

Flows of Value in Distributed Ecosystems

MDDI Workshop from 6th to 10th of May 2024



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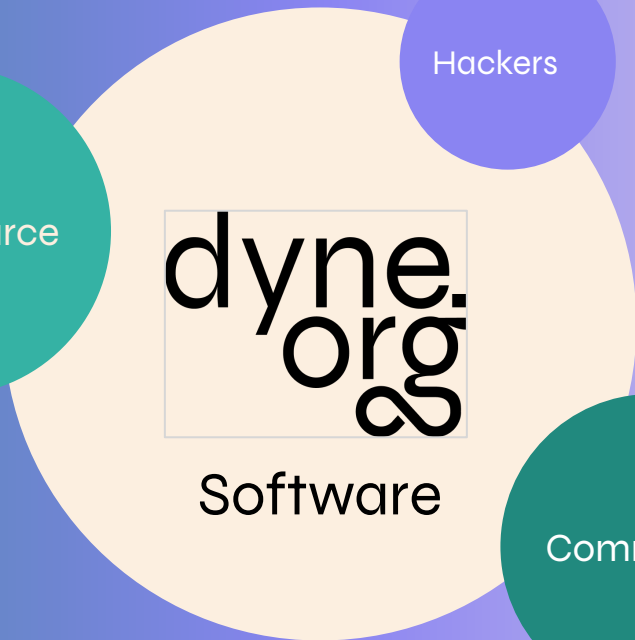
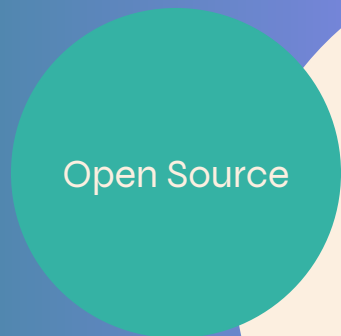
Mihaela Tudorache
Adam Burns
Stefano Bocconi

Workshop Overview

- 01 Context, from PITO to DIDO: open data & resilient infrastructures
- 02 Value Flows: the Resource-Event-Agent model & an example from [Reflow](#) EU project
- 03 Implementations: Digital Product Passport & Value distribution scenarios simulation
- 04 Case studies: [Interfacer](#) ERDF Hamburg & Creative flows & 'The precious' stool use-case
- 05 Final presentations

Class #01 - Agenda

- Intro - 30'
 - Who is **Dyne.org**
 - Who **We** are
 - Who **You** are (what are your expectations from this workshop)
- Open Data: Licensing, Standards and Evaluation, Meta-data, Responsible Data - 40'
- Break -15'
- Infrastructure: Interoperability, Privacy, Decentralised Identities, Federation - 40'
- Open discussion - 40'
- Wrap up & Next - 15'



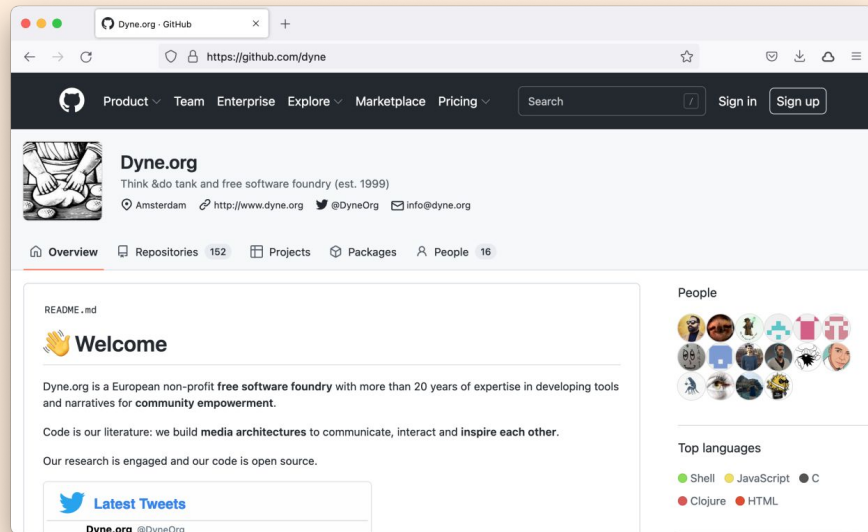
Dyne.org is a European non-profit **free software foundry** with more than 20 years of expertise in developing tools and narratives for **community empowerment**.



