



Blockchain in the Public Sector

The Dutch approach

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BLOCKCHAIN PROJECTS
DUTCH GOVERNMENT

BLOCKCHAIN PROJECTS

DUTCH GOVERNMENT

MINISTRY OF INTERIOR AFFAIRS

Conducted research into the potential powerful combination of digital identity and Blockchain.

MINISTRY OF JUSTICE

Did research to the possibilities to use Blockchain for the execution of the judicial decisions of juvenile courts.

COURT OF AUDIT

Investigated whether the role as controller of 240 billion Euros of yearly expenditures by the central government would change as the result of blockchain based administrations.

HUMAN ENVIRONMENT AND TRANSPORT INSPECTORATE

Rethought the administrative and logistical process of transporting toxic waste from the Netherlands to another EU State.

HUMAN ENVIRONMENT AND TRANSPORT INSPECTORATE

Developed a blockchain based system for the tracking of working and resting

CITY OF THE HAGUE

Developed a significantly improved (and highly automatized) regulation for subsidies on electric vehicles.

CAK

Created a blockchain process to make the financial and administrative process for subsidised public healthcare services more efficient.

CIBG

Did research into the ways to use blockchain as (part of) a register for medical instruments.

THE INSPECTORATE OF THE MINISTRY OF EMPLOYMENT

Created a use case for the improvement of data sharing with several other governmental organizations in order to improve detection of fraud, exploitation and organised crime within the chain of work and income.

MINISTRY OF FOREIGN AFFAIRS

Developed a use case for the improvement of financial arrangements that involved multiple stakeholders.

CHAMBER OF COMMERCE

Developed the business case for a blockchain service to make it possible to quickly establish a temporary foundation.

CITY OF AMSTERDAM

Looked into more simple and efficient ways to apply for a personal healthcare budget than the current complex financial and administrative process.

STICHTSE VECHT

Streamlined the process of requesting specific healthcare service (for example: wheel chair, stair lift) that requires data sharing with several other governmental organizations and healthcare organisations.

ROTTERDAM

Developed a blockchain process to collect tourist tax more efficiently.

CITY OF SCHIEDAM

Developed a blockchain system to streamline the internal financial administration.

CITY OF SCHIEDAM

CITY OF ZAANSTAD

Established a procedure for a DIY marriage and divorce on the blockchain.

HEALTHCARE INSTITUTE

Built a prototype on Ethereum to create a clear overview of authorisations in the healthcare process.

LEGAL AID BOARD

Developed a use case for a faster, more secure automated process for the attribution of legal support.

DRECHTSTEDEN

Created a use case for blockchain to streamline the process of the assignment of parking licenses for disabled citizens.

BAR ORGANISATION

Rethought the permit system for organizers of larger events (concerts for example) which

CITY OF ZUIDHORN

Developed a prototype of a blockchain based service to make it easier to get subsidies from different aid organizations.

JUSTID (JUDICIAL INFORMATION SERVICES)

Worked out a proof of concept for a log of what information was shared with whom at what time during a criminal trial proceedings.

CADASTRE, LAND REGISTRY AND MAPPING AGENCY

Developed a use case for Blockchain based registration of ships with the Delft University of Technology.

TAX AND CUSTOMS ADMINISTRATION

Created a use case that makes it possible to redistribute (income) tax money as soon as it gets deducted from an employee's income.

PROVINCE OF NOORD-BRABANT

Developed a use case that showed that it would be possible to reduce the time to get through the administrative and financial processes for subsidies from 13 weeks to 13 minutes.

CITY OF UTRECHT

Created a use case for the improvement of data sharing within the waste sector.

CITY OF EINDHOVEN

Developed a blockchain



Blockchain partnerships in Brussels

21 December 2018

At EU level too, parties from all corners of society are working together on blockchain....



Dutch Blockchain Coalition presents vision and societal use cases

07 December 2018

The vision of the future of blockchain for the Netherlands and its societal use cases

<https://www.youtube.com/watch?v=wnhpSLb30BU&feature=youtu.be>





Blockchain partnerships in Brussels

21 December 2018

At EU level too, parties from all corners of society are working together on blockchain....



Dutch Blockchain Coalition presents vision and societal use cases

07 December 2018

The vision of the future of blockchain for the Netherlands and its societal use cases



Vision document

The Dutch Blockchain Coalition originated from a unique collaboration between industry, government and education, also known as the 'triple helix'. This cooperation already yields the first results in practice; This...

[Read more >](#)



Self-Sovereign Identity (SSI)

A self-sovereign identity (SSI) is the driving force for a supple interaction in the online economy with a direct impact on the physical world. That is only possible with government interactions and therefore partic...

[Read more >](#)



Logistics

Blockcain offers many opportunities for logistics chains: ...

[Read more >](#)



Educational certificates and diplomas

A student who wants to continue his or her studies at a foreign institution faces the challenge of sharing the diploma gained or required and getting this recognised as authentic. This mostly paper-based procedure o...

[Read more >](#)



Pension

The changing employment market in which Dutch citizens change jobs with increasing speed and frequency, poses considerable administrative challenges for pension schemes that can result in uncertainties for pensioner...

