



8Lab Solutions - Project "Soldino"

User manual

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1 Introduction

This document is the user manual of *Soldino*, a project by *8Lab Solutions* based on the Ethereum infrastructure.

1.1 What is *Soldino*

Soldino is a platform, found at <http://soldino.surge.sh/>, that allows users to buy goods and services, allows business to manage the VATs related to those products and allows the Government to mint and distribute Cubits_G, reimburse businesses of their VAT credit and manage users registered on the platform.

More precisely:

- citizens can:
 - buy goods and services;
- business can:
 - sell goods and services;
 - buy goods and services;
 - manage VAT;
- Government can:
 - mint Cubits_G;
 - distribute Cubits_G;
 - activate disabled users;
 - deactivate active users;
 - reimburse businesses of their VAT credit;

Soldino is powered by the Ethereum_G network, allowing a high degree of security due to the distributed nature of the network.

1.2 Glossary

At the end of this document there is an appendix A where you can find the definitions of words that may be ambiguous or new to the users of *Soldino*. These words are marked with a subscript *G* (e.g. example_G).

1.3 Requirements

To be able to use *Soldino* you need to have the desktop version one of the following browsers:

- Google Chrome version 71 or newer;
- Mozilla Firefox version 64 or newer.

You also must have the MetaMask_G plug-in in your browser. More information will follow.

2 MetaMask

2.1 What is MetaMask

MetaMask_G is a browser extension that manages your Ethereum_G digital wallet_G and allows you to send and receive Ethers_G (Cubits_G or CCs_G in *Soldino*).

Note that MetaMask_G has to be installed in your browser as long as you want to use the platform: removing it from your browser will render you unable to use *Soldino*.

2.2 Installation

After entering *Soldino*'s homepage you should check if you have MetaMask_G installed. If not, you can check this by looking for its icon on the top right of your browser.

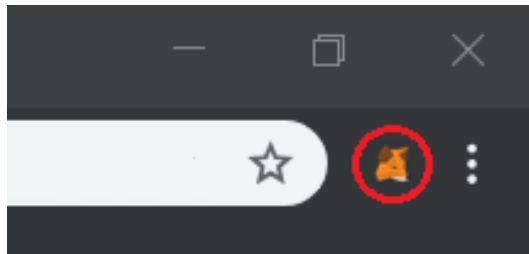


Figure 2.2.1: MetaMask's icon

If you have it proceed with the configuration of your account. Otherwise, watch the video introduction, click the link under the video and follow the instructions to download it.

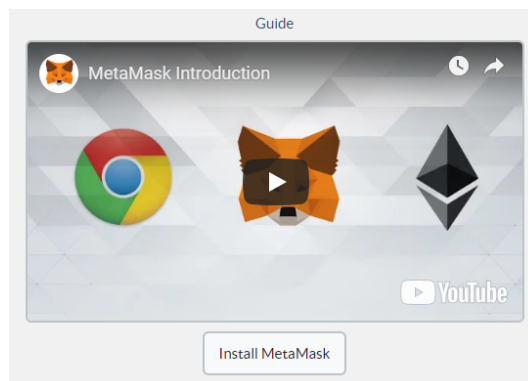


Figure 2.2.2: Introduction to MetaMask

After the installation process is complete you will see MetaMask_G's icon on the top right of your browser. A new window will then open where you will have to configure your account.

The download page can also be found at <https://metamask.io/>.

2.3 Configuration

Click on MetaMask's icon on the top right of your browser, and set up your Ethereum_G digital wallet_G by following the instructions. You can either create a new account or import an existing one using the 12 words seed phrase that was previously given to you.

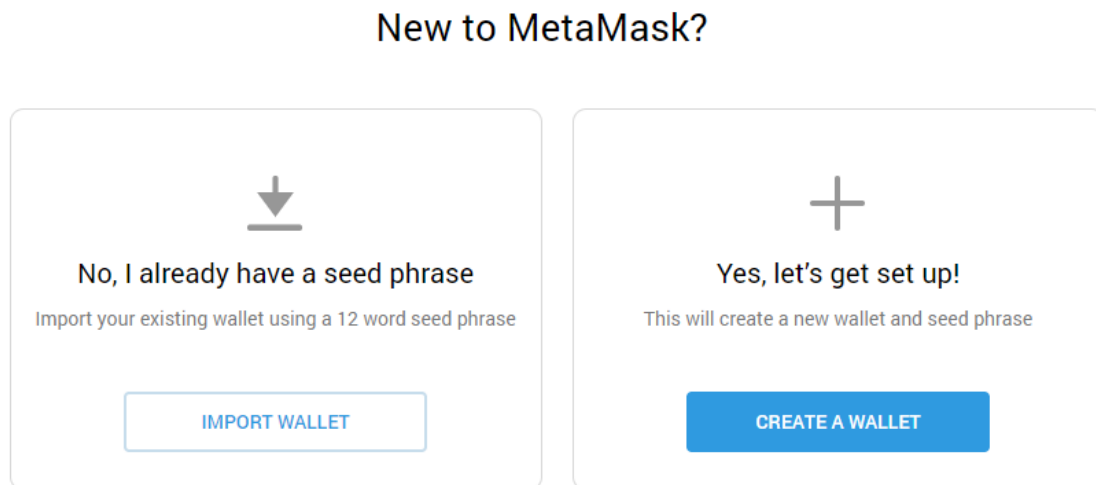


Figure 2.3.1: MetaMask setup

After setting up your account you will be able to join and use *Soldino*.

2.4 Operations

Every time you make a operation that changes the state of the Ethereum_G network MetaMask_G will open a pop-up window that shows you its total cost. From this window you will be able to accept or decline the transaction.

