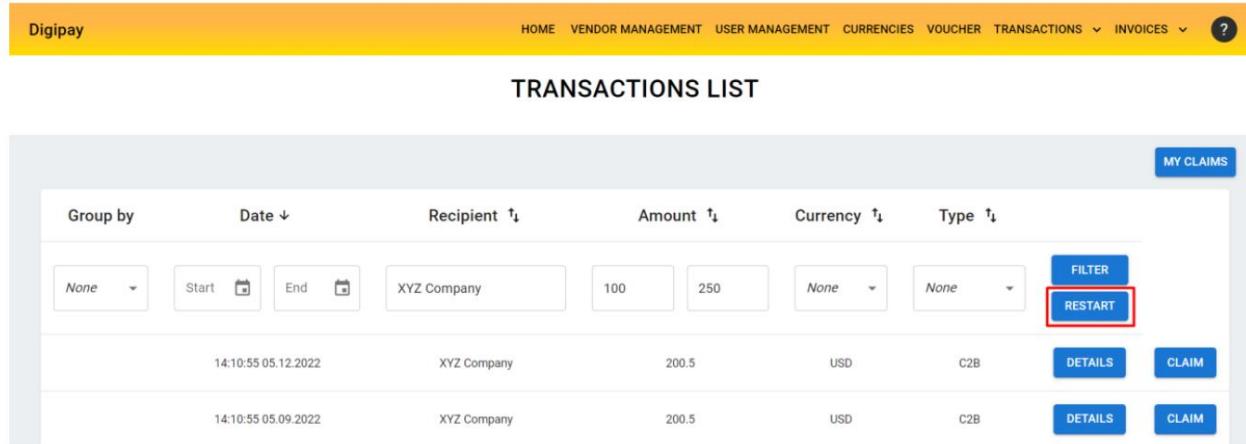


The screenshot shows the 'TRANSACTIONS LIST' page of the Digipay application. At the top, there is a navigation bar with links: HOME, VENDOR MANAGEMENT, USER MANAGEMENT, CURRENCIES, VOUCHER, TRANSACTIONS ▾, and INVOICES ▾. On the far right of the header is a question mark icon. Below the header, the title 'TRANSACTIONS LIST' is centered. In the top right corner of the main content area, there is a blue button labeled 'MY CLAIMS'. The main content area contains a table with the following columns: Group by, Date ↑, Recipient ↓, Amount ↑, Currency ↑, and Type ↑. There are dropdown menus for 'Group by' (None), date range ('Start' and 'End' with calendar icons), and currency ('Min' and 'Max'). To the right of these controls are 'FILTER' and 'RESTART' buttons. The table lists five transactions:

	Date ↑	Recipient ↓	Amount ↑	Currency ↑	Type ↑	DETAILS	CLAIM
	17:15:30 05.03.2025	YZA Corporation	4500	GBP	C2B	<button>DETAILS</button>	<button>CLAIM</button>
	10:55:18 20.06.2024	YZA Corporation	300.25	BAM	C2B	<button>DETAILS</button>	<button>CLAIM</button>
	18:30:15 12.09.2022	XYZ Store	120.99	GBP	C2B	<button>DETAILS</button>	<button>CLAIM</button>
	14:25:55 17.06.2026	XYZ Corporation	1500.6	BAM	C2B	<button>DETAILS</button>	<button>CLAIM</button>
	14:20:55 15.12.2025	XYZ Corporation	2250.75	BAM	C2B	<button>DETAILS</button>	<button>CLAIM</button>

**Figure 23:** Sorted transactions in ascending order by recipient.

To reset the sorting and display the default transactions, click on the button called "Restart".



The screenshot shows the 'TRANSACTIONS LIST' page of the Digipay application. The layout is identical to Figure 23, with the same navigation bar, title, and 'MY CLAIMS' button. The table also shows the same five transactions. However, the 'RESTART' button in the filtering section is now highlighted with a red box. The filtering section includes dropdowns for 'Group by' (None), date range ('Start' and 'End' with calendar icons), amount ('100' and '250'), and currency ('None').

	Date ↓	Recipient ↑	Amount ↑	Currency ↑	Type ↑	DETAILS	CLAIM
	14:10:55 05.12.2022	XYZ Company	200.5	USD	C2B	<button>DETAILS</button>	<button>CLAIM</button>
	14:10:55 05.09.2022	XYZ Company	200.5	USD	C2B	<button>DETAILS</button>	<button>CLAIM</button>

**Figure 24:** Restarting sorted transactions.

After clicking on the "Restart" button, the application looks like in Figure 24.

The screenshot shows the 'TRANSACTIONS LIST' page on the Digipay platform. At the top, there is a yellow header bar with the 'Digipay' logo and navigation links for HOME, VENDOR MANAGEMENT, USER MANAGEMENT, CURRENCIES, VOUCHER, TRANSACTIONS, and INVOICES. A question mark icon is also present. Below the header is a search bar with placeholder text 'Search' and a magnifying glass icon. The main area is titled 'TRANSACTIONS LIST'. It features a table with columns: Group by, Date (sorted by descending date), Recipient, Amount, Currency, Type, and two buttons per row: 'DETAILS' and 'CLAIM'. The table contains five rows of transaction data:

Group by	Date ↓	Recipient	Amount	Currency	Type	DETAILS	CLAIM
None	Start: [date] End: [date]	XYZ Company	200.5	USD	C2B	<button>DETAILS</button>	<button>CLAIM</button>
	14:10:55 05.12.2022	DEF Company	150.75	GBP	C2B	<button>DETAILS</button>	<button>CLAIM</button>
	18:22:10 28.11.2022	GHI Company	75.99	EUR	C2B	<button>DETAILS</button>	<button>CLAIM</button>
	9:30:40 15.10.2022	Sophia Davis	50	CAD	C2C	<button>DETAILS</button>	<button>CLAIM</button>
	15:20:30 10.10.2022	PQR Company	500.25	CAD	C2B	<button>DETAILS</button>	<button>CLAIM</button>
	16:45:20 25.09.2022						

**Figure 25:** Display of transactions after clicking on the "Restart" button.

## Creating a new transaction based on an old transaction (using a transaction template)

To create a new transaction based on an old one, you first need to follow the steps in chapter 3 and then do the following steps:

Click on the button called “Reuse”.

The screenshot shows the 'Transaction details' page on the Digipay platform. At the top, there is a yellow header bar with the 'Digipay' logo and navigation links for HOME, VENDOR MANAGEMENT, USER MANAGEMENT, CURRENCIES, VOUCHER, TRANSACTIONS, and INVOICES. A question mark icon is also present. The main area is titled 'Transaction details'. It features a table with columns: ID, Date, Recipient, Amount, Currency, Sender, Type, and Purpose. The table contains one row of transaction data. At the bottom right of the table, there are two buttons: 'CLOSE' and 'REUSE', with the 'REUSE' button being highlighted by a red box.

ID	Date	Recipient	Amount	Currency	Sender	Type	Purpose
56	17:15:30 05.03.2025	YZA Corporation	4500	GBP	Sophia Brown	C2B	Recip

**Figure 26:** Step to create a new transaction based on the old one.

After clicking on the button called "Reuse", the application will show you a new window where you will see a form containing data for the transaction. Of course, since it is an option to create a new transaction based on an old one, certain data will be automatically filled in for the given form.

The screenshot shows the 'New Transaction' form in the Digipay application. The form is titled 'New Transaction' and contains the following fields:

- Transaction amount: 4500
- Purpose: Recip
- Type: C2B
- Currency: (dropdown menu)
- Sender account number: (dropdown menu)
- Recipient name\*: YZA Corporation
- Recipient account number\*: 1234567892345678
- Category: (dropdown menu)

A blue back arrow button is located on the left side of the form.

**Figure 27:** Form where data is automatically filled in when creating a transaction.

## Grouping of transactions

The software owner allowed the development team to decide what to group the transactions by. The developer team decided to group transactions by transaction type and currency.

## Grouping of transactions by type

Click on the option marked with a red rectangle in Figure 28.

The screenshot shows the 'TRANSACTIONS LIST' page. At the top, there is a navigation bar with links: HOME, VENDOR MANAGEMENT, USER MANAGEMENT, CURRENCIES, VOUCHER, TRANSACTIONS, and INVOICES. Below the navigation bar is a search bar with fields for Group by, Date, Recipient, Amount, Currency, and Type. The 'Group by' dropdown is open, showing options: None, Currency, and Type. The 'Type' option is highlighted with a red rectangle. The main area displays a list of transactions with columns for Date, Recipient, Amount, Currency, and Type, along with 'DETAILS' and 'CLAIM' buttons. The first transaction is from Wilson's Electronics.

Date	Recipient	Amount	Currency	Type	Actions
16:55:40 08.06.2028	Wilson's Electronics	2000.45	JPY	C2B	<button>DETAILS</button> <button>CLAIM</button>
14:20:15 05.12.2026	Walker's Bookstore	800.4	BAM	C2B	<button>DETAILS</button> <button>CLAIM</button>
14:25:55 17.06.2026	XYZ Corporation	1500.6	BAM	C2B	<button>DETAILS</button> <button>CLAIM</button>
14:20:55 15.12.2025	XYZ Corporation	2250.75	BAM	C2B	<button>DETAILS</button> <button>CLAIM</button>
17:15:30 05.03.2025	YZA Corporation	4500	GBP	C2B	<button>DETAILS</button> <button>CLAIM</button>

**Figure 28:** The first step towards grouping transactions.

Click on the "Type" option marked with a red rectangle in Figure 29.

This screenshot shows the same 'TRANSACTIONS LIST' page as Figure 28, but with a different state of the 'Group by' dropdown. The 'Type' option is now selected and highlighted with a red rectangle. The rest of the interface and data table are identical to Figure 28.

Date	Recipient	Amount	Currency	Type	Actions
14:10:55 05.12.2022	XYZ Company	200.5	USD	C2B	<button>DETAILS</button> <button>CLAIM</button>
18:22:10 28.11.2022	DEF Company	150.75	GBP	C2B	<button>DETAILS</button> <button>CLAIM</button>
9:30:40 15.10.2022	GHI Company	75.99	EUR	C2B	<button>DETAILS</button> <button>CLAIM</button>
15:20:30 10.10.2022	Sophia Davis	50	CAD	C2C	<button>DETAILS</button> <button>CLAIM</button>
16:45:20 25.09.2022	PQR Company	500.25	CAD	C2B	<button>DETAILS</button> <button>CLAIM</button>

**Figure 29:** The second step towards grouping transactions.

After clicking on "Type", the application performs the grouping of transactions by type and this is shown in Figure 30.

The screenshot shows the 'TRANSACTIONS LIST' page from the Digipay application. At the top, there is a navigation bar with links: HOME, VENDOR MANAGEMENT, CURRENCIES, REDEEM VOUCHER, TRANSACTIONS, and INVOICES. Below the navigation bar is a search and filter section titled 'TRANSACTIONS LIST'. The 'Group by' dropdown is set to 'Type'. Other filter options include 'Date', 'Recipient', 'Amount', 'Currency', and 'Type'. The results are grouped by currency: C2C, B2B, and C2B. Each group shows the total amount and count of transactions. A red rectangle highlights the downward arrow next to the 'Count: 6' for the C2C group.

Currency	Amount	Count
C2C	1272.22	6
B2B	206.62	2
C2B	77333.6499999998	92

**Figure 30:** Display of grouped transactions by type.

You can also see which transactions are in a given group by clicking on the option marked with a red rectangle in Figure 31.

This screenshot is identical to Figure 30, showing the 'TRANSACTIONS LIST' page with grouped transactions by type. A red rectangle highlights the downward arrow next to the 'Count: 6' for the C2C group, indicating where users can click to view individual transactions within that group.

**Figure 31:** Clicking on the reverse arrow to display the transactions in the group.

After executing the above, we get a list of transactions and it can be seen in Figure 32.

Group by	Date ↓	Recipient ↑	Amount ↑	Currency ↑	Type ↑	
Type	Start <input type="button" value=""/>	End <input type="button" value=""/>	<input type="text"/>	Min <input type="button" value=""/>	Max <input type="button" value=""/>	None <input type="button" value=""/> None <input type="button" value=""/>
<input type="button" value="FILTER"/> <input type="button" value="RESTART"/>						
Currency: C2C						
						Amount: 1272.22 Count: 6
00:19:11 30.07.2022		John Doe	6.44	USD	C2C	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
6:11:51 07.05.2022		345-678-9012	43.41	ZAR	C2C	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
18:30:22 25.08.2022		PQR Company	120.87	GBP	C2C	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
15:20:30 10.10.2022		Sophia Davis	50	CAD	C2C	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
14:20:30 15.05.2022		UVW Company	800.75	EUR	C2C	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
16:20:30 15.12.2022		William Johnson	250.75	EUR	C2C	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
Currency: B2B						
						Amount: 206.62 Count: 2
Amount:						

**Figure 32:** Display of transactions in a group.

## Grouping of transactions by currency

Click on the option marked with a red rectangle in Figure 28.

TRANSACTIONS LIST						
Group by	Date ↓	Recipient ↑	Amount ↑	Currency ↑	Type ↑	
<input style="border: 2px solid red; padding: 2px 10px; margin-right: 10px;" type="button" value="None"/>	Start <input type="button" value=""/>	End <input type="button" value=""/>	<input type="text"/>	Min <input type="button" value=""/>	Max <input type="button" value=""/>	None <input type="button" value=""/> None <input type="button" value=""/>
						<input type="button" value="FILTER"/> <input type="button" value="RESTART"/>
16:55:40 08.06.2028		Wilson's Electronics	2000.45	JPY	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
14:20:15 05.12.2026		Walker's Bookstore	800.4	BAM	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
14:25:55 17.06.2026		XYZ Corporation	1500.6	BAM	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
14:20:55 15.12.2025		XYZ Corporation	2250.75	BAM	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>
17:15:30 05.03.2025		YZA Corporation	4500	GBP	C2B	<input type="button" value="DETAILS"/> <input type="button" value="CLAIM"/>

**Figure 33:** The first step towards grouping transactions by currency.

Click on the "Currency" option marked with a red rectangle in Figure 34.

The screenshot shows the 'TRANSACTIONS LIST' page. At the top, there are navigation links: HOME, VENDOR MANAGEMENT, CURRENCIES, REDEEM VOUCHER, TRANSACTIONS (with a dropdown arrow), INVOICES (with a dropdown arrow), and a help icon. Below the navigation is a search bar with placeholder text 'Search...'. Underneath the search bar is a table header with columns: Group by, Date ↓, Recipient ↑, Amount ↑, Currency ↑, and Type ↑. The 'Group by' column has a dropdown menu with options: None, None, Currency (which is highlighted with a red box), and Type. The table body contains five rows of transaction data:

Group by	Date ↓	Recipient ↑	Amount ↑	Currency ↑	Type ↑
None	Start: [date] End: [date]	XYZ Company	200.5	USD	C2B
Currency	14:10:55 05.12.2022	DEF Company	150.75	GBP	C2B
Type	18:22:10 28.11.2022	GHI Company	75.99	EUR	C2B
	9:30:40 15.10.2022	Sophia Davis	50	CAD	C2C
	15:20:30 10.10.2022	PQR Company	500.25	CAD	C2B
	16:45:20 25.09.2022				

At the bottom right of the table are two buttons: 'DETAILS' and 'CLAIM'.

**Figure 34:** The second step towards grouping transactions by currency.

After clicking on "Currency", the application performs the grouping of transactions by type and this is shown in Figure 35.

The screenshot shows the 'TRANSACTIONS LIST' page after grouping by currency. The interface is similar to Figure 34, with the same navigation and search bar. The 'Group by' dropdown is now set to 'Currency'. The table body is divided into two sections:

- Currency: CAD**: Shows a total amount of 17572.149999999998 and a count of 16.
- Currency: CNY**: Shows a total amount of 55.29 and a count of 1.

At the bottom right of the table, it says 'Amount: 12786.33'.

**Figure 35:** Display of grouped transactions by currency.

## Defining electronic invoices for companies

This option can only be used by a user with the administrator role.

If you want to create additional fields for e-invoices, you need to do the following steps:

Locate the "Invoices" option on the navigation bar and click on it.



**Figure 36:** The first step towards defining the attributes for the e-invoice.



**Figure 37:** Display of options within the "Invoices" option.

In the drop-down list, click on the "E-invoice data" option.



**Figure 38:** The second step towards defining the attributes for the e-invoice.

Digipay

HOME VENDOR MANAGEMENT USER MANAGEMENT CURRENCIES VOUCHER TRANSACTIONS INVOICES ?

### Define e-inovice atributs for company

+

DEFINE

**Figure 39:** View of the application after selecting the "E-invoice data" option from "Invoices".

Select a company by clicking on the field highlighted in red.

Digipay

HOME VENDOR MANAGEMENT USER MANAGEMENT CURRENCIES VOUCHER TRANSACTIONS INVOICES ?

### Define e-inovice atributs for company

+

DEFINE

**Figure 40:** The third step towards defining the attributes for the e-invoice.



**Figure 41:** Display of the application after selecting the company.

Enter the specific name of the attribute in the field marked in red.



**Figure 42:** The fourth step towards defining the attributes for the e-invoice.

**Optional:** It is possible to add more attributes by clicking on the icon marked in red.

The screenshot shows a web application interface for 'Digipay'. At the top, there is a yellow header bar with the 'Digipay' logo on the left and navigation links for 'HOME', 'VENDOR MANAGEMENT', 'USER MANAGEMENT', 'CURRENCIES', 'VOUCHER', 'TRANSACTIONS', 'INVOICES', and a help icon on the right. Below the header, the main title 'Define e-inovice atributs for company' is displayed. Underneath the title, there is a dropdown menu set to 'Fondacija Hastor'. Below the dropdown is a text input field containing 'dokumentacija\_prvi'. To the right of the input field are two icons: a blue square with a white plus sign and a blue square with a white minus sign. At the bottom of the form is a blue 'DEFINE' button.

**Figure 43:** Fifth step step towards defining attributes for e-invoice.

This screenshot shows the same application interface as Figure 43, but with an additional attribute defined. The dropdown menu is still set to 'Fondacija Hastor'. The text input field now contains 'dokumentacija\_prvi' and 'dokumentacija\_drugi', separated by a comma. The blue 'DEFINE' button is located at the bottom of the form.

**Figure 44:** View of the application after defining another attribute.

Click on the button named “Define” to define the given attributes for the selected company.

Digipay

HOME VENDOR MANAGEMENT USER MANAGEMENT CURRENCIES VOUCHER TRANSACTIONS INVOICES ?

## Define e-invoice atributs for company

Fondacija Hastor

dokumentacija\_prvi F

dokumentacija\_drugi F

+

**DEFINE**

**Figure 45:** The sixth step towards defining the attributes for the e-invoice.

Digipay

digipay.cc says Successfull OK

HOME CURRENCIES VOUCHER TRANSACTIONS INVOICES ?

## Define e-invoice atributs for company

Fondacija Hastor

dokumentacija\_prvi F

dokumentacija\_drugi F

+

**DEFINE**

**Figure 46:** The application sends feedback that the attributes have been successfully defined for the given company.

That the attributes have been successfully defined can be seen in the image below. For which it is necessary to perform the following steps: Invoices => Register for E-invoice =>

The screenshot shows a yellow header bar with the 'Digipay' logo on the left and navigation links for HOME, VENDOR MANAGEMENT, USER MANAGEMENT, CURRENCIES, VOUCHER, TRANSACTIONS, INVOICES, and a help icon on the right. Below the header, the page title 'Register for electronic invoices' is displayed. A sub-instruction 'Please fill out the form below to register for electronic invoices.' follows. The form consists of three input fields: 'B2B name-' containing 'Fondacija Hastor', 'dokumentacija\_prvi', and 'dokumentacija\_drugi'. A 'REGISTER' button is located at the bottom right of the form area.

## Registration for electronic invoices

If you want to register an electronic invoice for a specific company, you need to do the following steps:

Locate the "Invoices" option on the navigation bar and click on it.



**Figure 47:** The first step towards registering an e-invoice.



**Figure 48:** Display of options within the "Invoices" option.

In the drop-down list, click on the "Register for E-invoice" option.