[Read more >](#)



Compliance

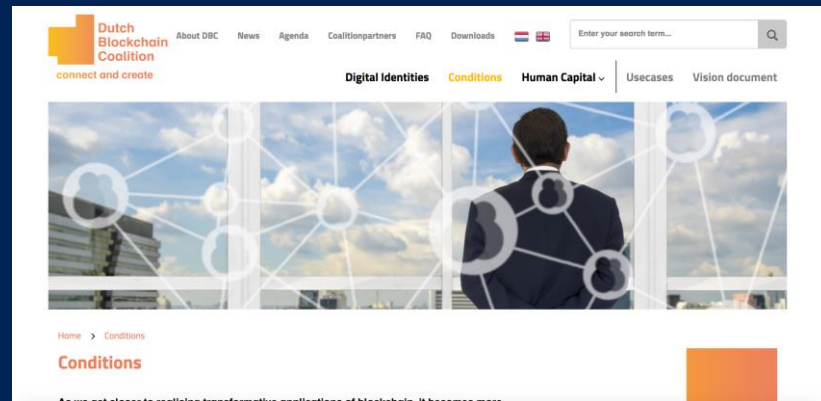
Subsidies are an important tool for ensuring that we organise society in the way that we want. For example, subsidies for green energy, for farmers who produce what we need or for helping people who need help. ...

[Read more >](#)



Workgroups 2019

- Cyber Security
- Legal
- Governance
- Cabinet & Board Level Engagement
- Research Agenda
- Human Capital Agenda



The Netherlands' **International Blockchain Collaboration**

Do you want to add a public sector blockchain ecosystem to the map?

Send us an email:
koen@blockchainprojects.nl
marloes@blockchainprojects.nl



THE NETHERLANDS

- Dutch Blockchain Coalition (private public partnership) launched in 2016
- 50 blockchain projects run by the Dutch Government

CANADA

Working together to unlock the potential of self sovereign identity for secure and seamless travel.

NEW YORK: UNITED NATIONS

Blockchain projects launched by several UN Agencies (2016-ongoing)

- Book on the legal aspects of Blockchain (in collaboration with UNOPS)
- Blockchain mission (September 2018)

WASHINGTON DC: WORLD BANK

Start of the World Bank Blockchain Lab (2017)

- Blockchain side event during the spring meeting of the World Bank
- Pilot with the World Bank on Palm Oil

BRUSSELS: EUROPEAN UNION

EU Blockchain Observatory and Forum (2018)

- Working with Benelux and the EU Commission to co-create the right conditions for the advent of an open, innovative, trustworthy, transparent, and EU law compliant DLT driven data and transactional environment.

MALTA

Malta Blockchain Strategy Taskforce 2017

- Collaboration on diploma's and certificates

DUBAI

Ambition: the first blockchain-powered government in the world by 2020

- Participates in several conferences, first meetings with the government

SCANDINAVIAN COUNTRIES

Scandinavian Blockchain Association (private public partnership) launched in 2017

- Collaboration & joint hackathon in 2018
- Interreg project that involves municipalities in the Netherlands, Germany, Belgium, Sweden and Denmark.

INDIA

First Hackathon + Roadmap (Feb 2018)

- Working on an blockchain MOU + joint projects

SINGAPORE

FinTech hub
Clear regulations for ICO's (Nov. 2017)

- First Blockchain- trade mission (Nov 2017)
- 3-year collaboration between NL and Singapore on blockchain and security



EUROPEAN BLOCKCHAIN PARTNERSHIP (PUBLIC AUTHORITIES)



USE-CASES / CROSS-BORDER DIGITAL
PUBLIC SERVICES

GUIDING PRINCIPLES AND TECHNICAL
SPECIFICATIONS

GOVERNANCE MODEL FOR EBSI

DEVELOPMENT OF
THE EUROPEAN
BLOCKCHAIN SERVICES
INFRASTRUCTURE
(EBSI)

INTERNATIONAL ASSOCIATION OF TRUSTED BLOCKCHAIN APPLICATIONS (IATBA) (INDUSTRY, SMEs, CIVIL SOCIETY)



TRANSPARENT AND INCLUSIVE GOVERNANCE
OF BLOCKCHAIN INFRASTRUCTURES

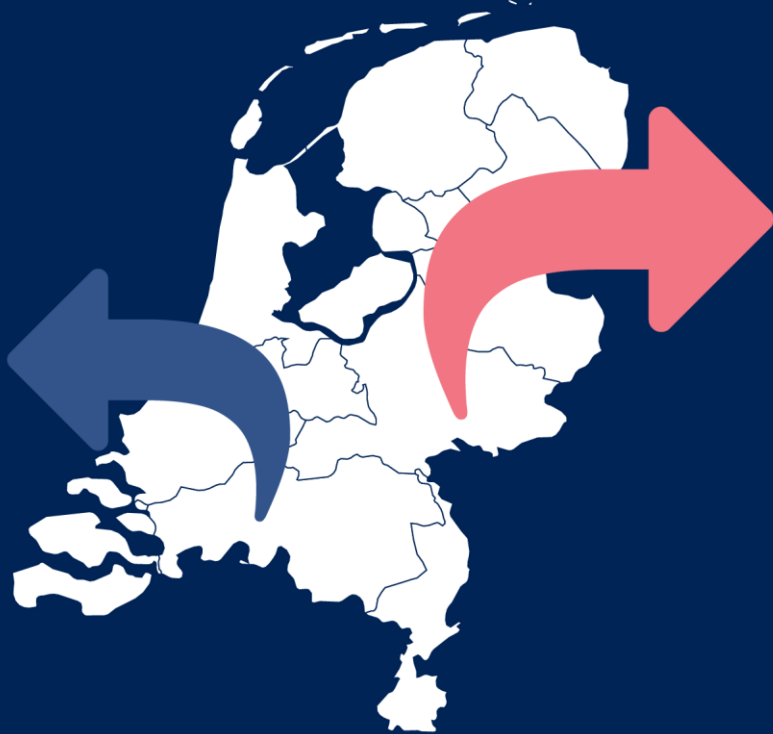
DIALOGUE WITH PUBLIC AUTHORITIES AND
REGULATORS

PROMOTE COMPLIANCE WITH EU ACQUIS

SECTORAL SPECIFICATIONS / USE-CASES
(PRIVATE-SECTOR APPLICATIONS)

