

**BLOCKCHAIN  
FOR NEXT  
GENERATION  
INTERNET**



A new software ecosystem for trusted,  
traceable & transparent ontological knowledge

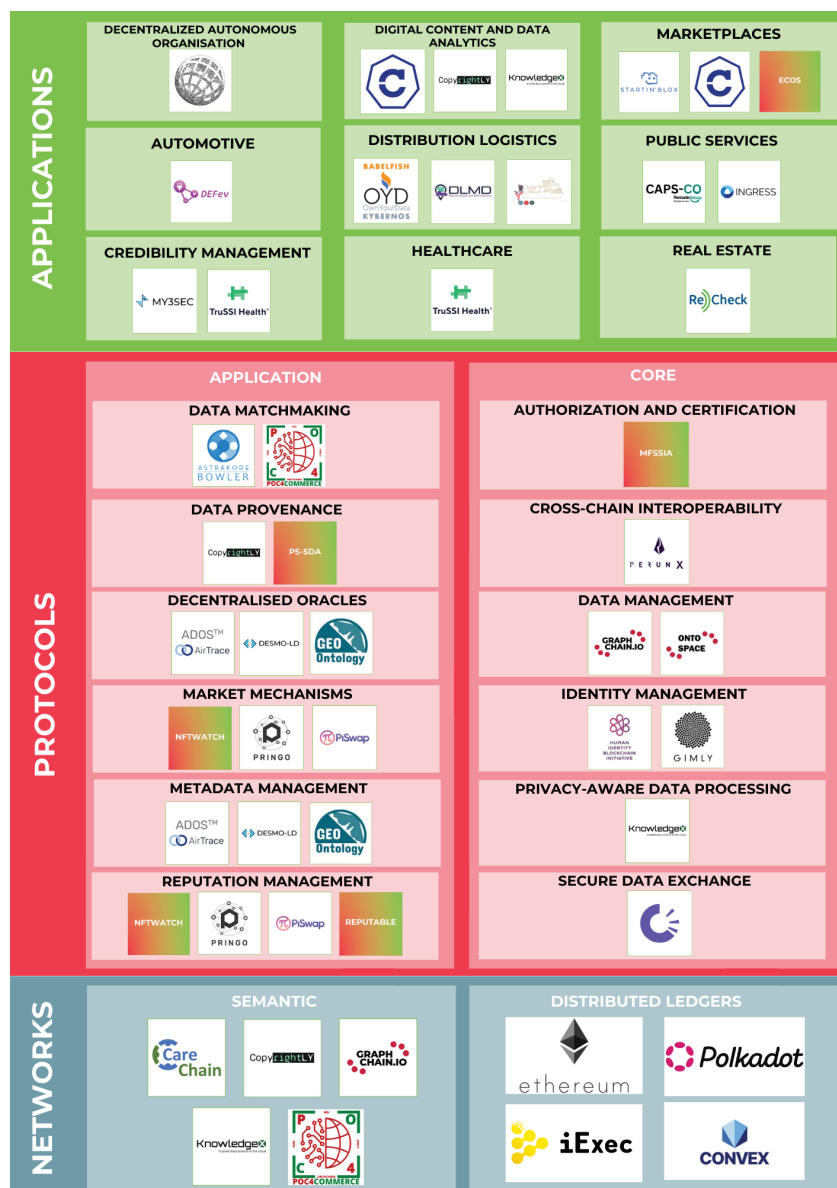
# End-users guide

# The ONTOCHAIN Software Ecosystem

Multiple threats have been identified when citizens interact with online services, such as unknown provenance of information, unknown quality of service providers, spread of fake news, fraud, personal privacy violation, centralisation of power to name a few.

ONTOCHAIN presents a new software framework, that leverages semantic web and blockchain technology to build, as distinct value for the Next Generation Internet, fundamental support for trustworthy data/services exchange and trustworthy content handling.

It comprises a novel protocol suite grouped into high-level application protocols, such as data provenance, reputation models, decentralised oracles, market mechanisms, ontology representation and management, privacy-aware and secure data exchange, multi-source identity verification, value sharing and incentives, and lower-level core protocols that include authorisation, certification, privacy-aware data processing, cross-chain gateways, identity management, secure data exchange, and data semantics in smart contracts.



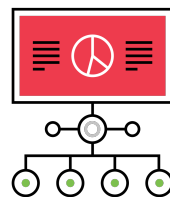
# The ONTOCHAIN Software Ecosystem

## What's in it for you

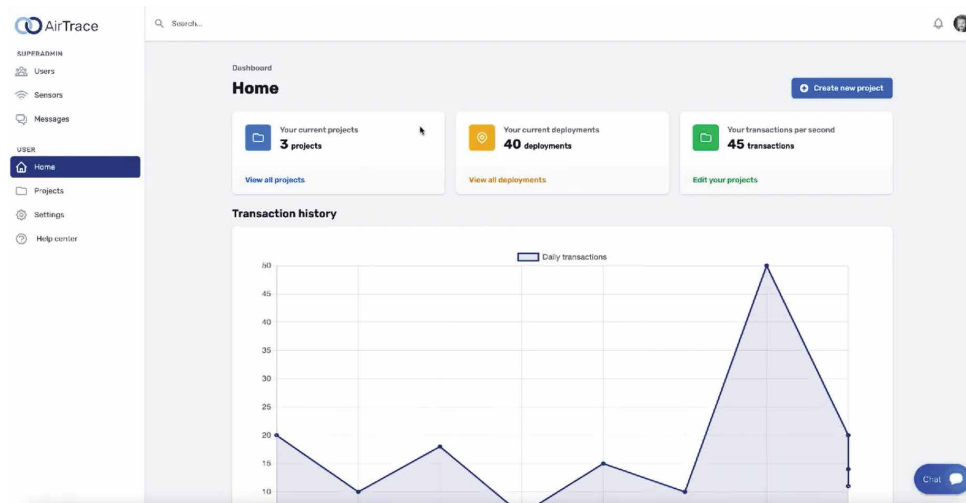
The ONTOCHAIN software ecosystem provides individuals, SMEs, big corporates and public institutions access to dApps, made available by dApp providers:

- 1. Benefit from Trust and Transparency:** ONTOCHAIN leverages blockchain technologies to ensure the integrity and transparency of data transactions
- 2. Obtain improved Data Control:** ONTOCHAIN empowers secure and transparent knowledge management solutions
- 3. Benefit from solutions in Diverse Domains** to real-world challenges: ONTOCHAIN facilitates access to a wide range of applications and services available within healthcare, energy, logistics, and more
- 4. Access enhanced Services and Applications:** the development of blockchain-based applications on the ONTOCHAIN platform can streamline various processes, improve service quality, and offer new functionalities
- 5. Participate in Web3 Innovation:** By being part of the ONTOCHAIN ecosystem, you become active participant in the web3 innovation movement and contribute to the growth and evolution of blockchain technologies
- 6. Participate in a Collaborative Community:** ONTOCHAIN fosters a collaborative community that you can engage with and contribute to the development of future applications and services

Overall, ONTOCHAIN offers you enhanced data control, trust and transparency, access to diverse and innovative applications, and the opportunity to be part of a collaborative and forward-thinking community driving web3 innovation.



# ONTOCHAIN Services & Functionalities at a Glance



## Keywords

- ▶ Decentralised oracles
- ▶ Metadata management
- ▶ Application protocols



MORE INFO

## ADOS: AirTrace Decentralized Oracle System

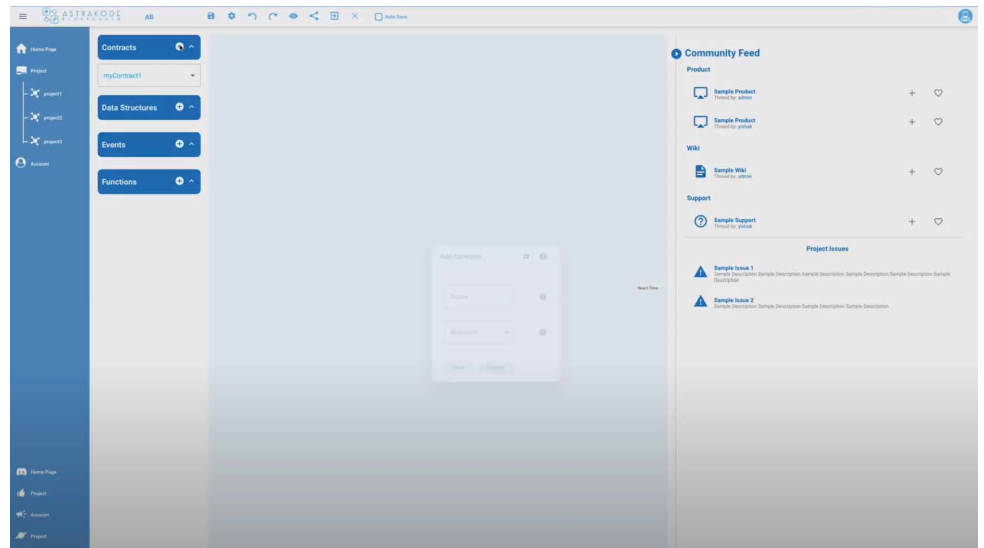
AirTrace is a platform that allows, both visually as well as programmatically to quickly and easily deploy IoT networks supporting Blockchain.

Users (IoT system integrators and IoT SaaS platforms) simply choose the IoT devices to deploy among the growing database of IoT System Integrators, and after a few configuration steps, the resulting interfaces (RestFUL API, MQTT, etc.) are generated, so that integrators can easily support them in their IoT projects. IoT oracles that meets a predefined data quality level.

The real utility of ADOS in the platform AirTrace (as well as other potential platforms that in the future might make use of ADOS for other non-necessarily blockchain-related anomaly detection schemes) is that it helps potential audits later to verify the reliability of data when already stored in the Blockchain. This increases transparency of data and improves the reliability of Blockchain and IoT systems by improving the core element: reliability of data and its credibility.

ADOS helps to maximize data reliability by proving that anomaly detection algorithms can be used in distributed oracle systems in order to have an extra layer that can convey important information to enhance data credibility before injecting into the Blockchain.

# ONTOCHAIN Services & Functionalities at a Glance



## Keywords

- Data matchmaking
- Application protocols



[MORE INFO](#)

## BOWLER: Blockchain-Oriented Warehouse & Low-Code Engine and Reasoner

A low-code development environment which speeds up low level smart contracts development.