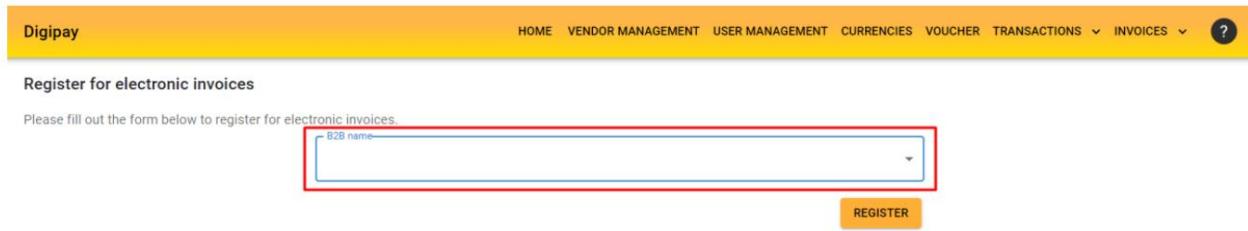


**Figure 49:** The second step towards registering an e-invoice.

This screenshot displays the 'Register for electronic invoices' form. The header and 'SI projekat' title are consistent with previous figures. The 'Register for E-Invoice' option in the dropdown menu is highlighted with a red border. The main form includes the title 'Register for electronic invoices', a note about filling out the form, and a single input field labeled 'B2B name' with a dropdown arrow. A yellow 'REGISTER' button is positioned to the right of the input field.

**Figure 50:** Display of the application after clicking on the "Register for E-invoice" option

Click on the field marked in red in Figure 51.



Digipay

HOME VENDOR MANAGEMENT USER MANAGEMENT CURRENCIES VOUCHER TRANSACTIONS INVOICES ?

Register for electronic invoices

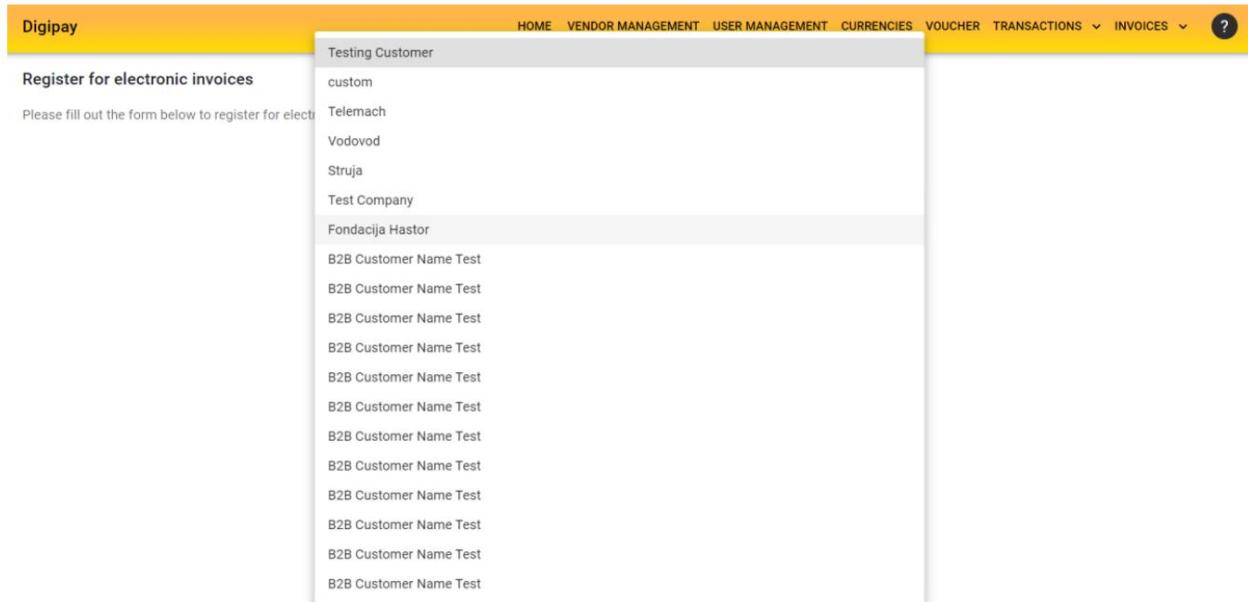
Please fill out the form below to register for electronic invoices.

B2B name

REGISTER

The screenshot shows a registration form for electronic invoices. At the top, there's a navigation bar with links like HOME, VENDOR MANAGEMENT, etc. Below it, a section titled "Register for electronic invoices" with a note to fill out the form. A dropdown menu is open under the "B2B name" label, listing various company names. The first item in the list, "Testing Customer", is highlighted with a red border, indicating it's the field to click on as per the instructions.

**Figure 51:** The third step to the e-invoice registration.



Digipay

HOME VENDOR MANAGEMENT USER MANAGEMENT CURRENCIES VOUCHER TRANSACTIONS INVOICES ?

Register for electronic invoices

Please fill out the form below to register for electronic invoices.

B2B name

Testing Customer  
custom  
Telemach  
Vodovod  
Struja  
Test Company  
Fondacija Hastor  
B2B Customer Name Test  
B2B Customer Name Test

The screenshot shows the application after the third step of the registration process. The dropdown menu for "B2B name" is still open, displaying a list of company names. The first item, "Testing Customer", is highlighted with a red border, indicating it has been selected.

**Figure 52:** View of the application after the third step.

Select a company from the list.

Digipay

HOME VENDOR MANAGEMENT USER MANAGEMENT CURRENCIES VOUCHER TRANSACTIONS INVOICES ?

Register for electronic invoices

Please fill out the form below to register for electronic invoices.

B2B name

Fondacija Hastor

dokumentacija\_povi

dokumentacija\_dugli

REGISTER

**Figure 53:** View of the application after the fourth step.

It is intentionally shown for the company "Hastor Foundation" because in chapter 8 the attributes for the e-invoice for the company "Hastor Foundation" were defined. As you can see, those attributes that we defined earlier appear for input, which leads to the conclusion that defining attributes works.

Enter specific values in the given text fields highlighted in red.

Digipay

HOME VENDOR MANAGEMENT USER MANAGEMENT CURRENCIES VOUCHER TRANSACTIONS INVOICES ?

Register for electronic invoices

Please fill out the form below to register for electronic invoices.

B2B name

Fondacija Hastor

dokumentacija\_povi

dokumentacija

dokumentacija\_dugli

dokumentacija

REGISTER

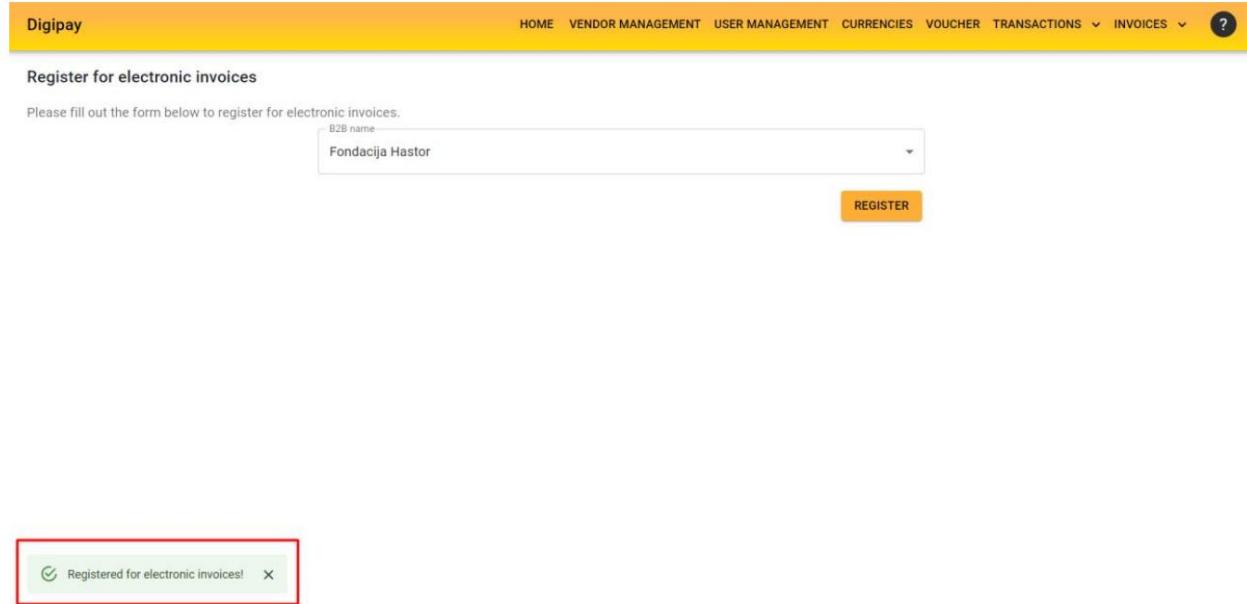
**Figure 54:** The fifth step towards registering an e-invoice.

Click on the button called "Register".

The screenshot shows a web application interface for 'Digipay'. At the top, there is a yellow header bar with the 'Digipay' logo on the left and navigation links for 'HOME', 'VENDOR MANAGEMENT', 'USER MANAGEMENT', 'CURRENCIES', 'VOUCHER', 'TRANSACTIONS', 'INVOICES', and a help icon on the right.

The main content area has a title 'Register for electronic invoices' and a sub-instruction 'Please fill out the form below to register for electronic invoices.' Below this, there is a dropdown menu labeled 'B2B name' containing three options: 'Fondacija Hastor', 'dokumentacija\_prvi', and 'dokumentacija\_drugi'. The first option, 'Fondacija Hastor', is selected. To the right of the dropdown is a large orange 'REGISTER' button.

**Figure 55:** The sixth step towards registering an e-invoice.



**Figure 56:** The message we receive from the system after clicking on the button called "Register" is marked in red.

## Acceptance of requests for electronic invoice registration

To use this option, the user must be an administrator. If you are an administrator and want to accept someone's request for e-invoice registration, do the following steps:

Locate the "Invoices" option on the navigation bar and click on it.



**Figure 57:** The first step towards accepting the e-invoice registration request.



**Figure 58:** Display of options within the "Invoices" option.

Select the "E-invoice approval" option from the drop-down list.



**Figure 59:** Second step towards accepting the e-invoice registration request.

fmaric1	Testing Customer	<i>neko:</i> fmaric1@etf.unsa.ba	<i>novo:</i> Pa\$\$w0rd	<i>polje:</i>		APPROVE	REJECT
fmaric1	Testing Customer	<i>neko:</i> fmaric1@etf.unsa.ba	<i>novo:</i> 1234567891234	<i>polje:</i>		APPROVE	REJECT
fmaric1	Struja	<i>nova:</i> polje	<i>polja:</i> polje			APPROVE	REJECT
fmaric1	Telemach	<i>neko:</i> Fila	<i>promjena:</i> jakK	<i>novo:</i> La;K		APPROVE	REJECT
abruhic1	Struja	<i>nova:</i> testing1	<i>polja:</i> testing2	null	null	APPROVE	REJECT
adminUser	Struja	<i>nova:</i> testni scenario	<i>polja:</i> proba	null	null	APPROVE	REJECT
abruhic1	B2B Customer Name Test	null	null	null	null	APPROVE	REJECT
abruhic1	Fondacija Hastor	<i>dokumentacija_prvi:</i> dokumentacija	<i>dokumentacija_drugi:</i> dokumentacija	null	null	APPROVE	REJECT

**Figure 60:** View of the application after the second step towards accepting the invoice registration request.

One note should be made here! As you can see in the last row in Figure 60, we have the company "Hastor Foundation" displayed with the fields "documentation\_first: documentation" and "documentation\_second: documentation" respectively, which means that we have successfully sent the request for e-invoice registration, that is, the option from chapter 9 is working successfully.

Click on the "Approve" option for the request you want to approve.

fmaric1	Testing Customer	<i>neko:</i> fmaric1@etf.unsa.ba	<i>novo:</i> 1234567891234	<i>polje:</i>		APPROVE	REJECT
fmaric1	Struja	<i>nova:</i> polje	<i>polja:</i> polje			APPROVE	REJECT
fmaric1	Telemach	<i>neko:</i> Fila	<i>promjena:</i> jakK	<i>novo:</i> La;K		APPROVE	REJECT
abruic1	Struja	<i>nova:</i> testing1	<i>polja:</i> testing2	null	null	APPROVE	REJECT
adminUser	Struja	<i>nova:</i> testni scenario	<i>polja:</i> proba	null	null	APPROVE	REJECT
abruic1	B2B Customer Name Test	null	null	null	null	APPROVE	REJECT
abruic1	Fondacija Hastor	<i>dokumentacija_prvi:</i> dokumentacija	<i>dokumentacija_drugi:</i> dokumentacija	null	null	APPROVE	REJECT

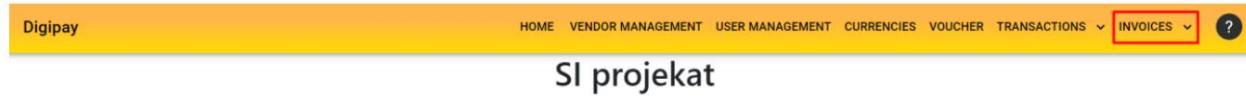
**Figure 61:** The third step towards accepting the e-invoice registration request.

After this, the registration is accepted and deleted from the request list.

## Rejection of the request for electronic invoice registration

To use this option, the user must be an administrator. If you are an administrator and want to reject someone's request for e-invoice registration, do the following steps:

Locate the "Invoices" option on the navigation bar and click on it.



**Figure 62:** The first step towards accepting the e-invoice registration request.



**Figure 63:** Display of options within the "Invoices" option.

Select the "E-invoice approval" option from the drop-down list.



**Figure 64:** Second step towards accepting the e-invoice registration request.

						APPROVE	REJECT
abruic1	Telemach	<i>neko:mj</i>	<i>promjneio:hg</i>	<i>novo:hgj</i>	null	APPROVE	REJECT
abruic1	Vodovod	<i>nesto:tesanjska</i>	<i>novo:1404000112211</i>	12.12.2012	null	APPROVE	REJECT
fmaric1	Testing Customer	<i>neko:fmaric1@etf.unsa.ba</i>	<i>novo:Pa\$\$w0rd</i>	<i>polje:</i>		APPROVE	REJECT
fmaric1	Testing Customer	<i>neko:fmaric1@etf.unsa.ba</i>	<i>novo:1234567891234</i>	<i>polje:</i>		APPROVE	REJECT
fmaric1	Struja	<i>nova:polje</i>	<i>polja:polje</i>			APPROVE	REJECT
fmaric1	Telemach	<i>neko:Fila</i>	<i>promjneio:jakK</i>	<i>novo:La;K</i>		APPROVE	REJECT
abruic1	Struja	<i>nova:testing1</i>	<i>polja:testing2</i>	null	null	APPROVE	REJECT
adminUser	Struja	<i>nova:testni scenario</i>	<i>polja:proba</i>	null	null	APPROVE	REJECT
abruic1	B2B Customer Name Test	null	null	null	null	APPROVE	REJECT

**Figure 65:** View of the application after the second step towards accepting the invoice registration request.

Click on the "Reject" option for the request you want to approve.

abruvic1	Vodovod	<i>nesto</i> :tesanjska	<i>novo</i> :1404000112211	12.12.2012	null	APPROVE	REJECT
fmaric1	Testing Customer	<i>neko</i> :fmaric1@etf.unsa.ba	<i>novo</i> :Pa\$\$w0rd	<i>polje</i> :		APPROVE	REJECT
fmaric1	Testing Customer	<i>neko</i> :fmaric1@etf.unsa.ba	<i>novo</i> :1234567891234	<i>polje</i> :		APPROVE	REJECT
fmaric1	Struja	<i>nova</i> :polje	<i>polja</i> :polje			APPROVE	REJECT
fmaric1	Telemach	<i>neko</i> :Fila	<i>promjene</i> :jakK	<i>novo</i> :La;K		APPROVE	REJECT
abruvic1	Struja	<i>nova</i> :testing1	<i>polja</i> :testing2	null	null	APPROVE	REJECT
adminUser	Struja	<i>nova</i> :testni scenario	<i>polja</i> :proba	null	null	APPROVE	REJECT
abruvic1	B2B Customer Name Test	null	null	null	null	APPROVE	<span style="border: 2px solid red; padding: 2px;">REJECT</span>

**Figure 66:** The third step towards accepting the e-invoice registration request.

After this, the registration is rejected and deleted from the request list.

# B2C Client Management

## Description

The application has the ability to manage B2C clients, thus enabling users with appropriate authorizations (privileges) to create, edit and delete B2C clients.

## Additionally

### **Personal information**

Management of B2C clients enables the storage of information about each B2C client, such as name, address, telephone number, e-mail address and other relevant data, as well as the management of this information.

### **Contact management**

Contact management is integrated with customer management.

### **Management of groups (segments)**

It is possible to group B2C clients, as well as manage defined groups (segments).

### **Price management**

As part of B2C management, it is possible for B2C clients to manage prices for each individual group (segment), as well as define additional discounts and special prices, in total and by supplier.

### **Account Management**

B2C client management also involves users managing accounts for each B2B client, including account status, history and payment information.

### **Reports and**

**Analytics** B2C Client Management enables users to view reports and analyze client data, with the aim of analyzing sales, orders, payments and other relevant information, as well as identifying, monitoring trends and relevant metrics.

# Management of user accounts and coupons

The application enables the management of user accounts for B2B and B2C clients. Each client can have multiple user accounts, one for each allowed currency. The application also enables the generation of coupons in code format in each currency. Users can use coupons and thus get additional credit on their accounts.

## User manual

### Creating

the new one

user

From the home page, by clicking on USER MANAGEMENT, we open the option of displaying and managing user accounts.



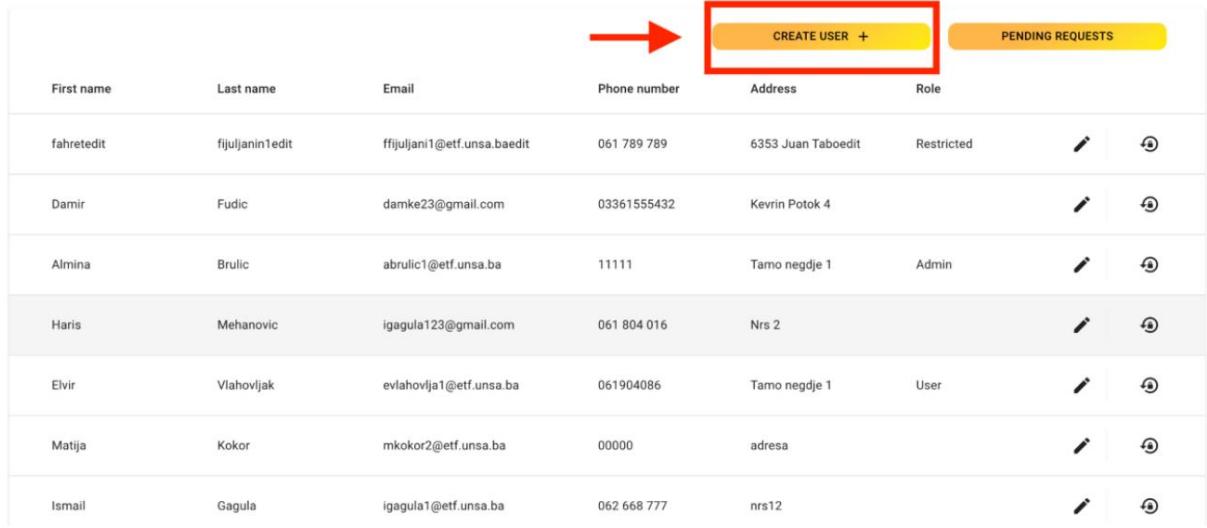
Figure 1.1. Button in the navigation panel for viewing and editing user accounts

The option of displaying and editing user accounts, in the form of a list, is shown in Figure 2.

