

**WHITE PAPER**

**DATA SPACES**

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# **THE DECENTRALISED DIGITAL COMMONS**

**The new paradigm  
of data sharing**



# **OKP4**

OPEN KNOWLEDGE PLATFORM FOR



**The fact that knowledge is a limiting factor to common good and that data is a non-rival asset means that one of the major issues of the 21st century is to create conditions that allow and encourage data sharing and allowing it to circulate with minimum constraint.**

# EDITORIAL

**D**igital technologies are quickly taking up more and more space in our lives. On a global scale, the production of data has been following an exponential curve for over 15 years now. This data is sometimes considered as the new “black gold”, the fuel of the digital economy. Even though this comparison may be questionable, it is clear that the strategy of certain key players is to collect, retain and exploit data. This is in keeping with the economy of the 20th century that is characterised by verticality and centralisation of the custodians of confidence (banks, insurance companies, multinationals, states) and web giants adopt strategies from the same paradigm. This is definitely profitable, however, their exponential tendency towards domination raises questions.

However, there are possible alternatives. Technology gives the possibility to make abrupt changes to this organisational model and to use decentralised digital commons, without intermediaries, without irrelevant extraction of value and without the ambition of holding the users hostage.

As a developer of data sharing infrastructures, OKP4 contributes to the movement of fragmentation and horizontalization against our current economic organisation. DataSpaces are starting to become a key tool in the central organisations (companies, communities... society as a whole) of tomorrow. For us at OKP4 it is essential to participate in the reflection and bring profound paradigm changes.

## **This white paper covers:**

- **The damaging consequences of accepting the status quo**
- **The possible alternatives we hope to bring with the concept of the Minimum Value Extraction Protocols (MVEP)**
- **The prospects of a “European” model for data sharing in 2025**



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# 1. A world engineered by trusted third parties

## 1.1. STATE OF PLAY

Modern society has been constructed and is operated by databases that are generated by trusted third parties. In order for our society of today to function, millions of databases are needed. For example, for individuals to earn and spend money, to travel, to be able to vote, to have internet access, to have places to stay, to not go to prison, databases are essential. They enable identification, following actions, giving access to certain services and ensure our rights are respected. These administrative databases are held by trusted third parties.

Who are these trusted third parties? BNP Paribas, Google, Amazon, Accor Hotels, Air cœur, Engie, Bouygues Telecom, OVH, Blablacar, Uber, tax authorities, town councils etc... They are everywhere. This is not a bad thing in its own right; it is just the best way that we have found for our society to function.

In practice, the trusted third parties are the ones who decide to exercise our rights whether this be for something trivial or important. The intermediary can cancel our hotel reservation, authorise or not the use of a credit card or not authorise the right to vote in elections.

We consider this mode of operation as a given, we see it as stable and as normal functioning of society. Together with the digital boom in our daily life, our dependency on trusted digital intermediaries has installed itself slowly but surely in the background of our lives, on both an individual and collective scale.

In our everyday lives, every action carried out on the web is recorded by a trusted third party, every discussion between friends or colleagues is transmitted by a trusted third party. Over the past few years, the architecture of our society has started to resemble Amazon or Microsoft databases more and more.

They also stored precious metals in their temples. The bank accounts and temples were managed by databases that were in the form of clay tablets.

However, modern trusted third parties that use information technologies and communication are in a completely different league. They are accessible all over the world, they are of very little cost and offer an unrivalled quality of service because of the treasure trove of data that they exploit. This evolution of digital trusted third parties brings with it new socio-economic issues at a micro and macro-economic level that are becoming more and more concerning if we don't find an alternative fast.

**The trusted third parties are the ones who decide to exercise our rights whether this be for something trivial or important**

**So what? What is the problem with trusted third parties?**

Trusted third parties have always existed since the start of civilisation. In 20th century BC in Babylon, banks were already lending grain in exchange for repayment at the next harvest.



## 1.2. MICRO-ECONOMIC PROBLEMS

The main problem on a micro-economic level, on a company scale, is that the modern trusted third parties tend to be anti-competitive. The digital infrastructures and their exponential capabilities of gaining and processing data brings enormous savings and competitive advantages that boost the development of a handful of dominant companies. Thus, as these companies develop, they build enormous databases and numbers of users along with new technologies and this progressively reinforces the entry barrier into the market for any competitors.

These days, no startup is able to compete with Google. Entrepreneurs dream of joining the long list of hundreds of companies that are bought out by the giant. The main strategy of these all the is giants to improve themselves, propose new products and services is to buy out new innovations to either use them or to kill

them. Lots of these takeovers are considered as Killer Acquisitions and overall, they limit the amount of possible innovation.

**These days, no startup is able to compete with Google**

Studies have shown that there has been a feeling of antitrust for years in Europe and the USA towards GAFAM. China has even adopted a strategy of independence against the American giants. The regulators recognise that there is dysfunction however, they struggle to understand the new nature of these trusted third parties. The solutions used in the 19th century are no longer sufficient for example, forcing them to lower prices or increasing taxes. These don't change the relations of power; all they do is arouse geopolitical tensions.

## 1.3. MACRO-ECONOMIC PROBLEMS

The main problem with the trusted third parties is their centralised nature and the fact that they concentrate and govern the data and services that run the society. As they become a more and more essential part of society, and therefore more and more powerful, the number of companies that society relies on becomes increasingly restricted.

Human progress and knowledge naturally go towards decentralisation yet, internet and machine learning could bring about the greatest centralisation humankind has ever seen. Although centralisation can be a good option most of the time, it can also make society fragile and bring about catastrophic aberrations.