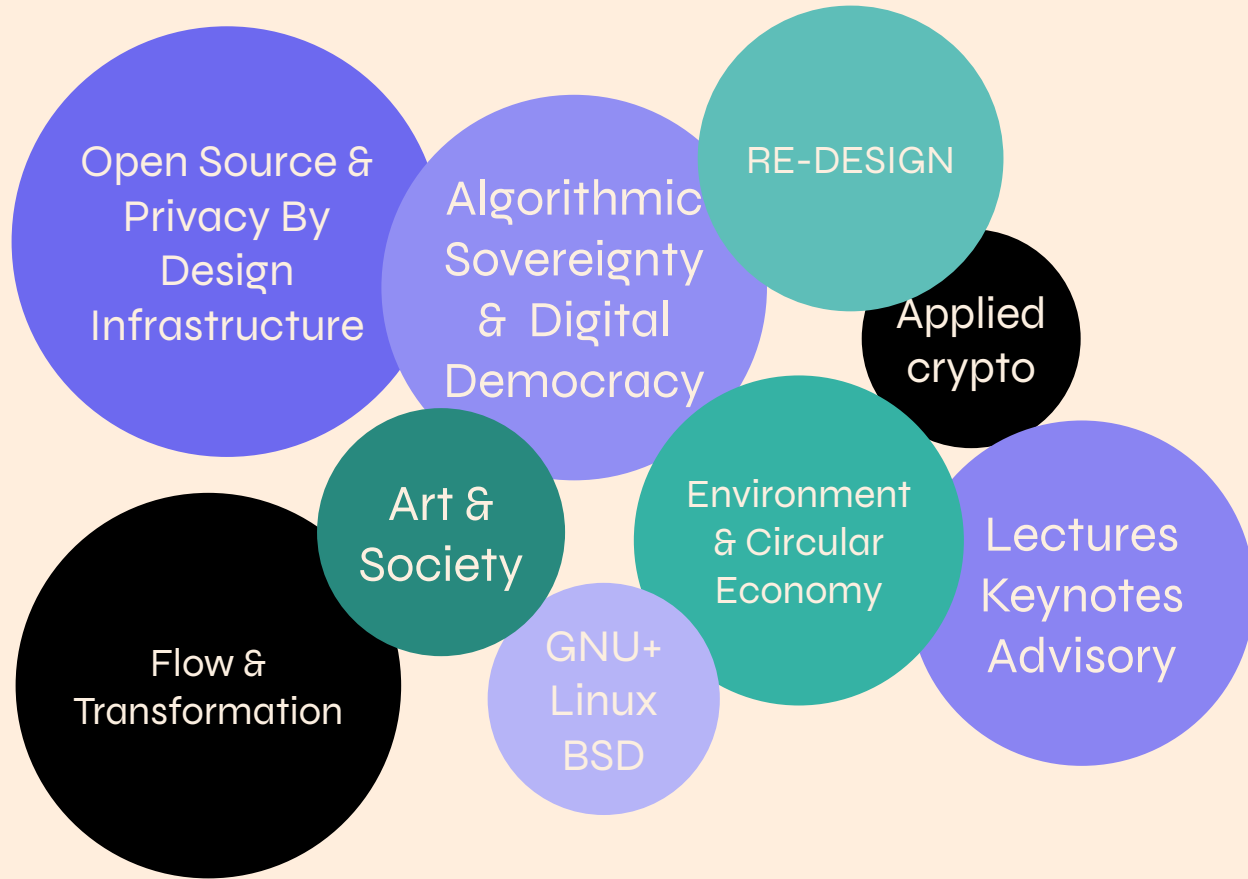
http://github.com/dyne

Code is our literature: we build
media architectures to
communicate, interact and
inspire each other.

Our research is engaged
and our code is open source.