						<a href="#">CREATE USER</a> +	PENDING REQUESTS
First name	Last name	Email	Phone number	Address	Role		
fahredit	fijuljanin1edit	fijuljani1@etf.unsa.baedit	061 789 789	6353 Juan Taboedit	Restricted		
Damir	Fudic	damike23@gmail.com	03361555432	Kevrin Potok 4			
Almina	Brulic	abrulic1@etf.unsa.ba	11111	Tamo negdje 1	Admin		
Haris	Mehanovic	igagula123@gmail.com	061 804 016	Nrs 2			
Elvir	Vlahovljak	evlahovlja1@etf.unsa.ba	061904086	Tamo negdje 1	User		
Matija	Kokor	mkokor2@etf.unsa.ba	00000	adresa			
Ismail	Gagula	igagula1@etf.unsa.ba	062 668 777	nrs12			
Kenan	Omeric	kenooo@gmail.com	03363000999	Moja kuca			
Fejza	fejza2806@gmail.com	062518214	Tamo negdje 1	User			

Figure 1.2: Display of user accounts in the form of a list

Users can create a new user by clicking the CREATE USER button.



First name	Last name	Email	Phone number	Address	Role		
fahreedit	fijuljanin1edit	ffijuljani1@etf.unsa.baedit	061 789 789	6353 Juan Taboedit	Restricted		
Damir	Fudic	damke23@gmail.com	03361555432	Kevrin Potok 4			
Almina	Brulic	abruslic1@etf.unsa.ba	11111	Tamo negdje 1	Admin		
Haris	Mehanovic	igagula123@gmail.com	061 804 016	Nrs 2			
Elvir	Vlahovljak	evlahovlja1@etf.unsa.ba	061904086	Tamo negdje 1	User		
Matija	Kokor	mkokor2@etf.unsa.ba	00000	adresa			
Ismail	Gagula	igagula1@etf.unsa.ba	062 668 777	nrs12			

Figure 1.3: Button for creating a new user

After clicking on the CREATE USER button, a window opens with fields for entering the basic data of the new user, such as first name, last name, e-mail, phone number, address and user role.

## Create User

Please fill out the form below to create a new user.

Name —

Surname —

Email —

Phone —

Address —

Role —

**CANCEL** **CREATE**

Figure 1.4: User data entry window for creating a new user

After entering the user data, the administrator will click on the CREATE button, save the user data and receive a notification about the successfully saved user as shown in Figure 5.

Kenan	Omeric	kenooo@gmail.com	03363000999	Moja kuca		
Kenan	Fejza	fejza2806@gmail.com	062518214	Tamo negdje 1		

Figure 1.5: Notification of successfully saved user data of another user

The user creation process will automatically send a confirmation e-mail to the new user. Figure 6 shows the content of the confirmation e-mail, which contains a link that redirects the user

to the page where you will have the option of setting your preferred password.

*Note: In case the e-mail is not displayed in the inbox, please look in the section spam (unwanted) e-mails.*

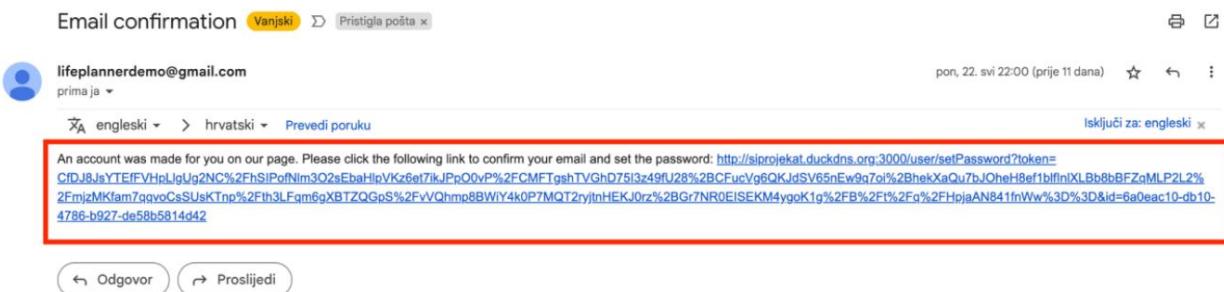


Figure 1.6: Display of the content of the e-mail message for the confirmation of a new user

When entering the desired password, please note that the password must have at least six characters and contain an uppercase letter, a lowercase letter, a number and a character that is not a letter or a number.

An example of a correctly created password is password: *String1!*.

## Set your new password

Password

---

Confirm password

---

SUBMIT

Figure 1.7: Display of the window for entering the user's password

Figure 8 shows a scenario in which the user receives a notification about the incorrect entry of the user's password and an instruction on what format the password must be, which was explained in the previous paragraph.

## Set your new password

Password  
.....

Confirm password  
.....

>Passwords do not match.

SUBMIT

Figure 1.8. Displaying a notification about incorrect user password format The creation of a new user will be completed only when the user confirms the previously received e-mail and sets his password, and will be able to log in to the [DigiPay](#) website with his access data.

## Set your new password

Password  
.....

Confirm password  
.....

SUBMIT

 Your new password has been set.

X

Figure 1.9: Display of the notification about the successful setting of the user's password

## Editing user data

The administrator has the ability to edit and manage user data of other users, such as name, surname, e-mail, phone number, address and user role.

**Update User**

Please update the user information below.

Name	beba
Surname	bebic
Email	emesic1@etf.unsa.ba
Phone	033225883
Address	bebe bebara 22
Role	User

CANCEL      **SAVE**

Figure 1.10: Window for editing user data of another user

The administrator has the option of resetting the password for other users by sending a password reset e-mail message with a link that expires after a certain period of time. The reset option is executed by clicking on the marked icon in Figure 11.



Figure 1.11: Password reset button for other users by sending an e-mail

Figure 12 shows the content of the e-mail message for resetting the user's password.



Figure 1.12. Password reset button for other users by sending an e-mail

Figure 13 shows the input form and the notification about the successful setting of the new password.

**Set your new password**

Password  
.....

Confirm password  
.....

**SUBMIT**

✓ Your new password has been set. ×

Figure 1.13: Display of the form and notification of the successful setting of a new password

Administrators also, as previously described, have the ability to assign or modify user roles of other users. There are three different user roles: *User*, *Admin* and *Restricted*.

Each of the mentioned user roles has its own characteristics that make it specific compared to the other.

### Update User

Please update the user information below.

Name  
beba

Surname  
bebic

Email  
emesic1@etf.unsa.ba

Phone  
033225883

Address  
bebe bebara 22

Role  
User

User

Admin

Restricted

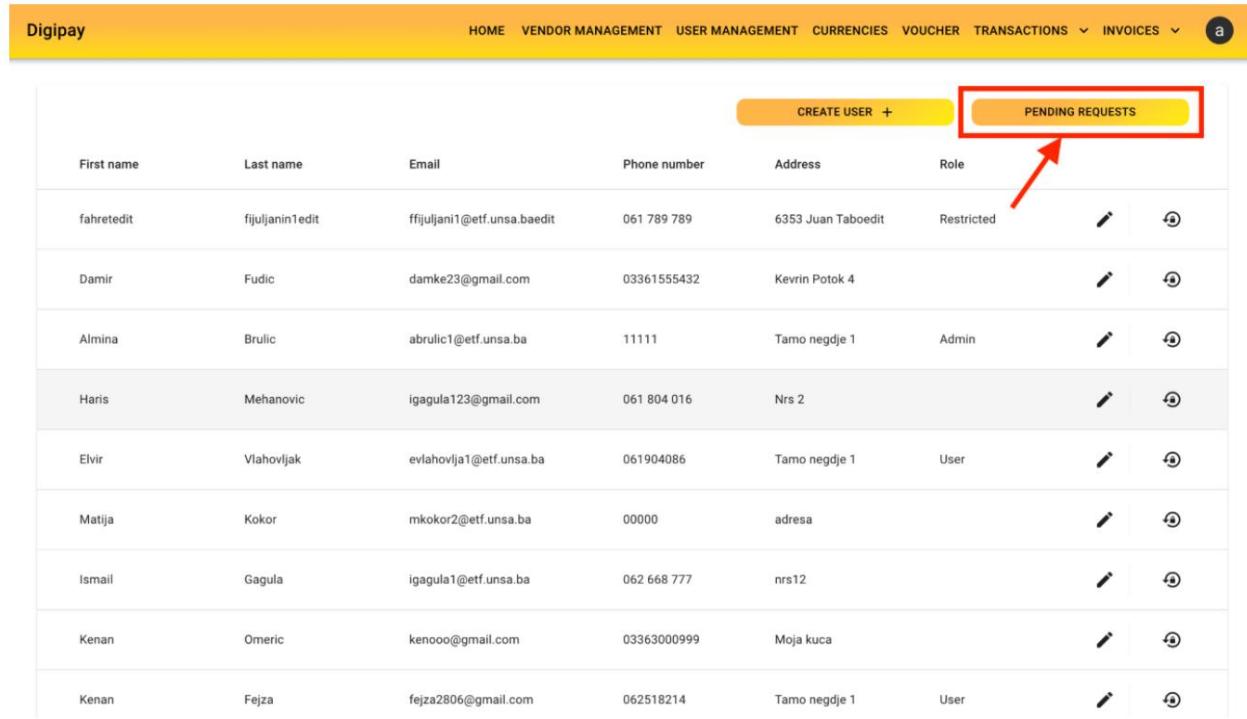
Figure 1.14. Assigning user roles to other users

Review demands for creating users accounts

Administrators have an overview of the list of users they can access or modify.

Also, there is an option to display a list of requests for creating user accounts.

The PENDING REQUEST button opens a new window with a list of user account requests, Figure 15.



The screenshot shows a user management interface for 'Digipay'. At the top, there is a yellow navigation bar with the brand name 'Digipay' on the left and links for 'HOME', 'VENDOR MANAGEMENT', 'USER MANAGEMENT', 'CURRENCIES', 'VOUCHER', 'TRANSACTIONS', 'INVOICES', and a profile icon on the right.

The main area displays a table of user information:

First name	Last name	Email	Phone number	Address	Role		
fahreedit	fijuljanin1edit	ffijuljani1@etf.unsa.baedit	061 789 789	6353 Juan Taboedit	Restricted		
Damir	Fudic	damke23@gmail.com	03361555432	Kevrin Potok 4			
Almina	Brulic	abrulic1@etf.unsa.ba	11111	Tamo negdje 1	Admin		
Haris	Mehanovic	igagula123@gmail.com	061 804 016	Nrs 2			
Elvir	Vlahovljak	evlahovlja1@etf.unsa.ba	061904086	Tamo negdje 1	User		
Matija	Kokor	mkokor2@etf.unsa.ba	00000	adresa			
Ismail	Gagula	igagula1@etf.unsa.ba	062 668 777	nrs12			
Kenan	Omeric	kenooo@gmail.com	03363000999	Moja kuca			
Kenan	Fejza	fejza2806@gmail.com	062518214	Tamo negdje 1	User		

A red box highlights the 'PENDING REQUESTS' button located at the top right of the table area. A red arrow points from the text 'Figure 1.15: View of the PENDING REQUESTS button' to this highlighted button.

Figure 1.15: View of the PENDING REQUESTS button

Figure 16 shows the layout of the window with the list of requests for creating user accounts.

Administrators have the ability to view and download attachments from requests.

## Account Creation Requests

Ismail Gagula igagula1@etf.unsa.ba, USD	✓	<a href="#"></a>
Amina Frljak afrljak1@etf.unsa.ba, EUR	✓	<a href="#"></a>
Amina Frljak afrljak1@etf.unsa.ba, USD	✓	<a href="#"></a>
Ermin Hadzic ehadzic4@etf.unsa.ba, EUR	✓	<a href="#"></a>
string string fuadjaganjac@gmail.com, BAM	✓	<a href="#"></a>
string string fuadjaganjac@gmail.com, USD	✓	<a href="#"></a>
Damir Fudic damke23@gmail.com, USD	✓	<a href="#"></a>
Haris Mehanovic igagula123@gmail.com, USD	✓	<a href="#"></a>
AccountCreationTest AccountCreationTest AccountCreationTest@gmail.com, USD	✓	<a href="#"></a>
		<a href="#">CLOSE</a>

Figure 1.16: Display of the list of requests for creating user accounts

The administrator downloads attachments from the request for creating user accounts by clicking the download button, as shown in Figure 17:

## Account Creation Requests

Ismail Gagula

igagula1@etf.unsa.ba, USD

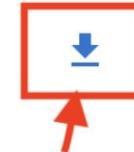


Figure 1.17. Button for downloading attachments from the request to create a user account

By clicking the accept button, the administrator can approve the request to create a new user account, shown in Figure 18.

By approving the request, the user account creation process is started, and after the account creation process has been successfully completed, the newly created user is on the list of user account management.

## Account Creation Requests

Ismail Gagula

igagula1@etf.unsa.ba, USD



Figure 1.18: Button for approving the request to create a user account

## Overview of all requests by users

From the home page, by clicking on TRANSACTIONS, we open the drop-down menu.



Figure 1.19. Transactions button in the navigation panel

Figure 20 shows the layout of the drop-down menu, choosing CLAIMS will display all requests from the user.



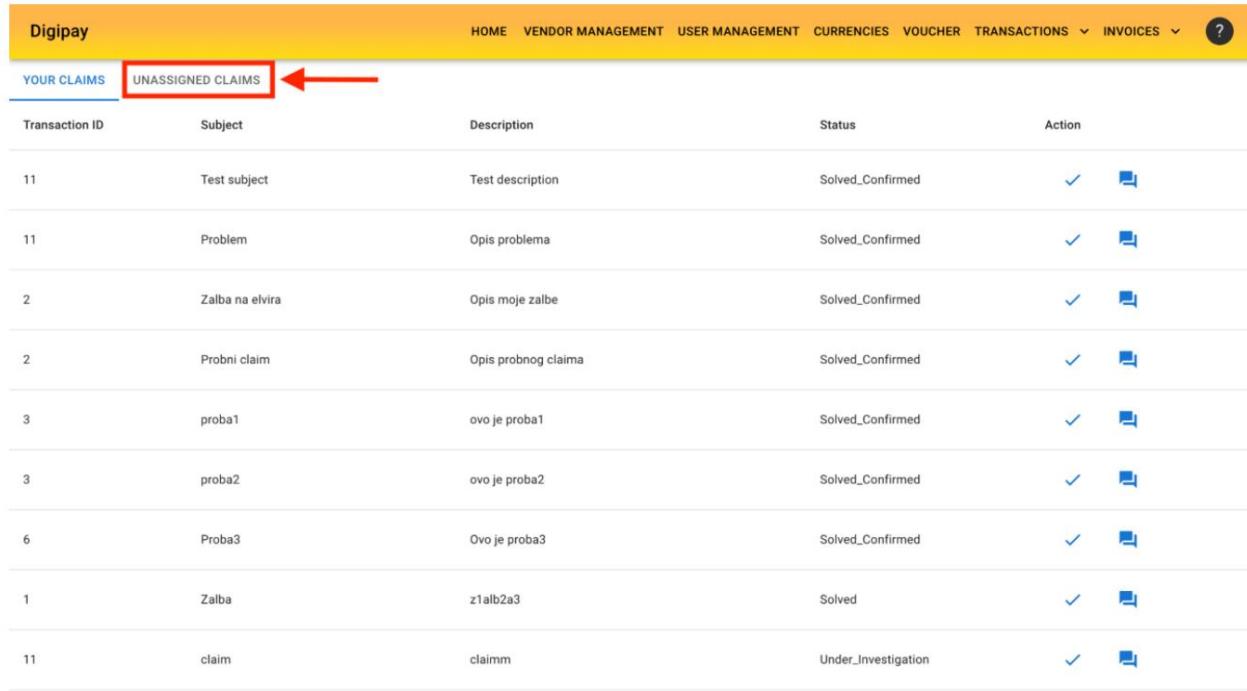
Figure 1.20: Appearance of the drop-down menu for transactions

Figure 21 shows the layout of the list of all requests submitted by users, for which the administrator is responsible.

YOUR CLAIMS		UNASSIGNED CLAIMS		
Transaction ID	Subject	Description	Status	Action
11	Test subject	Test description	Solved_Confirmed	✓
11	Problem	Opis problema	Solved_Confirmed	✓
2	Zalba na elvira	Opis moje zalbe	Solved_Confirmed	✓
2	Probni claim	Opis probnog clama	Solved_Confirmed	✓
3	proba1	ovo je proba1	Solved_Confirmed	✓
3	proba2	ovo je proba2	Solved_Confirmed	✓
6	Proba3	Ovo je proba3	Solved_Confirmed	✓
1	Zalba	z1alb2a3	Solved	✓
11	claim	claiimm	Under_Investigation	✓

Figure 1.21. Layout of the window showing requests from the user

Clicking on the UNASSIGNED CLAIMS button opens a new window for the administrator where he can see all unassigned/unresolved claims.

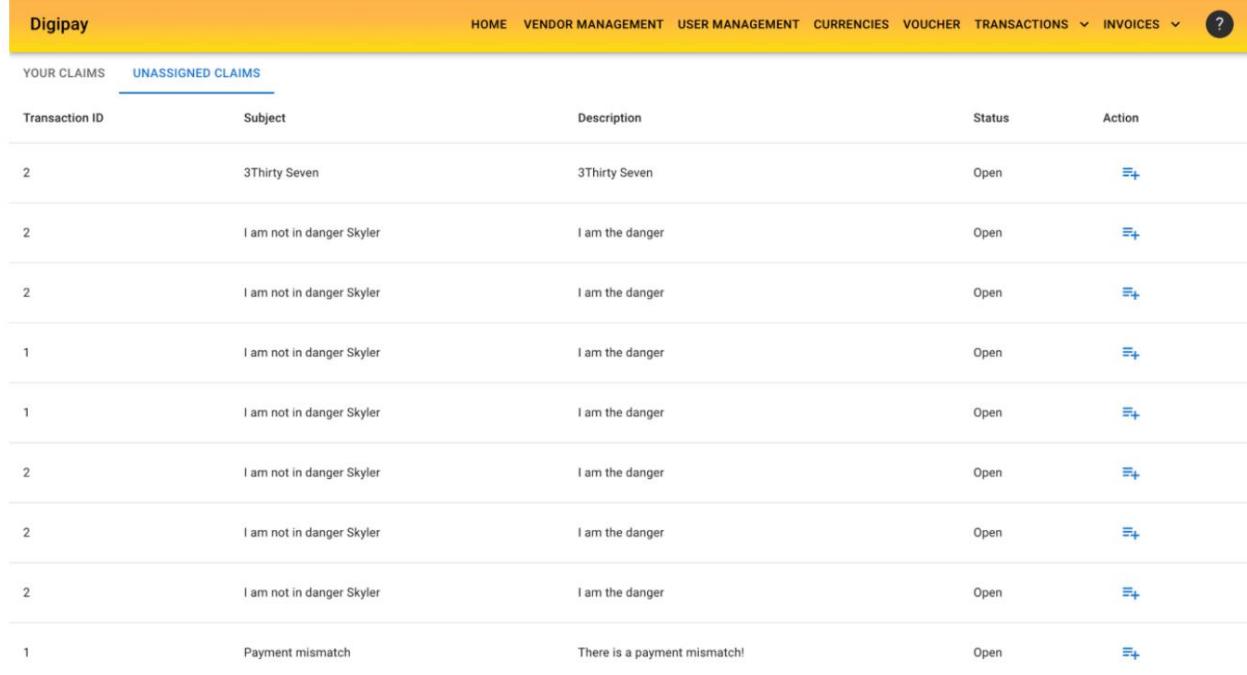


Digipay					
YOUR CLAIMS		UNASSIGNED CLAIMS			
Transaction ID	Subject	Description	Status	Action	
11	Test subject	Test description	Solved_Confirmed	✓	✉
11	Problem	Opis problema	Solved_Confirmed	✓	✉
2	Zalba na elvira	Opis moje zalbe	Solved_Confirmed	✓	✉
2	Probni claim	Opis probnog clama	Solved_Confirmed	✓	✉
3	proba1	ovo je proba1	Solved_Confirmed	✓	✉
3	proba2	ovo je proba2	Solved_Confirmed	✓	✉
6	Proba3	Ovo je proba3	Solved_Confirmed	✓	✉
1	Zalba	z1alb2a3	Solved	✓	✉
11	claim	claimm	Under_Investigation	✓	✉

Figure 22: Button for displaying unassigned/unsolved requests by the user

Figure 23 shows all unassigned/unsolved requests by users.