Every architect that designs a social system whether that be monetary or political should ask themselves "What if an enemy took control of the system?" A large number of our architects both public and private

could not be further from this way of thinking. The drive to centralise is high and rarely questioned, the GAFAM model is often desired and used as a model.

***"What if an enemy took control of the system?"***

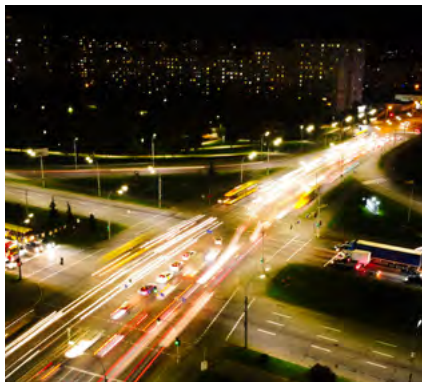
No king in history has had the capabilities to censure every transaction in the economy and know the personal interest and opinion of each individual and even know where that individual is at any moment in time. Today, this is the case if our centralised systems fall into the wrong hands. But we haven't seen anything yet. The combination of big data, the internet of things, robots and drones, virtual reality and machine learning could bring extremely enhanced social control systems.

## 1.4. SHARING DATA, KNOWLEDGE AND THE TRUSTED THIRD PARTIES

Knowledge is a, if not THE, limiting factor to the success of any initiative. We don't "know" how to go to Mars, we don't "know" how to predict cancer, we don't "know" how to farm in a desert, and we don't "know" what present would please our mother for her birthday. Knowledge is a limiting factor to common good.

**One of the mechanisms to develop new knowledge is using data.**

Data is an elementary description of the reality. To create information, it needs to be treated, combined, contextualised by humans or algorithms and/or go through statistical processing. Making a decision, automatising tasks or discovery of a new innovation from the information is the knowledge. The trusted third parties have a great power and a big responsibility – they coordinate and govern the data flux. It is their great weapon to be able to provide the best services to know us and know their environment better.



Data is a non-rival immaterial asset; it can be easily used and duplicated an infinite number of times without changing the nature or the quality. The production of knowledge from data is therefore theoretically infinite. The use of data and the collective value that it brings are proportional to its potential to be shared.

We can see that digitalisation of the economy and new chains of value brought by collecting and exploiting data are vectors and opportunities in all sectors of activity. Creating

infrastructures that encourage free sharing of data between individuals and organisations would release the new chains of value that today are difficult to imagine.

The fact that knowledge is a limiting factor to common good and that data is a non-rival asset means that one of the major issues of the 21st century is to create conditions that allow and encourage data sharing and allowing it to circulate with minimum constraint.

### What are the constraints on sharing and exchanging data?

There are 3 areas:

- 1 **Technical difficulties** (interoperability, common frameworks, sharing and exchange protocols...)
- 2 **Lack of confidence** (how can I ensure that the consent and permissions are respected and the security of the data exchanges...)
- 3 **Lack of interest to share data**

To resolve these constraints the infrastructures for data sharing respect these 3 recommendations:

- 1 Allowing the simple portability of data to be able to stimulate the competition between sharing infrastructures.
- 2 Trusted third parties are required to have maximum inclusivity and transparency on the use of the data
- 3 Not use the position of “centraliser” to extract a maximum value therefore penalising the interests and other actors

Hoping that the digital trusted third parties follow these recommendations for the common good is wishful thinking. They would be shooting themselves in the foot by letting go of their biggest competitive advantage. Why would they impose additional constraints on themselves and decrease their profitability?

Many believe that regulation is the solution. However, apart from the GDPR that introduced the right of portability of personal data (a right that is complicated to enforce), legal action is far away from the conditions set out above.

The impact of the regulatory efforts is probably overestimated. The interests are too great and too geopolitical. What's more, even if Europe

acted in its own interests, digital technology has no borders, VPNs exist, and regulations are bypassed. American law is extraterritorial, not to mention China's double talk...

In essence, regulation will not resolve all other micro and macro problems generated by trusted third parties

and it won't allow new infrastructures to emerge that would be able to fully exploit the data.

**Only the construction of better alternatives has the potential to truly replace the dominant players!**

## 1.5. A VISION OF THE FUTURE

**What is at stake here?**

Is it the fact that only a handful of companies and organisations position themselves as trusted third parties to manage our lives and limit innovation because of their monopolistic position and gain an enormous profit?

**Only on the surface.**

What is really at stake is the preservation of our children and grandchildren's freedom. That the sovereignty of their data remains intact. We must not become sheep and follow blindly in a panoptic society controlled by a handful of people that have an



almost divine vision from big data and machine learning.

**Dystopian? Maybe, but the trend is bad.**

China has probably already lost. The United States are going in the wrong direction by regulating innovation from a standpoint of anti-money laundering and KYC (Know Your Customer), which indirectly encourage the giant companies to stay that way.

Without a strategic vision and without considering the power that these giants have over our future freedom, any short-term decisions will do no good. Even though Europe has a willingness and has encountered some success, nothing has been learned from the mistakes made and it still continues to lag behind. The lack of coordination and alignment of interests in Europe will probably mean we have to bear the burden of the American and/or Chinese decisions.

**The only option is to act now in the hope that we haven't gone past the point of no return.**

Acting now has no down sides – if the defenders of the status quo are right and the system is not irreparably centralised, then our decentrali-

sation efforts should be welcomed with open arms by governments and businesses. If these efforts we may find too few allies, then we would have been right to act today.

