Introduction - Blockchain for Mobility Pilot Use Cases

In the past decades humans have become more mobile while at the same time we have seen -and continue to see- a high degree of urbanisation. In a country like The Netherlands where 17 million people live on 41 thousand square kilometers, mobility is an important theme to keep our economy running, keep our cities liveable and our living environment healthy. Creating a more optimised mobility system is the core of the challenge that we face. Luckily digitalisation is enabling us to have more real-time information to plan ahead and adapt if needed, using a wide range of transportation. Also transport modes themselves have changed and this is gives citizens a wider range of opportunities. In order to help citizens, companies and governments to make better decisions we not only need more data but also a way to help individual participants in the mobility system to make better choices.

And this is where blockchain comes in. We see blockchain as an important enabler of creating a digital infrastructure to help individual participants in the mobility system make better decisions. Based on availability of data, transparency in algorithmic decision making and preservation of privacy. That not only optimizes the system but makes sure that it is done in a fair and inclusive manner. Blockchains enable a mobility optimisation infrastructure which is verifiable, rule-based and open.

This document describes five use cases to which we invite all those in mobility to show their interest and participate. First and foremost these are organisations that would use such an infrastructure like mobility providers, energy companies and government organisations. But equally important are providers of technology solution providers. There are a number of important criteria that will be considered:
- Interoperabilisty
- Scalability
- Use of fully public or public-permissioned chain
- Privacy-by-design
- Open-source
- Transparent business model
- Level of maturity

We are very much looking forward to your expression of interest. We aim to start the work early September through a series of scoping sessions in which we will determine the final project goals, deliverables, budget and financing thereof. The projects themselves will run from October through 1st quarter of 2022, dependent on scope and budget.

Pilot Use Case 1: Open Mobility Trust Network

Experimenting a common digital trust network base layer for an open, fair and sustainable mobility ecosystem that can address the challenges of tomorrow. As an extension of the existing Dutch TOMP API that defines standards for data exchange in mobility.

The open mobility trust network would act as a single "switchboard" to which participants only need to connect once (instead of the current situation that requires n to n integrations). With verified decentralized identifiers for organizations, persons and assets being foundational components. Offering "platform advantages" to all sector stakeholders and preventing new platform monopolists in the mobility sector. Offering citizens an "open mobility marketplace" with transparency and freedom of choice to the sum of all large and small participating mobility providers. Any certified mobility provider can join. Government can still set specific rules and use the underlying technology to request citizens and companies to share data in a direct peer2peer and privacy friendly manner. Each participating mobility provider can develop direct customer relations or via others. Providing benefits like "wider market access through other apps and sales channels", "optimizing capacity by having others sell your mobility service", "you, selling mobility services from others" and "KYC re-use for onboarding customers". The open mobility network should be able to act as a basis for new tokenized solutions, and new type of payments, incentivization and financial transactions.

A pilot should validate if such a trust network can indeed offer above type of benefits for parties that do not necessarily share the same interests, like competing market parties, local and national government organizations and of course citizens themselves. It should provide insights and learnings about technical effort and feasibility. And maybe even most important, it should provide learnings on how such a trust network can be governed and financed. You could discuss all this in theory, but pilots will make it more tangible and easier to understand for all stakeholders.

Keywords:
#DigitalTrust #DecentralisedIdentifiers #VerifiableCredentials #Smartcontracts #DiscoveryServices #OpenAPIs #DataSharing #Privacy

Pilot Use Case 2: Personal Data Ownership & Mobility

There is a natural tension between commercial (and sometimes government) organizations trying to collect personal data to offer innovative, high quality personalized mobility services versus citizens that are trying to keep control over their personal data.

In the future you still want allow citizens to travel as anonymous as they want, for instance, when using public transport or using their own vehicles. If citizens need to be identified, they shouldn't necessarily share "all" their personal data. For instance, you shouldn't need to share your home address, email address, telephone number or birth date with any mobility provider you once travelled with. Similarly disabled persons shouldn't need to share their disability by default, but only in a controlled way if they ask for specific services.

At the same time maintaining personal data of customers in a GDPR compliant manner is very costly for organizations. Ensuring that this data is correct and up to date is even more complex and costly. However, good know your customer (KYC) processes are crucial for many mobility providers for preventing fraud so they currently don't have much choice then arranging expensive KYC solutions.