BOWLER offers a model-driven Web-IDE to allow:

- faster time to market (KPI: 1-statement smart-contract deployment in < 1hr)
- easier evolution through reusable models
- fostering standardization and thus interoperation amongst the entire ONTOCHAIN ecosystem.

Indeed, the BOWLER provides end-to-end support through its web-enabled IDE to reuse pre existing model specifications (blueprint), model them and generate deployable Solidity code.

In this way, the BOWLER can be used by any member of the ONTOCHAIN ecosystem to quickly deliver trustworthy smart contract solutions.

## ONTOCHAIN Services & Functionalities at a Glance



Address \* 0x6635f3421b059c811118007271286856e4

Topic \* 1

Conditions

Number of conditions \* 2

Condition 1: \* claim1

Start date: \* 01/01/2022 01:00 End date: \* 01/01/2023 00:00

Condition 2: \* claim2

Start date: \* dd/mm/yyyy --:-- End date: \* dd/mm/yyyy --:--

### Keywords

- ▶ Ontologies
- ▶ Semantic
- ▶ Networks



[MORE INFO](#)

### CARECHAIN: Supporting CARE through microinsurances using blockCHAIN

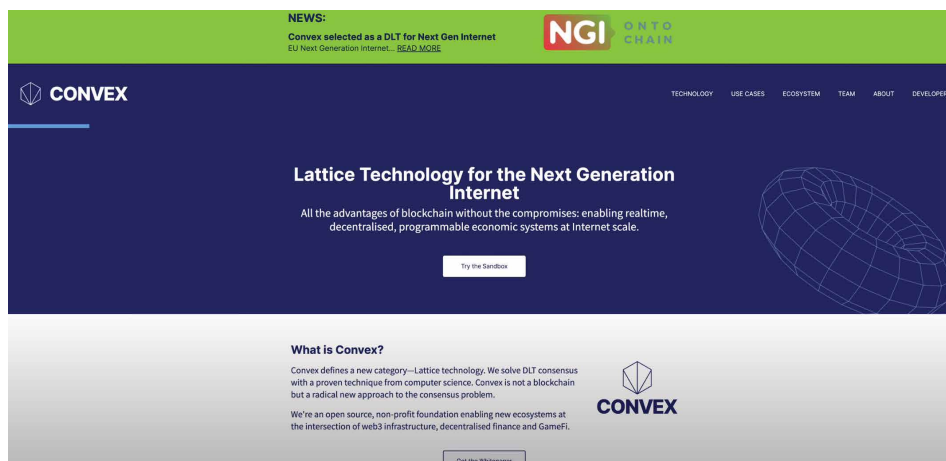
CARECHAIN offer a platform where companies can provide services of insurance contracting, advice and risk management.

CARECHAIN addresses the following challenges:

- 1) these insurance contracting companies, to enhance services, reduce managing costs and provide secure online mechanisms, and
- 2) competitor companies seeking comparative advantages to enter this market, within the scope of ONTOCHAIN ecosystem.

CARECHAIN designs and implements an environment for the execution of smart contracts for parametric microinsurance based on the distributed ledger, to guarantee users the application of coverage when meeting contract conditions, in search for new market niches and allowing the revitalization of the economy caused by COVID19 pandemic.

## ONTOCHAIN Services & Functionalities at a Glance



### Keywords

- Networks
- Distributed Ledgers



[MORE INFO](#)

### Convex Global DLT: A hosting infrastructure and decentralised ledger for the Next Generation Internet

Despite all the research in the blockchain space, combining performance and sustainability in a decentralised network remains an unresolved challenge. Convex delivers a unique blend of innovative ideas that aim to solve it. A new global network removing the most salient barrier of entry for new blockchain users in an environmentally sustainable manner.

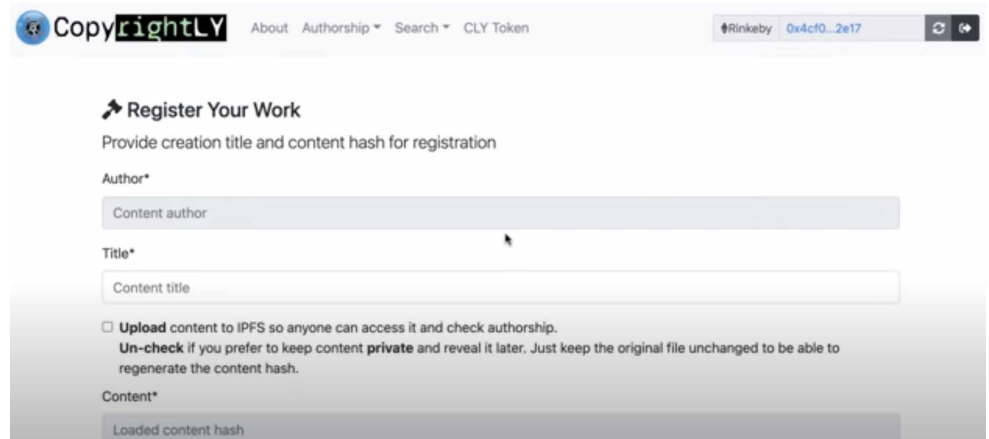
Convex Global DLT provides an energy efficient and scalable platform for the ONTOCHAIN Network. It supplies documentation, ecosystem services, training and API implementation support for selected ONTOCHAIN use-case partners. The network operates with any number of peer operators that confirm the global state in real time at thousands of transactions per second.

Elements of the infrastructure are:

- Decentralised and permissionless peers running Convergent Proof of Stake consensus
- APIs for connecting with partner systems
- Full stack development system for open-source developers
- Documentation and training for partners
- Strategic advice for managing on-chain and off-chain storage

## ONTOCHAIN Services & Functionalities at a Glance

CopyrightLY



The screenshot shows the 'Register Your Work' interface on the CopyrightLY website. The page has a header with the CopyrightLY logo, navigation links for 'About', 'Authorship', and 'Search', and a 'CLY Token' section. The main content area is titled 'Register Your Work' and includes the instruction 'Provide creation title and content hash for registration'. There are three input fields: 'Author\*' (with a sub-label 'Content author'), 'Title\*' (with a sub-label 'Content title'), and 'Content\*' (with a sub-label 'Loaded content hash'). Below the 'Title\*' field, there is a checkbox for 'Upload content to IPFS so anyone can access it and check authorship.' and a note: 'Un-check if you prefer to keep content private and reveal it later. Just keep the original file unchanged to be able to regenerate the content hash.'

### Keywords

- ▶ Data provenance
- ▶ Application protocols
- ▶ Ontologies
- ▶ Semantic
- ▶ Networks



MORE INFO

### CopyrightLY: Decentralised Copyright Management for Social Media

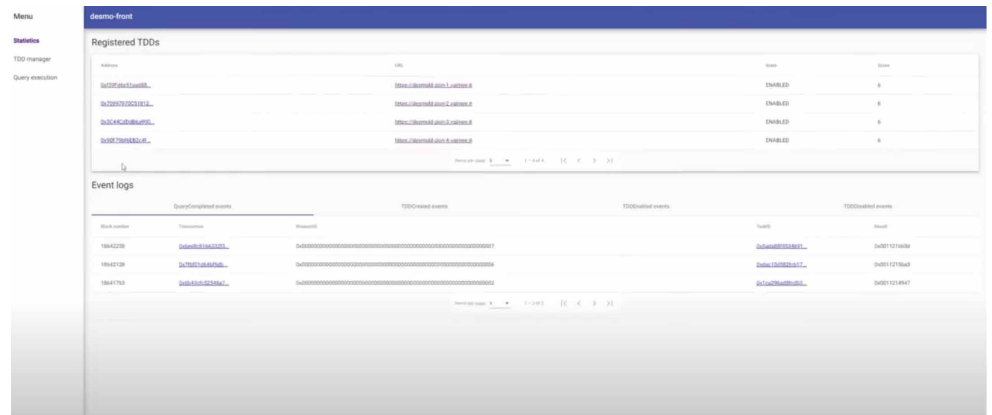
CopyrightLY is an application that helps managing ownership and rights in the ONTOCHAIN ecosystem. From claiming authorship of content or data, to linking these claims to evidence off-chain or associating reuse terms that once agreed set the reuse conditions among the involved parties.

CopyrightLY proposes a system capable of rooting on-chain copyright transactions, especially NFTs, on copyright claims that can be tied to evidence and validated on court.

These set of evidence, together with the opportunity to make complaints and use incentives to curate them, makes it possible to build a scalable and community driven content ownership layer.



# ONTOCHAIN Services & Functionalities at a Glance



## Keywords

- ▶ Decentralised oracles
- ▶ Metadata management
- ▶ Application protocols



MORE INFO

## DESMO-LD: Decentralized Smart Oracles for Trusted Linked Data

DESMO-LD aims to provide a fully integrated distributed solution for consuming IoT external data, enriched with Web of Things semantics and data model, inside the ONTOCHAIN. This addresses the objectives of designing new trustful decentralized Oracles to poll semantic data from off-chain data sources.

Besides, DESMO-LD introduces novel strategies to solve the above-mentioned problems thanks to the heavy deployment of standard ontology and semantic-oriented consensus algorithms for data quality and trustiness.

The system architecture of the DESMOLD is divided between an on-chain part, consisting of a set of smart contracts, and an off-chain part with the Oracle DApp and the Web of Things Thing Description Directory (TDD).

In DESMO-LD different types of clients may be interested in using the system: a classic smart contract, a complete full-stack DApp, or even a pure web3 frontend application. In particular, the environments span from on-chain deployments (i.e., smart contracts) and off-chain services and applications.