The administrator has the display of information about the status and the option of action on the desired request.



Digipay					
YOUR CLAIMS		UNASSIGNED CLAIMS			
Transaction ID	Subject	Description	Status	Action	
2	3Thirty Seven	3Thirty Seven	Open	☰+	
2	I am not in danger Skyler	I am the danger	Open	☰+	
2	I am not in danger Skyler	I am the danger	Open	☰+	
1	I am not in danger Skyler	I am the danger	Open	☰+	
1	I am not in danger Skyler	I am the danger	Open	☰+	
2	I am not in danger Skyler	I am the danger	Open	☰+	
2	I am not in danger Skyler	I am the danger	Open	☰+	
1	Payment mismatch	There is a payment mismatch!	Open	☰+	

Figure 1.23: Window view showing all unassigned/pending requests by the user

The administrator will have the option of accepting the request and becomes responsible for the approved request, and the request is automatically transferred and found in the *YOUR CLAIMS display list*. By simply approving the request, the status changes from "Open" to "Under investigation".

Transaction ID	Subject	Description	Status	Action
2	I am not in danger Skyler	I am the danger	Open	

Figure 1.24: Action button display - acceptance of unassigned/pending request by user

Administrators will be able to add messages to the request. The window for adding messages is displayed by clicking on the marked button in Figure 25.

Transaction ID	Subject	Description	Status	Action
11	Test subject	Test description	Solved_Confirmed	

Figure 1.25: View of the button for adding messages to the request

Figure 26 shows a window where text messages can be added to the request.

New message

ABRULIC1    dobar dan!

CANCEL
SEND MESSAGE

Figure 1.26: Display of the window for adding messages to the request

Figure 27 shows the exchange of messages in the window for adding messages to the request. Administrators can see their messages and the messages of users on request.

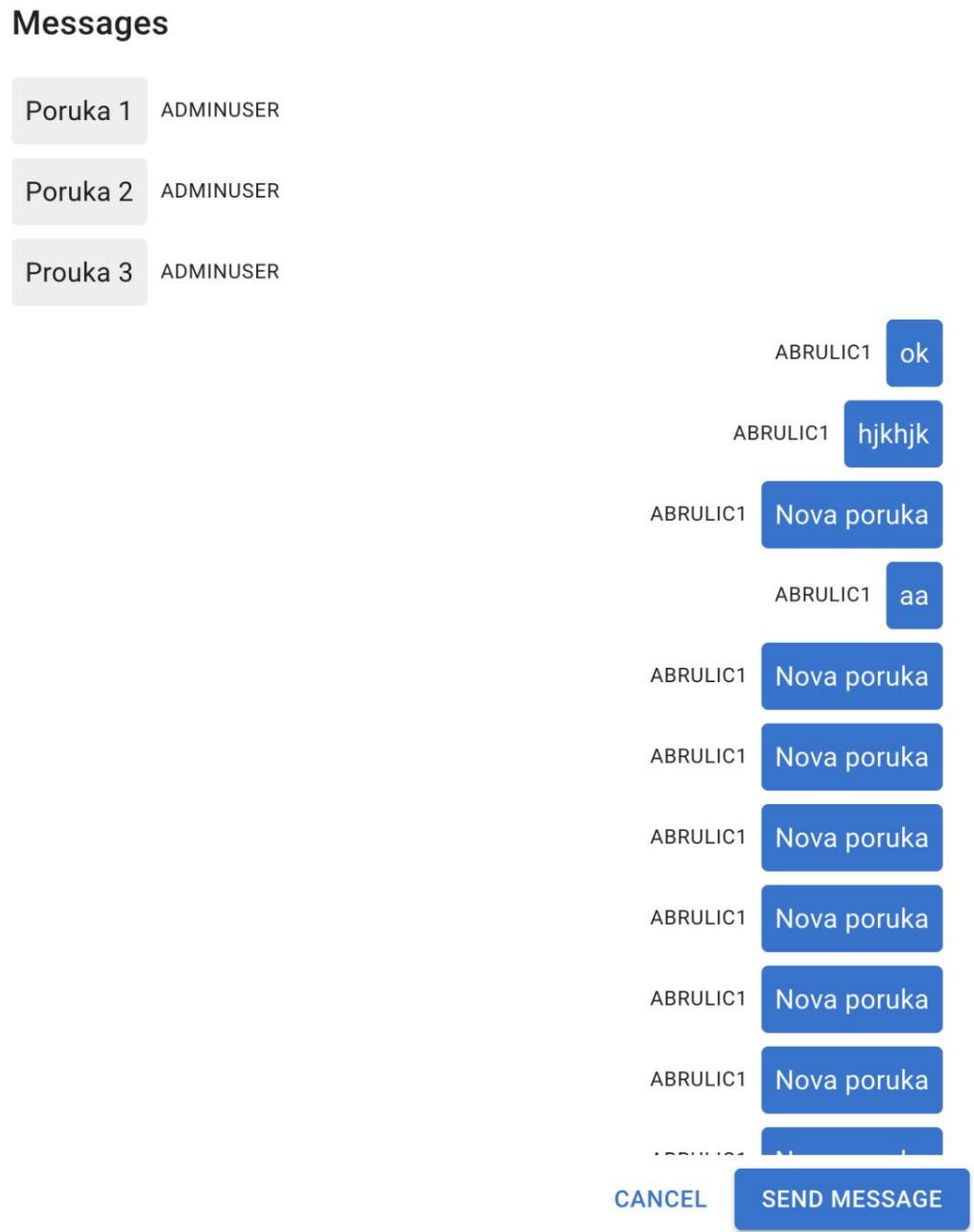


Figure 1.27. Displaying the window for adding messages to the request - conversation

Administrators will be able to change the request status from "Open" to "Under investigation" and from "Solved" to "Solved - confirmed". The described functionality of changing the status se

is executed by clicking on the confirmation tick marked in Figure 28.

The statuses change in the specified order, which is shown below in Figures 29 and 30.

9	Subject claima	Opis claima	Under_Investigation	<input checked="" type="checkbox"/> 
---	----------------	-------------	---------------------	---

Figure 1.28. Displaying the button to change the status of the request

Figure 28 shows an example of changing the status of a request from the status "Under investigation" to the status "Resolved".

9	Subject claima	Opis claima	Solved	<input checked="" type="checkbox"/> 
---	----------------	-------------	--------	---

Figure 1.29: Display of the request status change from "Under investigation" to "Resolved" status

Figure 29 shows an example of changing the status of a request from the status "Solved" to the final status "Solved - confirmed", from the specified status, which represents a confirmation that the request has been resolved, no more status changes can be made.

9	Subject claima	Opis claima	Solved_Confirmed	<input checked="" type="checkbox"/> 
---	----------------	-------------	------------------	---

Figure 1.30. Display of change of request status from "Solved" to "Solved - confirmed" status

## Displaying the list of e-invoices

The DigiPay application supports uploading electronic invoices (e-invoice) through file upload.

Every day at 00:05, the uploaded files are checked and e-invoices are created for users based on the uploaded data. Sent e-invoices are stored and available to the user in the form of a list.

E-invoices can be created, listed for the user to view and paid for.

Clicking on the INVOICES button (picture 31) opens options for working with e-invoices.



Figure 1.31: Drop-down menu for options for working with e-invoices

By selecting the option *MY INVOICES* (picture 32), the user gets an overview of the list of registered e-invoices.

The screenshot shows the 'My Invoices' dropdown menu from Figure 1.31. The menu items are: 'My Invoices' (highlighted with a red box and an arrow pointing to it), 'Register for E-Invoice', 'E-invoice data', and 'E-invoice approval'. The 'Paid' option is also visible at the bottom right of the menu.

Payer Name	Payer Address	Reference	Description	Payee Name	Payee Account Number	Payer	My Invoices
HAMO HAMIC	FERHADIJA 12	127328249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BIH	1274973843	ZMAJA bb	Paid
HAMO HAMIC	FERHADIJA 12	127328249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BIH	1274973843	ZMAJA OD BOSNE bb	127 BAM
HAMO HAMIC	FERHADIJA 12	127328249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BIH	1274973843	ZMAJA OD BOSNE bb	127 BAM
HAMO HAMIC	FERHADIJA 12	127328249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BIH	1274973843	ZMAJA OD BOSNE bb	127 BAM
HAMO HAMIC	FERHADIJA 12	127328249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BIH	1274973843	ZMAJA OD BOSNE bb	129 BAM
HAMO HAMIC	FERHADIJA 12	127328249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BIH	1274973843	ZMAJA OD BOSNE bb	460 BAM

Figure 1.32: Obtaining a list of e-invoices via the My Invoices option

Sending e-invoice B2B user

Each B2B user owns his own folder on the server and can only access it. Files are *uploaded* to the server via FTP . B2B users *upload* a file with all e-invoices for a certain day.

The name of the uploaded file must start with a date in the following format "day-month-year". An example of a valid file name is "04-06-2023.txt". Each line in the file represents one e-account.

For example, one line of the file might look like this:

HAMO HAMIC; FERHADIJA 12; 127328249; ELECTRICITY BILL FOR MAY  
2023; 1274973843; ELEKTROPRIVREDA BIH; DRAGON OF BOSNIA bb; 127.00 BAM;  
MEASURING PLACE 123; email hhamo@gmail.com;

Every night at 00:05 a script is started on the server that goes through the folders of all B2B users and reads a file whose name starts with the date of the previous day in the previously mentioned format and each line of that file, that is, each e-invoice is sent to the API . After each e-invoice is sent, its status is saved in the database.

Status can have two possible values: successful sending and unsuccessful sending. The above script is written in the Python programming language.

## Processing Server

### Functionalities

- Update request processing - The processing server receives update requests via the REST API and processes them as transactions. The server validates requests to ensure they are complete and correct before processing them. The type of request depends on the type of transaction and which vendor will accept the request. The request processing update includes the following:
  - Transaction processing
  - Vendor integration
  - Error management
  - Authentication and authorization
  - Security and data protection
- Transaction Logging - The processing server logs transaction details, including vendor, transaction amount, and date and time. Logging should be safe and efficient. This functionality includes:
  - Data validation
  - Error management
  - Data security and protection
- Manage vendor responses - The processing server forwards transaction details to the vendor and waits for a response. If the response is successful, the server should update the transaction status accordingly. If the response is unsuccessful, the server should notify the administrator of the failure and take appropriate action. Includes:

- o Error management

## Management

In order for the user to be able to work with real, real data, he needs to have access to the backend. Swagger is an IDL for describing and documenting REST APIs using JSON format.

All the necessary information about the routes and specifically the API can be found right there. On Swagger (link: <https://processingserver.herokuapp.com/swagger/index.html>) there is clearly documented which route, what each of the routes expects as parameters, what is expected to be in the body of the request or in the header part, and what result it should return in the best case. Based on this information, it is possible in tools like Postman to test how the created routes work.

## Transactions

### Creating transactions

First, the route **/api/Transaction/CreateTransaction** (*POST API*) is created , which allows a transaction to be made between two users. To check this route, it is necessary to generate a JSON Web Token for the user who is logged into the system. With this method, a successful call results in a status of 200 and the returned result is in text/plain form. Also, if the user wants to test the functionality, he can do so by pressing the "Try it out" button. Here, in addition to the size of the transaction amount, the name of the recipient and his account details, some other items such as: currency, transactionType, transactionPurpose, category etc. are passed. When it comes to currency, the user should select only those currencies that are retrieved from the backend. The application should check, validate all data with the backend that everything is entered correctly. Also the amount should be formatted.

The screenshot displays the Swagger UI for the **ProcessingServer.API**. The top navigation bar includes the Swagger logo, the title "ProcessingServer.API 1.0 OAS3", and a dropdown menu "Select a definition" set to "ProcessingServer.API v1". The main content area is organized into sections:

- EInvoicePayment**: Contains a single endpoint: `POST /api/EInvoicePayment/ExecuteInvoicePayment`.
- Transaction**: Contains five endpoints:
  - `POST /api/Transaction/CreateTransaction`
  - `GET /api/Transaction/GetTransactionsForUser`
  - `GET /api/Transaction/GroupTransactionsByCurrency`
  - `GET /api/Transaction/GroupTransactionsByType`
  - `GET /api/Transaction/GetTransactionById`
- UserBankAccount**: Contains five endpoints:
  - `POST /api/UserBankAccount/CreateAccount/{userId}`
  - `POST /api/UserBankAccount/CreateAccount`
  - `GET /api/UserBankAccount/GetAllAccountsForUser`
  - `GET /api/UserBankAccount/GetAllAccounts`
  - `DELETE /api/UserBankAccount/DeleteAllAccountsForUser` (highlighted with a red border)
- VendorBankAccount**: Contains three endpoints:
  - `POST /api/VendorBankAccount/CreateVendorBankAccount`
  - `GET /api/VendorBankAccount/GetBankAccountsForVendor`
  - `DELETE /api/VendorBankAccount/DeleteVendorBankAccounts` (highlighted with a red border)
- Voucher**: Contains a single endpoint: `POST /api/Voucher/ExecuteVoucherRedemption`.

Figure 2.1. Swagger documentation layout

## Transaction fetching, sorting and filtering

The next route created was **/api/Transaction/GetTransactionsForUser** (*GET API*). When the User selects the "my transactions" option on the home screen, with the help of this API, all the transactions that the User had should be listed. Pagination is also done on this API. This method accepts mandatory and optional parameters, related to sorting and filtering.

Obavezni parametri:

- token (required): JSON Web Token used for user authentication.
- pageNumber (mandatory): Page number for pagination of transaction results.
- pageSize (required): Page size for pagination of transaction results.

Filtering parameters:

- o AmountStartFilter: Minimum transaction amount.
- o AmountEndFilter: Maximum transaction amount.
- o CurrencyFilter: Filter transactions by currency.
- o TransactionTypeFilter: Filter transactions by transaction type.
- o RecipientNameFilter: Filter transactions by recipient name.
- o RecipientAccountNumberFilter: Filter transactions by recipient account number.
- o SenderNameFilter: Filter transactions by sender name.
- o CreatedAtStartFilter: Filter transactions by the start date of creation.
- o CreatedAtEndFilter: Filter transactions according to the end date of creation.
- o CategoryFilter: Filter transactions by category.
- sortingOrder: Transaction sorting order.

These parameters are optional and the user can specify the desired filters to narrow the transaction results according to certain criteria. For example, the user can set the minimum and maximum transaction amount, select a specific currency or transaction type, filter transactions by recipient or sender name, and sort the results in the selected order.

Name	Description
token * required	token
pageNumber * required	pageNumber
pageSize * required	pageSize
AmountStartFilter	AmountStartFilter
AmountEndFilter	AmountEndFilter
CurrencyFilter	CurrencyFilter
TransactionTypeFilter	TransactionTypeFilter
RecipientNameFilter	RecipientNameFilter
RecipientAccountNumberFilter	RecipientAccountNumberFilter
SenderNameFilter	SenderNameFilter
CreatedAtStartFilter	CreatedAtStartFilter
CreatedAtEndFilter	CreatedAtEndFilter
CategoryFilter	CategoryFilter
sortingOrder	sortingOrder

Figure 2.2. GET API: fetching, filtering and sorting transactions

## Grouping of transactions

The next step was to allow the user to group transactions based on all criteria.

Two GET APIs are implemented:

### **GroupTransactionsByCurrency (GET API):**

- Ruta: /api/Transaction/GroupTransactionsByCurrency
- Parameters: token (JSON Web Token)
- Result: Text response (text/plain)

### **GroupTransactionsByType (GET API):**

- Ruta: /api/Transaction/GroupTransactionsByType
- Parameters: token (JSON Web Token)
- Result: Text response (text/plain)

## Bank account

### Creating a bank account

Users are enabled to create an account on the server.

A route **/api/**

**UserBankAccount/CreateAccount (POST API)** is created which receives the token of the user who wants to create an account. In addition to the token, it also receives the currency, bankName and description attributes. The account number is automatically generated and assigned to the user. With this method, a successful call results in a status of 200 and the returned result is in text/plain form.

The screenshot shows a POST API endpoint for creating a bank account. The URL is /api/UserBankAccount/CreateAccount. The interface includes:

- Parameters:** A table showing a required parameter `token` of type string (query).
- Request body:** Set to `application/json`.
- Example Value | Schema:** A JSON schema for the request body:
 

```
{
  "currency": "string",
  "bankName": "string",
  "description": "string"
}
```
- Responses:**

Code	Description	Links
200	Success	No links

 The response example is a JSON object:
 

```
{
  "userBankAccountId": 0,
  "accountNumber": "string",
  "createAt": "2023-06-05T18:40:02.028Z",
  "currency": "string",
  "bankName": "string",
  "description": "string",
  "credit": 0,
  "debit": 0,
  "total": 0,
  "ownerId": "string",
  "owner": {
    "userId": "string",
    "name": "string",
    "type": "string",
    "phoneNumber": "string"
  }
}
```

Figure 2.3. POST API: Creating a bank account

Supplying a bank account Supplying the current user's account is made possible by implementing the GET API. **GetAllAccountsForUser (GET API):**

- Ruta: /api/UserBankAccount/GetAllAccountsForUser
- Parameters: token (JSON Web Token)
- Result: Text response (text/plain)

Deleting a bank account The route / **api/UserBankAccount/DeleteAllAccountsForUser (DELETE API)** has been created for the purpose of deleting a user account.

The screenshot shows the DELETE API endpoint for deleting all bank accounts for a user. It includes parameters (token) and responses (200 Success).

Name	Description
<code>token</code> * required string (query)	token

Code	Description	Links
200	Success	No links

Figure 2.4. DELETE API: Delete a bank account

## Voucher

The application also offers a "Voucher" option which is established by creating the route `/api/Voucher/ExecuteVoucherRedemption` (POST API). To check this route, it is necessary to generate a JSON Web Token for the user who is logged into the system.

The screenshot shows the POST API endpoint for executing a voucher redemption. It includes parameters (token), request body (application/json), and responses (200 Success).

Request body (application/json):

```
{
  "amount": 0,
  "accountNumber": "string"
}
```

Responses:

Code	Description	Links
200	Success	No links

Media type: `text/plain`

Example Value | Schema:

```
{
  "voucherId": 0,
  "amount": 0,
  "userBankAccountId": 0,
  "account": {
    "userBankAccountId": 0,
    "accountNumber": "string",
    "creationDate": "2020-08-05T18:41:24.060Z",
    "currency": "string",
    "bankName": "string",
    "description": "string",
    "credit": 0,
    "debit": 0,
    "total": 0,
    "ownerId": "string",
    "owner": {
      "userId": "string",
      "name": "string",
      "type": "string",
      "phoneNumber": "string"
    }
  },
  "activatorId": "string",
  "activator": {
    "userId": "string",
    "name": "string",
    "type": "string",
    "activationDate": "string"
  }
}
```

Figure 2.5. POST API: Voucher

## Payment of bills

The invoice payment API **/api/EInvoicePayment/ExecuteInvoicePayment** receives a token and information related to the user making the payment, as well as information about the vendor to whom the payment is made. It also receives the following items: description, reference, currency and amount. The database also records the history of bill payments, information about who paid to which vendor and what amount was paid.

For the purposes of this route, the following three routes were also created for creating, obtaining and deleting vendors:

**/api/VendorBankAccount/CreateVendorBankAccount (POST API)**

**/api/VendorBankAccount/GetBankAccountsForVendor (GET API)**

**/api/VendorBankAccount/DeleteVendorBankAccounts (DELETE API)**

The screenshot shows a REST API documentation interface for the **/api/EInvoicePayment/ExecuteInvoicePayment** endpoint. The top bar indicates a **POST** method and the endpoint URL. Below this, there are sections for **Parameters**, **Request body**, and **Responses**.

- Parameters:** A table with one row for **token** (required, string, query).
- Request body:** A section titled "Example Value | Schema" containing a JSON schema example:
 

```
{
        "payer": {
          "name": "string",
          "address": "string"
        },
        "payee": {
          "name": "string",
          "address": "string",
          "bankAccountNumber": "string"
        },
        "description": "string",
        "reference": "string",
        "currency": "string",
        "amount": 0
      }
```
- Responses:** A table with one row for **200 Success**.