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■ decode



INTERFACER 



Mihaela Tudorache

Bachelor degree in Public Administration, SNSPA Bucharest

Almost 10 years experience in the private sector as a full stack developer, software analyst and PM

ICT for Development and social good Master, UNITO Turin #ICT4D

Main technical mentor in the **Ledger** project for the 2nd and 3rd cohorts (18 teams coached and supported)

Part of the technical coordination for the **Interfacer** project and Product Owner team for the Interfacer platform



Adam Burns

A passionate Internet technologist, pioneer and advocate

- over 25 years of experience & research in human-centred internet technologies
- technical manager of Australia's first Internet Service Provider
- co-founder of the Australian chapter of ISOC
- founder of Europe's first community wireless network
- Technical Lead in EU research/innovation projects:
 - Urban circularity with Digital Product Passports (H2020 REFLOW)
 - Advancing distributed design with FabCity Hamburg (EFRA Interfacer)

Stefano Bocconi

- Software developer for Dyne
- Interested in technologies about privacy and citizen public participation, particularly in artificial intelligence, data analysis and decentralised systems.
- Worked as a researcher in computer science in the Netherlands at TU Delft, VU University Amsterdam, and Elsevier and in Italy at the University of Turin.
- Worked as software engineer at Lucent Technologies and other companies.
- PhD in “Automatic Generation of Video Documentaries” at CWI, Amsterdam in 2005
- Master degree in Electrical Engineering from the University of Florence, Italy.



MDDI students

Intro, projects, expectations

Open Data



Definitions: Data

- A collection of discrete or continuous values that convey **information**, describing the **quantity, quality, fact, statistics**, other basic **units of meaning**, or simply **sequences of symbols** that may be further interpreted formally
- Data is usually **organized into structures** such as tables that **provide** additional **context** and **meaning** and which may themselves be used as data in larger structures
- Data may be used as **variables** in a computational process
- Data may represent abstract ideas or concrete measurements

Definitions: Data

- Data is commonly used in scientific research, economics, and in virtually every other form of human organizational activity

Examples of **data sets** include **price indices** (such as consumer price index), **unemployment rates**, **literacy rates**, and **census data**. In this context, data represents the **raw facts and figures** from which useful information can be extracted.

Source: <https://en.wikipedia.org/wiki/Data>

Definitions: Data

Data includes **digital content** and **software**, following the same principles

In computing, data is information that has been translated into a form that is efficient for movement or processing.

Relative to today's computers and transmission media, **data is information converted into binary digital form.**

Source: <https://www.techtarget.com/searchdatamanagement/definition/data>



Definitions: Open Data

Open

‘Open means anyone can freely **access, use, modify**, and **share** for any purpose (subject, at most, to requirements that preserve provenance and openness)

Open Data

‘Open data is data that can be **freely used, re-used** and **redistributed** by anyone - subject only, at most, to the requirement to **attribute** and **share-alike**.’

Source: <https://opendefinition.org/>



Open Licensing

An open license is one that places very few restrictions on what you can do with the content or data that is being licensed.

Two kinds of restrictions that an open license can place:

- Give **attribution** to the source of the content or data.
- Publish any derived content or data under the same license (this is called **share-alike**).

Open Licensing

Public domain license has no restrictions at all (technically, these indicate that the rights owner has waived their rights to the content or data).

Attribution license just says that you must give attribution to the publisher.

Attribution & share-alike license says that you must give attribution and share any **derived content or data** under the same license.

5-Star Open Data Evaluation

1. ★ Make your stuff available on the Web (whatever format) under an open license.
2. ★★ Make it available as structured data (not of scanned image of a table from a book).
3. ★★★ Make it available in a non-proprietary open format (e.g., CSV).
4. ★★★★ Use URIs to denote things, so that people can reference to your stuff.
5. ★★★★★ Link your data to other data to provide context.

Source: <https://5stardata.info/en/>

Give a **5-Star Open Data Evaluation** rating for each:

- PPT
- PPTX
- ODP
- PDF

5-Star Open Data Evaluation:

Assuming they are open licensed and publicly available on the web:

- PPTX ★★
- ODP ★★★
- PDF ★
- PPT ★

Metadata

- Data about data
- Data that describes other data

Examples:

- License information that applies to the dataset
- User context information (e.g. age range, location...)
- What else?



Filename: Tadzik.jpg
Author: Piotr Kononow
Date: August 15, 2016 6:40:10PM
File: 5,312 × 2,988 JPEG
15.9 megapixels
3,393,448 bytes
(3.2 megabytes)
Camera: Samsung SM-G920F
4.3 mm
Lens: Max aperture f/1.9
(shot wide open)
Auto exposure
Program AE
Exposure: 1/402 sec
f/1.9
ISO 40
Flash: none



Source: <https://dataedo.com/kb/data-glossary/what-is-metadata>

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Metadata use

- Web analytics
- Data driven decisions
- Recommendation engines

“Web analytics is the collection, reporting, and analysis of website data. The focus is on **identifying measures** based on your organizational and user **goals** and **using the website data to determine the success** or failure of those goals and to drive strategy and improve the user's experience.”