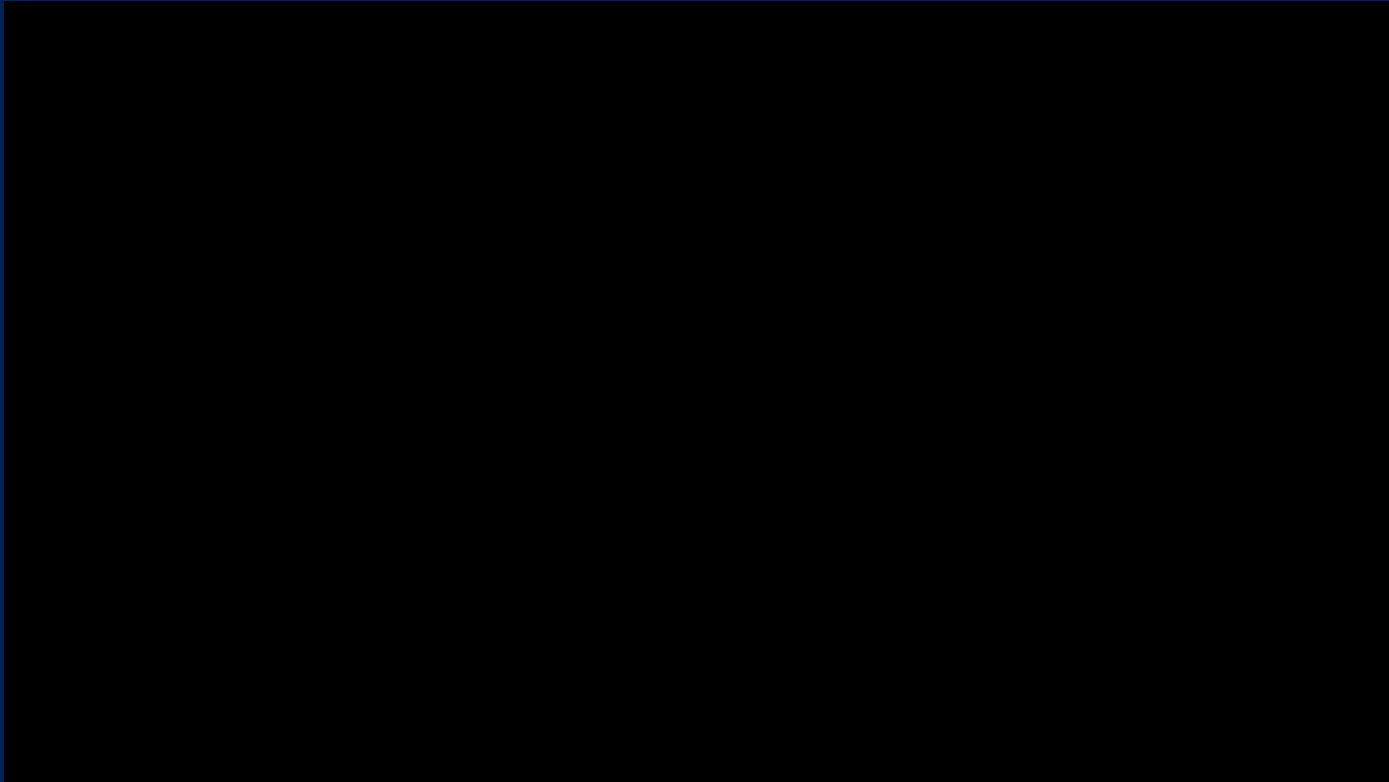
GLOBAL
GOLD-STANDARD FOR
BLOCKCHAIN
TECHNOLOGY
APPLICATIONS





Export knowledge to other countries:

- 1. Incoming visits**
- 2. Blockchain/ AI Trade missions**
- 3. Cross-border projects**
- 4. Partners in International Business**
- 5. Education**
- 6. Mentors**
- 7. Hackatons**





<https://blockchaininnovationconference.com/>

5:51



Rabobank



randstad



Ministerie van Onderwijs, Cultuur
Wetenschap



Claims & Zero Knowledge Proof



In Debt?

Income above or below?

Do you live in Amsterdam, Yes or no?

.....

https://www.youtube.com/watch?time_continue=28&v=hxbgsamAtW8

<https://www.youtube.com/watch?v=7BQnlv5VONo>

Stakeholders

- People with debts
- Municipality
- CJIB

Componenten

- App voor the citizens
- Dashboard for the municipality
- API CJIB
- Wallet for each stakeholder
- Blockchain

Step 1

- A citizen wants to receive a proof from the municipality that he she is in debt in order to share it with various agencies such as the CJIB
- To do this, the citizen downloads the SSI app

Step 2

- Citizens goes to the municipality's debt counseling for physical identification.
- When the identification is positive, and the debts are proven, the citizen makes a secure connection with the municipality by scanning a QR code on the municipality's dashboard, with the SSI app

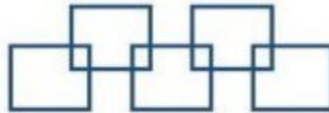
Citizen



Claim



Ledger



Municipality



**Claim
Issue**

Citizen



Claim



Ledger



Step 3

- Via the secure connection, the citizen receives proof from the municipality that he/she gets debt assistance from the municipality.
- This proof is signed with the key of the municipality, and contains the reference to the scheme that the municipality uses, and the so-called credential definition.