# ONTOCHAIN Services & Functionalities at a Glance



## Monitors deployment

Monitors are well-known geolocated servers, that are deployed widely in different locations/countries



```

ubuntu@ip-172-31-43-237: ~$ curl -s -X GET http://localhost:8080/api/monitors
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```

- The monitor's country
- The monitor's city
- Its public IP
- Latitude
- Longitude
- Coefficient M
- Coefficient B

## Keywords

- Metadata management
- Decentralised oracles
- Application protocols



MORE INFO

## GEONTOLOGY: A geo-aware network protocol for enabling trustable cross-border operations and data exchange in a global digital economy

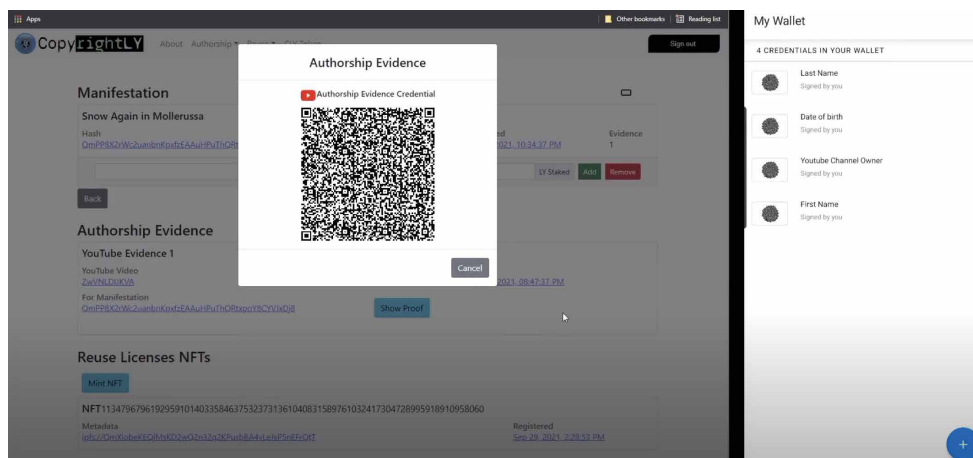
GEONTOLOGY aims to provide a network protocol that promotes regulation of data exchange, trust, consent management, reputation and security as contribution for the emerging Data Economy Ecosystem built on Blockchain technology.

In details, GEONTOLOGY proposes an innovative protocol called Proof of Offset (POO) to enable a higher control and limit data access by geo-location, accountability, data exposition minimization, data semantic annotation that guarantee cross-domain data re-use and higher awareness about data protection.

POO algorithm is provided with a deterministic mechanism to validate the geo-location from nodes requesting data in order to validate its legal jurisdiction. In addition, POO algorithm is specialised to detect the use of relay nodes such as proxies and other entities that could manipulate the network location (IP address).

Geolocation service: Maintains a network of registered nodes that are used to verify the geolocation of future objectives (either objects to be geolocated, or new nodes to be registered into the network). Nodes receive a payment for each verification they participate in.

# ONTOCHAIN Services & Functionalities at a Glance



## Keywords

- ▶ Identity management
- ▶ Core protocols



[MORE INFO](#)

## OntoSsiVault / Gimly ID: an SSI application suite

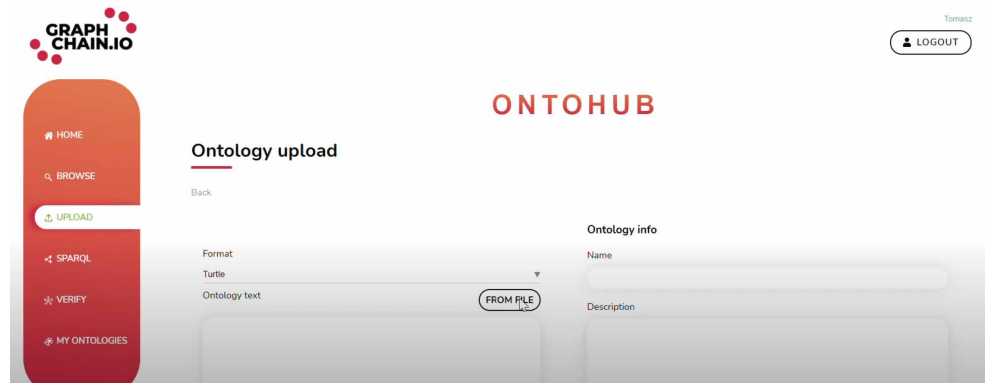
Solution that implements SSI and Verifiable Credentials (VCs) standards for creating organizations and registering users.

Gimly ID is a fully self-sovereign identity solution that brings trust and usability to users without compromising the security and privacy of the ecosystem and its members.

Gimly ID centers around the mobile application, which offers a passwordless single-sign-on experience and selective disclosure of data by leveraging decentralised identifiers (DIDs) and VCs and a sovereign data vault.

The Gimly ID mobile app can be used as a standalone solution, aiming for full interoperability with other SSI-conformant solutions.

## ONTOCHAIN Services & Functionalities at a Glance



### Keywords

- ▶ Data management
- ▶ Core protocols
- ▶ Ontologies
- ▶ Semantic
- ▶ Networks



[MORE INFO](#)

### GraphChain: a framework for on-chain data management for ONTOCHAIN

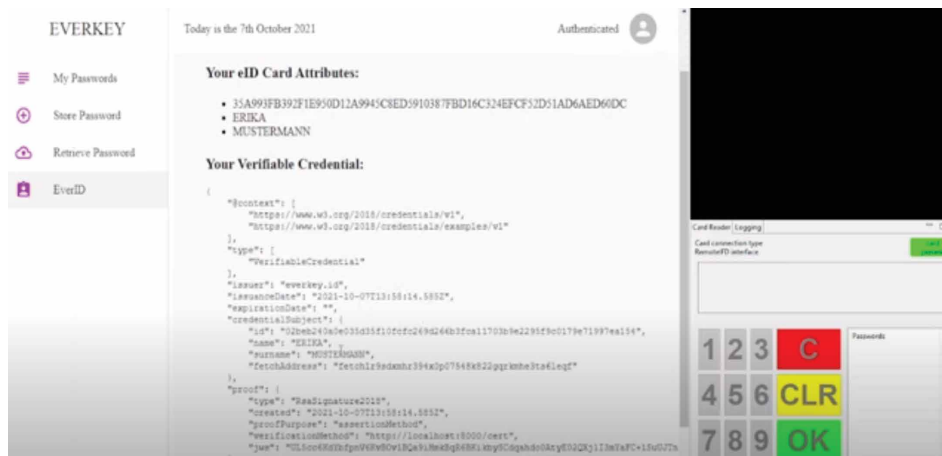
Metadata management through smart contracts without the use of oracles.

GraphChain is a framework for on-chain data management for ONTOCHAIN which implements decentralised on-chain graph management technologies, including the ability to perform usual graph operations.

Exposes its data with explicit semantics, is easily and natively accessible and applies Blockchain security mechanisms to the RDF graph data model directly, without additional packaging or specific serialisation.

GraphChain proposes a radically different approach: instead of encapsulating the semantic data into Blockchain blocks, they propose to design and implement the Blockchain mechanisms on top of semantic data.

# ONTOCHAIN Services & Functionalities at a Glance



## Keywords

- Identity management
- Core protocols



[MORE INFO](#)

## HIBI: Human Identity Blockchain Initiative

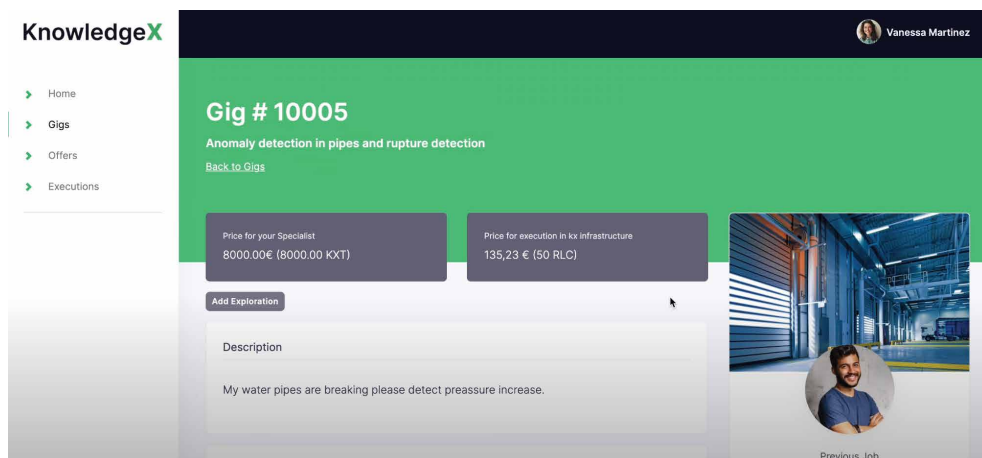
SSI to eIDAS bridge. HIBI encompasses scalable Blockchain, decentralised legal reputation and identity systems and interoperable semantic web technologies.

HIBI is provided to developers as a modular SDK for adding specific features to an application. All of the features are based on the eIDAS standard for qualified electronic signatures and require the NFC scans of a legal EU identification document.

HIBI provides the user with the power and sovereignty of their keys, identifiers, and verifiable credentials. Therefore, it contradicts existing identity management systems that are usually based on centralised data silos managed by identity providers.

HIBI has the potential to fundamentally add value to the internet by providing an interface for legal identities to the internet in a secure and verifiable manner, as well as solve the problem of users losing their keys and everything that helps them recover it. Application Examples: Decentralized finance, Social Media, real estate transactions, tokenized firms, real DAOs

## ONTOCHAIN Services & Functionalities at a Glance



### Keywords

- ▶ Privacy-aware data processing
- ▶ Core protocols
- ▶ Ontologies
- ▶ Semantic
- ▶ Networks



[MORE INFO](#)

### KnowledgeX: Trusted data-driven knowledge extraction

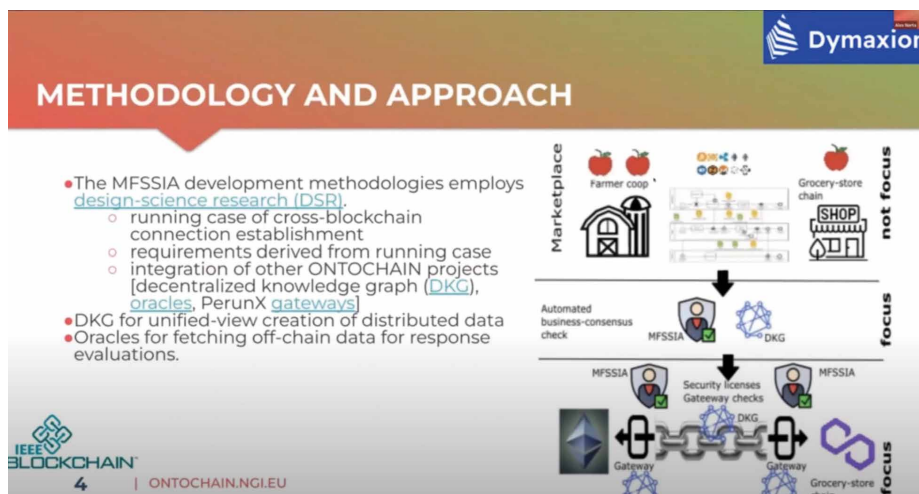
KnowledgeX is a trustworthy marketplace for data scientists with preservation of data confidentiality.

This means data owners can outsource data science tasks to independent contractors without risking data misuse. Independent data scientists can bid on proposed tasks without getting prior access to confidential data.

Currently data markets are hampered by confidentiality requirements due to competitive (e.g., cost data) or regulatory (e.g., personal data) considerations. Data scientists have to be employed in-house or are contractually restricted by non-disclosure stipulations, which tend to be ambiguous and costly to enforce.

KnowledgeX aims to solve this problem via a process where data privacy, and contract fulfillment are technologically guaranteed, so the need for non-disclosure agreements does not arise.

# ONTOCHAIN Services & Functionalities at a Glance



## Keywords

- ▶ Authorization and certification
- ▶ Core protocols



MORE INFO

## MFSSIA: Multi-Factor Self-Sovereign Identity Authentication

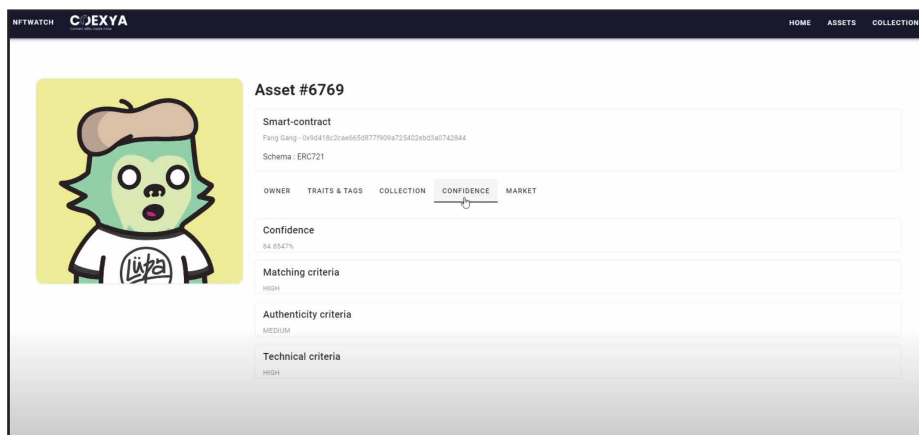
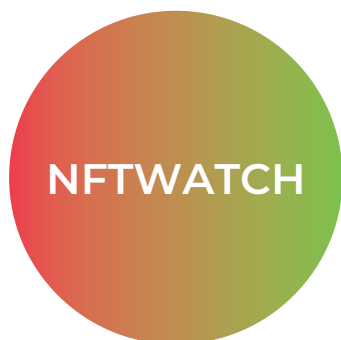
Multifactors authentication verification: set an agreement between two parties thanks to self-sovereign identity authentication by these 2 parties on cross-chain connection establishment.

Verification is based on specific qualities, the identity is linked to specific qualities rather than numbers.