Source: [usability.gov](https://www.usability.gov)



Standards

- Developed by subject-matter experts coming to consensus on how to solve business problems – so it represents the “best” solution.
- They are harder to develop than non-standards, but are more economical in the long term because you can use the same code or presentation and publishing mechanisms to provide access to information.
- Enable transparency and understanding: use of standards promotes common, clear meanings for data that is often reused.

Standards

- Enable access: the same well understood terms, codes, and data structures can be used for data retrieval
- Encourage and enable reuse of data and software for multiple purposes
- Mappings to standards allow comparisons even when data isn't standardized
- They provide consistent results during data retrieval

Further read: [Data standards: What are they and why do they matter? The Introduction](#)

HOW STANDARDS PROLIFERATE:

(SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC)

SITUATION:
THERE ARE
14 COMPETING
STANDARDS.

14?! RIDICULOUS!
WE NEED TO DEVELOP
ONE UNIVERSAL STANDARD
THAT COVERS EVERYONE'S
USE CASES.



YEAH!

SOON:

SITUATION:
THERE ARE
15 COMPETING
STANDARDS.



Source: <https://xkcd.com/927/>

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Data protection

- Consent must be crystal-clear.

- Can't use confusing or misleading legalese or fine print to state this information – it must be accessible, clear, and easy to understand
- Can't collect data for one purpose and then reuse it later for another purpose.

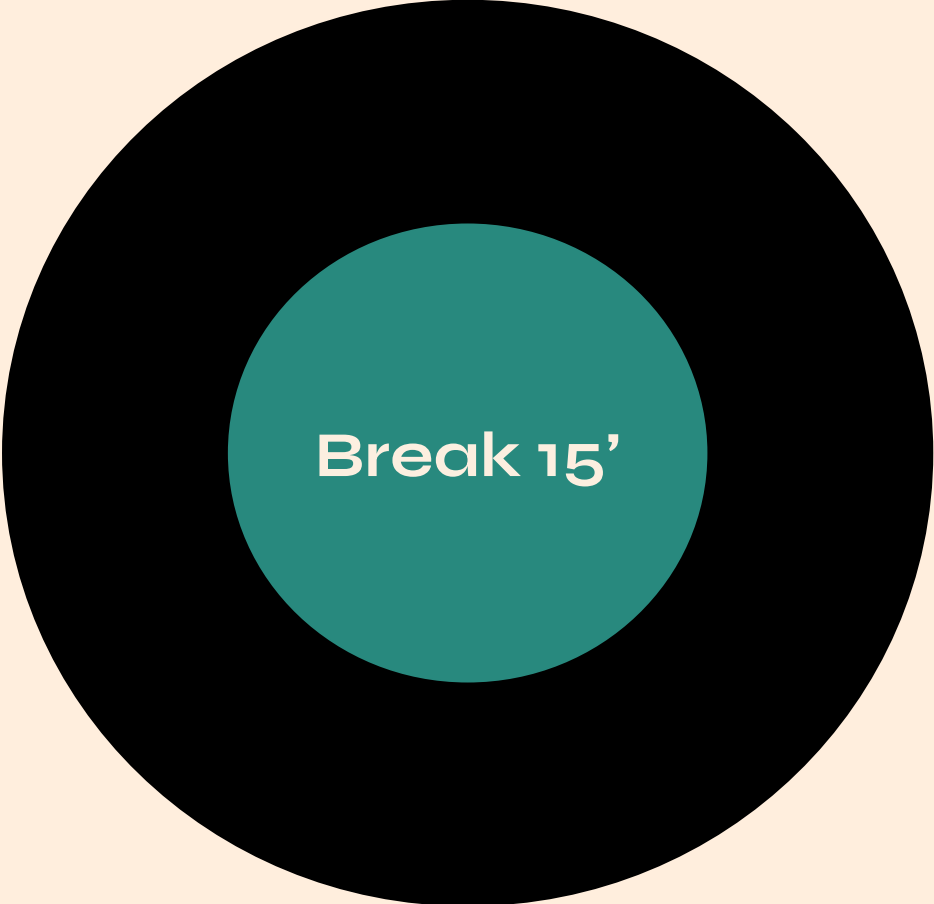
i.Example: you can't offer a free download in exchange for emails, and then keep those emails and use them to populate your mailing list.