**The only option is to propose a better alternative – digital commons that are non-extractive and decentralised.**

# The Data Spaces, new digital commons



OKP4 constructs infrastructures called Data Spaces and develops methods to manage them.

The aim – to allow data sharing and processing services in a secure, transparent, reliable and easy way to generate the maximum amount of new knowledge.

The challenge facing the infrastructure is therefore to limit the number of technical constraints and the risks associated with sharing data. To be able to combat this OKP4 has chosen to allow data sharing without exchange. In other words, only the data coming from different services (algorithms, tools, visualisation...) is accessible to the users, not the raw data.

This brings confidence and also widens the scope of possibilities to innovate with economic models. We move away from the dominant model of selling data sets and access to data flows at fixed prices.



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# 2. Minimum Value Extraction Protocols (MVEP) and decentralised governance

## 2.1. IN THE BEGINNING THERE WAS BLOCKCHAIN.

**B**lockchain technology is currently the subject of a multitude of discussions and speculations stimulated by intermittent media frenzy. This makes it difficult to extract valuable insights and ideas amid the noise caused by ignorance, marketing and scams.

The bottom line is that Bitcoin enabled decentralised consensus. That is, the ability of a distributed network to come to a perfect agreement over a shared database. Networks based on sufficiently

decentralised consensus methods are inherently inviolable, resistant to censorship and «permissionless».

Centralised consensus, as explained above, is very easy to set up – share information between people you trust or go through a trusted third party such as a bank or a cloud host. By default, decentralised consensus systems allow participants to coordinate without intermediaries, this is possible due to cryptography and game theory principles that align individual and collective interests.



An effective decentralised consensus system knows how to solve a major challenge, known the Byzantine Generals problem (Byzantine fault) described in 1982 (see next page).

For decades the great minds of this world searched for the key to solving this problem, until an anonymous person (or group of anonymous people) called Satoshi Nakamoto published the short, elegant and ground-breaking Bitcoin White Paper.

### **The Nakamoto consensus contains 3 distinct elements:**

- 1** A fully open, peer-to-peer network and architecture with no single point of failure
- 2** A blockchain data structure (interdependent), inviolable and secured by asymmetric cryptography
- 3** An evolving proof of work mechanism, involving a very energy intensive activity (mining) to be authorised to add a new block (and new data) to the chain.

The Bitcoin Blockchain is therefore the first iteration of a method that

allows humanity to reach a decentralised consensus.

Bitcoin's value proposition is, and always will be, the lack of permission and resistance to censorship, which is a property of decentralisation.

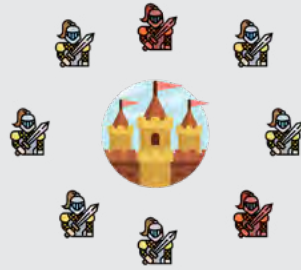
**Services where the confidence is not in the intermediary or the authority but in the auditable code of smart contracts that are inviolable and inclusive**

Everything else is secondary. The resolution of the Byzantine General's problem is not a discovery that brings a way of exchanging value peer-to-peer without permission or even to immeasurable digital gold. It is just the beginning.

Bitcoin, which is a simple distributed transaction register for the storage and transfer of value, laid the foundation for a second generation of blockchains offering the possibility of decentralised consensus on much more complex transactions. Thanks

## The Byzantine Generals problem (Byzantine fault)

« Several divisions of the Byzantine army are stationed just outside of an enemy city and are preparing for battle. Various generals can only communicate with each other via a messenger. They must agree upon a common course of action. However, we must assume that some generals are traitors who wish to prevent loyal generals from agreeing upon a common course of action. An algorithm is needed to ensure that a small group of traitors can't disrupt communications. To solve the Byzantine Generals problem, loyal generals need a secure way to come to agreement on a plan. »



A Byzantine general could very well issue an order to attack and then flee, thus endangering the entire army out of selfishness. In a decentralised system, the selfishness of some should not jeopardize the integrity of the network.

to Smart Contracts introduced by Ethereum, a new generation of decentralised applications was born. Thus, several parties can develop agreements and actions that run autonomously within the decentralised network.

Smart contracts are the backbone of numerous applications that have the potential to replace many historical trusted third parties. For example, over the past three years, a variety of

protocols Uniswap, Aave, Olympus-DAO, MakerDAO, Terra, Sushiswap and consorts offer services that are inspired by central private banks but where the confidence is not in the intermediary or the authority but in the auditable code of smart contracts that are inviolable and inclusive. Outside of finance, there are numerous other fields of application for these emerging technologies. For example, Filecoin and Arweave manage the data hosts (individuals or profession-

als) and the clients without relying on the confidence of an intermediary. The potential application of these new types of companies is difficult to grasp. If the idea that money based on the internet is powerful then the idea of management based on the internet is even more. This revolution is just starting...

**In summary:**

- Centralised consensus is everywhere.
- 1 Trusted third parties create
- 2 both micro (anti-competitive) and macro (existential threat) problems.
- Bitcoin is proof of the concept
- 3 of decentralised consensus.
- Decentralised consensus can
- 4 replace trusted third parties.

**What if we could create huge internet-wide communities, coordinated around rules and tools for collective decision-making, and the alignment of individual and collective interests?**

To understand how such a thing is possible the following must be understood:

- The role of digital tokens in the management of decentralised organisations:
  - To align both collective and individual interests
  - For security
  - For governing the organisation
- The fundamental differences between a decentralised organisation and a classic company.
- Why this alternative could be much more attractive for the participants than the status quo of the trusted third parties.