Figure 2.6: Bill payment

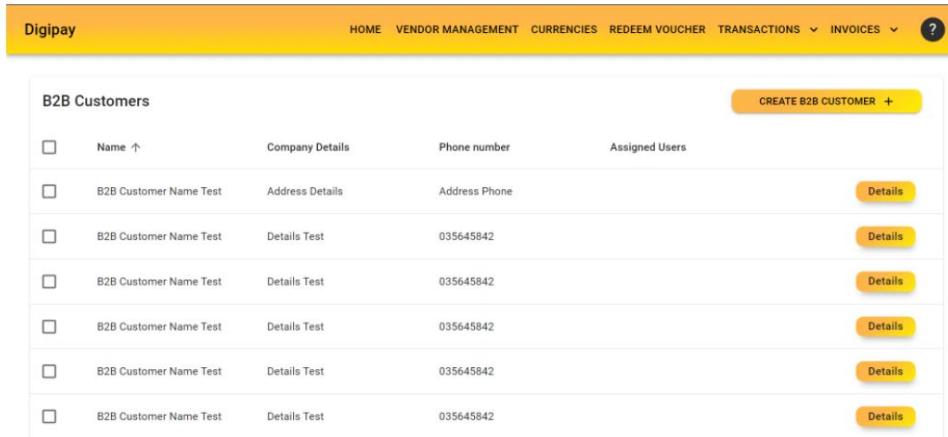
## B2B buying and customer creation

In the next segment, there are instructions for the general management of B2B customers, which have been executed in such a way as to comply with the following principles:

- The user should be able to create a new B2B customer, which contains standard data like name, address and similar company details • Users should be assigned to a B2B customer
- Users will be able to list B2B customers • Users will be able to define/CRUD locations of B2B customers
- Users will be able to define/CRUD sales points at each location
- Users will be able to define/CRUD payment terms for each B2B user • One or more contracts (PDF) • Start date and expiration date • Invoice frequency • Payment terms (term)
- Users will be able to raise a complaint for a transaction • Users will be able to upload a pdf or similar documentation for a complaint • The complaint will be a document and channel of communication between the user and the administrator

### Creating a new B2B customer

By clicking on the Vendor Management button, a page with listed B2B customers opens. In the upper right corner, the option to create a new B2B customer is enabled.



The screenshot shows a web-based application for managing B2B customers. At the top, there's a yellow header bar with the 'Digipay' logo on the left and navigation links for 'HOME', 'VENDOR MANAGEMENT', 'CURRENCIES', 'REDEEM VOUCHER', 'TRANSACTIONS', and 'INVOICES'. On the far right of the header is a question mark icon. Below the header, the main content area has a title 'B2B Customers'. Underneath the title is a table with the following columns: a checkbox column, 'Name ↑', 'Company Details', 'Phone number', and 'Assigned Users'. To the right of the table is a yellow button labeled 'CREATE B2B CUSTOMER +'. The table lists seven rows, each representing a B2B customer with placeholder names ('B2B Customer Name Test') and phone numbers ('035645842'). Each row also includes a 'Details' button. The entire interface has a clean, modern design with a white background and light blue accents.

It is necessary to enter standard data: name, address, phone number, and it is also possible to enter details.

## Create B2B Customer

Name \*

Address \*

Details

Phone number \*

Assign Users  ▾



CREATE

It is possible to assign a user to a new B2B customer.

## Create B2B Customer

Name \*

Address \*

(User)

- ffijuljanin11
- damke23
- abrusic1
- nrs123
- evlahovlja1
- mkokor2



CREATE

## Create B2B Customer

Name \*

Address \*

Details

Phone number \*

Assign Users  abrusic1  evlahovlja1  (User)  ▾



CREATE

On the Vendor Management tab, it is possible to mark a B2B customer, and the delete option appears (to the left of the button for creating a new B2B customer).

	Name	Company Details	Phone number	Assigned Users
<input checked="" type="checkbox"/>	B2B Customer Name Test	Address Details	Address Phone	<button>Details</button>
<input type="checkbox"/>	B2B Customer Name Test	Details Test	035645842	<button>Details</button>
<input type="checkbox"/>	B2B Customer Name Test	Details Test	035645842	<button>Details</button>
<input type="checkbox"/>	B2B Customer Name Test	Details Test	035645842	<button>Details</button>
<input type="checkbox"/>	B2B Customer Name Test	Details Test	035645842	<button>Details</button>
<input type="checkbox"/>	B2B Customer Name Test	Details Test	035645842	<button>Details</button>

By clicking on the Details button for a particular customer, a window opens with the listed locations of the B2B customer.

	Name	Address
<input checked="" type="radio"/>	Address Test	Address
<input type="radio"/>	Address Test	Address
<input type="radio"/>	Address Test	Address
<input type="radio"/>	Address Test	Address
<input type="radio"/>	Address Test	Address
<input type="radio"/>	Address Test	Address
<input type="radio"/>	Address Test	Address

By clicking the Create Address button, a window opens in which you need to enter the name and address of the B2B location.

### Create B2B Location

Name \*

Address \*

By clicking on one of the locations, the option to delete and edit it, and to list the sales points for that location to the left of the button for creating a new address, appears.

Dense padding

1 selected

POINTS OF SALES

EDIT ADDRESS

DELETE ADDRESSES

CREATE ADDRESS +

	Name ↑	Address
<input checked="" type="checkbox"/>	Address Test	Address
<input type="checkbox"/>	Address Test	Address
<input type="checkbox"/>	Address Test	Address
<input type="checkbox"/>	Address Test	Address
<input type="checkbox"/>	Address Test	Address
<input type="checkbox"/>	Address Test	Address

Rows per page: 25 1-6 of 6 < >

The Edit Address button has the same fields as I Create Address, so their content can be changed.

Edit B2B Location

Name \*

Address Test

Address \*

Address

CONFIRM

Clicking on the Points of Sales button opens a new window with the listed cash registers of that location.

Point of Sale

CREATE A POINT OF SALE

	Name ↑
<input type="checkbox"/>	Address Test

Rows per page: 25 0-0 of 0 < >

Dense padding

It is also possible to create a new point of sale by clicking on Create a Point of Sale, where it is necessary to enter only the name of the point.

Create a Point of Sale

Name \*

CREATE

## Payment terms

By clicking on the details of the B2B customer, in addition to the locations, payment terms are also listed.

Payment Terms

<input type="checkbox"/>	Name ↑	Invoice Frequency	Start Date	Expiry Date	Due Date

Rows per page: 25 0–0 of 0 < >

Dense padding

To create a new payment term, it is necessary to enter the name, start and end date, frequency of invoices, term, and it is also possible to upload contracts as documents.

### Payment Terms Form

Name \*

Start Date

Expiry Date

Invoice Frequency  
Monthly

Payment Terms / Due Date

Drag and drop files here or click to select files

CANCEL CREATE

By clicking on a specific payment condition, options for editing and deleting it appear.

1 selected

<input checked="" type="checkbox"/>	Name ↑	Invoice Frequency	Start Date	Expiry Date	Due Date
<input checked="" type="checkbox"/>	Test	Monthly	4 June 2023	5 June 2023	12 June 2023

Rows per page: 25 1–1 of 1 < >

Dense padding

The Edit form looks the same as I Create Payment Term, so it is possible to change previously defined fields for that payment term.

### Payment Terms Form

Name \*  
Test

Start Date  
06/04/2023 

Expiry Date  
06/05/2023 

Invoice Frequency  
Monthly 

Payment Terms / Due Date  
06/12/2023 

**Contracts**

<input type="checkbox"/> Name	Extension

Rows per page: 25  0–0 of 0  

Dense padding

Drag and drop files here or click to select files



## Complaints

In My Invoices (from the drop-down list for Invoices) you can find all approved claims. Clicking on a complaint opens its details and the Pay button. Once the payment has been made, the status of the claim Paid changes from No to Yes.

Digipay								
Payer Name	Payer Address	Reference	Description	Payee Name	Payee Account Number	Payee Address	Amount	Paid
HAMO HAMIC	FERHADUJA 12	127326249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BH	1274973843	ZMAJA OD BOŠNE bb	127 BAM	No
HAMO HAMIC	FERHADUJA 12	127326249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BH	1274973843	ZMAJA OD BOŠNE bb	127 BAM	No
HAMO HAMIC	FERHADUJA 12	127326249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BH	1274973843	ZMAJA OD BOŠNE bb	127 BAM	No
HAMO HAMIC	FERHADUJA 12	127326249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BH	1274973843	ZMAJA OD BOŠNE bb	127 BAM	No
HAMO HAMIC	FERHADUJA 12	127326249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BH	1274973843	ZMAJA OD BOŠNE bb	129 BAM	No
HAMO HAMIC	FERHADUJA 12	127326249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BH	1274973843	ZMAJA OD BOŠNE bb	460 BAM	No
VEDAD VEDIC	FERHADUJA 12	127326249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BH	1274973843	ZMAJA OD BOŠNE bb	127 BAM	No
neko nekic	FERHADUJA 12	127326249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BH	1274973843	ZMAJA OD BOŠNE bb	127 BAM	No
neko nekic	FERHADUJA 12	127326249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BH	1274973843	ZMAJA OD BOŠNE bb	127 BAM	No
neko nekic	FERHADUJA 12	127326249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BH	1274973843	ZMAJA OD BOŠNE bb	137 BAM	No
neko nekic	FERHADUJA 12	127326249	RACUN ZA STRUJU ZA MAJ 2023	ELEKTROPRIVREDA BH	1274973843	ZMAJA OD BOŠNE bb	147 BAM	No
Matija Kokor	adresa	127326249	RACUN ZA STRUJU ZA MAJ 2023	Test Company	1274973843	ADDRESS	127 BAM	No
Matija Kokor	adresa	127326249	RACUN ZA STRUJU ZA MAJ 2023	Test Company	1274973843	ADDRESS	127 BAM	No

#### Payment Details

Payer Name: HAMO HAMIC  
 Payer Address: FERHADUJA 12  
 Reference Number: 127328249  
 Description: RACUN ZA STRUJU ZA MAJ 2023  
 Payee Name: ELEKTROPRIVREDA BIH  
 Payee Account Number: 1274973843  
 Payee Address: ZMAJA OD BOSNE bb  
 Amount: 127  
 Currency: BAM

CLOSE

PAY

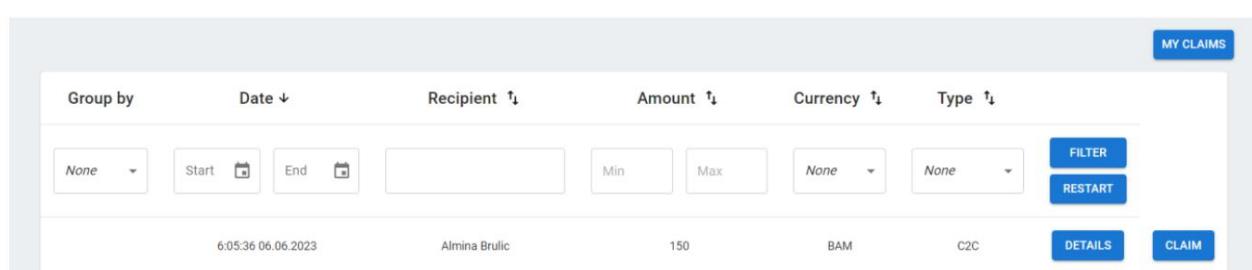
## Requests as part of the transaction

### Creating and tracking requests from the user's perspective

If you believe that one of your completed transactions is not valid or you doubt its integrity, you can make a request for an official review by the administrator. This opens a communication channel through which you can discuss the transaction with attached evidence in the form of documentation. In case of successful proof, the request is approved.

The request is made by clicking the "Claim" button next to the problematic transaction.

**TRANSACTIONS LIST**



The screenshot shows a user interface titled "TRANSACTIONS LIST". At the top right is a blue button labeled "MY CLAIMS". Below it is a search bar with several dropdown and input fields: "Group by" (None), "Date" (Start and End date pickers), "Recipient" (input field), "Amount" (Min and Max input fields), "Currency" (None dropdown), "Type" (None dropdown), and buttons for "FILTER" and "RESTART". Below the search bar, transaction details are listed: "6:05:36 06.06.2023", "Almina Brulic", "150", "BAM", "C2C", and two buttons: "DETAILS" and "CLAIM".

Image: Transaction and claim button

When clicking on the Claim button, a window opens for filling in more details. Here you can create an overall image of the remark, through a short and meaningful title and detailed content. To send a remark, it is necessary to attach a document that supports your claim, so that the administrator has a justified reason for the amendment.

# File a Claim for Transaction

Subject  
Primjer naslova

Description  
Kratki opis problema

Drag and drop your file here or click to select file.



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**FILE CLAIM**

Image: Window for creating a remark

After a successfully sent request, a green status bar will appear in the window to confirm the transport. After that, the user can monitor his claims in the window where the transactions are, by clicking on the "My Claims" button, which is located in the upper right corner of the screen (also visible in the first picture in this segment).

My Claims			
Id	Subject	Last updated	Status
10	claim	2023-05-21	Under_Investigation
Rows per page: 25   1-1 of 1   < > <span style="border: 1px solid #ccc; border-radius: 50%; padding: 2px;">Dense padding</span>			

Image: Pending requests

Requests can have the status Under Investigation, Approved and Rejected, and now the user engages in direct communication with the Administrator.

If we click on one of the listed requests, a chat box with the administrator opens where we can provide additional information.

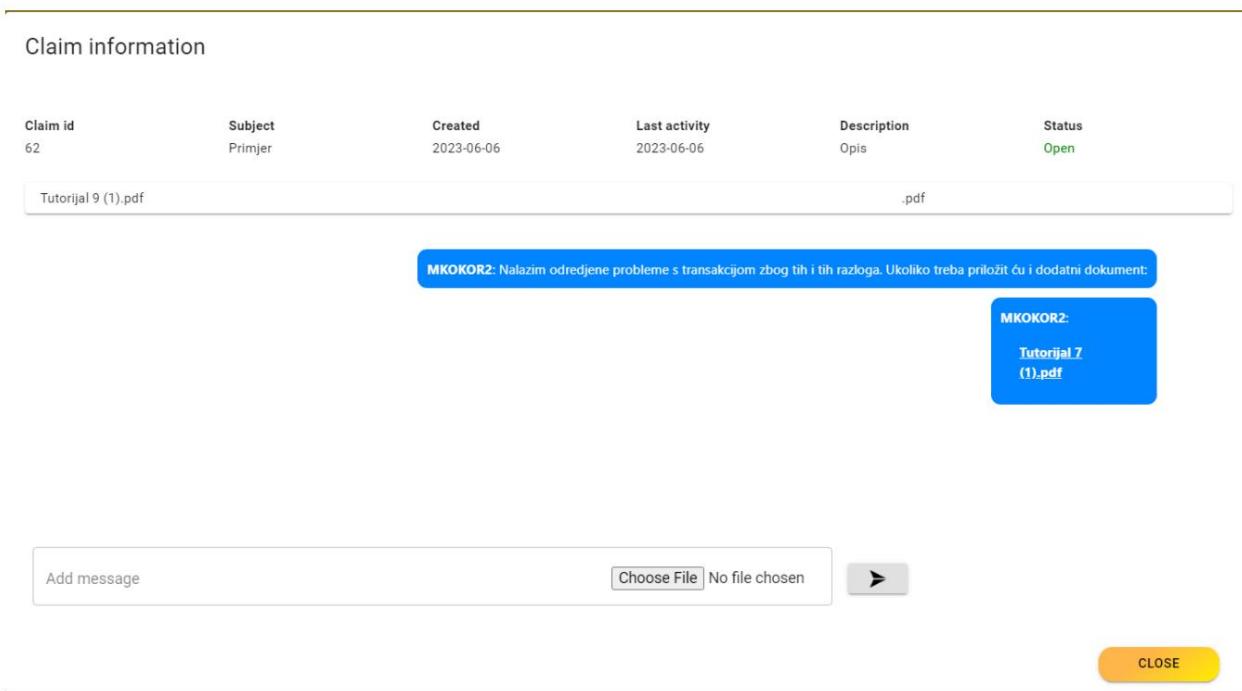
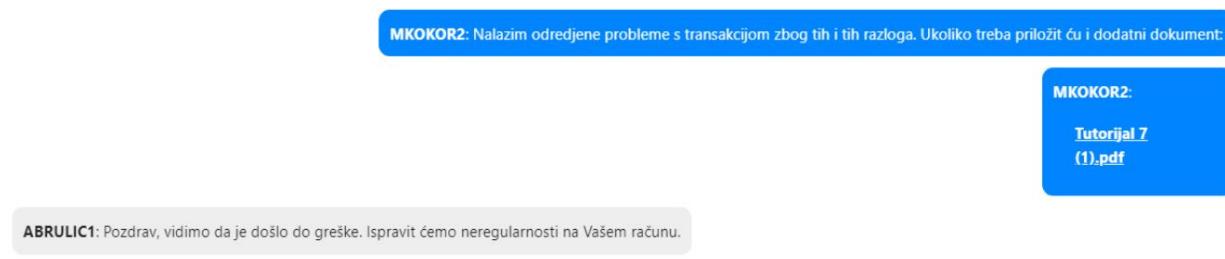


Image: Communication with the administrator

## Request results from the user's perspective

When sending a request, different situations are possible. If the request is valid, it is natural to expect this reaction from the administrator:



Picture: Successfully resolved request - chat

In the upper right corner of the chat window, as well as on the request table, the message "Solved\_Confirmed" will appear. Thus, from the user's perspective, the submission of the request has been successfully completed and he can continue with regular activities.

**Status**  
**Solved\_Confirmed**

Image: Request successfully resolved - status

However, if the administrator does not find enough valid reasons to edit the transaction, he can also leave the request only on "Solved", which closes the request without changing anything related to the user. This is reported to the user in the same way as in the case of a successful request.

#### Claim information

Claim id	Subject	Created	Last activity	Description	Status
63	Nevalidan claim	2023-06-06	2023-06-06	Loš opis	Solved

Tutorijal 8 (1).pdf .pdf

**ABRULIC1:** Poštovani, nažalost, Vaš claim nije osnovan. Nemamo razloga da reagiramo na ovu transakciju.

Image: Unsuccessfully resolved request

Although the request was unsuccessfully resolved, the user can make a new claim or continue communicating in the old chat box. The admin can change the decision to Solved\_Confirmed, but the reverse process is not enabled, so the user has nothing to worry about once the request is confirmed.

## Request tracking from an administrator's perspective

Application users with an administrator role have a responsibility to monitor requests from other users and to respond within a reasonable time frame. A separate window for all requests is available to this type of user, which opens in the transaction menu.

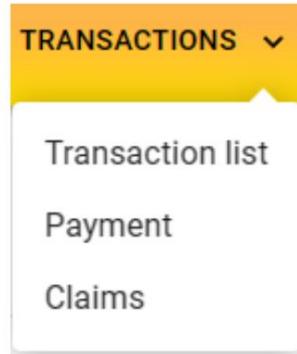


Image: Transaction menu and additional request selection

Clicking on the specified content opens a separate window that has two tables: requests that the admin has already taken to process or has processed, and requests that have not yet been determined and can be taken by any administrator currently online. The tabs are located in the upper left corner and are called "My Claims" and "Unassigned Claims" respectively.



Image: Cards with requests In

unclaimed requests, we can see the title and short description of the request, and next to it the functionality that selects that request and transfers it to the administrator's personal requests, where it waits for processing.

Transaction ID	Subject	Description
2	I am not in danger Skyler	I am the danger

Image: Unclaimed request

The status of all requests in this table is naturally Open, and next to it there is a plus button for the aforementioned addition.

Status	Action
Open	

Image: Status and activity to add

When the administrator receives enough complaint requests, he can process them in turn in a similar table. The only difference is that now it has an assortment of possible statuses and two options: chat and approval.

With one click, the admin closes the unsuccessful complaint, and with two clicks, he approves the client's complaint.