Data protection

- Only collect the **minimum amount of information** needed to achieve your objective.
i.Example: if you want consent to collect a consumer's email address to send them your newsletter, you don't need their age or employment status to do it.
- Consumers have the right **to access** and **review** the data you collect from them.
- Consumers have the right to have the data you collect be deleted (right to be “**forgotten.**”)

Responsible Data

- Do we have consent?
- Plan for data disposal? Secure data storage?
- How can a community benefit from participating in data collection?
- Am I following the “do no harm” principle?
- Am I using secure methods to collect and store data?
- Is there anyone else who could use or benefit from the data?
- Has representation bias been taken into account?
- Method in finding data is random or targeted?
- Are we examining our method for possible bias?



Break 15'

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Infrastructure



Introduction

Digital infrastructure can be an effective fabric upon which participants can remotely collaborate, share, learn, and contribute to specific knowledge domains.

Characteristics of this infrastructure, from network topology to the design and use applications, all influence the nature of the relationships between participants and the external world.

We'll introduce the concept of a participatory value exchange network and examine qualities of building blocks that promote collaborative, equitable participation.

Principles:

- Openness
- Interoperability
- Privacy
- Equitable Participation



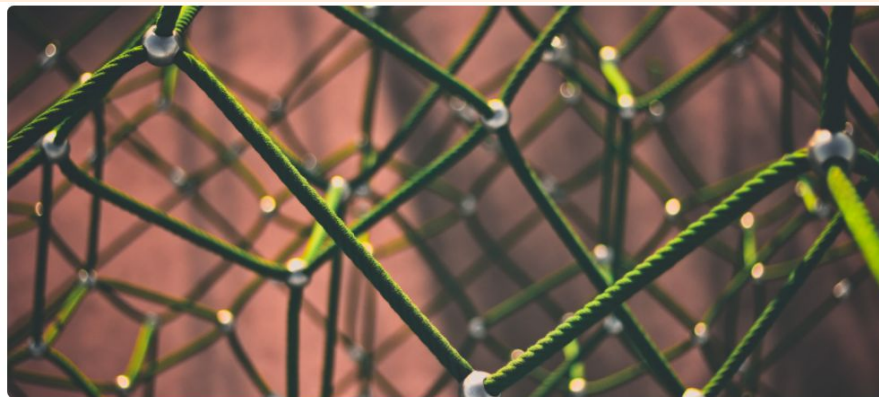
Value Exchange Networks

A value exchange (or economic) network is a set of independent agents, which could be individual persons or organizations, who regularly collaborate to create and exchange goods and services.

Examples of value exchange networks include distributed design or manufacturing supply chains, joint ventures, or municipalities.

To facilitate the coordination, organization and documentation of, say, distributed design & manufacturing value chains, a value exchange network should provide:

- controls for data protection, availability & integrity
- decentralised ownership & management of data
- interoperable standards for open exchange of data
- trust though privacy by design principles
- modularity with extensible data standards



Open Data & Network Metabolism

A value exchange network may require a change in perspective for participants in viewing “business” activities and relationships with economic partners, how to define and follow governances that are driven not only by profit alone but also addressing ecological and political challenges without losing economic sustainability.

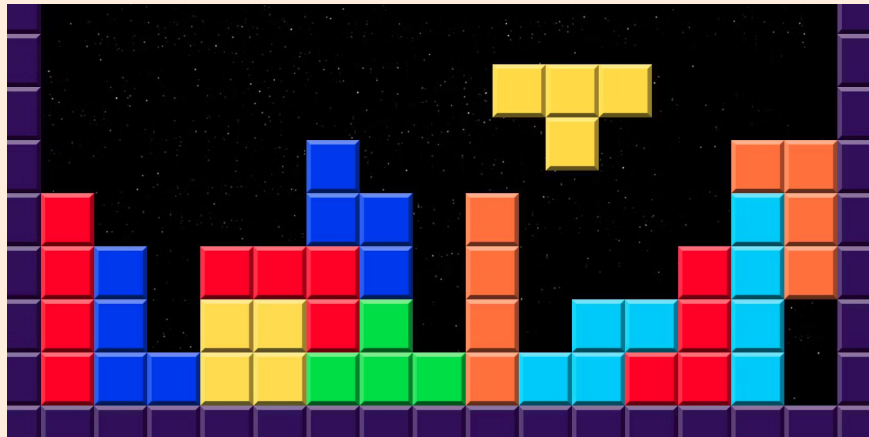
The network and its constituents benefit from a shared understanding of details of its activities in order to understand sustainable opportunities of addressing challenges more effectively.