## 2.2. TOKENOMICS FREES THE POTENTIAL TO MANAGE DECENTRALISED ORGANISATIONS

Let's start by studying the fundamental differences between companies and decentralised organisations.

A company has a legal vocation to maximise the profits for its shareholders. There are numerous different strategies for extracting the maximum value of the products and services that the company offers. This is particularly prevalent when companies own the intellectual property of their products/services and therefore have the exclusivity.

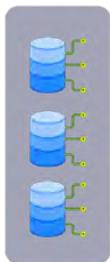
On the contrary, a decentralised organisation is not a company. They have no shareholders, no owners and no legal requirement to maximise profits. The only thing they have is the free access software and open code that are maintained by decentralised independent operators. They can be seen as common digital assets of which the services are accessible equally for all. They are distributed in nature and not owned; these decentralised organisations

operate protocols that take the form of minimum value extraction protocols (MVEP).

**A MVEP manages using algorithms the interest rate in a dynamic way that allows each party to conserve as much value as possible without extracting excessive value**

If we take an example discussed earlier, a MVEP like Aave, puts lenders (suppliers of digital tokens) in contact with entrepreneurs. The protocol then manages using algorithms the interest rate in a dynamic way that allows each party to conserve as much value as possible without extracting excessive value. The protocols carry out these functions in a similar way to platform-based companies like Amazon and Uber, with the difference being that the company is replaced by a decentralised network of computers. This network

## Data sources



## Network



## Users



Example  
of MVEP



## Smart contracts

of computers connects the offer to the demand according to certain preestablished rules that everyone can check and that no one can alter unless they have the decentralised consensus.

In simpler terms, to use a blockchain like Bitcoin or Ethereum, the only transaction fees are paid to the miner. No other additional costs go to a trusted third party. This is the opposite to the way in which the trusted third party works where they

are a facilitator or intermediary that can use the role to generate profit. This means that they can hire the prices and eventually monopolise the market, censure certain actions, favour certain groups, sell data that comes from these activities which is against the interests or the users etc...

In other words, to use a blockchain like Bitcoin or Ethereum there are only transaction fees.

The minimum extraction protocols are therefore designed to offer the benefits of a trusted third party (like a bank, social media or e-commerce platform) but without the micro and macro problems they create. (See page 8)

**The major factor that determines the success of these protocols - generate a sufficient network effect. But how?**

## 2.3. THE DIGITAL TOKEN, THE TOOL TO KICKSTART MVEPS

Let's start with some definitions. Generally, the term crypto-currency refers to the digital assets that can be used to exchange or store value, hence the term "currency". The term token refers to the digital assets that have some form of utility as well as being able to exchange or store value. We will go into more detail about the use of tokens, but they generally allow access to a certain network/service, give rights to certain cash flows and give a right to the governance of the protocol etc. The line between crypto-currency and tokens is not always clear. This is why, to encompass both terms, we use the term digital token, which refers to crypto-assets secured and stored in a decentralised distributed network.

The incentives for companies to act one way or another come from mainly profit, legal obligations, company reputation (by extension, their capitalisation on a stock market and their ability to generate future profits) and sometimes the values of the employees. The idea is to make good decisions in order to construct a sustainable and profitable company. We have seen that with these companies they can sometimes act in a way that benefits their own interests, but this goes against public interest.

For decentralised organisations, the participants are independent, they act in a way that is in their own personal interest without any legal obligations. The aim is therefore to align the personal interest of the inde-

pendent actors (network nodes) with the collective interest (capability of the network to offer the best service). The most obvious way of doing this is with financial incentives.

**The aim is therefore to align the personal interest of the independent actors (network nodes) with the collective interest (capability of the network to offer the best service)**

These financial incentives need a source of capital. Traditionally it could come from a source of external capital (fund-raising and debts), which can be useful in the short term to finance the first developments and the first members in the network, however it is detrimental in the long term because it encourages the extraction of value. Indeed, the extraction of value can make an organisation more vulnerable (with respect to other protocols that could copy the code) and lower the incentive to participate in the decentralised protocol (less economic incentive sacrifices the security or the

utility of the protocol). What's more, this kind of financial mechanism results in a loss of the neutrality of the organisation which is the basis of its credibility and the trust that the user community is ready to give.

**Therefore, this strategy is unsuccessful in the long term.**

Instead of relying on external funding, the most beneficial approach is to create a dedicated digital asset (token). An asset is not derived from debt or any capital fundraising. By making a digital token that is required to use the protocol, the asset has a certain value that it derived from the use and the size of the network that it manages. This creates a scenario where the network participants that have a token have a financial interest in their performance, the security and the growth of the organisation. The native digital token is used as a tool to finance the growth of a protocol in the long term, this allows:

- To raise funds and finance developments without generating debt and without commitment of return on investment (by carrying out an Initial Coin Offering for example).

- Put in place incentive mechanisms that are very attractive to entice new participants and quickly reach a critical mass of participants where the network effect occurs.

Thus, a minimum value extraction protocol can do the work of a trusted third party without an intermediary and the associated annuity.

The challenge being, if the token does not have any value, then none of this is possible:

- 1 No incentive to increase the network size
- 2 No recurrent funding for developments
- 3 No interest alignment of the participants for the project to succeed.

The only condition so that a project like this succeeds is to ensure that the digital token has a market value.