Municipality



**Claim
Issue**

Citizen



Claim



**Proof of schedule and credential
definition of claim**

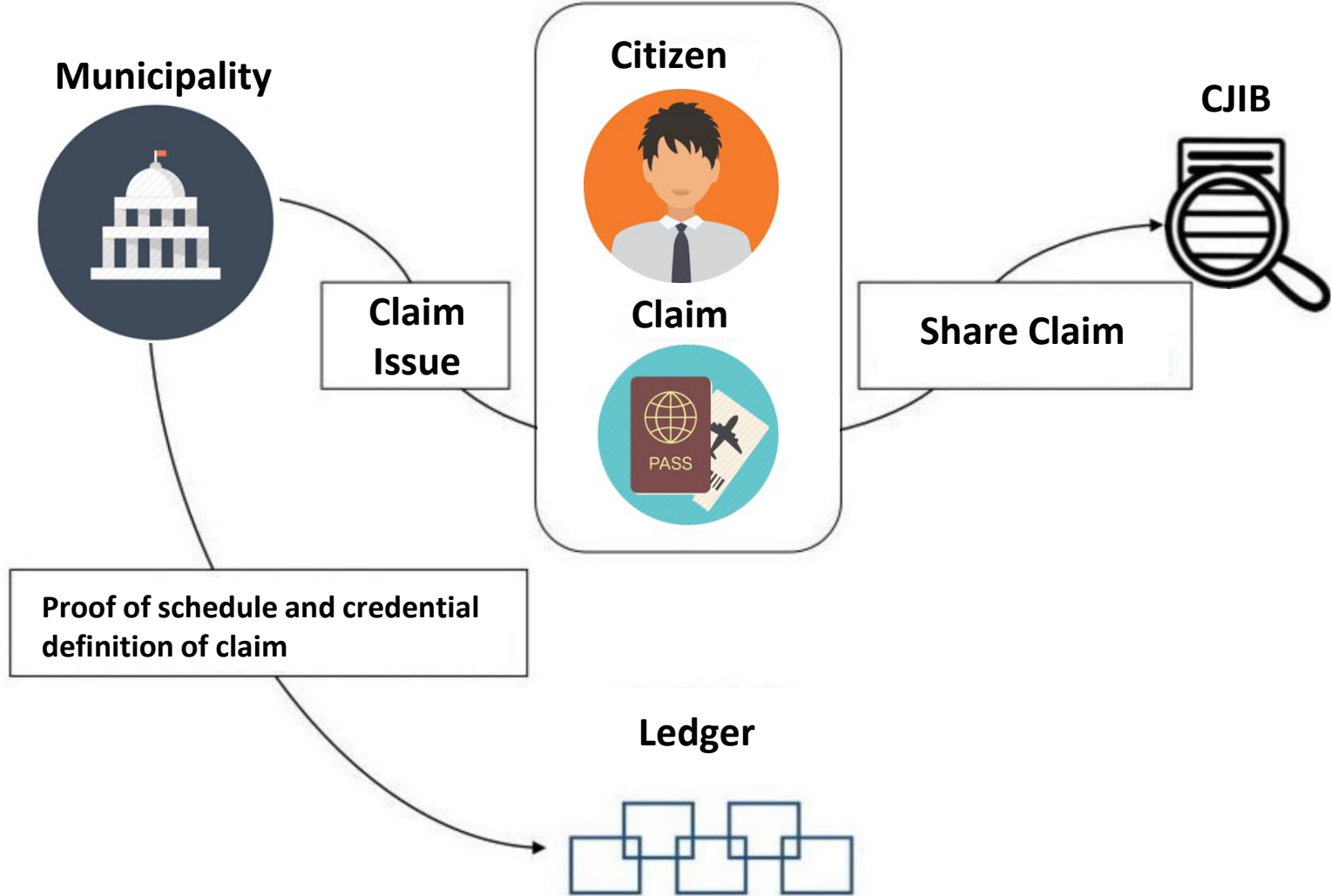
Ledger



Step 4

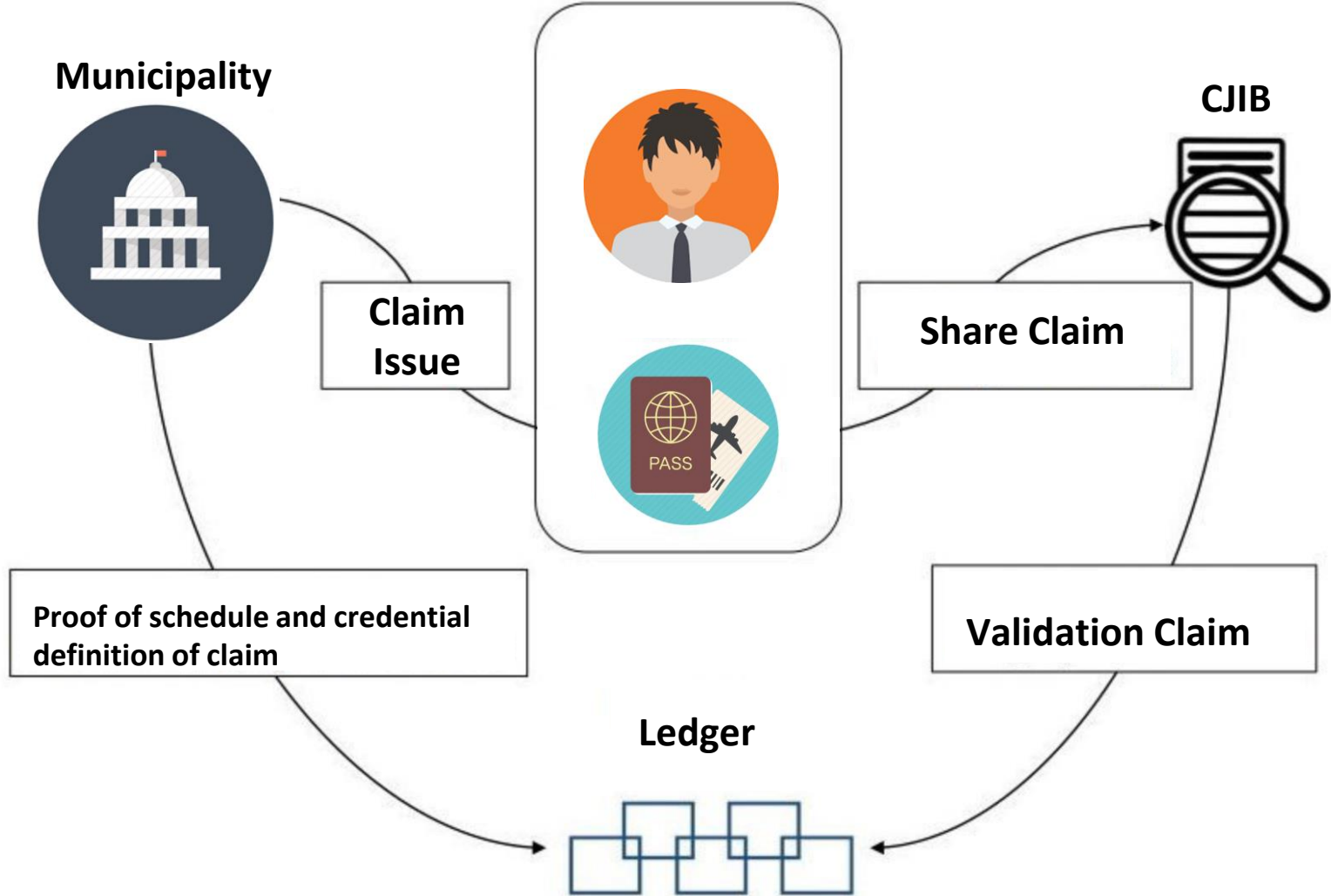
The citizen can now use the evidence in the wallet to prove to the CJIB, for example, that he she is under the supervision of debt counseling

To do this, the citizen gives the CJIB permission via the app to check this, and can also easily withdraw it (revoke)



Step 5.

- The CJIB can now check the data based on the permission and Zero Knowledge Proof.
- The CJIB can check via the blockchain whether the scheme used and the attributes (credential definition) have been issued by the municipality.



Result

Citizens can communicate their debt position to selected parties in a digital way