The Decentralized Knowledge Graph (DKG) solution has been used for expressing challenges and also to capture contexts for which responses to the challenges must be detected. The iExec Cloud is on the one hand the deployment infrastructure and on the other hand also delivers oracles to the MFSSIA lifecycle for confirming the validity of responses to the configured challenge sets. When Identity is established, it is recorded on the blockchain. Verifiable credentials are part of the solution.

The challenge can make use of oracle data. There is no specific schema for Challenge creator and can be defined according to their needs.

# ONTOCHAIN Services & Functionalities at a Glance



## Keywords

- ▶ Market mechanisms
- ▶ Identity Management
- ▶ Application protocols
- ▶ Core protocols



[MORE INFO](#)

## NFTWATCH: an RDF-based ontology to describe exhaustively what NFTs are, as well as a set of IT tools to interact with it

The NFT market is booming and is lacking both specialised data vendors and data models to analyse it. The information is spread online, onchain, in multiple marketplaces.

NFTWATCH is an open-source project aiming to help the collection and aggregation of all NFT-related information. NFTWATCH provides an ontology dedicated to NFTs and tools to manipulate usually unstructured (on-chain data, transaction history, online marketplaces metadata, semantic data...) NFT-related data.

Most users will only refer to NFT by data presented by the artists on its website, or by the seller on a marketplace. This raises a first concern: do these data correspond to the advertised token? Does the image displayed really correspond to the NFT? This is further complicated by the fact that NFT marketplaces use very little criteria to classify, search, or select NFT.

Through advanced ML and semantic-based technology, NFTWatch will analyse and classify not only the structured data provided by the artist, but also unstructured data from different sources, including the piece of art itself. The service will use both the collected and the generated data to propose a multi-facet search and visual discovery of the NFT world. The data will then be available through an application and a REST API.

By creating a complete ontology around NFT data fed by multiple sources associated with online visual data explorer, NFTWATCH is helping the fight against IP fraud.



## ONTOCHAIN Services & Functionalities at a Glance



### Keywords

- ▶ Data management
- ▶ Core protocols



[MORE INFO](#)

### ONTOSPACE: a stable, scalable, efficient and cost-effective network for ONTOCHAIN

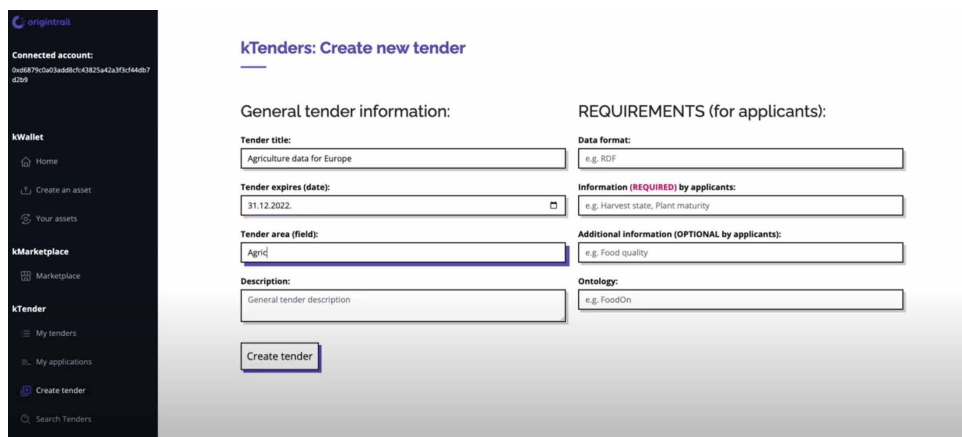
The aim of ONTOSPACE is to expand on GraphChain's project to enable networks to emerge. It provides the necessary building blocks to make the deployment of the ecosystem as easy as possible with graph databases.

ONTOSPACE can be used to develop applications using Ontologies or Knowledge graphs and Smart Contracts.

ONTOSPACE's value proposition contains the innovative use of RDF graphs with Blockchain to provide a trusted environment for improved performance of structural data storage with the use of the graphs.

ONTOSPACE provides a working ecosystem in which various networks can be launched and coexist under the fundamental principles of the construction of Layer2 networks.

# ONTOCHAIN Services & Functionalities at a Glance



## Keywords

- ▶ Secure data exchange
- ▶ Core protocols



MORE INFO

## OriginTrail DKG: Decentralised and Scalable Knowledge Graph Economy Tools Supporting the "Trusted, traceable and transparent ontological knowledge on blockchain — ONTOCHAIN"

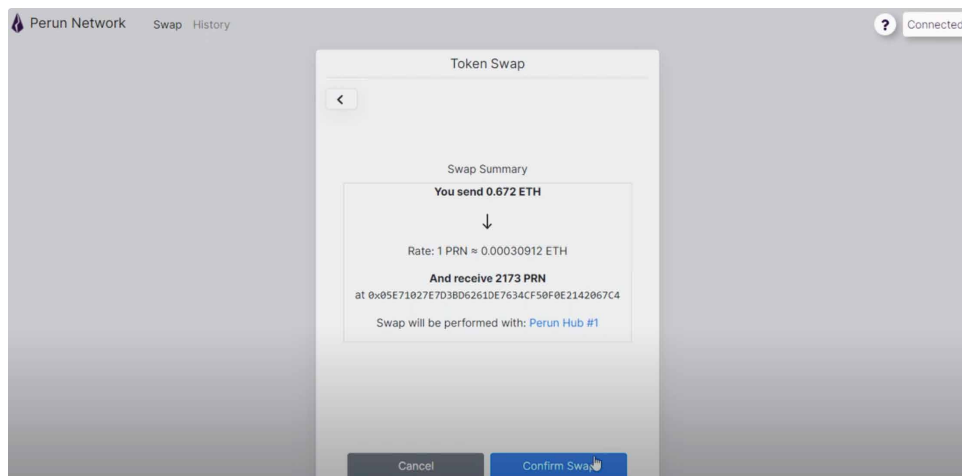
OriginTrail Decentralized Knowledge Graph (DKG) harnesses the power of two technologies, blockchain and knowledge graphs, to enable turning data into assets and making those assets discoverable, verifiable, and valuable.

Currently supported by an open network of over 2.500 nodes hosted by both individuals and businesses globally, the DKG has been deployed in a variety of industries, ranging from compliance to pharmaceuticals.

Building upon ONTOCHAIN infrastructure components, the core development team of OriginTrail, Trace Labs, has expanded the core functionality of the DKG in the ONTOCHAIN project to:

- Align it entirely with ONTOCHAIN core protocol functionalities (identity management and authorization, secure decentralized data storage, certification, and knowledge graph semantic services such as verifiable data linking using cryptographic connectors). Introduce a set of service-layer applications as a toolkit for builders of applications known as Knowledge Incentivisation Tools (kTools for short)

## ONTOCHAIN Services & Functionalities at a Glance



### Keywords

- ▶ Crosschain interoperability
- ▶ Core protocols



[MORE INFO](#)

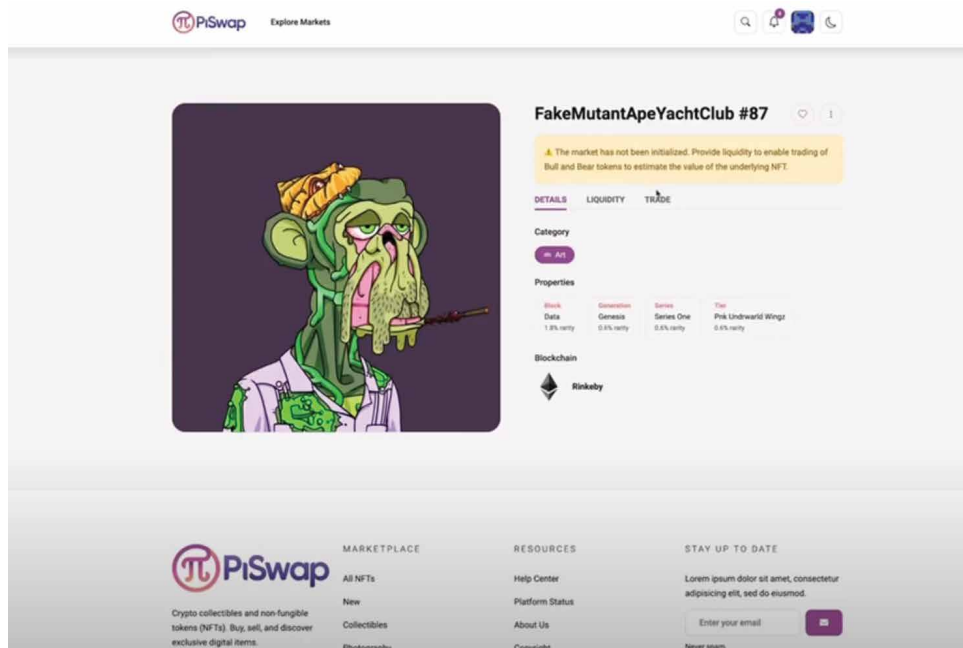
### PXC / Perun-X: Efficient Cross-Chain Infrastructure for ONTOCHAIN

PXC aims to build a decentralized and trustless channel network in which transactions from one ledger to another can be performed at minimal cost.

In addition to this feature, the framework allows for arbitrary logic to be executed within a channel, leading to potential cross-chain contracts and more advanced applications for industry and finance. In this setting, the trust assumptions are minimized and incentives for node operators are carefully designed.

PXC contributes to the overall objective of the ONTOCHAIN project to create a software ecosystem for the next generation Internet/social networks and for vital sectors of the European economy. It provides a secure, scalable and open cross-chain layer which is ready to connect ONTOCHAIN with any existing and future blockchain systems.

## ONTOCHAIN Services & Functionalities at a Glance



### Keywords

- ▶ Market mechanisms
- ▶ Reputation management
- ▶ Application protocols



MORE INFO

### NFTSwap / PiSwap: Price-Building-Mechanism for asymmetric NFT-markets

Platform for NFT price determination. Users can use NFTSwap to create markets for any owned or not-owned NFT by minting a derivative NFT.

This derivative market is provided with liquidity and creates a Bull-Bear-Token allowing users to participate in the price building of this particular NFT. The project prediction-system will pave the path for the availability of new assets on-chain.

With its open-source approach the blockchain-agnostic solution is used on additional chains opening new markets and new fields of interest.

The solution architecture of NFTSwap project can be compared to the smart contract architecture of UniSwap. There is a central factory contract (Registry) that deploys individual NFT markets. Instead of deploying ERC20 contracts, the factory contract is an ERC1155 contract that registers all individual tokens used by the deployed markets.

# ONTOCHAIN Services & Functionalities at a Glance