## 2.4. THE DIGITAL TOKEN AT THE HEART OF ALIGNING INTERESTS

**T**he token is a very powerful and configurable tool in many ways. It is possible to define and program mechanisms of creation/destruction of tokens, mechanisms to block them for certain periods, give promotional advantages proportional to how many are owned, give the right to vote etc...

The token can be inflationary, deflationary and even based on other underlying assets. The token can be very illiquid to start with (very few tokens on the market) or 100% of the tokens can be on the market from

the start. The options and strategies are infinite.

Either way, the token needs to have long-term value to support the community and the protocol. To have a long-term value it is essential that:

- The token captures the value generated by the protocol.
- The network objectives are clear and act as an incentive to reach these objectives. The token must be distributed in a fair, neutral, way to the contributors in proportion to their service on the network.



# OKP4 today and tomorrow

OKP4 is a simplified stock company that develops bricks of technology based on use cases for its customers. At OKP4 we understand the needs of our customers by using these use cases and we experiment and test our solutions in a centralised way. This process uses quick iteration and leaves room for error.

Today OKP4 is a provider of SaaS solutions and a trusted third party. Tomorrow OKP4 will be an architect and promoter of a minimum value extraction protocol governed by a DAO.

Today a company, tomorrow a foundation that will be the sword arm of the DAO. Tokens will be issued freeing OKP4 from its investors and therefore will no longer have a value extractive in nature.



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Without the first point the value of the token is only based on speculation and the hope of value in the future. Without the second, the extraction of value without contribution is possible the capital is not used effectively, and the long-term viability of the protocol is not guaranteed.

For the token to capture the value generated by the protocol, there are numerous strategies that can co-exist:

**Either way, the token needs to have long-term value to support the community and the protocol.**

### **1. Access to the network through token payments**

The most obvious way to use the token is as a mode of payment in the network. Thus, the users must acquire a token before they can use the services of the network. In the same way, the participants in the network that have paid with tokens have a financial interest in the value of the token increasing. If we take the

example of Ethereum and the token ETH - for a transaction to be accepted by a participant in the network (node, also called miner) the user must pay fees (gas fees) in ETH. The number of transactions per second is limited therefore, a mechanism of offer and demand comes into play where the validators integrate the transactions that are the most rewarding into the blockchain. The tokens are redistributed to the miners and can be resold on the market, and this is why it is even more effective to combine payment of tokens with mechanisms that compel participants to gain and keep tokens (see strategy 3).

### **2. Dividends and burnt tokens**

Another way to increase the value of tokens is to redirect a part of the fees to token owners, giving them access to a form of dividends. Another way is to use the fees to buy tokens and destroy them, creating a deflationary force.

Coming back to the example of Ethereum, in reality only a part of the fees is redistributed to the miners. The other part is "burnt", this therefore reduces the number of ETH in circulation this results in supply being

scarce which leads to an increase in the price of the token. Other applications like Sushiswap or Synthetix use similar mechanisms.

### **3. “Stacking” and blocking tokens**

Stacking is a way in which the token holders have an incentive to block their tokens in exchange for the right to provide specific service and/or receive specific services in the network. This mechanism is often associated in the form of dividends. It is used by all blockchains that have a consensus mechanism called proof-of-stake and also by numerous applications like Aave where the Aave token is blocked by participants and serves as a way to fuel insurance (Safety module) in case of a problem. In exchange for their service in the security protocol (and therefore the risk they are exposed to) they receive an annuity linked to the cost of the protocol and inflation.

### **4. Access to governance rights**

Decentralised consensus and smart contracts have made it possible for new types of organisations to emerge called DAO (decentralised Autonomous Organisations). The current DAOs are experiments into new ways of governance and coordi-

nation far from the industrial culture where the personified authority is the norm. The DAOs are organisations where the hierarchy is different and more fluid, it is a network of small groups that are coordinated by new decision-making mechanisms which involve digital tokens.

The token can also represent the right to vote in the organisation and therefore have an impact on the decisions that are made in proportion to the number of tokens held. There is a diverse range of ways to govern based on tokens, each with their advantages and disadvantages. The easiest way to vote on propositions on the blockchain is 1 token = 1 vote. To come back to the example of the DAO Aave (the DAO that administrates the Aave protocol) anyone can make a proposition to improve the protocol in the form of a smart contract. The Aave token holders can then vote for or against the proposition. If it is accepted the contract is executed.

The value of governance tokens is quite subjective, this is why the governance power is often associated with other mechanisms mentioned previously. The best solution for ensuring the increase in value of the tokens is to combine these approaches.

## 2.5.MVEP, TOKENS AND DIGITAL COMMONS

**N**ow you understand why tokens allow minimum value extraction protocols to exist and they do not rely on debt or investors. These MVEP can evolve thanks to decentralised autonomous organisations, DAOs, that are a new form of organisation to coordinate communities in a decentralised way via a blockchain.

This revolution is quiet today as it is still experimental. However, it gives us a glimpse into an alternative to trusted third parties that centralise data, orient innovation and little by little become more and more capable of observing and manipulating individuals and society.

**This alternative is another way to envisage social organisation and the society's economy.**

Digital tokens must permit the minimum value extraction protocols

and be generous with the community. Thus, large network effects are reachable by keeping the priority on the users and contributors without being preoccupied by a minority that want to extract value. The result of these innovations is a web of distributed protocols that operate solely on the basis of contributions from coordinated communities, thus constituting a new generation of digital commons.