Open and transparent event data shared within the network can be analysed in relation to previous or following events. The more activities shared, the more data is available for understanding emergent flows that help define further opportunities for the economic network metabolism - from events in each stage - e.g. from design to manufacturing, through to maintenance, reuse and recycling.



Building Blocks

- Privacy by Design
- Federation
- Decentralised Identities
- Interoperability & open data exchange
- Modularity



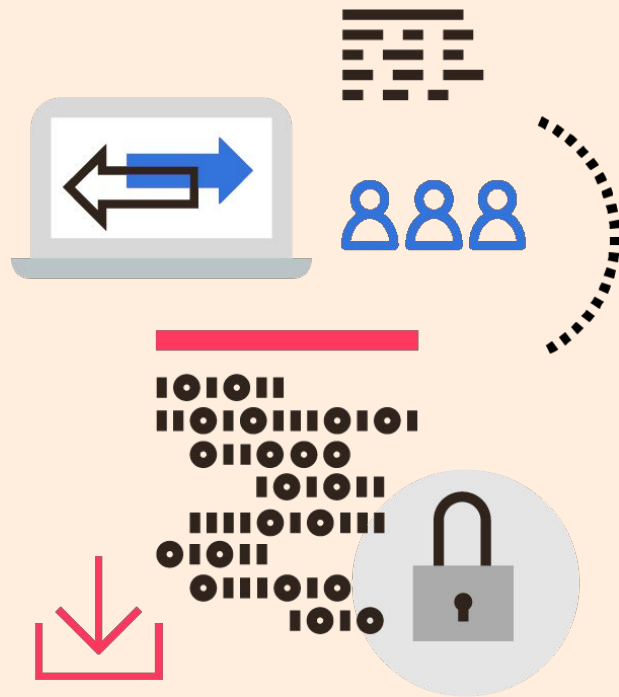
Privacy by Design

Privacy by Design is a framework set of principles that calls for privacy to be taken into account throughout entire network designs and system implementations.

- proactive not reactive approach
- full lifecycle end-to-end protection
- visible & transparent - open & verifiable
- user-centric approach
- data minimisation

Standards-based modern cryptographic techniques assist in aligning networks to these principles, including:

- data access - revealing only to authorised parties
- data signing - providing proof of who publishes data
- zero knowledge proofs - revealing only required data



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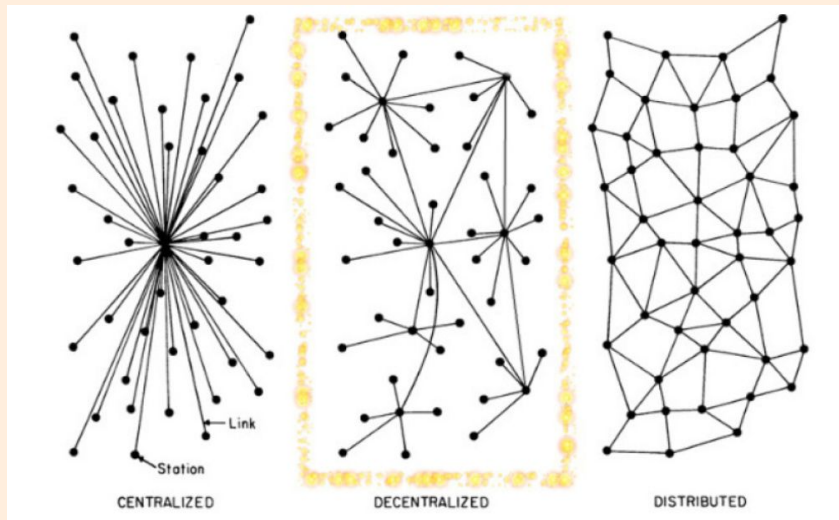
Federation

A federated network is a *decentralized* network, where members of each system can communicate with members of any other compatible system.