This pilot use case aims to address both angles. Offering personal wallets to citizens for collecting and storing verified personal data and keep control over it when using mobility services. Providing a clear history of what data is shared with who, on what moment. Concepts like "zero knowledge proofs" and "selective disclosure" allow citizens to share certain data while staying anonymous if possible.

At the same time, this pilot scenario should offer mobility providers and government organizations a mechanism to re-use high assurance KYC checks, only collecting up to date and verified personal data. In a different way though. E.g. checking if a customer has a valid driver's license or bank account without needing more details. The architecture will allow them to request separate attributes of personal data, only the data that they feel is absolutely needed. They can always request the citizen to share more personal data on which the citizen can decide to give consent or not.

Pilot scenario 1, Open Mobility Trust Network, may also provide the base architecture for personal data ownership. However, pilot 2 will be more focused on this particular topic. This pilot scenario is also very much in line with the EU plans for the new EU Digital Identity Wallets.

Keywords:
#DigitalTrust #CusomerOnboarding #DataSharing #Privacy
#SelfSovereignIdentity #DecentralisedIdentifiers #VerifiableCredentials

Use Case 3: Parking for Shared Cars

This pilot use case aims to address a concrete existing pain point by using decentralized technologies.

Currently it is very complex and costly to handle parking for shared cars. Both for the owners of shared cars (companies or individuals) as well as for cities. Most people will agree that parking for shared cars should be easier and cheaper compared to parking of "normal" cars. However, in practice, it's the opposite and this pilot scenario aims to provide technical ingredients for a potential solution. It is clear that an overall solution will also need political and commercial choices.

In this pilot scenario a limited number of shared cars will get a car wallet with a decentralized identifier. The car wallet can store verifiable credentials that provide verified meta data about the car. The Ministry of IenW (RDW) can for instance provide a verified credential for certified shared cars and a city can provide a verifiable credential for a parking license. Decentralised identities for vehicles, parking facilities, drivers, etc. are crucial in this case.

The car wallet can be used to automatically share car data, licenses and permits with cities or others in a privacy friendly way (the owner of the vehicle stays in control). This allows cities and commercial parking's to automatically recognize shared cars and offer them lower prices or free parking and/or incentives. Payments can be automatically handled from the care wallet based on the owner's consent.

#DigitalTrust #SharedCars #Parking #DataSharing #Privacy
#CarWallets #DecentralisedIdentifiers #VerifiableCredentials

Use Case 4: Vehicle Passport

Upcoming EU regulations like the 'Supply Chain Law' will require more proof on the usage of raw materials during the production of vehicles to contribute to the transition of a circular economy (incl insight in the battery life cycle management). New regulations will also require more proof that human rights have not been violated during any stage of the production process.

This pilot scenario focusses on how decentralized technologies like decentralized identifiers, and verifiable credentials can be used to address these new rules and processes in an efficient, automated, and trustworthy manner.

It should use generic decentralized architectural components like in the other pilot scenarios but focus on the production process, supply chain process and maintenance of vehicles. Since it uses generic components like car wallets, decentralized identifiers and verifiable credentials the infrastructure could also be used for instance for the parking use case (and vice versa) and generic features like privacy friendly, peer2peer data sharing and automatic payments.

#DigitalTrust #SupplyChainProvenance #rawmaterials #humanrights #VehcilePassport #CarWallets #DecentralisedIdentifiers #VerifiableCredentials #DataSharing #APK #PartRenewals #CarDamages #CarUsage #UsedCarSales

Use Case 5: Seamless EV Charging & local green energy

The original design of the energy grid was 'one-way', energy provider to consumer. Over the last couple of years this 'one-way' approach changed, adjusting to the growing amount of green (and locally) produced energy. On one hand this is good for lowering the emissions that are harmful for the environment, on the other hand there is more fluctuation and thereby destabilization within the energy grid.

This pilot use cases is using decentralized technologies to address a number of challenges to stabilize the energy grid with use of electric vehicles.

It allows citizens with electric vehicles and solar panels to be part of the grid, eg to share their electric vehicle battery while not driving, to sell or use the energy produced with their solar panels, producing renewable energy certificates (I-RECs) that can be traded , and to function as electricity storage when there is overcapacity on the grid.

The solution should be based on generic decentralized architecture components so they can also be re-used for more generic features like data sharing and automatic payments.

#DigitalTrust #100%renewablenergy #Proof #EVCharging
#CarWallets #DecentralisedIdentifiers #VerifiableCredentials
#Tokens #I-REC Standard