The MVEPs that are operated by DAOs are revolutionising finance at this very moment with protocols like Curve, Maker or Aave which manage tens of billions of dollars. It is also catching on in other sectors rapidly: insurance, video games, social networks ... and all types of digital applications, **particularly data sharing.**

# 3. Data Sharing in 2025

## 3.1. REMINDER OF THE PREVIOUS EPISODES

### ON THE ISSUE OF DATA:

- Knowledge is a limiting factor to common good.
- One way to gain new knowledge is via data
- Data is a non-rival asset
- One of the challenges of the 21st century is to create conditions that allow data to circulate and be shared with minimum constraints.

### CONSTRAINTS

- Technical difficulties (interoperability, common frameworks, sharing and exchange protocols...)
- Lack of confidence (how can I ensure that the consent and permissions are respected and the security of the data exchanges...)
- Lack of interest to share data
- Centralised consensus is everywhere.
- Trusted third parties create both micro (anti-competitive) and macro (existential threat) problems.
- Bitcoin is proof of the concept of decentralised consensus.

The first response to this kind of problem is to use a centralised solution, company or group of companies that serve as trusted third parties and facilitate exchanges. But as we have seen:

- Decentralised consensus can replace trusted third parties.

The decentralised consensus is possible thanks to blockchain technology. On this basis, it is possible to create digital tokens native to certain protocols and/or organisations that allow the emergence of new forms of DAO governance that operate minimum value extraction protocols (MVEP) that do not rely on debt or fundraising.

**This combination of DAO + MVEP gives rise to a new genre of digital commons.**

For ideological reasons (see macro-problem), it seems desirable that the economy of data should be based on such commons. Thus, no ill-intended individual or central organisation other than the community of users and contributors has the possibility to profit from a dominant position to push the principle of generalised surveillance to its climax or to imagine the possibility of a new kind of totalitarianism.

## 3.2. HOW DOES OKP4 MAKE THIS A SOLID ALTERNATIVE?

Let's apply the principles of data sharing spaces that OKP4 works with. For decentralised and minimally extractive data sharing spaces to be formed, it will probably take more than just ideas or convictions. The solutions that are developed must be better than their centralised alternatives.

To identify which solutions, have the greatest potential we need to remember the different barriers that are faced with data sharing - technical difficulty, lack of confidence and lack of interest. In the following section we will compare a centralised solution passing via a trusted third party to a minimum value extraction protocol.

Firstly, the technical building blocks exist to manage all the prerequisites for centralised or decentralised data sharing (identity management, data storage, service orchestration, interfaces to interact with the protocol...). Even though this architecture should be designed in a different way to a centralised solution, all of the challenges are on a political or governance level than a technical one. From a technical point of view, decentralisation is not a barrier nor a major opportunity.

Regarding the confidence in the data sharing spaces, firstly it is linked to the consent and permissions associated with the data. One feature of decentralised solutions is that it is possible to imagine networks where the participants are anonymous and there are no legal engagements. All of these engagements or rights are programmed into the smart contracts that are immovable (unless there is a consensus to remove them).

Thus, a data set can only be used in the conditions set out by those who share it in a totally transparent and auditable way. This means that the confidence then relies on the pro-

ocols and technical infrastructures that must be secure. Decentralised solutions are transparent and can be checked by the community and all actions are auditable in real time. If a security breach occurs the transparency coupled with a strong community brings a higher guarantee of confidence than a trusted third party that could hide any faults or errors for their own interests. MVEPs are therefore more capable of gaining the confidence of their participants than trusted third parties.

**Decentralised solutions are transparent and can be checked by the community and all actions are auditable in real time**

Regarding the alignment of interests, firstly it is a must that the ecosystem is useful and generates value for all. The users are ready to pay and provide for the shared data space but only if the knowledge that is produced is pertinent. Secondly, the participants who supply data and services must have an interest in doing so, they are fairly rewarded for this participation. In the same way, the

users that need data/knowledge pay the least possible. The main factor for generating value for everyone is to have a network effect that is powerful enough. We have seen that to obtain a network effect, digital coins and associated mechanisms (stacking, lockups, dividends...) give sustainable incentives to participate for either contributors or users. **On top of this, in both cases we have the following relationship:**

$$\begin{aligned} &\text{Value paid by the user} \\ &= \\ &\text{value reserved for contributors} \\ &+ \\ &\text{extracted value} \end{aligned}$$

In the scope of MVEP, the fees extracted would be inferior to those of a trusted third party. As well as this, the digital tokens and associated mechanisms (tokens in reserve that can be distributed or for an inflation mechanism) can stimulate the remuneration of contributors or relieve costs for users. Therefore, from an interest point of view MVEPs have a competitive advantage over trusted third parties.





### To summarise:

Type of constraint	Trusted Third Party or Minimal Value Extraction Protocol ?
Technical	Trusted Third Party = MVEP
Confidence	Trusted Third Party < MVEP
Interest	Trusted Third Party < MVEP

Data spaces as commons that are governed in a decentralised way are therefore not just a utopia. Even though some of the statements written here are detailed, the general idea is that they are a desirable alter-

native to all could seriously challenge the centralised models proposed by many actors.

## 3.3. HOW IS THIS POSSIBLE?

There are many bricks and open-source tools that already exist. In Europe there are numerous associations, universities and companies that advance in a more or less coordinated manner on technical developments and on the governance of data spaces. There are some projects that lead to promising proofs of concept, but these initiatives are often dispersed and lack coordination.

### Could a digital token unite them?

A token is a powerful tool that could bring together a large community via the principles of commons governance, common infrastructures or interoperability. Thus, by using the mechanisms that have been explained earlier in the text, it could be possible to obtain a sufficient network effect and therefore initiating a new era for the knowledge economy. An era where digital commons are supported by their communities of users, contributors and evangelists.