A system participating in a federated network is interoperable with other sites (known as instances) and federates by fetching and pushing data based on their users' interactions.

Advantages of a federated network:

- exchanges standardised open data with others
- protects private data on user's home instance
- keeps responsibility for its own data
- scales horizontally
- modularity through extensible open standards



Decentralised Identities

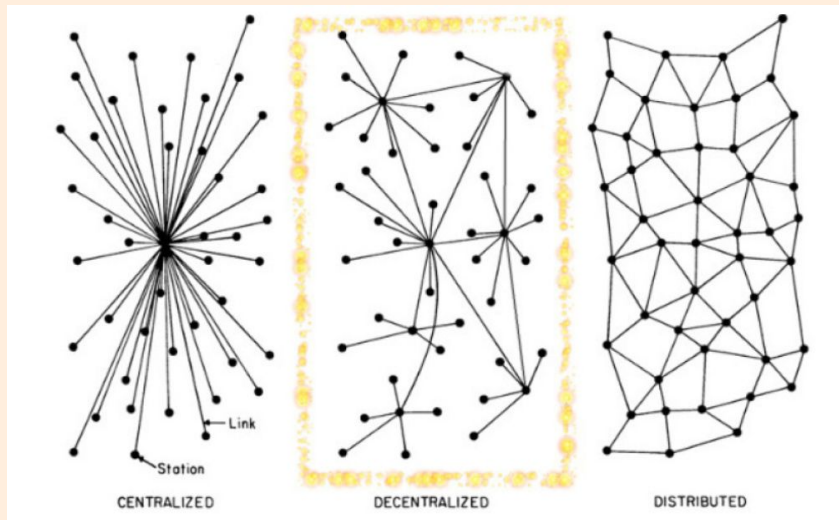
A decentralised identity system is a secure and user-centric method of digital identity management that does not require central authorities for user authentication.

Empowering individuals and organisations to manage their own identity provides them with control over their own data allowing them to choose with whom, when and how their information is shared.

Unlike centralised systems, no databases of identity credentials are stored on network servers on behalf of others, improving the security posture of the network and direct trust between its participants.

Advantages of decentralised identities:

- allows autonomy for individuals & organisations
- improves data privacy and self determination
- no trust mediation between network participants



Open Data Exchange vs Data Responsibility

Open Data Exchange requires data to be communicated in open standard formats so that all participants are equally able to fully make use of and contribute improvements to open data sets.

An open economic network exists within social & regulatory environments, so these changes need to take into consideration issues such as:

- data protection in transit and at rest
- strong privacy/security by design principles
- data integrity, availability & accessibility
- sector specific regulatory requirements



Modularity

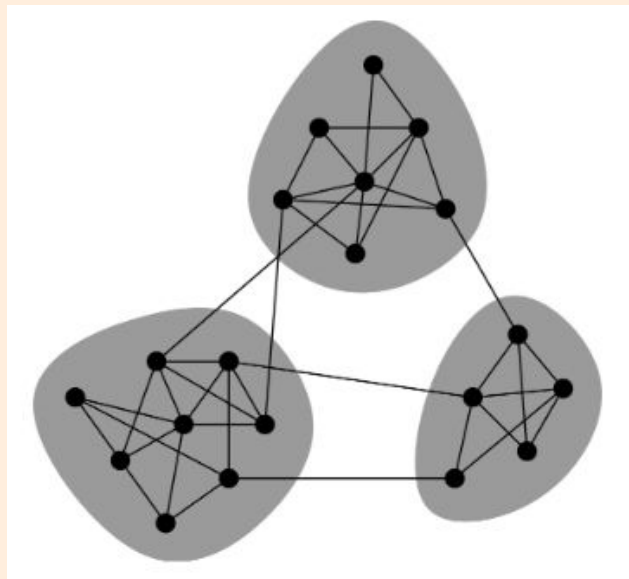
Modularity is a characteristic of the strength of network divisions into clusters of commonality.

Economic networks and their modularity will change and evolve over time with internal data needs and requirements (network metabolism), as well as external changing requirements such as evolving future legal and regulatory needs.

In order to remain relevant to participants over time an economic network should be adaptable to

- cluster or community specific need changes
- evolving new data & data exchange standards
- changing external legal & regulatory requirements
- maintenance of network system components

Question: What role and form can governance facilitate this?