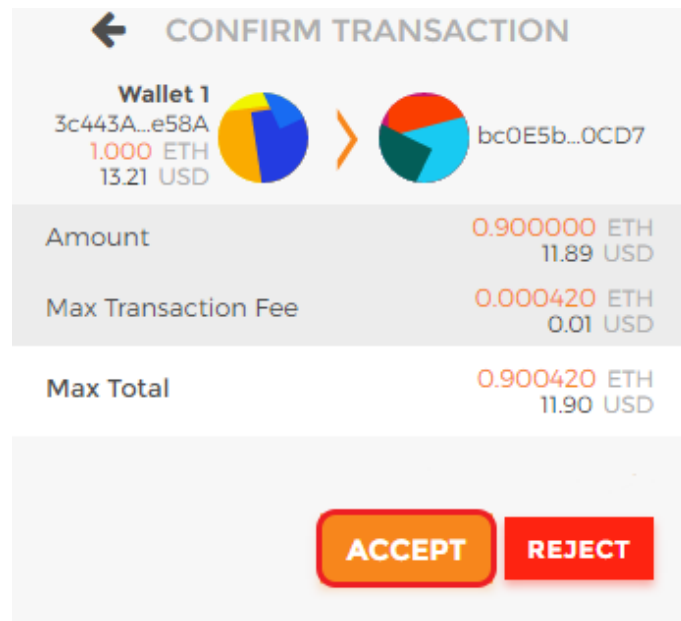


Figure 2.4.1: Example of a MetaMask transaction

Every change made on the Ethereum_G Network has a cost and it is called Gas_G and is measured in GWEI, a billionth of an Ether_G. When you make a transaction you can choose whether it should have a high or low priority: higher priority will consume more Gas than a lower one but will be mined quicker. We do not recommend changing the priority for operations made in *Soldino*.

2.4.1 Operations costs

In the table that follows you can find an estimate of the costs of operations you can make in *Soldino*.

Table 2.4.1: Costs of operations

Operation	Average gas cost	Average Cubit cost
Creating a citizen account	102098	0.34
Creating a business account	104598	0.35
Adding a new product	182044	0.60
Modifying a product	97986	0.33
Deleting a product	42338	0.14

The costs shown above were calculated 2019-03-25.

3 Citizens

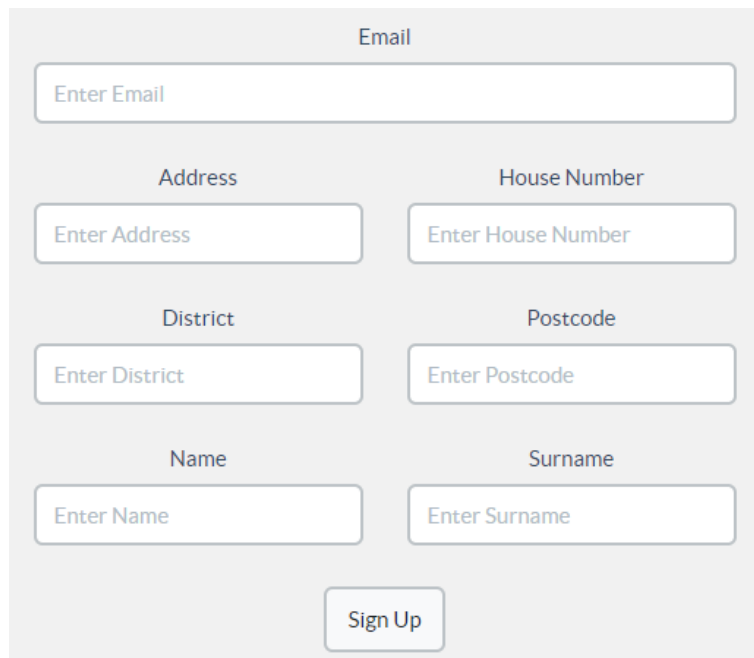
3.1 Registration

If you want to create a personal account for *Soldino* visit the homepage, make sure you are logged in your MetaMask_G account then make sure that the switch button is set on "Citizen".



Figure 3.1.1: Select "Citizen" from the switch button

Then, insert your data in the form.



The form is titled 'Email' at the top. It contains the following fields:

- Email: A single-line text input field with the placeholder 'Enter Email'.
- Address: A single-line text input field with the placeholder 'Enter Address'.
- House Number: A single-line text input field with the placeholder 'Enter House Number'.
- District: A single-line text input field with the placeholder 'Enter District'.
- Postcode: A single-line text input field with the placeholder 'Enter Postcode'.
- Name: A single-line text input field with the placeholder 'Enter Name'.
- Surname: A single-line text input field with the placeholder 'Enter Surname'.

At the bottom of the form is a 'Sign Up' button.

Figure 3.1.2: Citizen signup form

After you have completed all the fields with your informations press the "Sign up" button. If an entry is not valid (e.g. the email address does not contain a valid domain) the system will let you know and you have to correct that field to continue. If all informations are correct a pop-up window will ask you to allow *Soldino* to access your information.

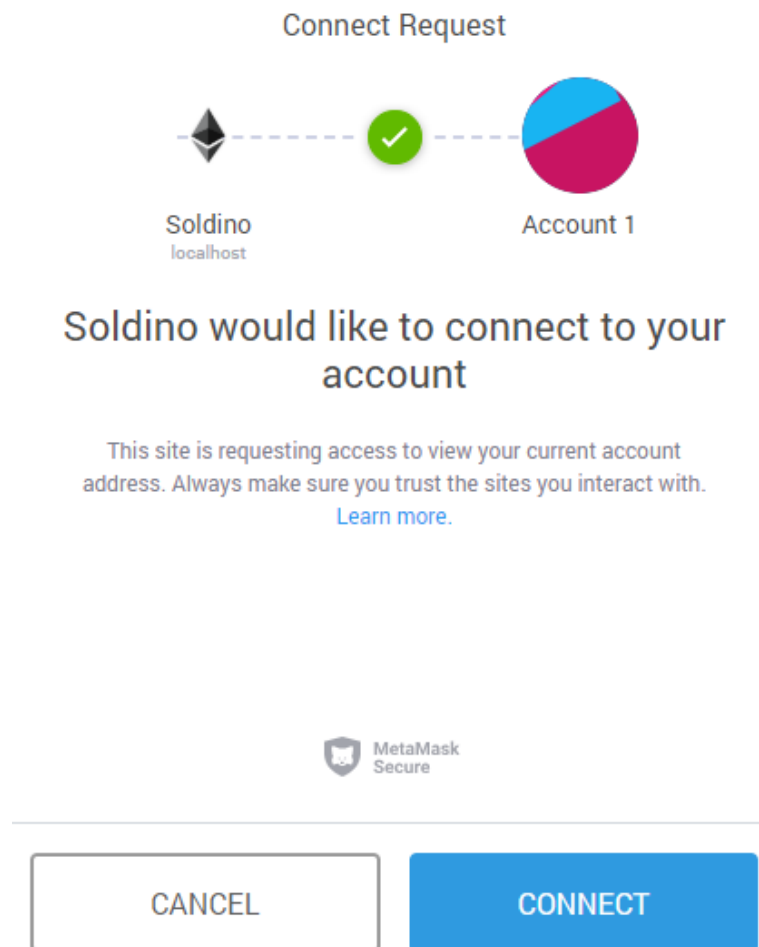


Figure 3.1.3: Connecting MetaMask to *Soldino*

Press "Connect" and you will be redirected to a page congratulating you for your registration on the platform.