## 3.4. INNOVATE TOWARDS NEW ECONOMIC MODELS

As well as MVEPs that will play the role of data sharing infrastructures, it is essential to question the economic models of these data spaces. Indeed, many envisage the data economy as a continuity of traditional models of offer and demand via marketplaces that sell access to data sets. This is a simple solution where the data is fixed at a price in the same way as other immaterial assets such as music files. However, the data has a radically unique economic nature.

By imposing a price on data (that doesn't have a value in itself) means that the marketplaces cannot allow data to circulate freely to generate a maximum amount of knowledge and value that reside in it. The entry barrier is often too high for many actors who would benefit from using this data. We can imagine an economic model where:

- The value of the data is attributed in proportion to the knowledge created, so the value depends on the use.
- Sharing data in the largest way possible is attractive for the contributors and a source of maximum knowledge creation (and therefore value) for the users.

The design of economic models that respect these conditions would truly free the value of data. The entry barrier would be lifted which would widen the field of possibilities.

Today, OKP4 is one of the rare companies that works towards a prototyping and testing such models.

## 3.5. PROSPECTS OF A EUROPEAN DOCTRINE FOR DATA SHARING.

This decentralised vision, open, without borders can only happen if a majority adopt this alternative before the point of no return. We would not win the battle against the giants by using lawsuits or constructing an infrastructure for a minority of techies.

To win the battle, multiple elements are necessary so that the public invests time and money to contribute to the commons:

- A simple way of converting tokens to euros.
- No untenable obligations to participate in the community
- No legal risk for contributors and users, companies or individuals.

This situation is a tremendous opportunity for Europe. On one hand, China plans to use the same technologies in a centralised way to have more control and surveillance. On the other hand, Washington is on the defensive, wielding the Howey test as soon as possible and nipping any decentralised alternatives to GAFAM in the bud.

The EU offers an interesting context. It is fundamentally positioned in favour of human rights, and it has missed the digital train and has no digital autonomy in the era of GAFAM. An initiative such as GAIA-X that looks to construct a data infrastructure federation shows that some European initiatives are orientated towards decentralisation. However, only a rare minority of the political elite seem to have understood the potential of these technologies for the common good. Apart from a few visionaries, no one sees the opportunity and we are very far from a consensus that adopts a strategic vision founded on these new technologies. It is rare that someone understands that cryptos could help us towards a more individual and societal sovereignty, more commons and less parasite intermediaries that endanger our liberties.

**This situation is a tremendous opportunity for Europe**



This opportunity would be a technological leap for Europe. The first step would need to be taken even with the European economic decline (relative to the American and Chinese powers) which could awaken the ghosts of the authoritarian state of regulation and centralisation. It seems probable that the lack of strategic vision and the defence of the current status quo could hinder any new ambitions and innovations. But we must try. Even if we are not understood. Even if they beat us. The destiny of our children plays out now.

The time is now, we must construct and experiment.

Construct infrastructures for data sharing, construct the principals and standards of governance. Experiment in a diverse range of contexts, new rules, new methods and new economic models. To give birth to a new generation of digital commons and further ourselves from the draconian threats that have their eye on us.

# OKP4 designs the workings of these future data spaces around a token that would have a multitude of functions

A means of payment within the protocol to buy knowledge.

Unit of remuneration for the contributors of data, services and possibly elements of infrastructure (for the nodes and DAO).

Blocking tokens for the contributors - by associating the tokens to sets of data and to the services that they provide the contributors are committed to the quality of their contribution. In the event of fraud, or non-compliance with commitments, the governance can decide to withdraw the blocked sum, thus securing users


Blocking tokens for evangelists - members of the community can block tokens on data sets or services to signal to other members the quality of the contribution. When a user pays to access the data, the evangelist gets a fraction of the remuneration.

Blocking tokens to become an infrastructure supplier (node) and have the right to a contribution. As a decentralised network, the treatments must be done in a distributed way outside of the blockchain. A network of nodes ensures that certain storage functions, indexation and treatments are managed.

Provision of tokens in decentralised finance protocols (providing liquidity via Uniswap and Olympus for example).

Stimulate the integration with new contributors, evangelists, users and/or nodes, either via an initial token fund provided at creation, or by an inflation mechanism depending on the DAO strategy.

Tokens would also have a governance function, direct or delegated (possibility of delegating votes to a trusted member)...



The time is now, we must construct and experiment.  
Construct infrastructures for data sharing, construct  
the principals and standards of governance.

Experiment in a diverse range of contexts, new rules,  
new methods and new economic models. To give birth  
to a new generation of digital commons and further  
ourselves from the draconian threats that have their  
eye on us.

# POSTFACE

***"The machines will become very good at being machines in the years ahead... So we need to be extremely good at being humans again".***

*Liselotte Lyngsø, futurologue et conférencière danoise*

We hope that in reading this white paper you have seen in a new light the potential that decentralised coordination applied to Data Spaces holds. But beware, technology and decentralisation can't do all the work....