```
OntoChain: test - scgen-test - scgen-test.owl  
1 From OCSEN, OCSEN Import *  
2  
3  
4 file = open("scgen-test-owl.owl", "r")  
5 ontology = Graph()  
6 ontology.parse(file)  
7  
8 namespace = Namespace("http://www.ngi.ontochain/ontologies/scgen-test.owl#")  
9 gr = Namespace("http://purl.org/goodrelations/v1#")  
10 blondie = Namespace("http://www.semanticblockchain.com/blondie.owl#")  
11  
12 ontology.bind("base", namespace)  
13  
14 b = OCSEN(ontology, namespace, "scgen-test.owl",  
15 ontology, namespace, "scgen-test.owl",  
16 ontology, namespace, "scgen-test.owl")  
17  
18 #Creating an Apple Seller  
19 b.createAgent("appleProducerAgent")  
20 myProducerIdentity = namespace + "appleProducerAgentIdentity"  
21 b.addObjPropertyAssertion(ontology, namespace="appleProducerAgent", b.getFoundEntityByName("hasDigitalIdentity"), myProducerIdentity)  
22  
23 myProducerObject = namespace + "appleProducerAgentResource"  
24 b.addClassAssertion(ontology, myProducerObject, namespace + "Apple")  
25 b.createAgentBehavior("produceAppleBatchOperator", "produceAppleBatchDeal", "produceAppleBatchTask",  
26 [{"produceAppleBatchOperator", "produce"},  
27 ],  
28 [{"produceAppleBatchOperator", "produce"},  
29 [{"produceAppleBatchTaskObject", "referentialAction", myProducerObject]  
30 },  
31 ],  
32 [{"produceAppleBatchOutput1", "referentialAction", myProducerObject]  
33 ]
```

## Keywords

- ▶ Data matchmaking
- ▶ Application Protocols
- ▶ Ontologies
- ▶ Semantic
- ▶ Networks



MORE INFO

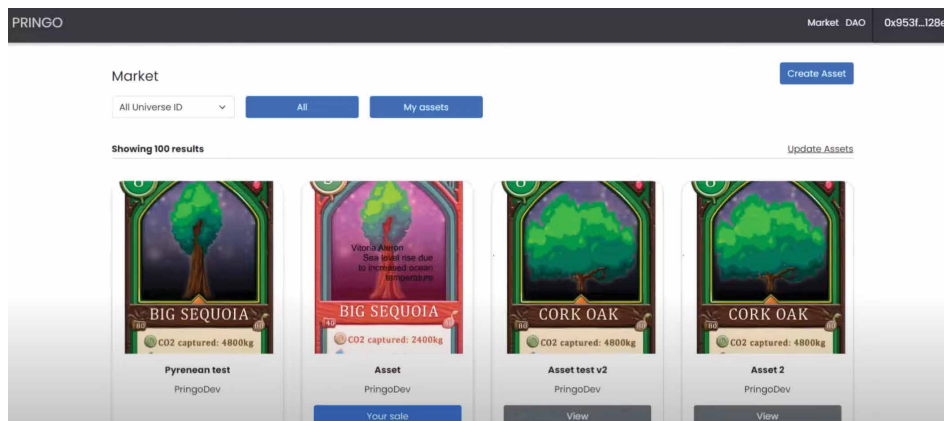
## POC4COMMERCE: Making ONTOCHAIN practical for eCommerce

Ontologies for service description in the blockchain e-commerce. Also, a search engine for finding suitable service/product matching user requirements.

POC4COMMERCE innovates the ontological representation of Blockchain-oriented digital commerce by integrating and extending the most representative ontologies for modelling, participants, in particular commercial actors, offers, products, and tokens emitted on the Ethereum Blockchain as digital representation of exchanged assets: providing a semantic descriptions of smart contracts and related transactions, in particular of smart contracts related with tokens trading and associated with commercial means.

POC4COMMERCE reuses and extends the most suitable and relevant ontologies in the domain, namely, OASIS for the representation of commercial participants and smart contracts, GoodRelations for representing commercial offers, and BLONDIE for describing Ethereum essential elements. All these ontologies are conjoined and extended to also cover the gap missing from the literature on the representation of digital tokens, smart contracts, digital identities, valuation mechanisms, and auctions.

# ONTOCHAIN Services & Functionalities at a Glance



## Keywords

- ▶ Market mechanisms
- ▶ Reputation management
- ▶ Application protocols



[MORE INFO](#)

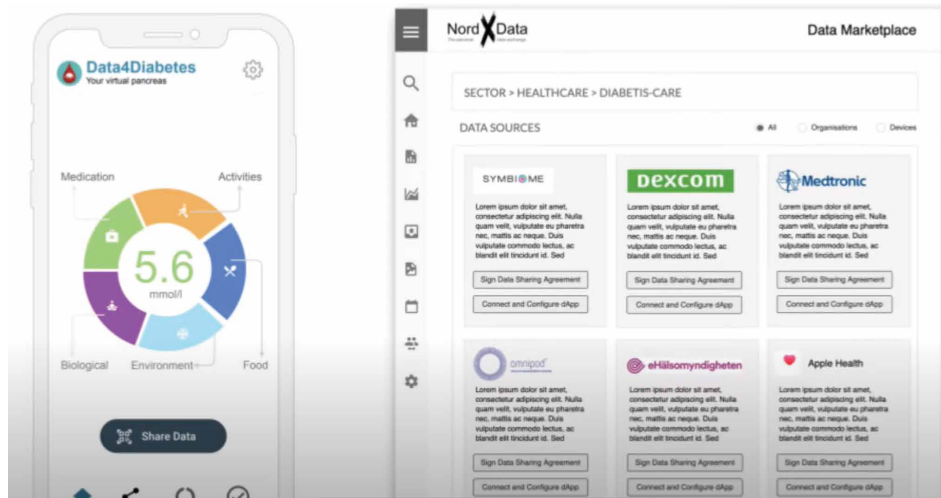
## PRINGO: Private Incentives for Common Goods

Platform that enables the creation of a digital representation of public goods in the form of NFTs.

The value of these NFTs can increase through their use in games, providing the NFT owners with a direct benefit, while part of the benefit goes to the public goods organisation. The platform provides the following functionalities:

- 1) decentralized governance to manage and define the rules and criteria that are necessary to comply with in order to implement initiatives or projects on the platform
- 2) a web dashboard for creating NFTs and updating their properties according to their evolution
- 3) an NFT marketplace that supports the link between the NFT and the common goods evolution in real life, and
- 4) an SDK that allows third parties to create, sell, and evolve the properties of NFTs.

## ONTOCHAIN Services & Functionalities at a Glance



### Keywords

- Metadata provenance
- Application Protocols



MORE INFO

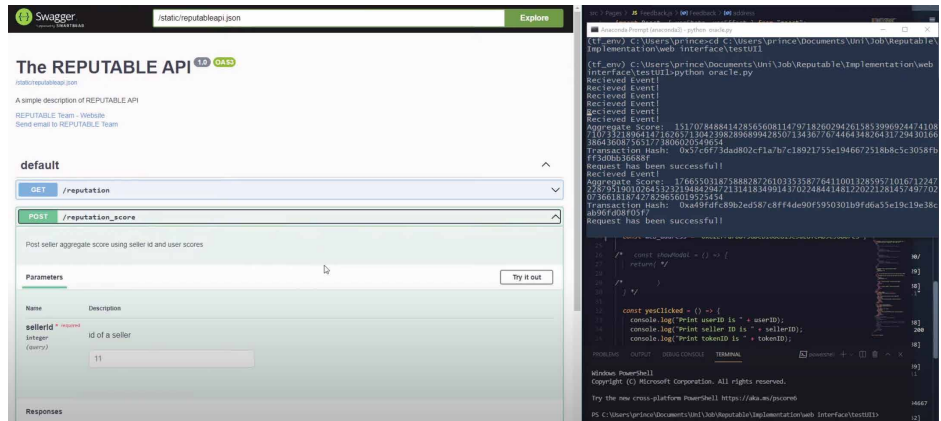
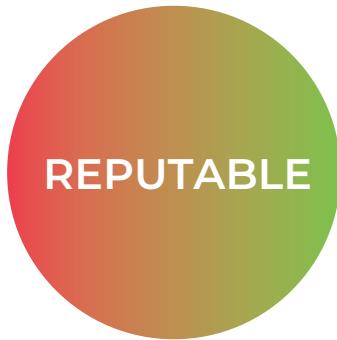
### PS-SDA: Provenance services with Smart Data Agreements

A Data Exchange Agreement (DEXA) protocol that enables data provenance, regulatory compliance, auditability, and transparency in data sharing scenarios. Functionalities offered regarding exchangeability of health data, for example, in compliance with GDPR or similar data regulations.

Description of the underline functionalities for the exchange of data: Embedding DEXA into any presentation exchange enables agreement/consent-based data exchange. Currently, user consent cannot be enforced, but it can be checked by auditors and all parties involved in an independent manner.

- The major components of DEXA (Data Disclosing Agreements (DDAs) and Data Agreements (DAs)) are defined formally with ontologies, so they can be matched automatically.
- Data usage agreements are recorded on-chain for immutability.

# ONTOCHAIN Services & Functionalities at a Glance



## Keywords

- ▶ Reputation management