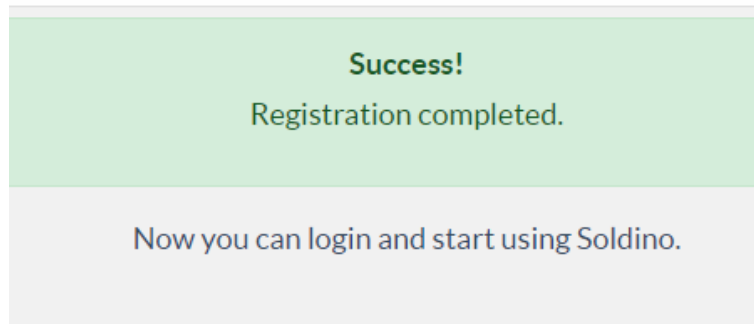


Figure 3.1.4: Registration is completed message

3.1.1 Citizen is already registered

If your Ethereum_G address is already registered in the platform you will see an error message.

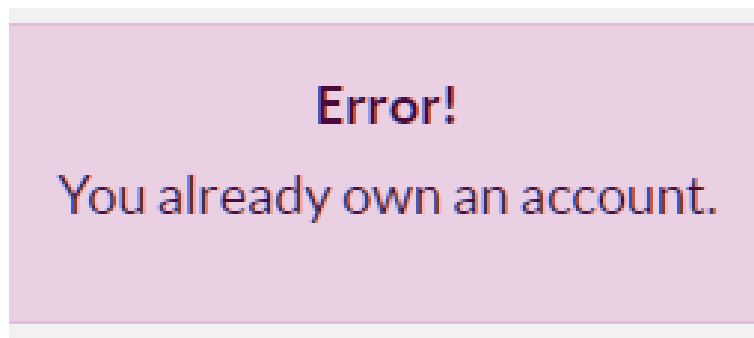


Figure 3.1.5: Error shown if you are already registered

Just press "Login" to log in your personal account.

3.2 Login

If you already have a personal account press the "login" button on the top right of the homepage, you will automatically log in your account (there is no need for a username or password, all is done via MetaMask).

To be able to log in you have to be logged in your MetaMask_G account.

3.2.1 Account is disabled

If your account was disabled by the Government you will see an error message.

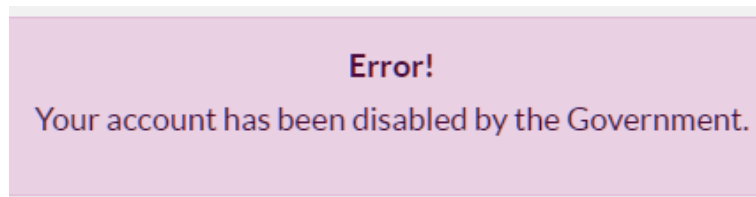


Figure 3.2.1: Error shown if your account has been disabled by the Government

If your account is disabled you cannot access it any more until it is enabled again by the Government.

3.3 Logout

To log out of *Soldino* you just have to log out of MetaMask_G. To do this you have to press MetaMask's icon on the top right of the browser, press your account's icon and then press "Log out" on the top right.

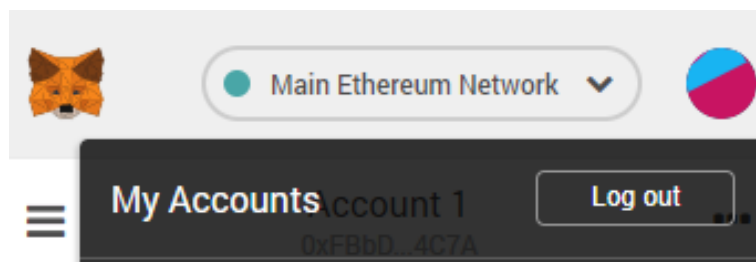


Figure 3.3.1: Logging out

3.4 Buying

Note that all prices shown in the platform are in Cubits_G (CC_G), *Soldino*'s own special token. Also, note that 1 Cubit equals 1 Euro.

3.4.1 Searching

You can search for products by name using the search bar that can be found at the top of the page. After you start typing you will see all results that match your search. If no matching products are found you will get a message showing you that.

3.4.2 Cart

You can add products in your cart, after selecting the quantity you need, by pressing the "Add to cart" button under it.

Quantity

Figure 3.4.1: Adding a product to your cart

The number on the cart shows you how many unique products are in it. You can access your cart by pressing the shopping cart icon in the navigation bar at the top of the page.



Figure 3.4.2: Icon to access your cart

Here you will see the total for your order and you will find every item you have previously selected with their quantity. If you need to modify the quantity press the "+" or "-" buttons.

Cart

Total price: CC 107.33

<div>Wireless Mouse</div> <div><input type="button" value="-"/> 1 <input type="button" value="+"/> CC 59.99</div> <div><input type="button" value="Remove"/></div>	<div>Wireless Keyboard</div> <div><input type="button" value="-"/> 1 <input type="button" value="+"/> CC 39.99</div> <div><input type="button" value="Remove"/></div>	<div>Energy Drink</div> <div><input type="button" value="-"/> 3 <input type="button" value="+"/> CC 2.45</div> <div><input type="button" value="Remove"/></div>
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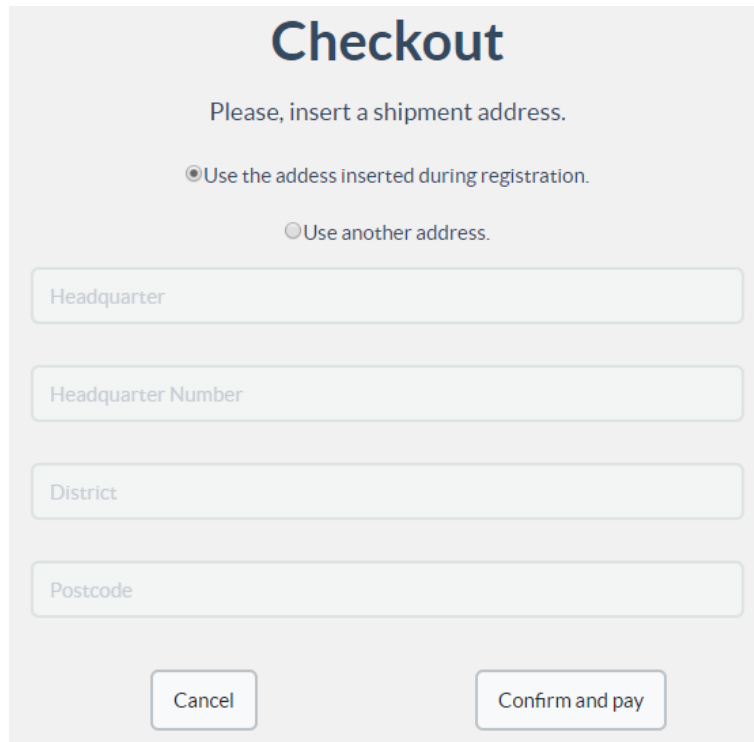
Figure 3.4.3: Example of a cart's content

When you want to proceed with the order press the "Checkout" button, in this way you will be

redirected to the checkout page.