YOUR CLAIMS		
UNASSIGNED CLAIMS		
Transaction ID	Subject	Description
11	Test subject	Test description
11	Problem	Opis problema
2	Zalba na elvira	Opis moje zalbe

Picture: Requests taken by admin

Under_Investigation	✓	💬
Under_Investigation	✓	💬
Solved_Confirmed	✓	💬
Solved	✓	💬
Solved	✓	💬
Under_Investigation	✓	💬

Image: Statuses and options available to the administrator

## Messages

Nalazim odredjene probleme s transakcijom zbog tih i tih razloga. Ukoliko treba priložit ču i dodatni dokument:

MKOKOR2

MKOKOR2

ABRULIC1

Pozdrav, vidimo da je došlo do greške. Ispravit ćemo neregularnosti na Vašem računu.

New message

CANCEL SEND MESSAGE

Image: The previously displayed chat from the administrator's perspective



# Mobile application

## User login

To access the SI-Wallet application, follow these steps:

- Start the application on the mobile phone.
- After opening the application, you will notice a field for entering an email or phone number and a field for entering a password. •

Enter the appropriate data. • Click that

login button. • If the entered data is

correct, you will be successfully logged in and redirected to your home page. If the entered data is incorrect, you will receive the message "Incorrect username or password" and you will be able to retype the required data.

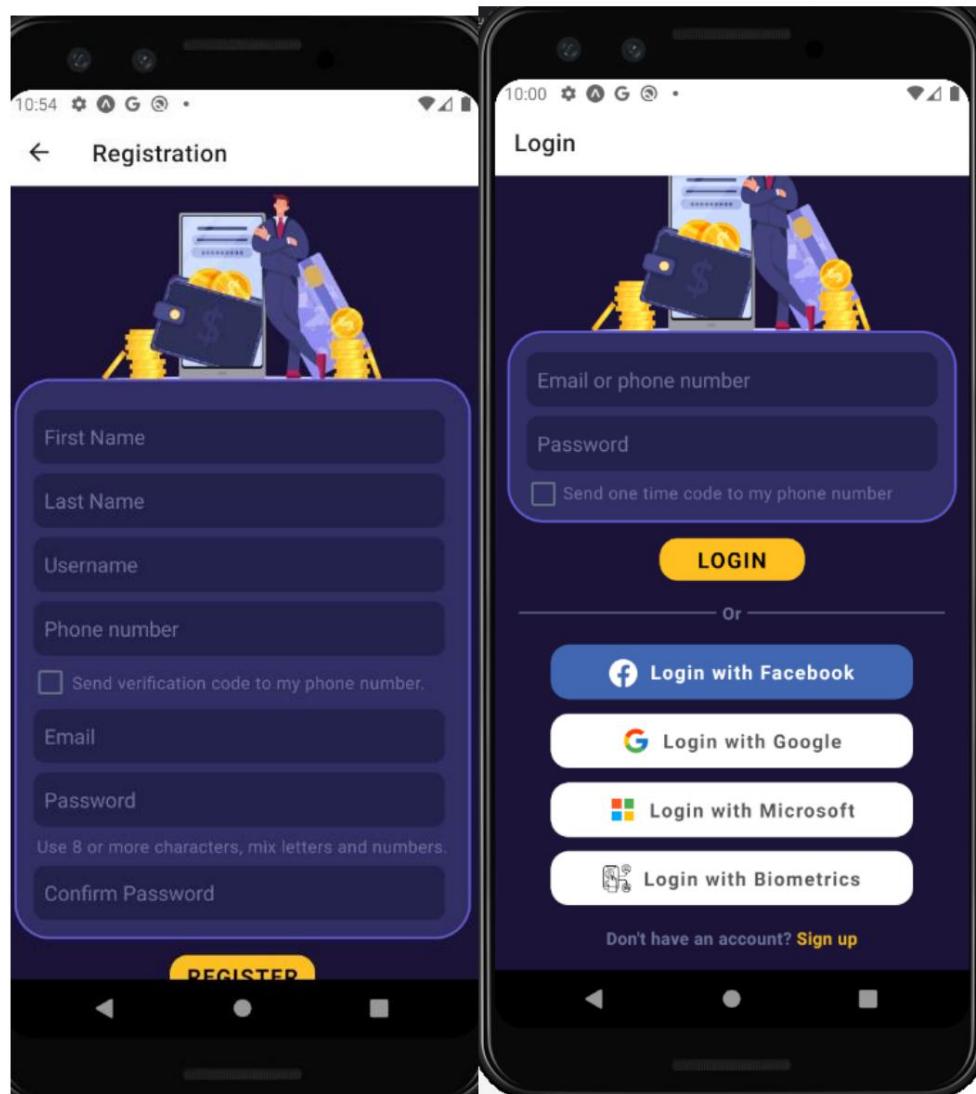


Image: Registration and login

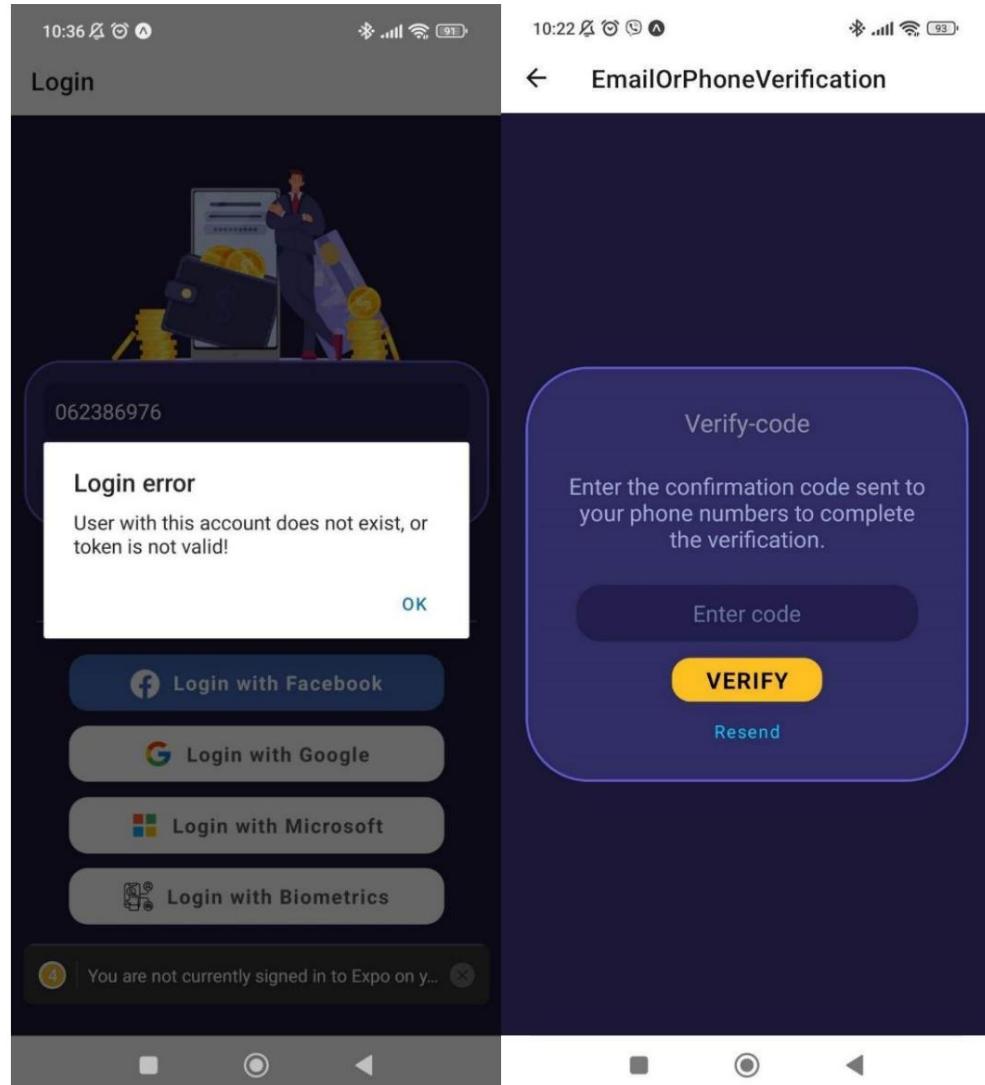
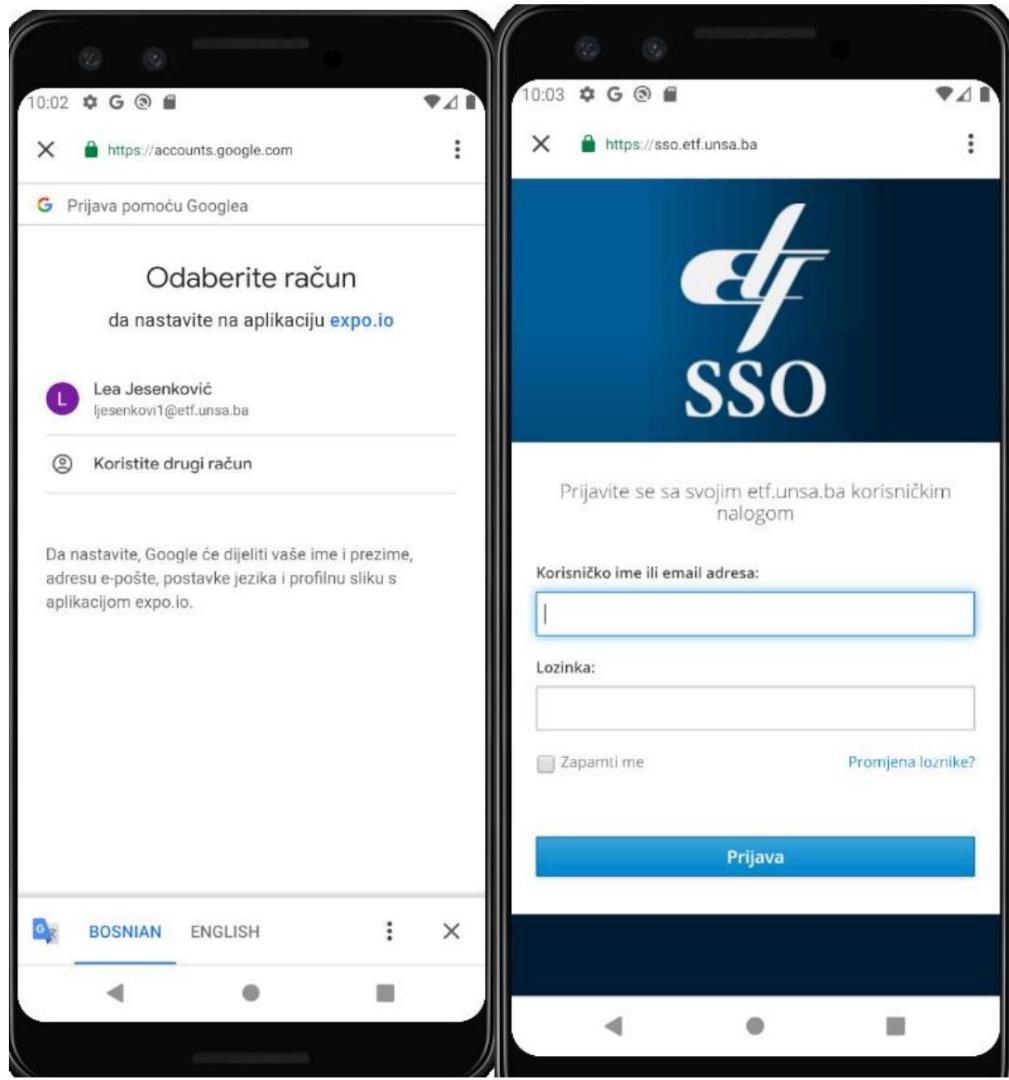


Image: Incorrectly entered data and two-factor authentication

**In the SI-Wallet application, you have the option to choose and log in via Facebook or Google account or biometrics. Here's how you can use that option:**

- Opening the application will show you fields for entering user data.
- Instead of manually entering data, check out the social media login options.
- Click the corresponding button to sign in with your Facebook or Google account.
- You will be redirected to the login page of your chosen social network.
- Enter your user information (such as email and password) for a Facebook or Google account.
- After entering the correct information, click on the login button.
- If the entered data is correct, you will be successfully logged into the SI-Wallet application using your Facebook or Google account.



Picture: Login via Google profile

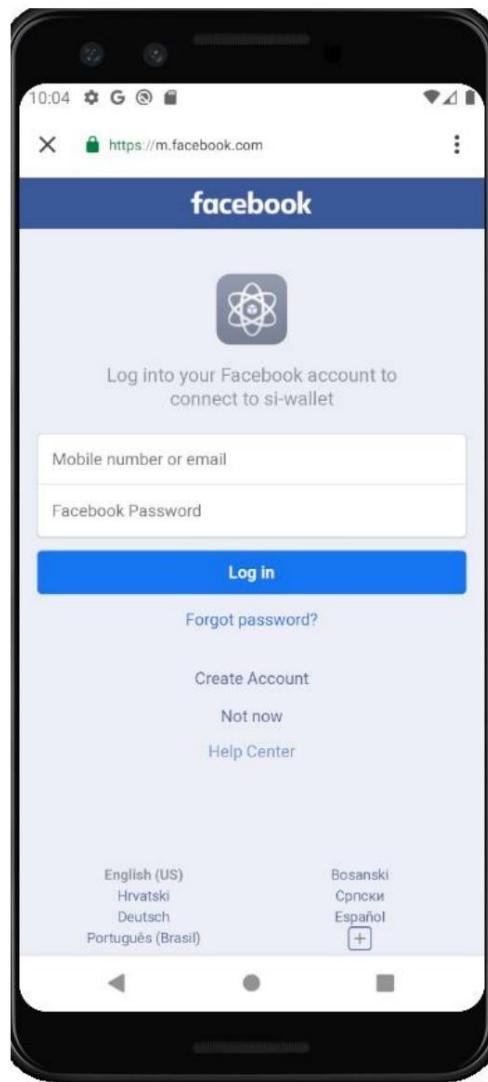


Image: Login via Facebook profile

- If you click the "Login with Biometrics" button, you have the option of logging in via fingerprint ID

a

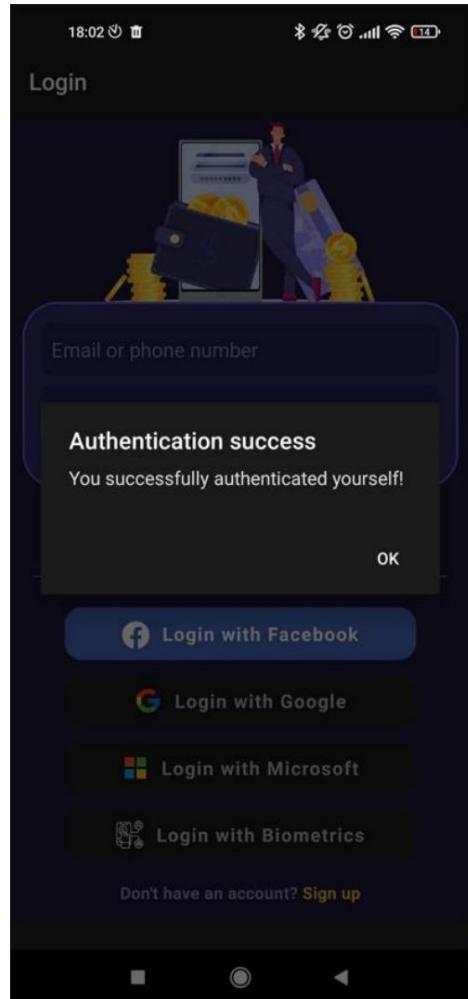
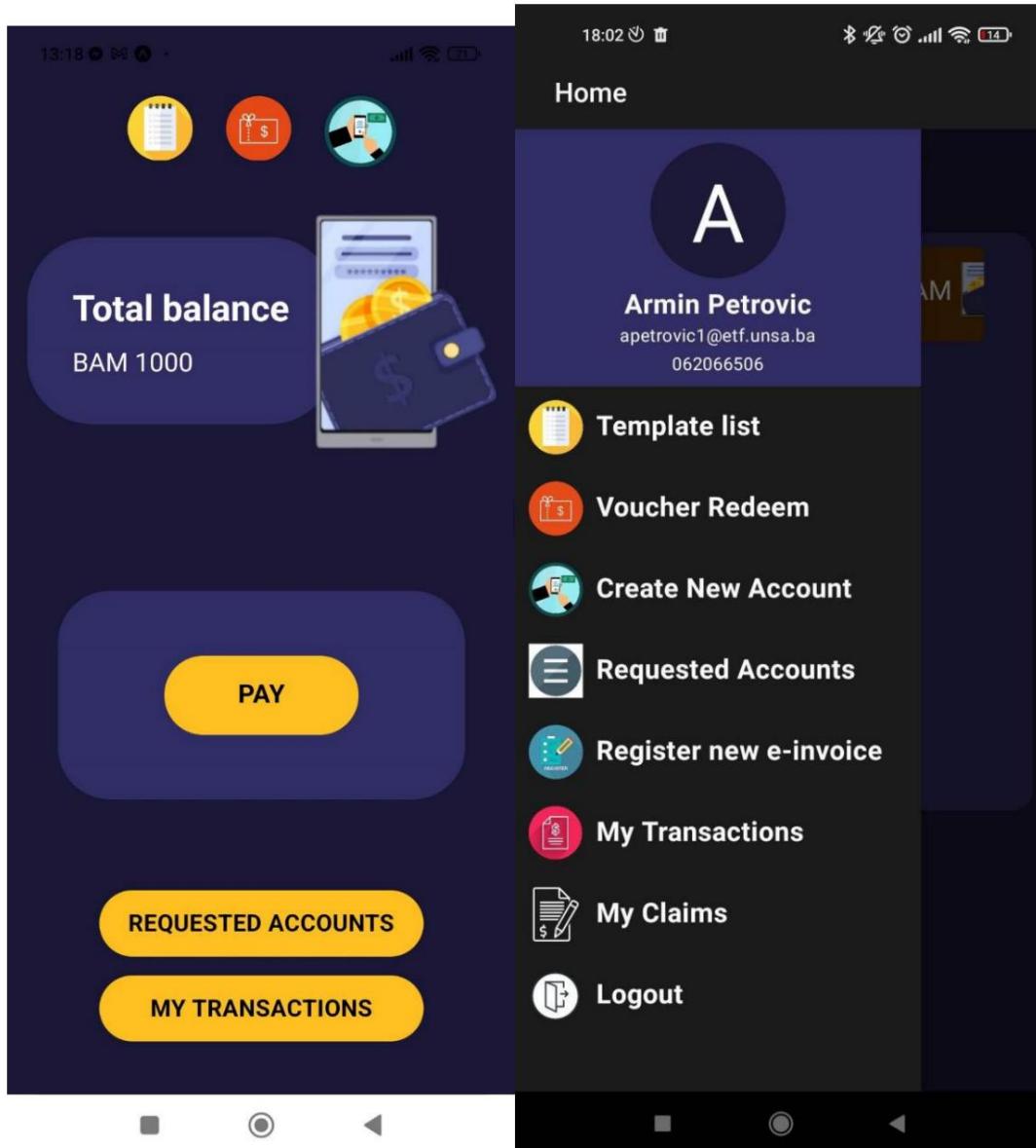