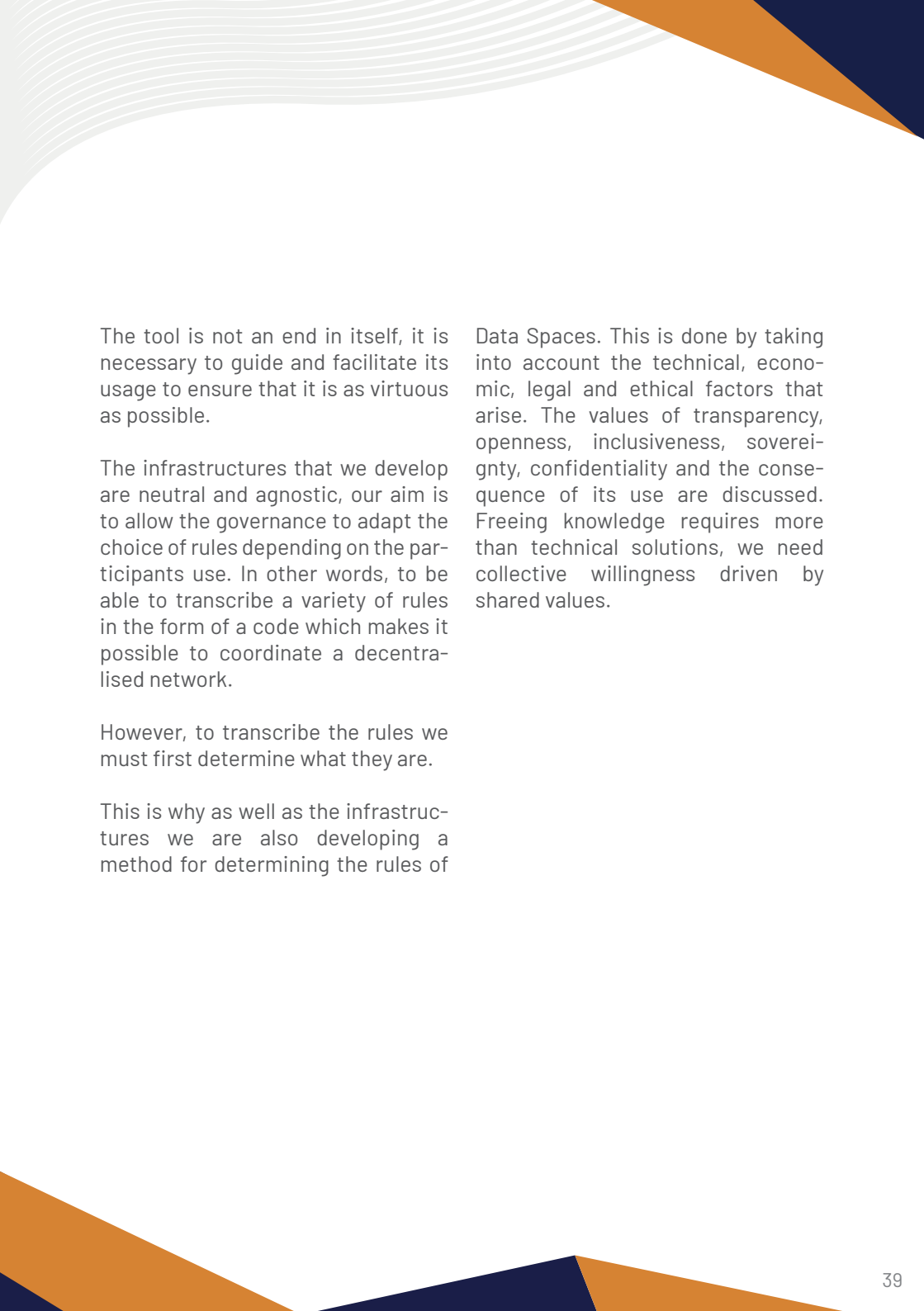
Indeed, Socrate and Platon defined "Technical Objects" as pharmaka, meaning both remedy and poison at the same time. The aim of this white paper is not to detract from this definition. Just like the technical objects governed by the web giants, their alternatives, decentralised governance, would be capable of both the best and the worst. The philosopher Bernard Stiegler invites us to appropriate digital technologies as philosophical objects, to criticise them and to transform them.

OKP4's mission is to participate in this appropriation and question the role and utility of technologies. This approach has already brought us towards multiple conclusions that are reflected by R&D choices that we have made.

At OKP4 we have chosen to put into practise these 4 pillars of innovation management:

- Innovate fast
- Think about the user above the technology
- Federate and co-construct innovation
- Accompany others in the change and encourage them to join

Our approach capitalises on technology as a catalyst of interest, but as favourable as this change carried by it may be, it profoundly transforms what already exists. There is a strong rupture. Change must IMPERATIVELY be accompanied in regard to both the recipients of any type of innovation and the organisation offering it. If we take the innovation diffusion curve or the "Rogers' Adoption Curve" once we have gone past the "innovators" and the "early adopters", the innovation is no longer seen as brand new and therefore does not interest users. Therefore, we must pay particular attention to the users, explain the benefits and encourage them to test it to engage them.



The tool is not an end in itself, it is necessary to guide and facilitate its usage to ensure that it is as virtuous as possible.

The infrastructures that we develop are neutral and agnostic, our aim is to allow the governance to adapt the choice of rules depending on the participants use. In other words, to be able to transcribe a variety of rules in the form of a code which makes it possible to coordinate a decentralised network.

However, to transcribe the rules we must first determine what they are.

This is why as well as the infrastructures we are also developing a method for determining the rules of

Data Spaces. This is done by taking into account the technical, economic, legal and ethical factors that arise. The values of transparency, openness, inclusiveness, sovereignty, confidentiality and the consequence of its use are discussed. Freeing knowledge requires more than technical solutions, we need collective willingness driven by shared values.





# OKP4

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## Open Knowledge Platform For everything and everyone

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