3.4.3 Checkout

In the checkout page you will be able to choose where your products will be delivered to by using the radio buttons: you can either select the address you gave during registration or enter a new one.



The screenshot shows a checkout page with a light gray background. At the top, the word "Checkout" is displayed in a large, bold, dark blue font. Below it, the text "Please, insert a shipment address." is centered. There are two radio button options: "Use the address inserted during registration." (which is selected) and "Use another address." Below these options are four input fields with placeholder text: "Headquarter", "Headquarter Number", "District", and "Postcode". At the bottom of the form are two buttons: "Cancel" and "Confirm and pay".

Figure 3.4.4: Example of a checkout page

Press the "Confirm and pay" button to proceed. In a new pop up window MetaMask_G will ask you to confirm the transaction. The price shown here will be a little higher because it includes the Gas fee.

Press "Cancel" button if you do not want to continue, you will be redirected to your cart.

3.4.4 Past orders

You can visit the page containing all past orders by pressing the "Orders" button in the navigation bar at the top of the page. Here you will find a chronological list of every purchase that you made through *Soldino*. Each order tells when it was made, who was the seller, what were the items bought, where it was shipped to and how much you paid for it.

Order # 8	2019/03/29	Via S. Donato 33, Bologna, 40127
Seller	VAT Number	
Biagetti Arredamenti	01384571004	
Products	Quantity	Unit price
Blue Chair	3	CC 9.99
Red Chair	3	CC 9.99
VAT Price: CC 4.3956	Net Price: CC 15.5844	Total Price: CC 59.94

Order # 9	2019/04/01	Via Alberto Cavalletto 10, Padova, 35122
Seller	VAT Number	
Vanuzzo Interni & Design	91388421067	
Products	Quantity	Unit price
White Table	1	CC 9.99
VAT Price: CC 2.1978	Net Price: CC 7.7922	Total Price: CC 9.99

Figure 3.4.5: Example of past orders

4 Businesses

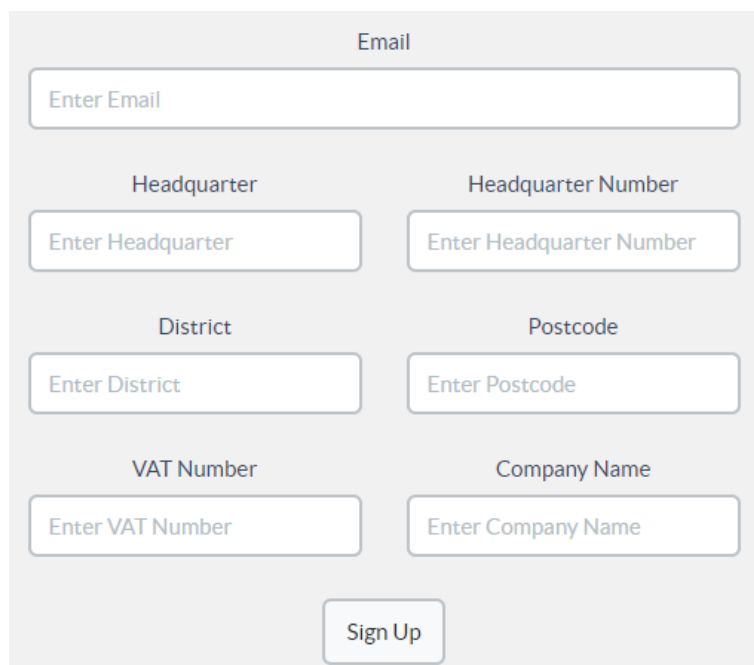
4.1 Registration

If you want to create a business account for *Soldino* visit the homepage, make sure you are logged in your MetaMask_G account then make sure that the switch button is set on "Business".



Figure 4.1.1: Select "Business" from the switch button

Then, insert your business' data in the form.



The form is titled "Business signup form" and contains the following fields:

- Email: Enter Email
- Headquarter: Enter Headquarter
- Headquarter Number: Enter Headquarter Number
- District: Enter District
- Postcode: Enter Postcode
- VAT Number: Enter VAT Number
- Company Name: Enter Company Name

At the bottom of the form is a "Sign Up" button.

Figure 4.1.2: Business signup form

After you have completed all the fields with your informations press the "Sign up" button. If an entry is not valid (e.g. the email address does not contain a valid domain) the system will let you know and you have to correct that field to continue. If all informations are correct a pop-up window will open asking you to allow *Soldino* to access your information.