Image: Login using biometrics



Picture: Home page after login and open sidebar

- If you want to log out, click the “Logout” button at the bottom of the sidebar

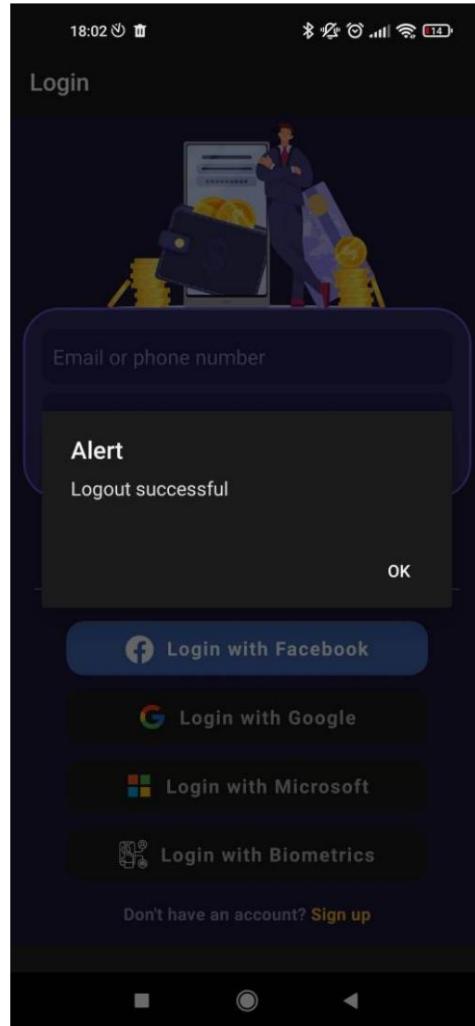
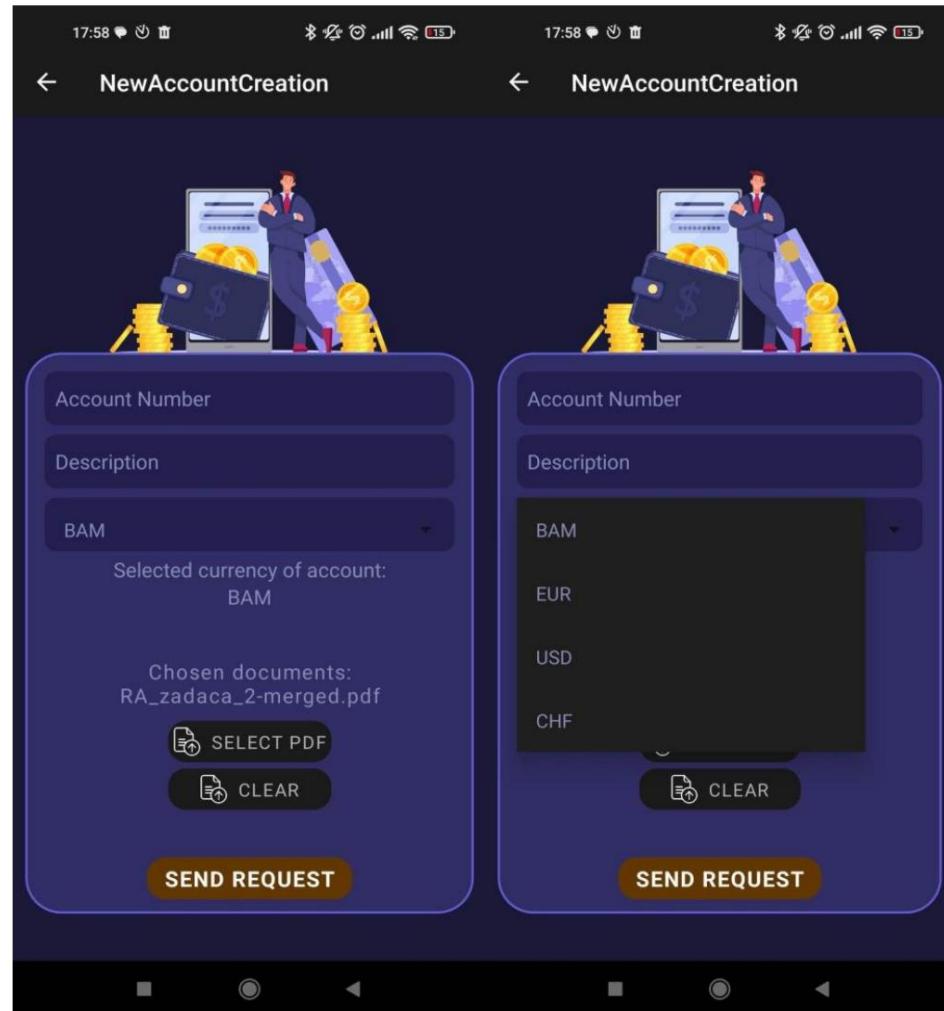


Image: Successful logout

## Creating a new account request

- If we look at the sidebar, we will see that we have the Create New Account option.
- Click on that option to open the form to create a new account.
- We need to enter the account number, description and select the desired currency.
- After successfully entering the data, we can upload the pdf document for approval creating our new account.



- If you try to add a pdf document without first clicking the "CLEAR" button, an error will appear.
- If you click the CLEAR button, the pdf document will be removed and you can re-upload the same or another pdf document.

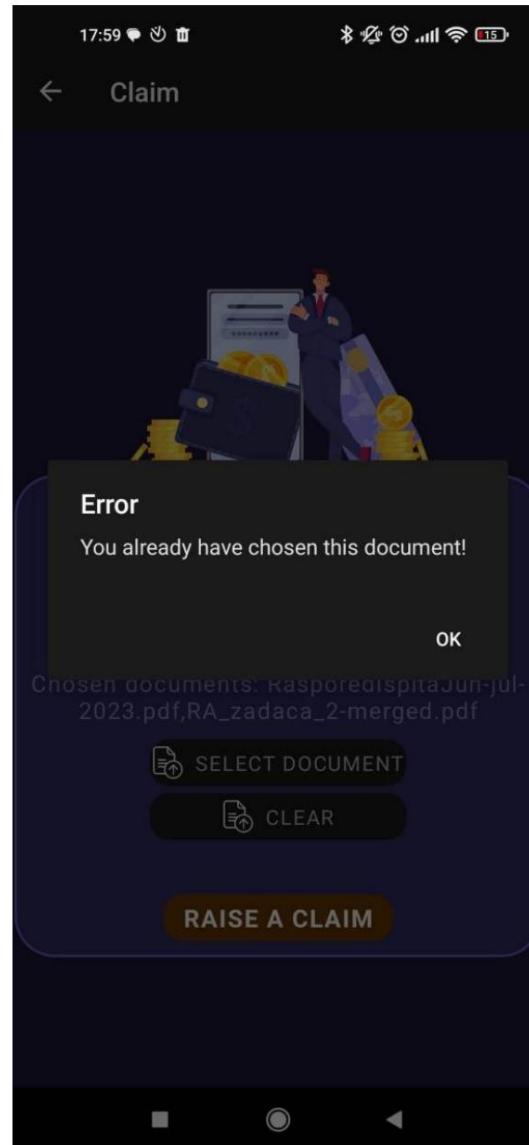
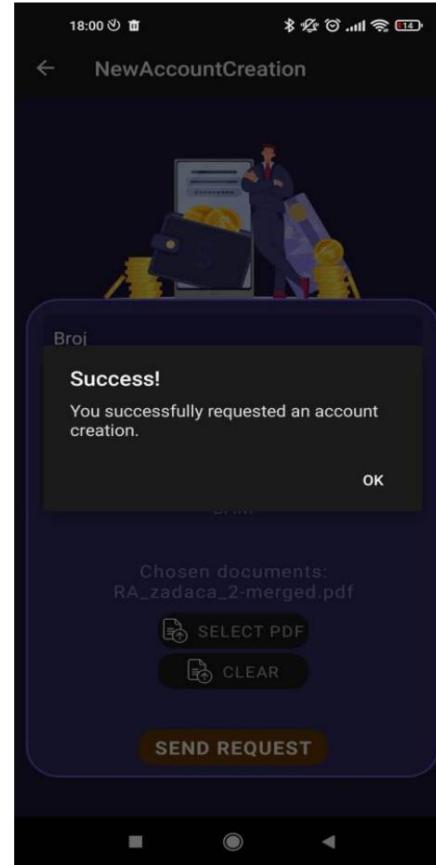
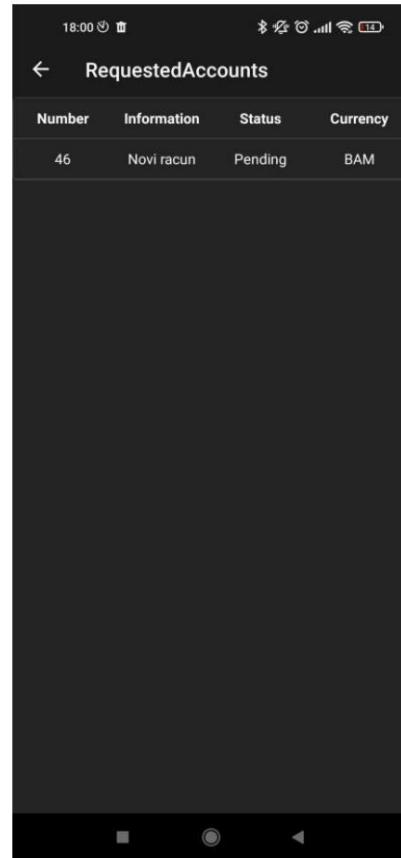


Image: Error uploading the document

- If we have entered all the data correctly and pressed the send request button, we have sent a request to create a new account.



- Once you have successfully created an account request, you can view it by clicking on the field "Requested Accounts" u sidebar-u



## Transactions

Users are enabled to exchange currencies using their accounts, with the previously displayed and agreed exchange rate. This functionality is similar to performing standard payment transactions.

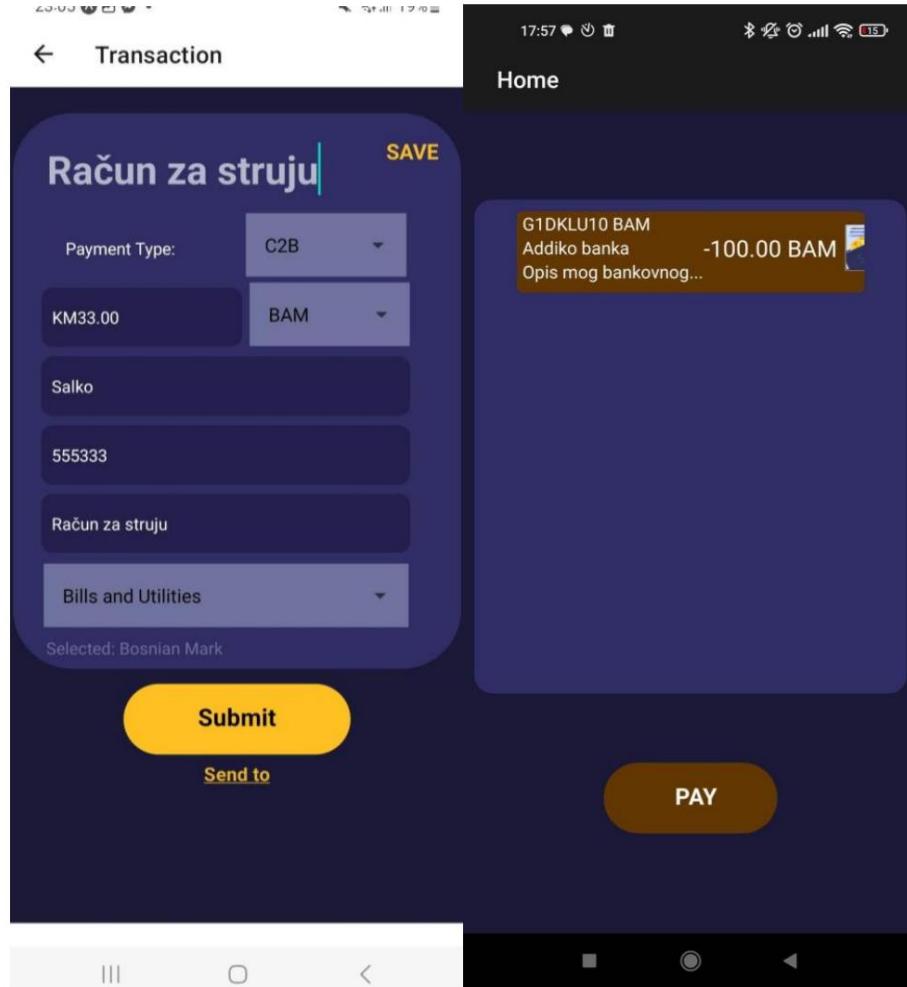
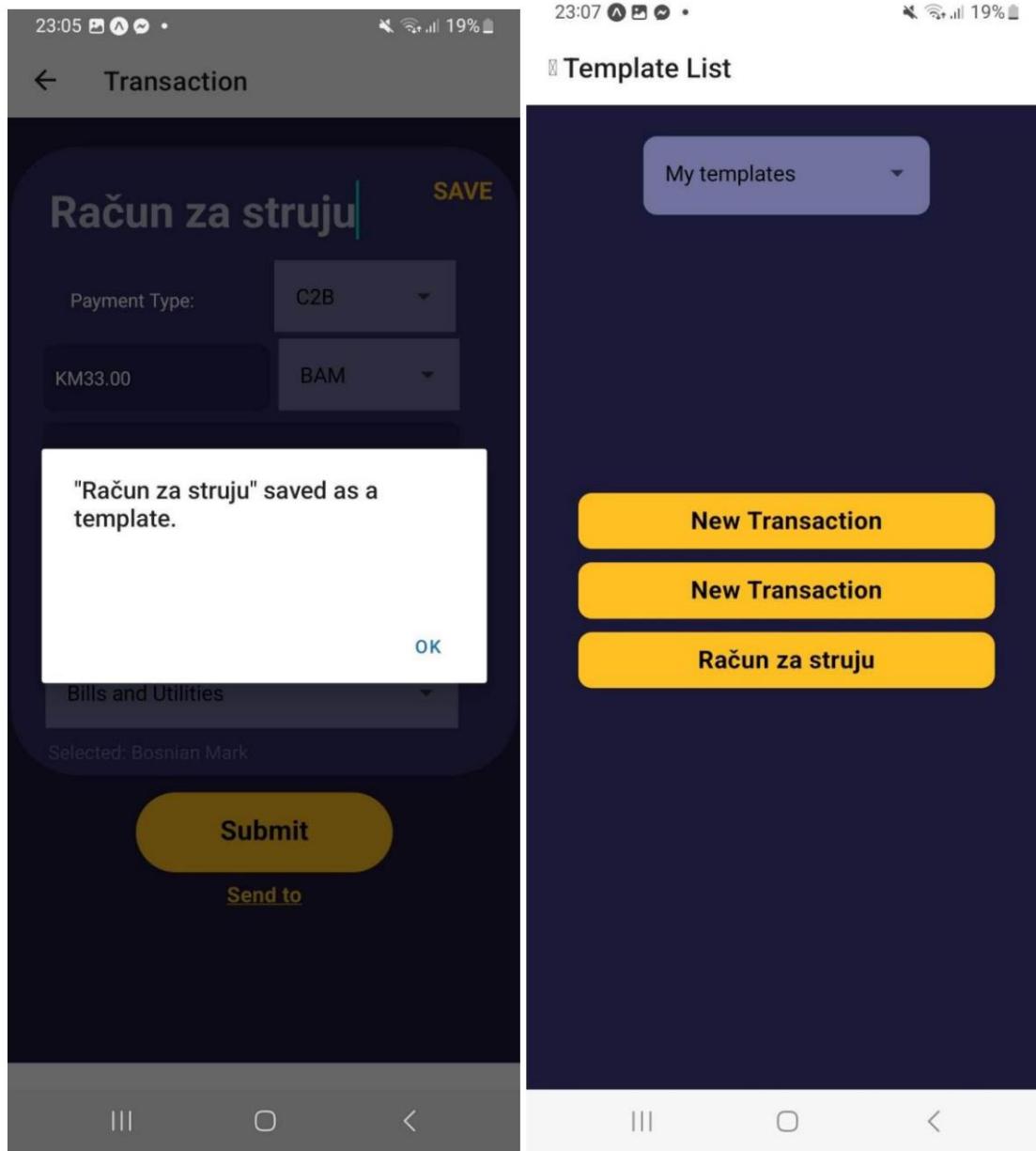


Image: Appearance of the home page after the transaction

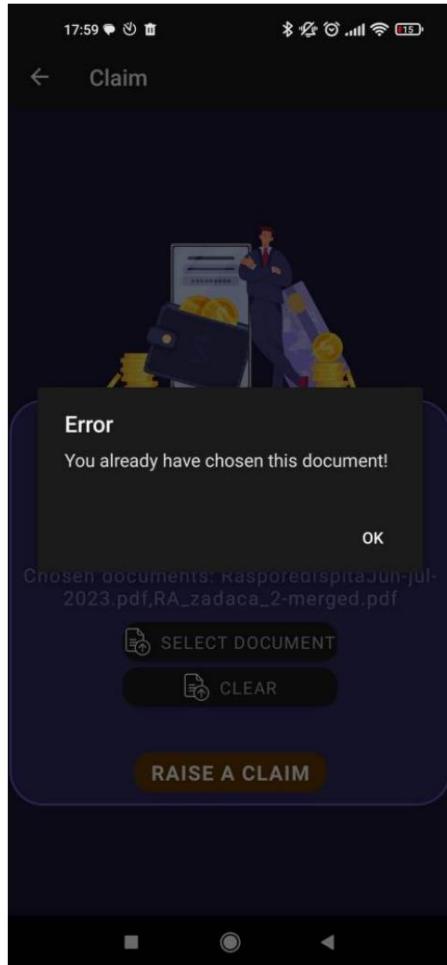
- After clicking on "save", the transaction is saved as a template and goes to the section "Template list" located in the sidebar



Picture of the Modal message after the completed transaction and the my templates section

## Submitting a request

- Within the sidebar we also have the My Transactions option. • Click on this option to open a list of all transactions. • When we select the desired transaction, click on it. • Transaction Details will open where we can see detailed information about transaction.
- At the bottom of the screen, we can see the raise a claim button, which, if pressed, will open for us new claim screen
- Within the claim screen, we must fill in the subject and description fields and select the appropriate one document.
- If you try to add a pdf document without first clicking the "CLEAR" button, an error will appear



- If we have completed all the steps, we can press the raise a claim button and we are successful submitted a request.