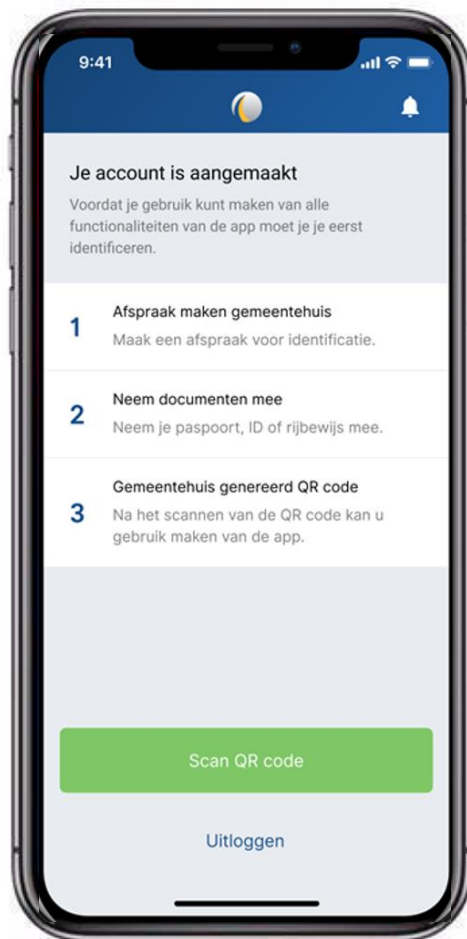
Burger has control over his own data

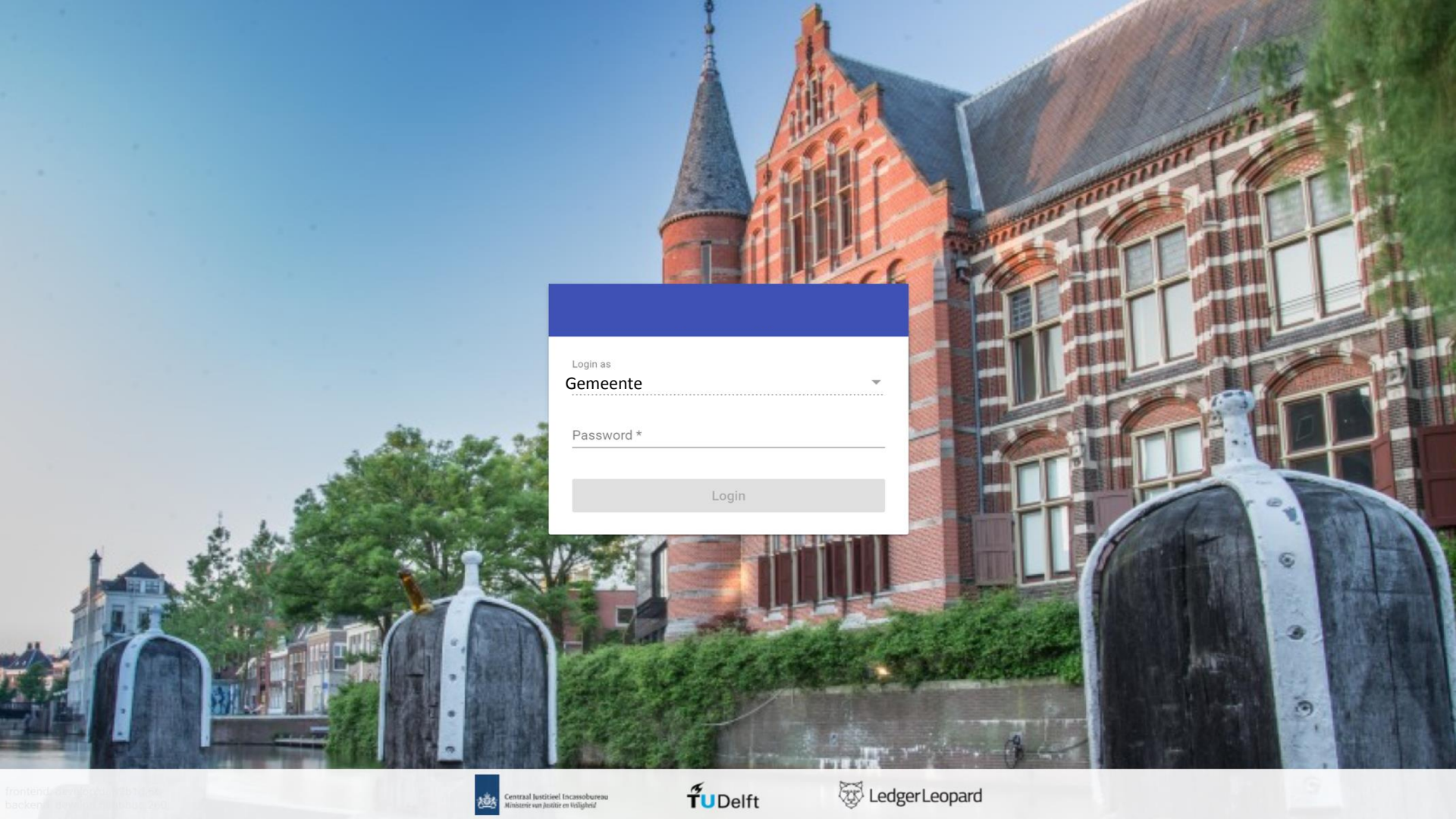
The municipality can make the debt position of a citizen available in a digital and secure way

CJIB can check data in an GDPR proof manner and on a need to know basis

Case Demo







Login as
Gemeente

Password *

Login

Login



Paspoorten

List of passports

Data gedeeld	BSN	Document nummer	Voornaam	Achternaam	Geboortedatum	Geslacht	Datum	
	168980149	SPECI2014	Doe	John	29-12-1980	Male	30-07-2016	

Items per page: 20 ▼

1 - 9 of 9





Paspoorten

List of passports

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	168980149	SPECI2014	Doe	John	29-12-1980	Male	30-07-2016	<div><div> Onboard</div><div> Edit</div><div> Delete</div></div>

Items per page: 20 ▼

1 - 9 of 9





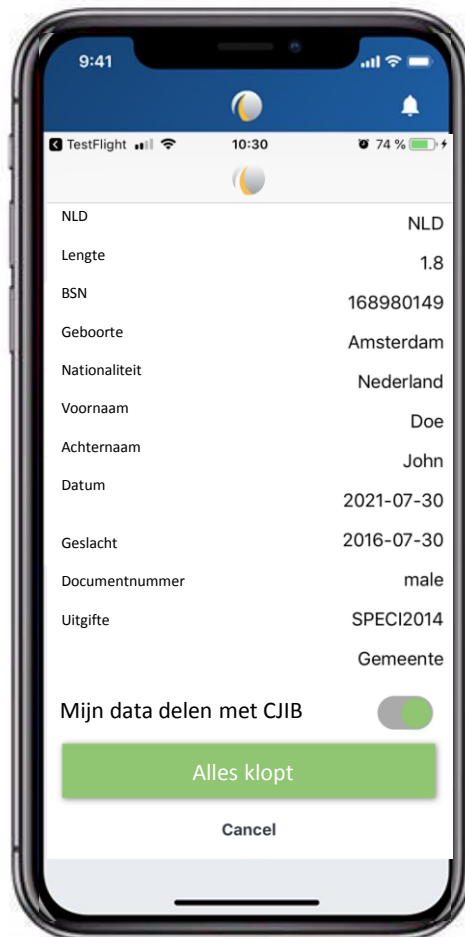
Onboarding

[List of passports](#) » [Passport](#) » [Onboarding](#)



QR code









The screenshot displays an IDE with the following components:

- Project Structure (Left):**
 - Project: CJBJavaExample
 - src/main/java
 - http
 - BaseResponse
 - HttpManager
 - utils
 - EnvironmentUtils
 - IndyUtils
 - PoolUtils
 - IndyDidVerkey
 - Main
 - Proof
 - resources
 - test
 - target
 - .gitignore
 - CJBJavaExample.iml
 - pom.xml
 - External Libraries
 - Scratches and Consoles
- Source Code (Right):**

```

import org.hyperledger.indy.sdk.ledger.Ledger;
import org.hyperledger.indy.sdk.ledger.LedgerResults;
import org.hyperledger.indy.sdk.pairwise.Pairwise;
import org.hyperledger.indy.sdk.pool.Pool;
import org.hyperledger.indy.sdk.wallet.Wallet;
import org.json.JSONArray;
import org.json.JSONObject;
import utils.EnvironmentUtils;
import utils.IndyUtils;
import utils.PoolUtils;

import java.io.File;
import java.nio.charset.StandardCharsets;
import java.util.Iterator;
import java.util.concurrent.ExecutionException;

public class Main {
    // MUNICIPALITY's did and verkey
    protected static final String THEIR_DID = "168980149";
    protected static final String THEIR_VERKEY = "168980149";

    // seed for generating CJIB's did and verkey
    private static final String CJIB_DID_SEED = "168980149";

    // test bsn to check
    protected static final String BSN_TO_CHECK = "168980149";

    // indy service constants
    protected static final String PAIR_NAME = "CONNECTION_NAME";
    protected static final String IDENTITY_JSON_TEMPLATE = "{\"did\":\"%s\",\"verkey\":\"%s\"}";
    private static final String WALLET_NAME = "cjb_wallet";
    private static final String WALLET_CONFIG = "{\"id\":\"\"+WALLET_NAME+\"\"}";

```

```
Run: Main x
INFO: src/commands/ledger.rs:221 | SubmitRequest command received
июн 04, 2019 10:35:40 AM org.hyperledger.indy.sdk.LibIndy$Logger$1 callback
INFO: src/commands/mod.rs:126 | LedgerCommand command received
июн 04, 2019 10:35:40 AM org.hyperledger.indy.sdk.LibIndy$Logger$1 callback
INFO: src/commands/ledger.rs:225 | SubmitAck command received
июн 04, 2019 10:35:40 AM org.hyperledger.indy.sdk.LibIndy$Logger$1 callback
INFO: src/commands/mod.rs:126 | LedgerCommand command received
июн 04, 2019 10:35:40 AM org.hyperledger.indy.sdk.LibIndy$Logger$1 callback
INFO: src/commands/ledger.rs:359 | ParseGetRevocRegDeltaResponse command received
июн 04, 2019 10:35:40 AM org.hyperledger.indy.sdk.LibIndy$Logger$1 callback
INFO: src/services/ledger/mod.rs:519 | parse_get_revoc_reg_delta_response >>> get_revoc_reg_delta_response: "{\"op\":\"REPLY\",\"result\":{\"to\":\"1559633740\",\"identifier\":\"AoEwSa74...\"}}\"}"
июн 04, 2019 10:35:40 AM org.hyperledger.indy.sdk.LibIndy$Logger$1 callback
INFO: src/services/ledger/mod.rs:540 | parse_get_revoc_reg_delta_response <<< res: ("8ukLnr59dzShFv4VPFoVn:4:8ukLnr59dzShFv4VPFoVn:3:CL:14:TAG1:CL_ACCUM:TAG1", "{\"ver\":\"1.0\", \"...\"})
июн 04, 2019 10:35:40 AM org.hyperledger.indy.sdk.LibIndy$Logger$1 callback
INFO: src/commands/mod.rs:114 | AnoncredsCommand command received
июн 04, 2019 10:35:40 AM org.hyperledger.indy.sdk.LibIndy$Logger$1 callback
INFO: src/commands/anoncreds/mod.rs:58 | Verifier command received
июн 04, 2019 10:35:40 AM org.hyperledger.indy.sdk.LibIndy$Logger$1 callback
INFO: src/commands/anoncreds/verifier.rs:39 | VerifyProof command received
июн 04, 2019 10:35:40 AM org.hyperledger.indy.sdk.LibIndy$Logger$1 callback
INFO: /Users/sergeybrazhnik/.cargo/registry/src/github.com-1ecc6299db9ec823/indy-crypto-0.5.0/src/c/verifier.rs:246 | Verifier verify proof -> done
User has "in debt claim" and provided DPA claim. We NOT able to issue fine

Process finished with exit code 0
```







IDE interface showing a Java project named **CJIBJavaExample** with the following structure:

- src
 - main
 - java
 - http
 - BaseResponse
 - HttpManager
 - utils
 - EnvironmentUtils
 - IndyUtils
 - PoolUtils
 - IndyDidVerkey
 - Main
 - Proof
 - resources
 - test
 - target
 - .gitignore
 - CJIBJavaExample.iml
 - pom.xml- External Libraries
- Scratches and Consoles

The **Main.java** file contains the following code:

```
import org.hyperledger.indy.sdk.ledger.LedgerResults;
import org.hyperledger.indy.sdk.pairwise.Pairwise;
import org.hyperledger.indy.sdk.pool.Pool;
import org.hyperledger.indy.sdk.wallet.Wallet;
import org.json.JSONArray;
import org.json.JSONObject;
import utils.EnvironmentUtils;
import utils.IndyUtils;
import utils.PoolUtils;

import java.io.File;
import java.nio.charset.StandardCharsets;
import java.util.Iterator;
import java.util.concurrent.ExecutionException;

public class Main {
    // MUNICIPALITY's did and verkey
    protected static final String THEIR_DID = "1559633860";
    protected static final String THEIR_VERKEY = "AoEwSa74";

    // seed for generating CJIB's did and verkey
    private static final String CJIB_DID_SEED = "EcixmzbY1VbPfpEQJYVhze";

    // test bsn to check
    protected static final String BSN_TO_CHECK = "168980149";

    // indy service constants
    protected static final String PAIR_NAME = "CONNECTION_NAME";
    protected static final String IDENTITY_JSON_TEMPLATE = "{\"did\":\"%s\",\"verkey\":\"%s\"}";
    private static final String WALLET_NAME = "cjbib_wallet";
    private static final String WALLET_CONFIG = "{\"id\":\"\"+WALLET_NAME+\"\"}";
    private static final String WALLET_CREDENTIALS = "{\"key\":\"cjbib_wallet_password\"}";

    public static void main(String[] args) {
        // ... (rest of the code) ...
    }
}
```