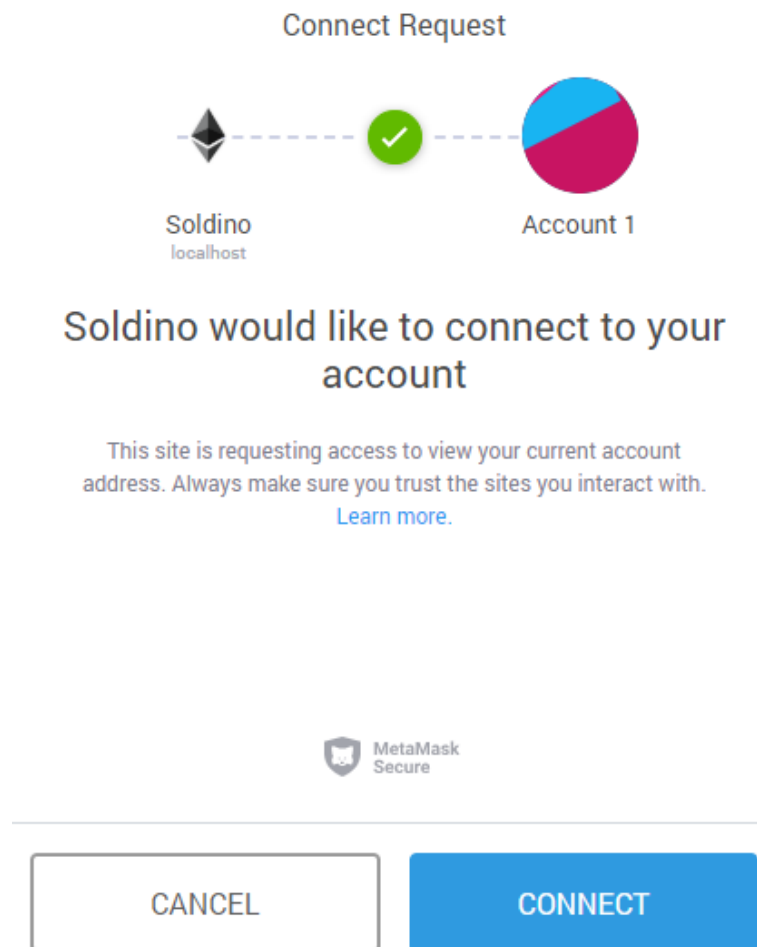


Figure 4.1.3: Connecting MetaMask to *Soldino*

Press "Connect" and you will be redirected to a page congratulating you for your registration on the platform.

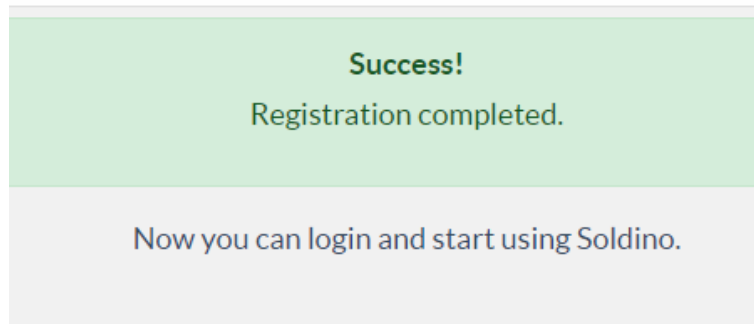


Figure 4.1.4: Registration is completed message

4.1.1 Citizen is already registered

If your Ethereum_G address is already registered in the platform you will see an error message.

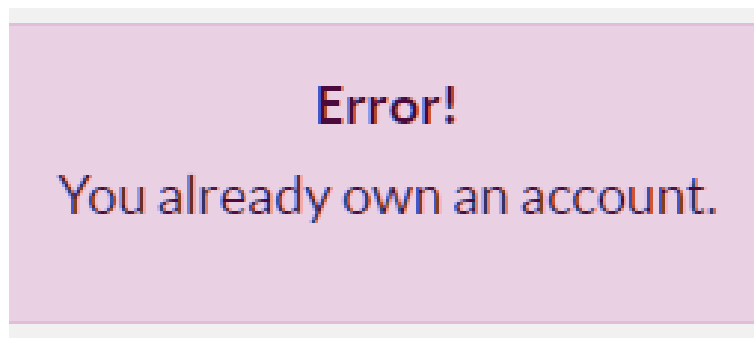


Figure 4.1.5: Error shown if you are already registered

Just press "Login" to log in your business account.

4.2 Login

If you already have a business account press the "login" button on the top right of the homepage, you will automatically log in your account (there is no need for a username or password, all is done via MetaMask).

To be able to log in you have to be logged in your MetaMask_G account.

4.2.1 Account is disabled

If your account was disabled by the Government you will see an error message.

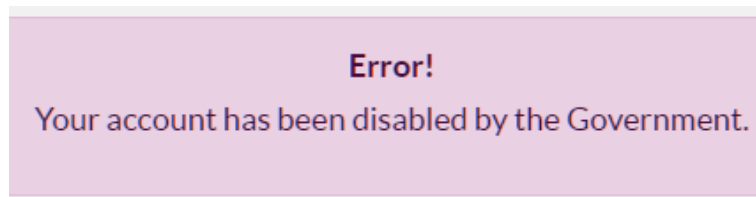


Figure 4.2.1: Error shown if your account has been disabled by the Government

If your account is disabled you cannot access it any more until it is enabled again by the Government.

4.3 Logout

To log out of *Soldino* you just have to log out of MetaMask_G. To do this you have to press MetaMask's icon on the top right of the browser, press your account's icon and then press "Log out" on the top right.

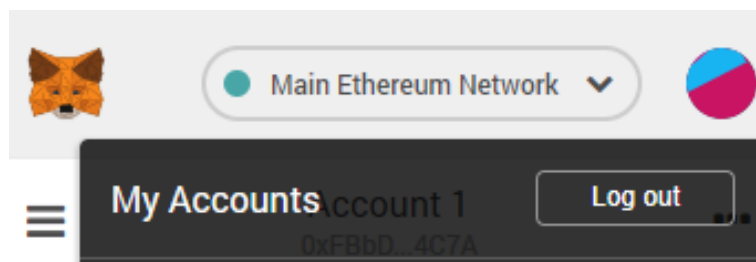


Figure 4.3.1: Logging out

4.4 Buying

Note that all prices shown in the platform are in Cubits_G (CC_G), *Soldino*'s own special token. Also, note that 1 Cubit equals 1 Euro.

4.4.1 Searching

You can search for products by name using the search bar that can be found at the top of the page. After you start typing you will see all results that match your search. If no matching products are found you will a message showing you that.

4.4.2 Cart

You can add products in your cart, after selecting the quantity you need, by pressing the "Add to cart" button under it.

Quantity

Add to cart

Figure 4.4.1: Adding a product to your cart

The number on the cart shows you how many unique products are in it. You can access your cart by pressing the shopping cart icon in the navigation bar at the top of the page.



Figure 4.4.2: Icon to access your cart

Here you will see the total for your order and you will find every item you have previously selected with their quantity. If you need to modify the quantity press the "+" or "-" buttons.

Cart

Total price: CC 107.33

Checkout

Wireless Mouse

-

1

+

CC 59.99

Remove

Wireless Keyboard

-

1

+

CC 39.99

Remove

Energy Drink

-

3

+

CC 2.45

Remove

Figure 4.4.3: Example of a cart's content

When you want to proceed with the order press the "Checkout" button, you will be redirected

to the checkout page.

4.4.3 Checkout

In the checkout page you will be able to choose where your products will be delivered to by using the radio buttons: you can either select the address you gave during registration or enter a new one.