- ▶ Application Protocols



MORE INFO

## Reputable: a Provenance-aware Decentralised Reputation System for Blockchain-based Ecosystems

Decentralized reputation management solution. Reputable delivers a cross-platform privacy-aware reputation system which leverages Blockchain technology to achieve decentralised, verifiable calculation of reputation scores.

Further it enables interaction with end users and systems through a secure, reputation analytics dashboard to facilitate user verification as seamless integration with other systems and services.

Within Reputable, the reputation data consists of two different types. Firstly, it is the individual user feedback i.e. the feedback provided by the users when contacted to share their experiences with a service/seller/marketplace.

Secondly, it is the aggregate reputation score which is calculated using the individual user feedback. As these two types of data are linked with each other, the linkage is preserved and utilised it to achieve verifiable reputation scores.



# ONTOCHAIN Current Applications



## OwnYourData SOyA-Forms

SOyA Schema DRI  
D2A [LOAD FORM](#)

Tag  Language

Purposes (click + to add a new purpose)

No data [+ Add to Purposes \(click + to add a new purpose\)](#)

**Data**

**Permalink**

<https://soya-form.ownyourdata.eu/?schemaDri=D2A&data=%7B%7D>

## Keywords

► Distribution logistics



[MORE INFO](#)

## Babelfish: Service Integration in Heterogeneous Environments

BABELFISH proposes to describe services on a technical, semantic, and governance layer and implement a component that uses such descriptions to translate interfaces (APIs), data, and data agreements from a foreign (and maybe proprietary format) to an interoperable format understood by the recipient.

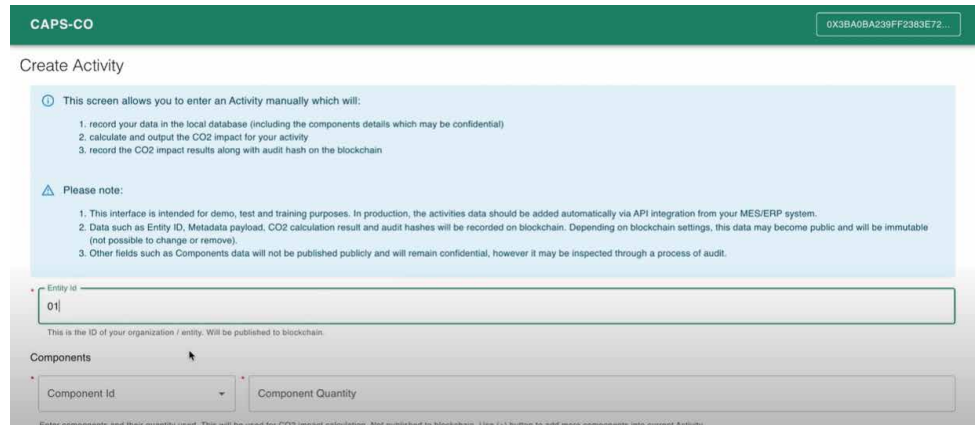
A registry maintains a list of all services and thus spans up an interoperable data space.

A concrete application area for Babelfish is in Supply Chain Management (SCM) to integrate data sources from stakeholders along the value chain. This approach creates a common data space and enables a circular economy where relevant data is shared between actors in a trustworthy and traceable way.

The building blocks to build a common data space are (i) Semantic Container (SemCon) for technical interoperability - enabling to connect APIs and handling authentication as well as processing aspects; (ii) Semantic Overlay Architecture (SOyA) for data harmonisation - using RDF and JSON-LD for data model management and aligning & transforming data models on the fly; (iii) Data Agreements - covering data governance, tracking provenance metadata and act as usage policies between services describing rules for the use of data.

These building blocks can use either decentralised SSI technologies (DIDs, VCs) to ensure immutability in a trustless environment or connect to available trust anchors on traditional client server architectures.

# ONTOCHAIN Current Applications



## Keywords

► Public services



MORE INFO

## CAPS-CO: Carbon Accounting of Product Supply Chains using ONTOCHAIN

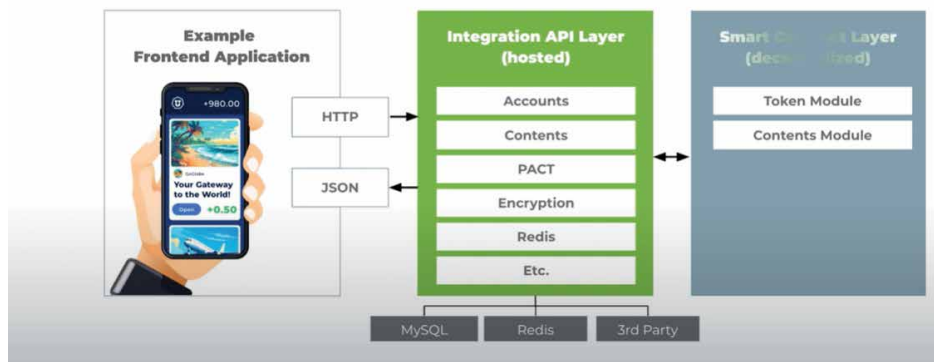
CAPS-CO has developed a practical application, a Carbon Accounting tool to calculate product carbon footprint (PCF) and implement a corporate carbon accounting (CCA) for manufacturers, resulting in transparent declared unit (DU) outputs based around the COP26 Pathfinder framework initiative (WBCSD, 2021).

This tool delivers trusted, privacy-preserving, traceable, transparent, and legislation-compliant carbon accounting to European industry and incentivises emission-efficient operations.

# ONTOCHAIN Current Applications



## CREATE Architecture



## Keywords

- ▶ Marketplaces
- ▶ Digital content



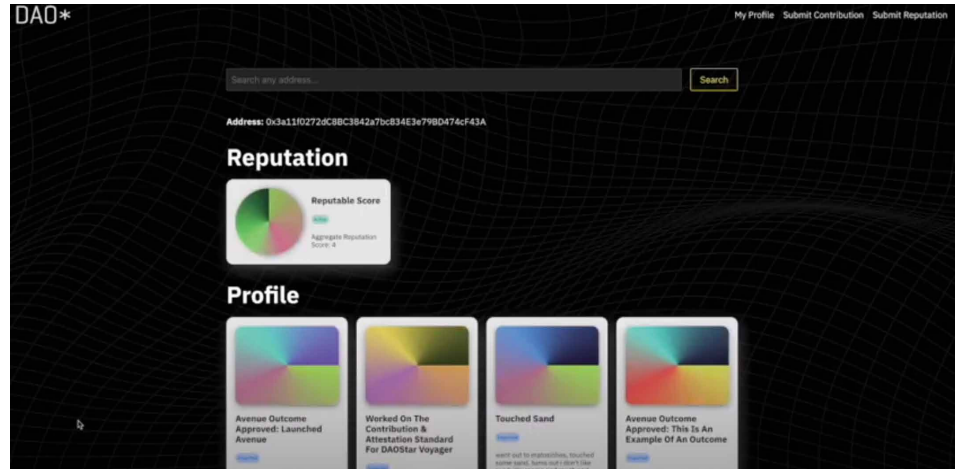
[MORE INFO](#)

## CREATE: Content Registry and Tokenized Exchange

UNITT Content Registry And Tokenized Exchange (CREATE) is a digital content marketplace that enables creators to distribute and monetize their creations in a trustworthy and transparent manner while ensuring privacy.

The marketplace is a solution that is intended to work with the ONTOCHAIN infrastructure and software and its future token(s), enabling content creators to exchange content for tokens from other users on a pay-per-view basis.

# ONTOCHAIN Current Applications



## Keywords

► DAO



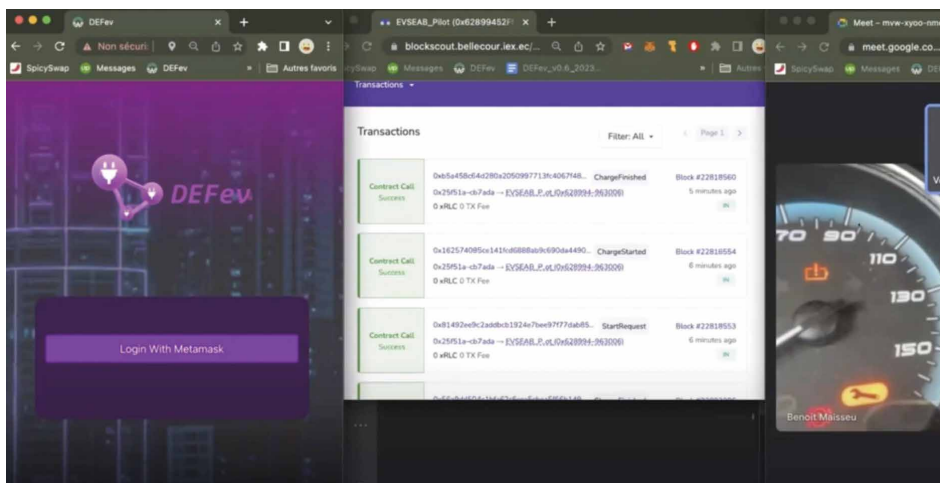
MORE INFO

## DAOstar: Semantic API Standards for DAOs

DAOstar is a standards body; in particular, this project uses the DAOIP-3: Attestations for DAOs standard in order to specify an integration with ONTOCHAIN's REPUTABLE service.

The idea here is to allow DAOs and members of DAOs to use REPUTABLE to declare reputation ratings, and then to have those reputation ratings show up across all sorts of different DAO tooling using the standard.

# ONTOCHAIN Current Applications



## Keywords

► Automotive



MORE INFO