The **Run** console shows the following output:

```
INFO: src/commands/ledger.rs:221 | SubmitRequest command received
INFO: src/commands/mod.rs:126 | LedgerCommand command received
INFO: src/commands/ledger.rs:225 | SubmitAck command received
INFO: src/commands/mod.rs:126 | LedgerCommand command received
INFO: src/commands/ledger.rs:359 | ParseGetRevocRegDeltaResponse command received
INFO: src/services/ledger/mod.rs:519 | parse_get_revoc_reg_delta_response >>> get_revoc_reg_delta_response: "{\"op\":\"REPLY\",\"result\":{\"to\":\"1559633860\",\"identifier\":\"AoEwSa74\"}}\"
INFO: src/services/ledger/mod.rs:540 | parse_get_revoc_reg_delta_response <<< res: (\"EcixmzbY1VbPfpEQJYVhze:3:CL:10:tag:CL_ACCUM:DPA_TAG\", \"{\\\"ver\\\":\\\"1.0\\\"\", \"User has NO \\\"in debt claim\\\" OR he did not provide DPA claim. We MUST issue a fine

Process finished with exit code 0
```

At the bottom of the IDE, the status bar shows: 282:1 LF UTF-8 4 spaces Git: master



Zoeken



Home



Mijn netwerk



Vacatures



Berichten



Meldingen



Ik ▾



Werk ▾

Premium 1 m
probt**Marloes Pomp**

Projectmanager Blockchain & AI
experiments / International
strategy and partnerships

**Volledig profiel
weergeven**



Centraal Justitieel Incassobureau
Ministerie van Justitie en Veiligheid

THE FINANCIAL EMERGENCY BRAKE

CJIB app provides
citizens with a GDPR-
proof way to declare
payment inability





Your World First

C/M/S/
Law . Tax

Rapportage met betrekking
tot CJB schuldhelpverlening
blockchain oplossing

Auteur: Simon Sanders
14 april 2019



GOVERNANCE

Who is the controller of data and who is the (sub) processor?

MATERIAL REQUIREMENTS OF THE BLOCKCHAIN

Automated decision making

International transfer

Legality, fairness and transparency

Purpose limitation

Minimum data processing

Correct and current

The principle of storage limitation

Security

TRANSPARENCY & THE RIGHTS OF THE PERSON CONCERNED

The right to information

The right to inspect

The right to rectification, the right to erase & the right to limitation of processing

The right to data portability

The right to objection

Exceptions to the rights of the person concerned

1. Ensure that the transactions on the blockchain do not contain any personal data (except for the (hashed) public key), for example personal data stored off-chain that also do not contain any personal data or if this is not possible; limit the personal data in transactions to a minimum and hash and encrypt this personal data for unauthorized users.
2. Determine which users of the blockchain act as controller or processor.
3. Determine whether the controllers have a sufficient legal basis for processing the personal data.
4. Ensure that a verification process ensures that there is no international transfer or that any international transfer is in line with the GDPR.
5. Establish the obligations and powers of the controllers in a mutual arrangement. Conclude processor agreements with processors.
6. Determine whether it is necessary to designate a super user.
7. Secure the blockchain in an appropriate manner.
8. Ensure that the rights of those involved can be implemented. An important part of this is the right to limitation and removal.

Watch the Banks!

Wetrade, Kombo, Deliver, Vakt,...

Blockchain in the public sector | The Dutch approach



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Post Trade Management Platform

VAKT's vision is to digitise the global commodities trading industry,
creating a secure, trusted ecosystem



Wetrade, Komgo, Deliver, Vakt,...

The screenshot shows the Komgo website with a purple header. The header contains the 'komgo' logo in yellow and a navigation menu with links: 'mission', 'blockchain' (underlined), 'shareholders', 'company', 'contact', and 'menu' (with a hamburger icon). The main content area is white and features the heading 'technology' on the left. To the right, it states: 'The komgo digital network is a blockchain-based solution to companies' data security and exchange.' Below this, a paragraph explains: 'The technology enables multiple parties - previously unconnected or connected haphazardly - to participate with one another seamlessly and securely across a shared network. These participants benefit from end-to-end industry optimization, lowering the time and cost needed to manage data and operations.' At the bottom right of the content area, there is a teal plus icon followed by the text 'read more'.

<https://blockchaininnovationconference.com/>

Lessons from the banks

1. Join each other initiatives
2. Build firm teams and sometimes even new organizations within your own
3. Build modules for public services
4. What is the Komgo of the public sector? SSI+ wallet with claims?



BLOCKCHAIN PROJECTS
DUTCH GOVERNMENT



1. Start: SSI + claims: Let's fill and test the basket together!
2. Learn: From the trade/ logistic sector
3. Explore: Blockchain helps deliver upon the promise of AI by providing new levels of data access, trust and security. From AI for your own organization to AI for a "chain of events"
4. Enjoy!!