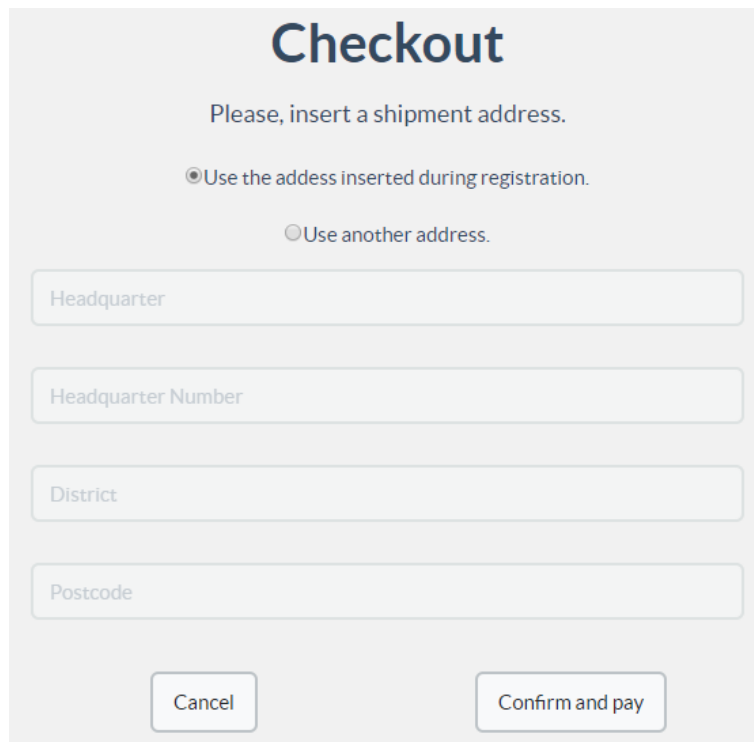


Figure 4.4.4: Example of a checkout page

Press the "Confirm and pay" button to proceed. In a new pop up window MetaMask_G will ask you to confirm the transaction. The price shown here will be a little higher because it includes the Gas fee.

Press "Cancel" button if you do not want to continue, you will then return to your cart.

4.4.4 Past orders

You can visit the page containing all past orders by pressing the "Orders" button in the bar at the top of the page. Here you will find a chronological list of every purchase that you made with *Soldino*. Each order tells when it was made, who was the seller, what were the items bought, where it was shipped to and how much you paid.

Order # 8	2019/03/29	Via S. Donato 33, Bologna, 40127
Seller Biagetti Arredamenti		VAT Number 01384571004
Products	Quantity	Unit price
Blue Chair	3	CC 9.99
Red Chair	3	CC 9.99
VAT Price: CC 4.3956	Net Price: CC 15.5844	Total Price: CC 59.94

Order # 9	2019/04/01	Via Alberto Cavalletto 10, Padova, 35122
Seller Vanuzzo Interni & Design		VAT Number 91388421067
Products	Quantity	Unit price
White Table	1	CC 9.99
VAT Price: CC 2.1978	Net Price: CC 7.7922	Total Price: CC 9.99

Figure 4.4.5: Example of past orders

4.5 Selling

If you want to manage the products you are selling on *Soldino* or add a new one you have to press the "Products Manager" on the bar at the top of the page. Here you will find every product you are currently selling.

ProductsManager

Add a product

VGA to HDMI converter

Pocket size adapter

CC 7.7922

CC 2.1978 ~ 22%

Edit

Remove

Thunderbolt to HDMI converter

For iMac and MacBook

CC 7.7922

CC 2.1978 ~ 22%

Edit

Remove

USB type C to USB 3 cable

1 meter long cable

CC 7.7922

CC 2.1978 ~ 22%

Edit

Remove

Ethernet cable

15 meters long ethernet cable

CC 7.7922

CC 2.1978 ~ 22%

Edit

Remove

Figure 4.5.1: Products Manager page

4.5.1 Selling a new product

If you want to sell a new product you have to press "Add a product", you will be redirected to a page where you will have to insert all the informations regarding your new product.

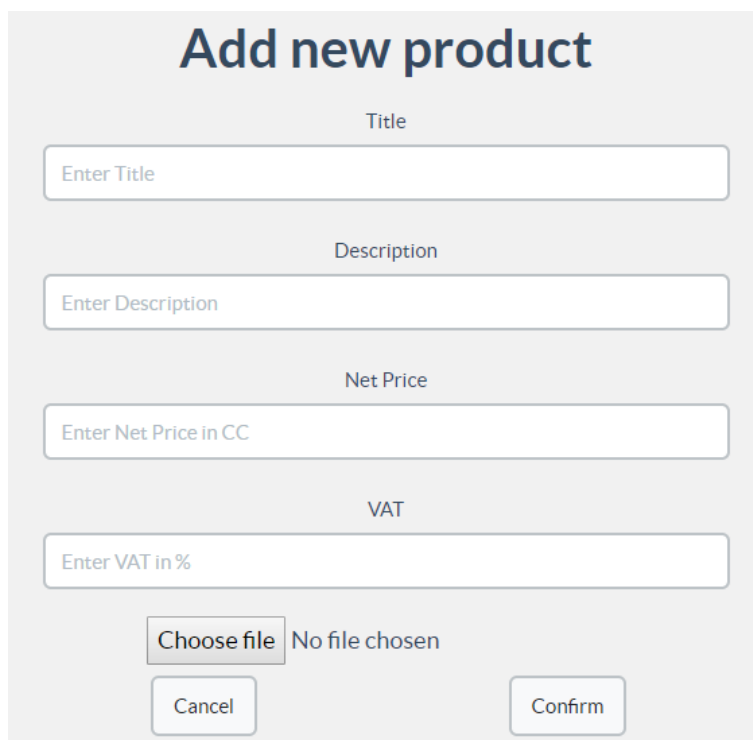
The screenshot shows a web form titled "Add new product" in a large, bold, dark blue font. Below the title, there are four input fields, each with a label above it: "Title" (with placeholder "Enter Title"), "Description" (with placeholder "Enter Description"), "Net Price" (with placeholder "Enter Net Price in CC"), and "VAT" (with placeholder "Enter VAT in %"). At the bottom of the form, there is a file upload section with a "Choose file" button, the text "No file chosen", a "Cancel" button, and a "Confirm" button.