## DEFev: DLT Ecosystem For Electric Vehicle Charging

Werenode is building an open ecosystem to simplify the electric vehicle charging network development. They use the blockchain to produce the user and charging point certificates in a decentralized way, removing the need for a central player. This agile process opens the path to the uberization of the charging point operation and wider and quicker deployment of charging infrastructure.

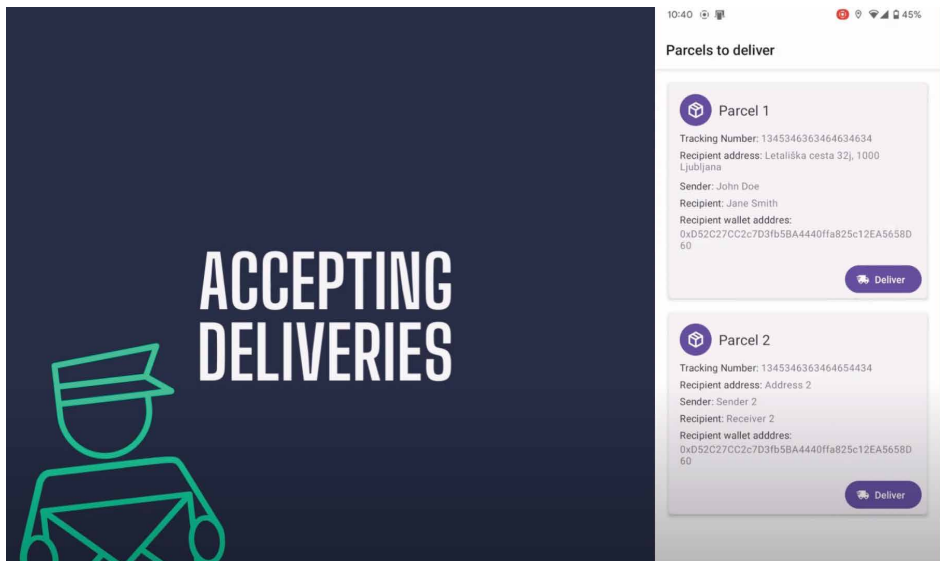
This solution is an app allowing mainly two features:

To pay for EV charging with cryptocurrencies

To share your own charging point. Moreover, our framework allows a simplified path toward new services valuation (Smart Charge, V2G, electricity branding...).

DEFev is the implementation of this solution in the ONTOCHAIN ecosystem, bringing decentralization even further with the combined concept of the EVSE pilot smart contract and of the EVSE community manager, a duplicable worker able to control the charging station (Electric Vehicle Supply Equipment).

# ONTOCHAIN Current Applications



## Keywords

► Distribution logistics



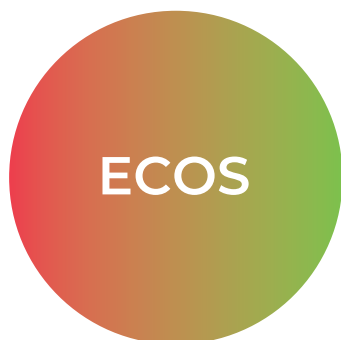
MORE INFO

## DLMD: Decentralised last mile delivery

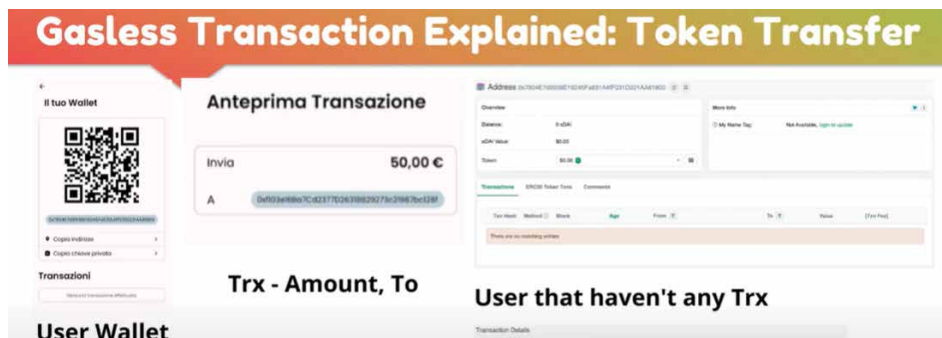
The Decentralized Last-Mile Delivery (DLMD) solution revolutionizes the last-mile delivery ecosystem by integrating blockchain technology with a usercentered application.

The solution is designed to enable efficient, transparent, and secure parcel transactions, utilizing parked vehicles as delivery points. This innovative approach addresses the challenges of conventional delivery systems, offering improved service for delivery companies, vehicle owners, and parcel senders and receivers.

Through its unique NFT-based parcel identification and vehicle access system, DLMD ensures the seamless transfer of parcels while optimising delivery times and costs.



### Gasless Transaction Explained: Token Transfer



**User Wallet**      **Trx - Amount, To**      **User that haven't any Trx**

## Keywords

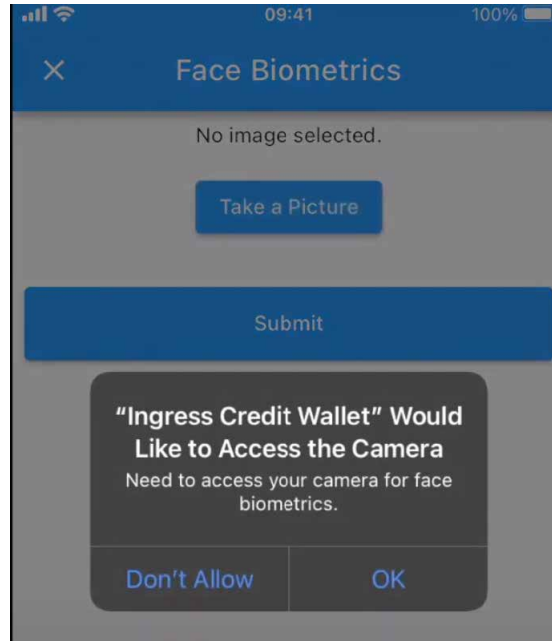
- ▶ Marketplaces



[MORE INFO](#)

## ecOS: Energy Community Operating System

ECOS is the full stack platform for the Energy Community, the platform enables a transparent, accountable system capable of creating economic value through Token Model for all the users involved in the energy community.



## Keywords

► Public services



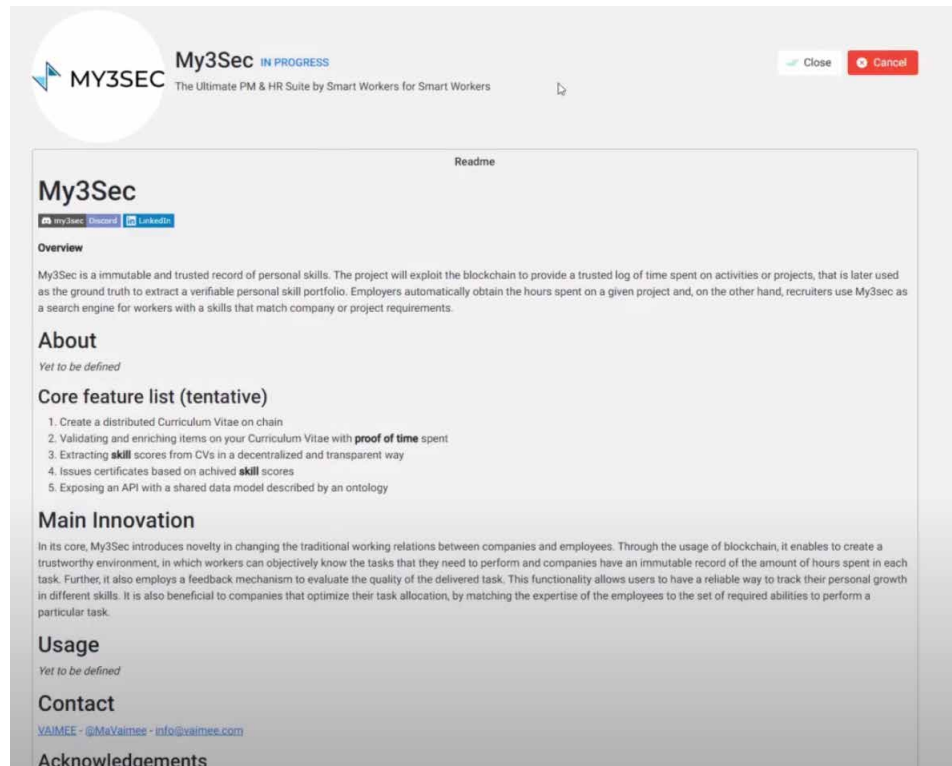
[MORE INFO](#)

## INGRESS: Gateway to financial inclusion

INGRESS provides access to cryptographically secured credit history for microlending in crypto and fiat currencies.

The solution addresses trust and security issues of digital economy using a combination of biometric identification with asymmetric cryptography. This enables individuals possessing the private keys of re-issuing the credentials they own in the unfortunate case of private key loss or compromise. INGRESS wallet connects the users to the marketplace of loans, provided by the lenders. Lenders compete among each other to win the users, which results in affordable credit for users with good credit histories.





## Keywords

- Credibility management



MORE INFO

## MY3SEC: The Ultimate PM & HR Suite by Smart Workers for Smart Workers

My3Sec is a fully decentralized system that redefines career growth and project management. It empowers individuals and employers with verified skill-oriented approaches, transforming the way we track progress.

With My3Sec, you can:

- Prove Skills: Showcase your expertise with verified skill profiles, standing out in the job market.
- Seek for Good Candidates: Streamline recruitment by finding workers who precisely match your desired skill profile.
- Track Workers' Growth for Projects: Optimize project management by monitoring individual progress and ensuring seamless collaboration.

Moreover, thanks to the decentralized nature of this system you can join the My3Sec DAO: the Collective that shapes the system parameters and ensures fairness, transparency, and accountability.

# ONTOCHAIN Current Applications



HOVLNG < Cargos > dfcdee96-1513-4e69-8ef4-202171847d5f

Cargos  
Emissions  
Ofsets  
Explore  
Contracting parties

GHG intensities + ADD Total CO2e intensity: 190 kg/kg

Reported by	Type	Stages	Location	Period	CO2 (kg/kg)	CH4 (kg/kg)	NO2 (kg/kg)	Total CO2e (kg/kg) Ⓢ
NETL, National energy technology laboratory	Avg.	• Natural Gas Boosting • Natural Gas Gathering	New Orleans, USA	1/1/2019 - 2/1/2019	50			50
NETL, National energy technology laboratory	Avg.	• Natural Gas Liquefaction	Corpus Christi, USA	1/1/2019 - 2/1/2019	41			41
NETL, National energy technology laboratory	Avg.	• Natural Gas Processing	New Orleans, USA	1/1/2019 - 2/1/2019	18			18

Digital assets + ADD Total volume: 100,000 tLNG

Owner	Volume (t)	Emissions (tCO2e)	Locked & Attached Offset (tCO2e)	Compensated (%)
9x3Ca5...AF69	100,000	19,000,000	27,837	0.15%

## Keywords

► Distribution logistics

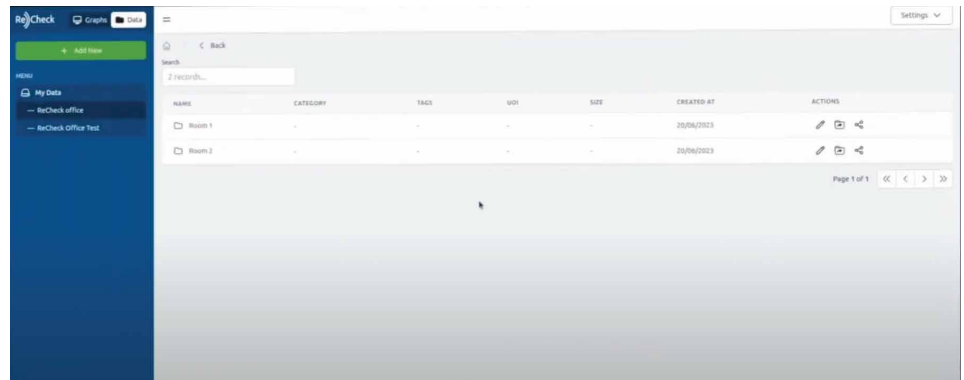


[MORE INFO](#)