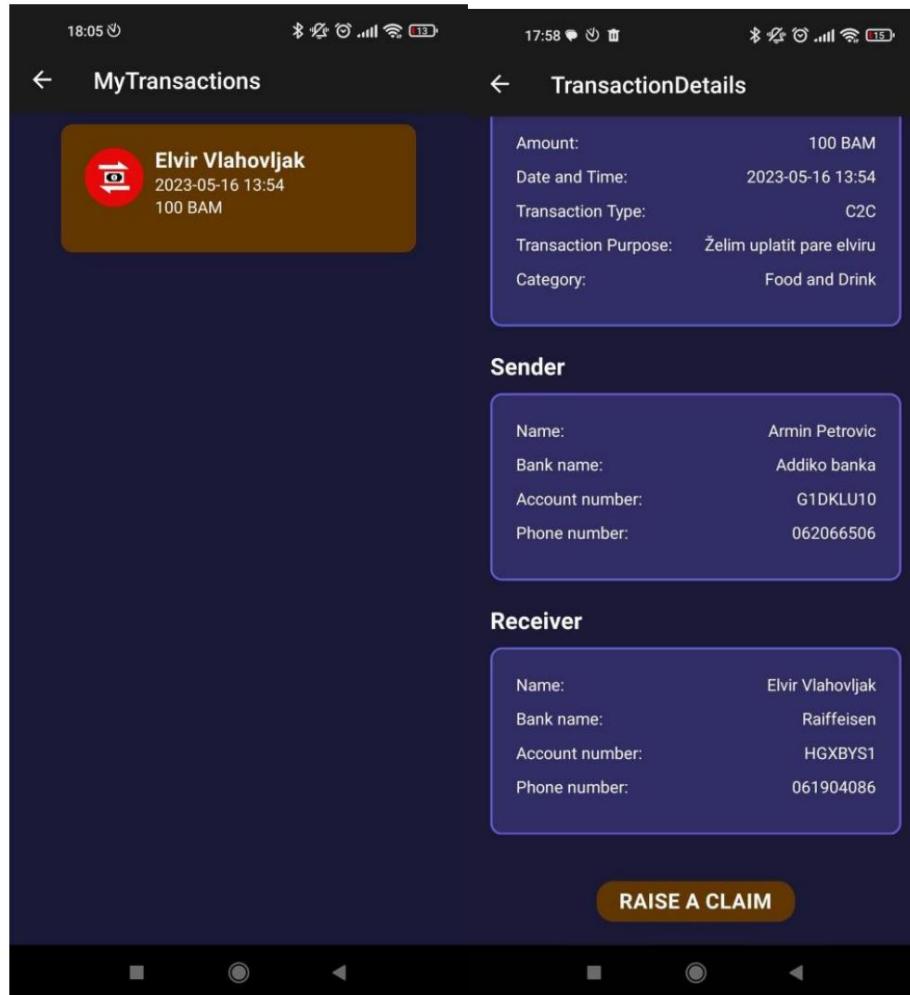


Figure: List of transactions and details of the selected transaction

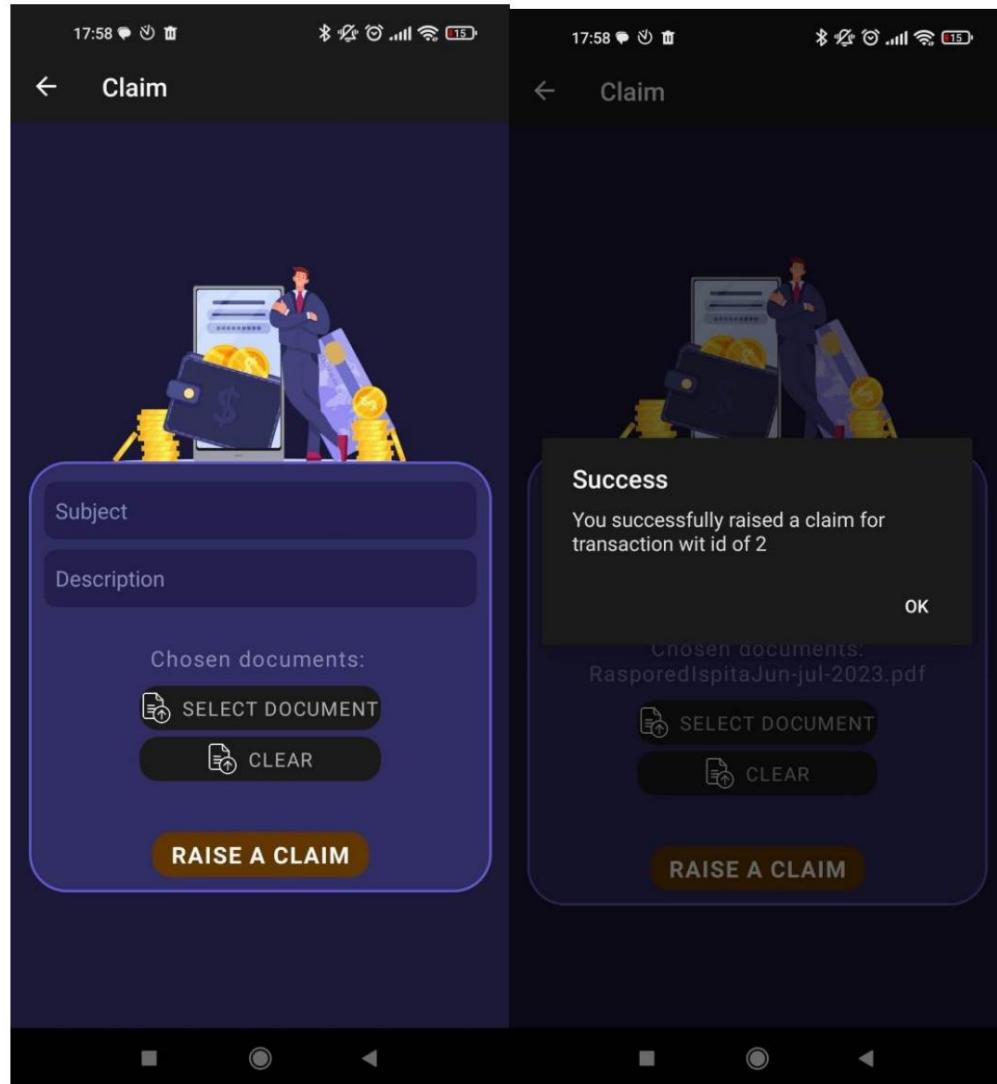
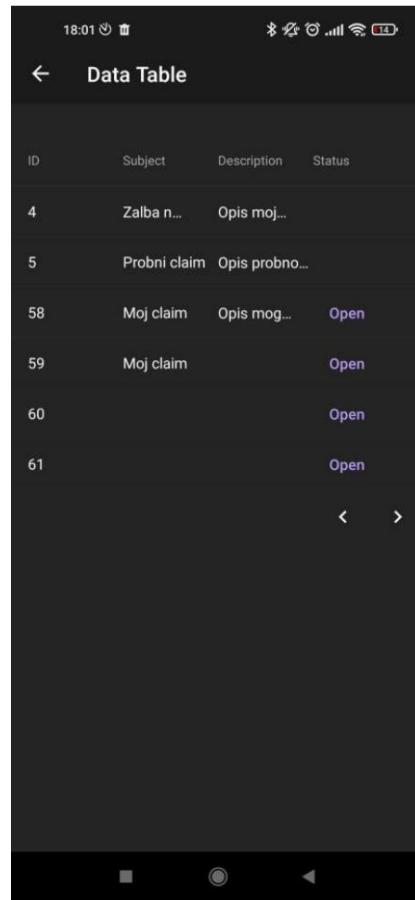


Image: Submitting a request

## View the list of requests

- Inside the sidebar we have the My Claims option.
- Click on that option to open a list of all requests. • The Data Table opens where you can see the transaction id for which the request was submitted, the name, description, and status of the request



A screenshot of a mobile application interface titled "Data Table". The screen shows a table with columns: ID, Subject, Description, and Status. There are six rows of data:

ID	Subject	Description	Status
4	Zalba n...	Opis moj...	
5	Probni claim	Opis probno...	
58	Moj claim	Opis mog...	Open
59	Moj claim		Open
60			Open
61			Open

Image: Opening the list of submitted requests

- Click on one of the listed requests to open Chat • By clicking on "Fetch messages" you get all previous messages between you and administrator

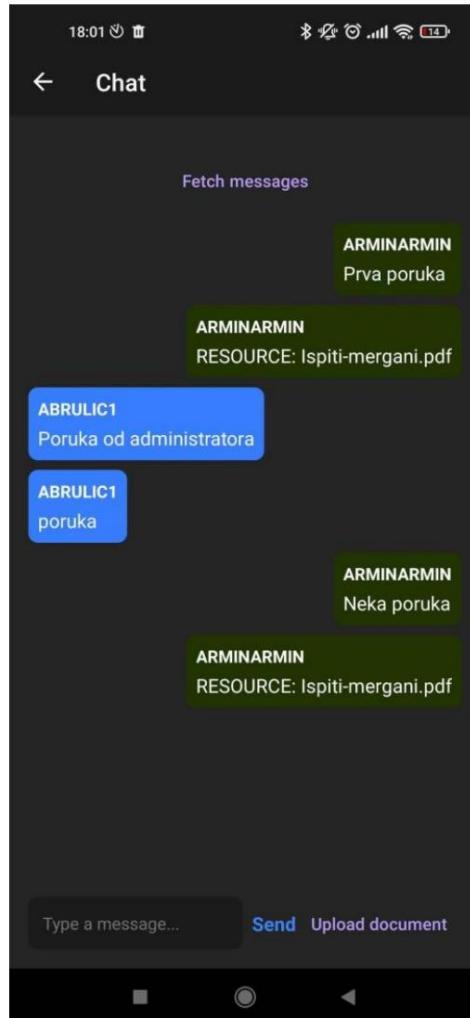


Image: Layout of the Chat screen

- If you click the "Upload document" option, after selecting the appropriate document, the name of the document you selected will be displayed at the top of the screen. If you click "Send", the document is sent in RESOURCE form. By clicking on RESOURCE, you can download the document to your mobile device again.

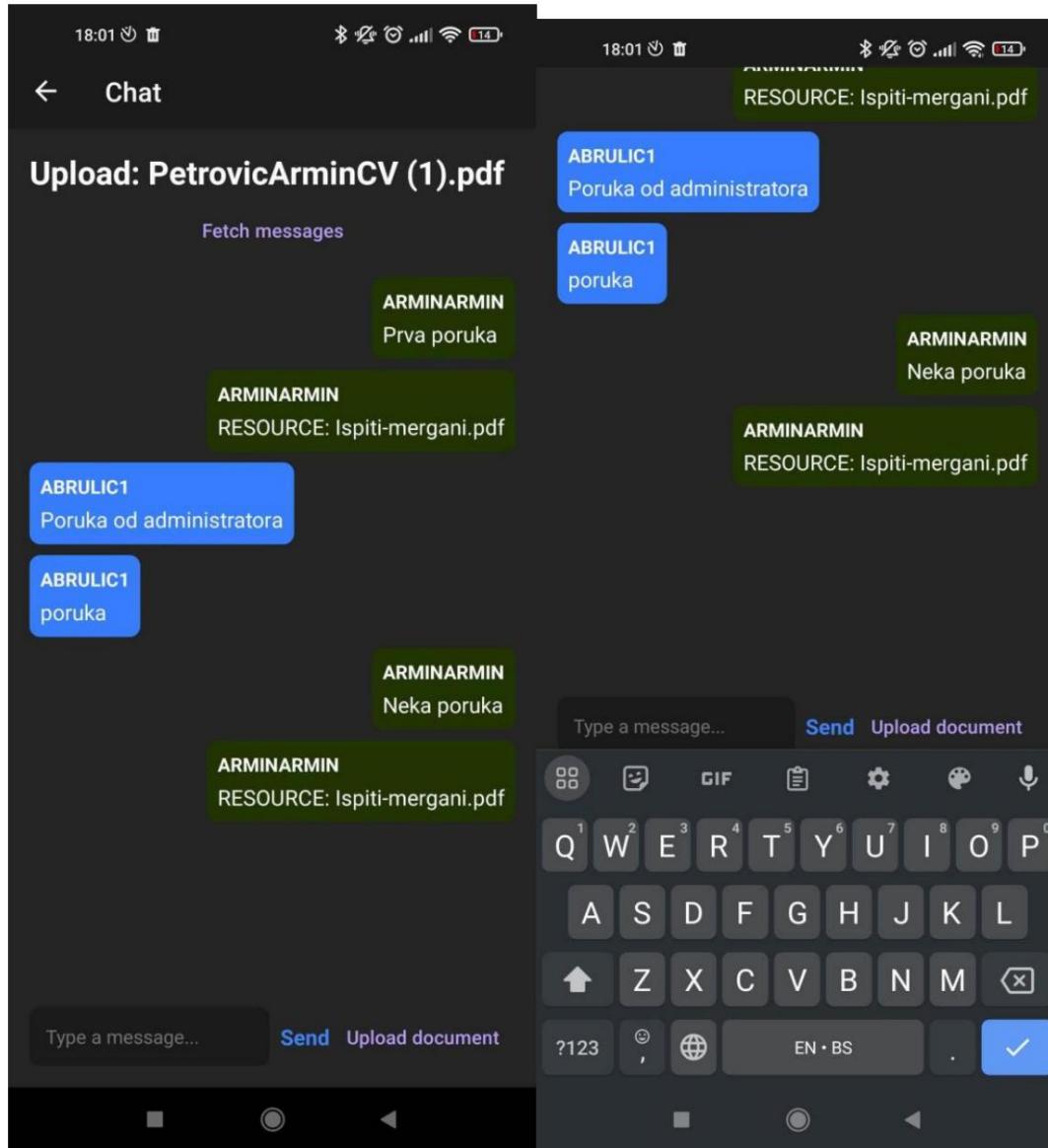


Image: Display of document exchange in chat

## Vouchers

Users will be able to exchange vouchers for a certain amount of money, subject to certain conditions. When redeeming a voucher, the amount of the voucher will be added to the user's account and the status of the voucher will be changed from active to used.

- Within the sidebar, select the "Voucher redeem" option

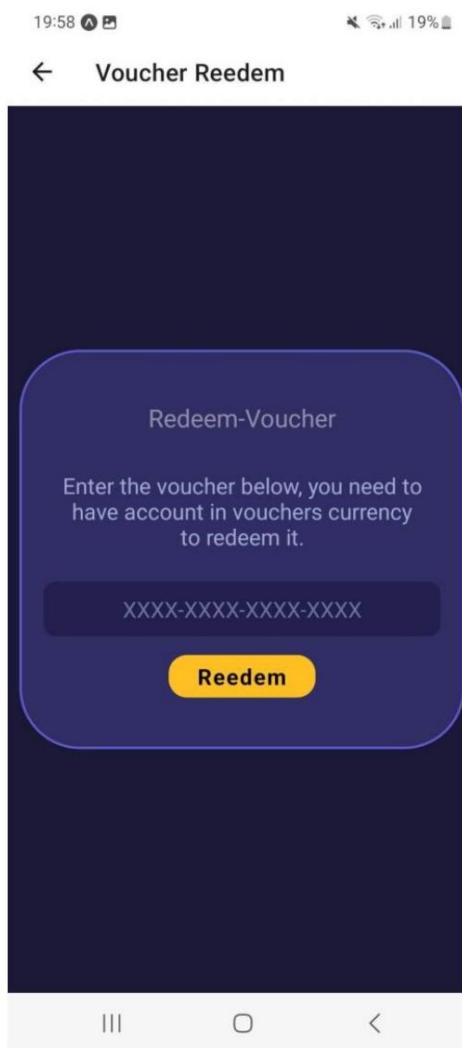


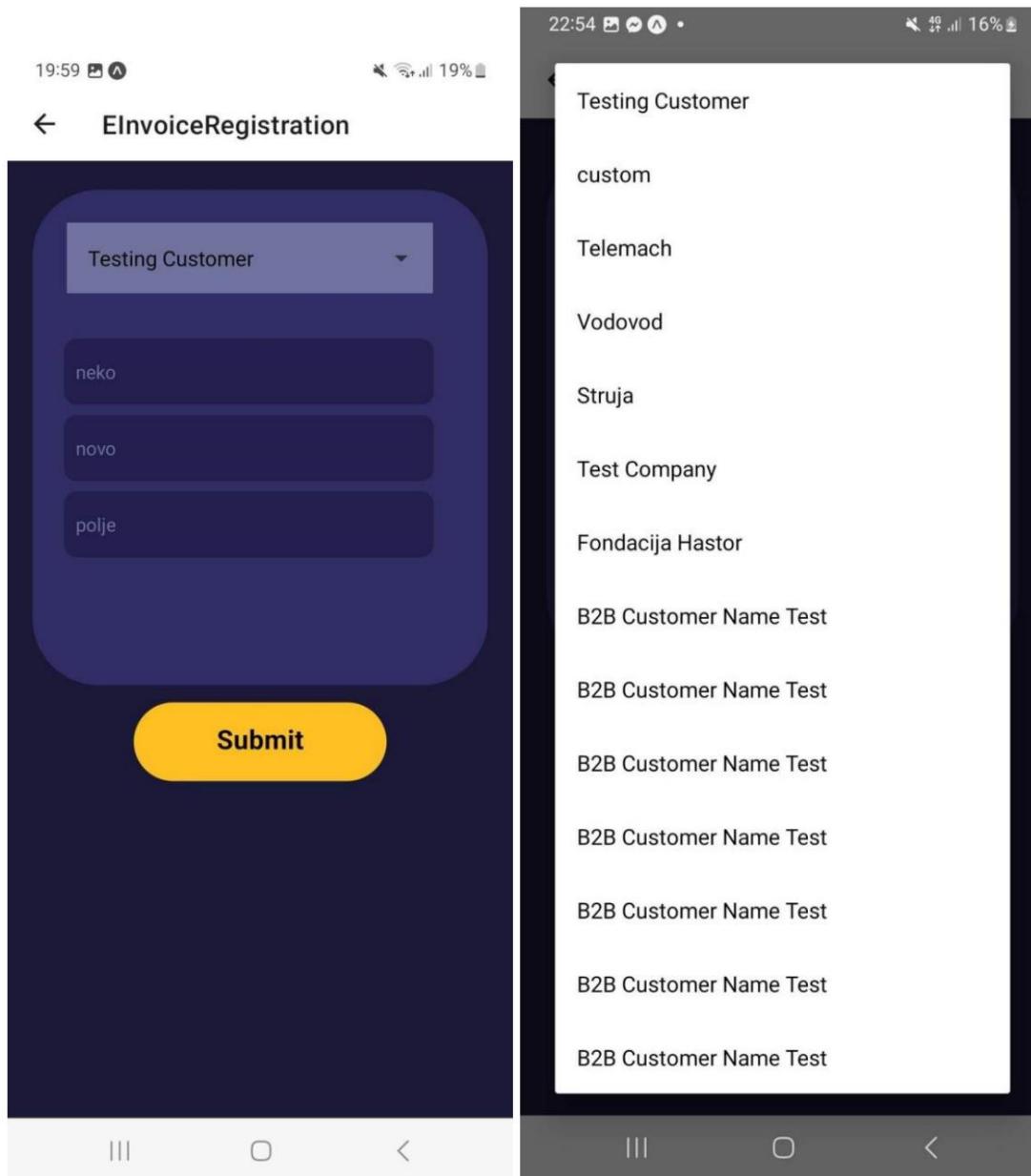
Image: Layout of the voucher redeem page

- Users will be able to enter the voucher by entering the corresponding code in the provided field on the user interface. Entering the voucher through the code allows users to activate the voucher for further use. After entering the code, the system will check the validity of the voucher and display its value.

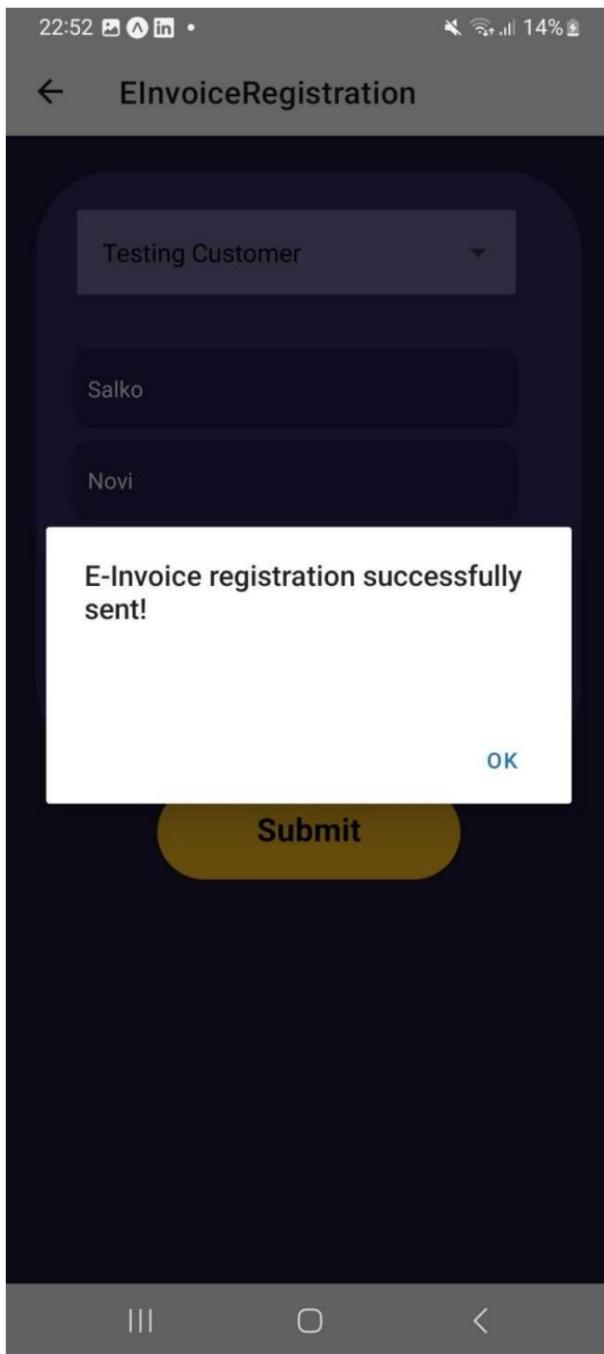
## Registration for eInvoice

eInvoice is an electronic form of invoicing that enables sending and receiving invoices via the Internet. It is a digital version of the traditional paper invoice used for invoicing products or services. eInvoice is used as a replacement for traditional invoices that are sent by post or delivered in person.

- In order for the user to register for Invoice, the following information must be submitted:



- After successful registration, a confirmation message is displayed



- After the confirmation message, the invoice registration was sent to the administrator at approval