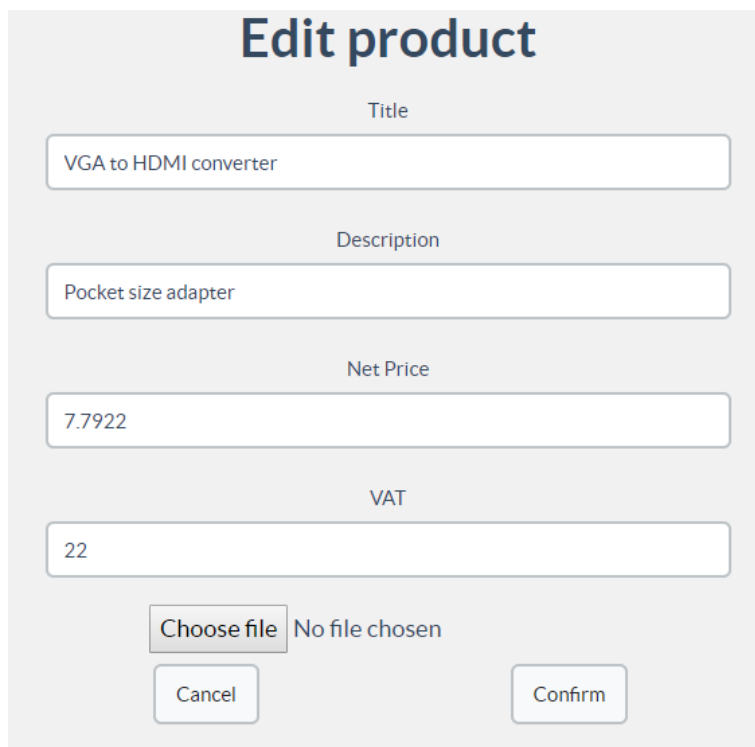
Figure 4.5.2: Adding a new product

After you completed every field and you selected a photo press "Confirm" button and it will be added to the products users can buy.

Press "Cancel" button if you do not wish to continue.

4.5.2 Editing a product

If you want to change the informations of a product you are already selling press the "Edit" button under it, you will be redirected to a page where you will be able to change the product's informations.



The screenshot shows a web form titled "Edit product". It contains four text input fields: "Title" with the value "VGA to HDMI converter", "Description" with the value "Pocket size adapter", "Net Price" with the value "7.7922", and "VAT" with the value "22". Below these fields is a file upload section with a "Choose file" button, the text "No file chosen", a "Cancel" button, and a "Confirm" button.

Figure 4.5.3: Editing the informations of a product

After you are done with the changes press the "Confirm" button to apply them.
If you do not wish to apply the changes press the "Cancel" button.

4.5.3 Removing a product

If you want to remove a product you are selling from the platform press the "Remove" button under it.

Note that removing a product will not delete orders made prior to the removal.

4.6 VAT management

If you are a business *Soldino* will manage VAT for the products you buy and sell on the platform automatically. You can access the page containing all invoices by pressing the "Transaction Manager" button in the navigation bar at the top of the page.

VAT status for the selected quarter: -321.23 CC					Instant Payment	Deferred Payment
Number	Type	Date	Total Price	Total VAT	Download PDF	
Invoice #12345	Purchase	2018/05/01	CC 10	CC 2.2	More details	
Invoice #67890	Purchase	2018/05/01	CC 10	CC 2.2	More details	

Figure 4.6.1: Example of past invoices

Here you will also see the status of the quarter.

A red value at the end of a quarter means that you will have to pay that amount to the Government.

VAT status for the selected quarter: -321.23 CC

Figure 4.6.2: Example of a negative VAT status

While a green one means that you will soon be reimbursed for that amount.

VAT status for the selected quarter: +173.87 CC

Figure 4.6.3: Example of a positive VAT status

4.6.1 Invoices

You can see more information about an invoice by pressing the "More details" button. This will open a pop-up window containing all the details.

Invoice #9845

×

Date:	2019/05/01
Order date:	2019/05/01
Order number:	4164
Products:	
Product:	Cookies
Total Price:	CC 10
Net Price:	CC 7.8
VAT %:	22
Description:	Fresh made chocolate chip cookies
Quantity:	CC 2
Total VAT: CC	2.2
Total Price: CC	10
Seller:	Tony S.P.A. 01384571004
Buyer:	Enrico Verdi
Shipment:	Via Antonio Grassi 13, Padova, 35020

Figure 4.6.4: Example of an invoice

You can also download a PDF file containing all the invoices of this trimester by pressing "Download PDF".

4.6.2 Paying VAT

At the end of a quarter, if you are in debit with the government, next to how much you have to pay you will see two buttons.

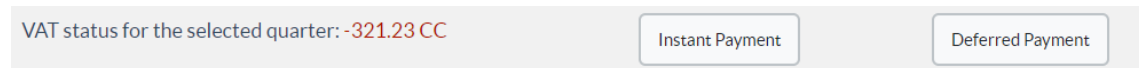


Figure 4.6.5: Paying off a negative Vat status

4.6.2.1 Instant payment

If you choose to instantly pay off what you owe press the "Instant payment" button. MetaMask_G then will open a new window asking you allow the transaction, accept to continue.

4.6.2.2 Deferred payment

Otherwise, you can choose deferred payment_G by pressing the "Deferred payment" button.

4.6.3 Checking past trimesters' VAT

You can see invoices of past quarters by using the drop-down menu at the top of the page.

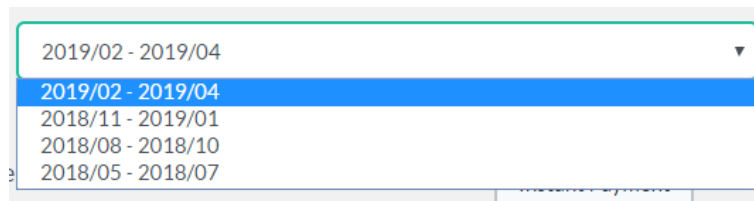


Figure 4.6.6: Past trimesters

From this page you will also be able to see specific details of an invoice or download them all as PDF as explained before.

5 Government

5.1 Registration

The government cannot register a new account like citizens and businesses because only one account is allowed. This account is provided by the developer of *Soldino*.

5.2 Login

If you want to log on the Government account press the "login" button on the top right of the homepage, you will automatically log in your account (there is no need for a username or password, all is done via MetaMask).

To be able to log in make sure you are logged in the correct MetaMask_G account.

5.3 Logout

To log out of *Soldino* you just have to log out of MetaMask_G. To do this you have to press MetaMask's icon on the top right of the browser, press your account's icon and then press "Log out" on the top right.