## OTCnLNG: A single origin of truth to provide LNG buyers and sellers with a decentralized interoperable view of carbon-neutral LNG cargoes

The OTCnLNG solution offers new capabilities to tackle issues actors are dealing with by generating transparent, traceable, accountable, secure data management for LNG buyers and sellers, responsible sourcing, and green LNG products.

It includes REST API based webservice, ontology-based data structures, smart contracts, and relies on the following external services: OriginTrail DKG for handling knowledge assets; and an EVM-compatible blockchain for deploying the OTCnLNG smart contracts.



## Keywords

► Real estate



[MORE INFO](#)

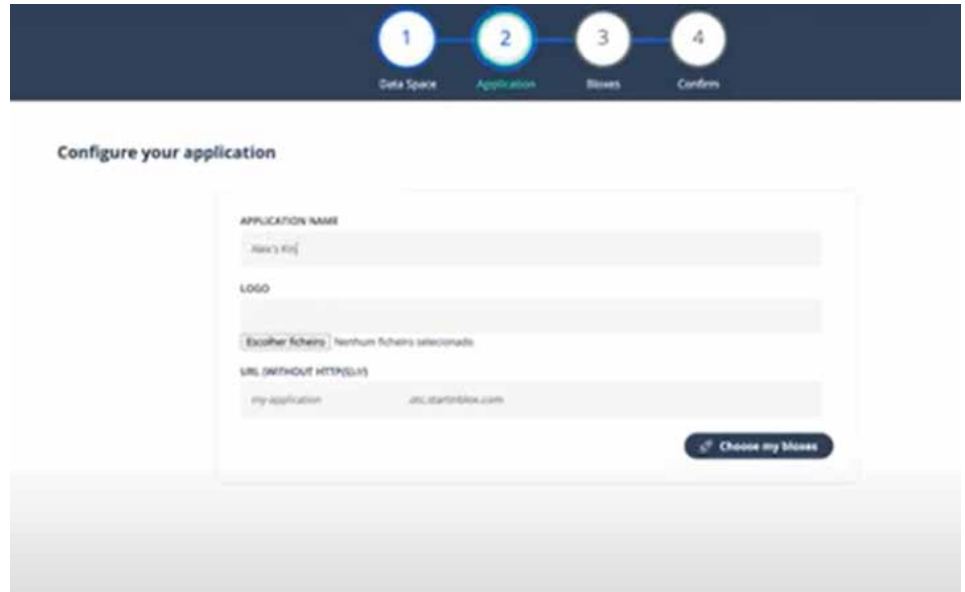
## ReCheck Green Box: A digital building logbook to store, secure, share and extract value from Real Estate data

The ReCheck Green Box is a digital building logbook that aggregates, normalizes and secures online and offline data about buildings.

The solution aggregates different types of documents, certificates, etc, linked to the life cycle of a building starting with design plans, execution plans and reports and maintenance protocols. The data is stored in a semantic data lake for further usage and querying.

The data origin, authenticity and its properties are protected by blockchain records.

# ONTOCHAIN Current Applications



## Keywords

► Marketplaces



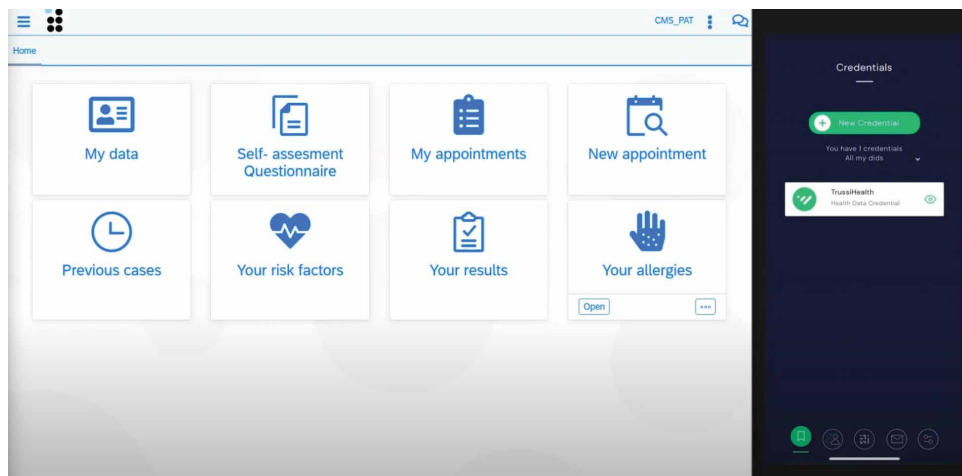
[MORE INFO](#)

## Startin'blox: Low-code app builder

The project within the ONTOCHAIN ecosystem consists of developing a low-code app builder to both ease the integration of different services of the ecosystem and make them more easily accessible to the end user by bundling them into an app. In other words, the solution can be thought of as the bridge between the different services of the ONTOCHAIN ecosystem and the end users.

In more details, that bridge is an application builder to enable the different ONTOCHAIN services to be bundled and accessed via an app in a couple of clicks.

# ONTOCHAIN Current Applications



## Keywords

- ▶ Healthcare
- ▶ Credibility management



[MORE INFO](#)

## TRUSSIHEALTH: Decentralized Trustworthy Health Information Exchange for Patient's Self-Sovereign Medical Records

The TRUSSIHEALTH project proposes a decentralized and trustworthy health information exchange system. It leverages the concepts of Self-Sovereign Identity (SSI) and related technologies. SSI refers to an innovative identity management system that empowers users to have control over their identities and associated data. Data portability and interoperability are fundamental principles of SSI.

In particular, TRUSSIHEALTH develops a middle-ware that allows the conversation between health data in FHIR data format and the verifiable credential (VC) data format. VCs were specially designed to support SSIs by providing an open and lightweight data format used for storing and exchanging data.

To add trust in the transformed health data, TRUSSIHEALTH utilises the so-called eIDAS bridge, a tool that allows to apply qualified and advanced electronic signatures on VCs. This way, not only trust but also legal value is added to the transformed health data VC.

## About ONTOCHAIN

The ONTOCHAIN software ecosystem was developed within the scope of the EU-funded project ONTOCHAIN - Trusted, traceable and transparent ontological knowledge on blockchain.

Under the European Commission's Next Generation Internet initiative, ONTOCHAIN was launched in September 2020, to contribute to a more human-centered Internet, an internet that fosters values of privacy, collaboration, diversity and more broadly human rights and democracy of utmost importance for the EU.

In practice, ONTOCHAIN enabled the co-design, development and implementation of a new generation of trustful and decentralized web applications, federating blockchain and semantic technologies for different application domains such as eScience, eEducation, eHealth, eGovernment, eCommerce, eInfrastructures and so on.

Via 3 Open Calls, the project supported 44 teams of innovators to develop blockchain-based knowledge management solutions that address the challenge of secure and transparent knowledge management as well as service interoperability on the Internet. Participants received up to 4.2 M€ funding, coaching, and access to top software infrastructure.

We now have an ecosystem that allows us to forge ahead into a new era of trusted, traceable & transparent ontological knowledge. Composed of different blocks, ONTOCHAIN has transformed into the software ecosystem that propels us forward.

The project was operated by 7 partners with complementary expertise that formed the core of a vibrant ecosystem: European Dynamics (Luxembourg), University of Ljubljana (Slovenia), IntelliSemantic (Italy), iExec Blockchain Tech (France), Athens University of Economics and Business (Greece), German Hellenic Chamber of Commerce and Industry (Greece) and F6S (Ireland).



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957338