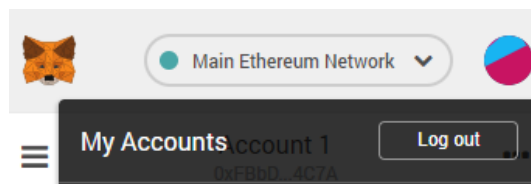


Figure 5.3.1: Logging out

5.4 Cubit

The Government can mint and distribute Cubits_G by pressing the "Cubit Manager" button in the navigation bar at the top of the page.

The screenshot shows a web interface for managing Cubits. At the top, it displays 'Total supply: 1500000 CC' and 'Government supply: 9000 CC'. Below this, there are two input fields: 'Amount' (with placeholder 'Enter amount') and 'Address' (with placeholder 'Enter address'). A 'Distribute' button is positioned between these fields. A horizontal line separates this section from the bottom section, which contains an 'Amount' input field (with placeholder 'Enter amount') and a 'Mint' button.

Figure 5.4.1: Government Cubit page

5.4.1 Minting

To mint Cubits_G you have to insert the quantity you want in the "Amount" field at the bottom of the page then press "Mint". You will now see that the "Government supply" is increased by the chosen amount.

This screenshot shows a simplified version of the interface for minting Cubits. It features a single input field labeled 'Amount' with the placeholder text 'Enter amount'. Below this field is a button labeled 'Mint'.

Figure 5.4.2: Minting Cubits

5.4.2 Distributing

To distribute Cubits_G you have to insert the amount in the "Amount" field, insert the address of the account you wish to send the Cubits to in the "Address" field then press "Distribute". Remember that this address is not the physical address of the user but their address on the Ethereum_G network.

Total supply: 1500000 CC Government supply: 9000 CC

Amount Address

Enter amount Enter address

Distribute

Figure 5.4.3: Distributing Cubits

Note that the amount of cubit must be lower than the "Government supply" otherwise you will not be able to send them.

5.5 Managing users

The Government can activate disabled accounts or deactivate active accounts. This can be done by clicking on the "Users List" button in the navigation bar at the top of the page. Here you will find all users registered in *Soldino* with all their information.

Type: Citizen
Name: Antonio
Surname: Pallonacci
Email: anto.pallo@tiscali.it
Address: Via Brombeis 75, Napoli 80124
Disable

Type: Business
Name: Buy or Die
VAT Number: 1738399634
Email: info@buyordie.co.uk
Address: Pepperoni street 51, Blairgowrie PH107QD
Disable

Figure 5.5.1: Example of users list

5.5.1 Deactivating users

After you have found the account you want to disable press the "Disable" button. Disabling an account means that it will not be able to make purchases on *Soldino* until it is enabled.

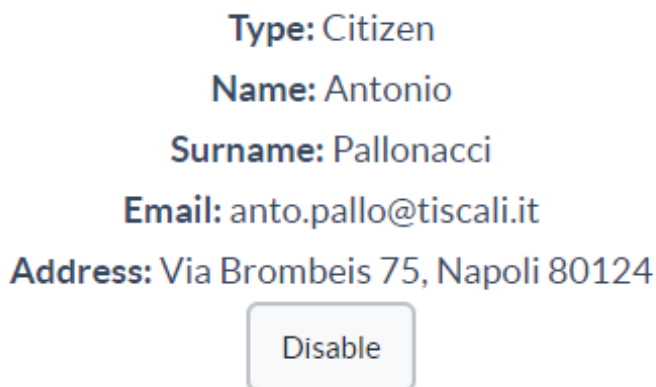


Figure 5.5.2: Example of disabling an activated account

5.5.2 Activating users

After you have found the account you want to enable press the button "Enable". After being enabled an account will again be able to make purchases on *Soldino*.

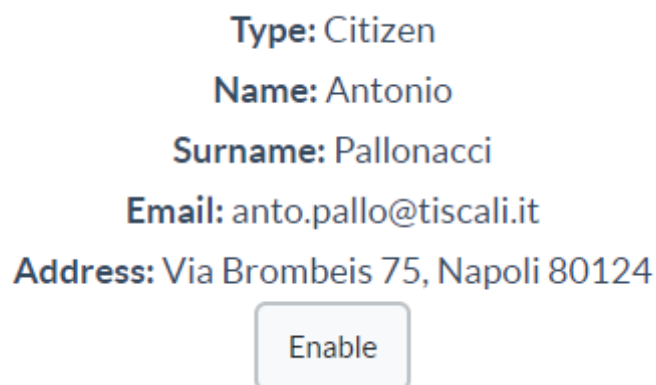


Figure 5.5.3: Example of enabling a deactivated account

5.6 Reimbursing businesses

To reimburse businesses of their VAT credit you have to press the "VAT Refund" button in the navigation bar at the top of the page, in the page that loads you will find all businesses with a positive VAT credit. Press "Refund" to refund the selected business.

Company name: Buy or Die
VAT number: 1738399634
Payment status: await refund
Balance: CC 133.87

Refund

Figure 5.6.1: Example of reimbursing a business

6 Issues

We, members of *8Lab solutions*, did our best to build *Soldino* bug-free and did extensive tests to squish all of them, but we cannot be sure that they are all gone.

If you encounter a bug we would appreciate if reported it to us at our email address (8labsolution@gmail.com) or in the dedicated page at the project's repository (<https://github.com/8LabSolutions/Soldino/issues>).

When reporting an issue please include:

- what type of user encountered it (citizen, business or Government);
- a detailed sequence of steps that must be done to reproduce the error;
- if the error included Metamask_G and what type of error it shows;
- your browser's console log output.

A Glossary

C

Cubit

Cubit is the custom Ethereum currency of *Soldino*, it has the value of 1€. All prices shown are in Cubits. The Government can mint and distribute Cubits to the platform's users.

CC

Short version of Cubit, see Cubit above.

D

Deferred payment

Businesses can choose to not pay their due taxes immediately and pay it later.

Digital wallet

Digital wallets are where virtual currency is stored.

E

Ether

Ether is the currency of Ethereum.

Ethereum

Ethereum is an open software platform based on blockchain technology that enables developers to build and deploy decentralized applications.

G

Gas

Gas is the cost of transactions made on the Etehreum network. It is measured in GWEI which is a billionth of an Ether.

M

MetaMask

MetaMask is a Plug-in available for Chrome, Firefox, Opera and Brave that allows you to interact with the Ethereum network without hosting a node and create multiple digital wallets_G. It is required to use in *Soldino*.

P

Product

Products include both goods and services.

V

VAT

VAT or value-added tax is a type of tax that is assessed incrementally, based on the increase in value of a product or service. The VAT percentage is chosen by the product's seller.