Summary Goals of an open common infrastructure

- compatibility, coherence and scalability through the use of
 - standards in data exchange, formats, protocols, principles and frameworks
- flexible design & governance to adapt to changing
 - internal needs, and
 - environments
- ease of use through minimising technical knowledge requirements
- structures offering community support & further future development ...

DPG initiative



Digital Public Goods Alliance (DPGA)



A multi-stakeholder initiative that accelerates the accomplishment of the SDGs by facilitating the discovery, development, use of, and investment in digital public goods.

dyne.org

Digital public goods

are open-source software, open standards, open data, open AI systems, and open content collections that adhere to privacy and other applicable laws and best practices, do no harm, and help attain the Sustainable Development Goals (SDGs).

<https://digitalpublicgoods.net/>



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Advantages

Discoverability and promotion: The Digital Public Goods Registry uniquely shares digital public goods with a broad audience of stakeholders including governments, NGOs, and the private sector.

Deployment opportunities: potential added exposure through DPGA Communities of Practice who review digital solutions with high-impact potential in a particular focus area

Global community of DPG practitioners: exchange experiences and share knowledge with peers and experts

Benefits of DPG

Adoptability: DPGs can be freely adopted by governments or agencies.

Avoid Vendor Lock-in: Because DPGs are open source, they do not lock the user into one technology vendor, thus ensuring compatibility.

Scalability: Adopting DPGs that have been successfully implemented at scale elsewhere can save countries and institutions resources and enable lower risk experimentation, piloting, and roll-out.

Adaptability: DPGs can be adapted to fit local needs which can also help build long-term ownership and agency of implementing countries.

Benefits of DPG

Collaboration: Any users of a particular DPG can collaborate and share best practices, as is the case in most communities of practice.

Project sustainability: Adaptations and iterations in countries can be supported by open-source communities. New features and best-practices developed by implementing countries can be merged into the generic DPG.

Country ownership and capacity: DPGs can enable deep involvement of local expertise in country-specific implementations and can be deployed together with dedicated efforts to build long-term local capacity to maintain and iterate these implementations for future needs.

Benefits of DPG

Transparency and accountability: The open-source licensing of DPGs means that their code base can be independently scrutinised and audited. This also facilitates accountability and public discourse around issues such as incorporating best practices and designing DPGs with the aim of doing no harm.

<https://digitalpublicgoods.net/>



CONCLUSIONS

Why is it so important?!

- Informed decisions policymaking
- National and International Security
- Providing Essential services
- Self-sufficiency
- New Skills
- Else?

Since we are aware of all this, what are we waiting
for ?! 🙄

Why don't we have everything already opened?! 🙄

.... The **compensation mechanisms**
what we perceive as value and motivation in the
actual economic perspective

Economic incentive challenges

- Shifting from accumulation to self-sufficiency and balance - mindset change takes time
- Complementary currencies not accepted
- Difficulty to translate 'fair' around different areas of the planet
- Difficulty to find balance between rules and creativity -flexibility, freedom
- Reconsider non remunerated 'affective' activities (like housekeeping, babysitting, assisting elderly ppl), should the value of these activities be quantified - if so, how?
- Ownership - common goods DAOs governance
- Else?

Open Discussion



Fill in the Pad 😊 MDDI - Projects info 2024

Next

02nd Day

Value Flows:

the Resource-Event-Agent model &
an example from Reflow EU project



Resources:

<http://github.com/dyne>

<https://zenroom.org/zenbridge>

<https://zenroom.org>

<https://decodeproject.eu/>

<https://reflowproject.eu/>

<https://ledgerproject.eu/>

<https://www.interfacerproject.eu/>

Barbara Carfagna 'Let's get our data back' - Ita with auto translate for Eng

<https://www.youtube.com/watch?v=TFaNFbpr3Go>

Blurring boundaries: an analysis of the digital platforms-military nexus

https://www.researchgate.net/publication/377002091_Blurring_boundaries_an_analysis_of_the_digital_platforms-military_nexus

Big Pharma raked in USD 90 billion in profits with COVID-19 vaccines largely due to decades of research funded by public investment

<https://www.somo.nl/big-pharma-raked-in-usd-90-billion-in-profits-with-covid-19-vaccines/>

Utilities: Last Week Tonight with John Oliver (USA electric grid & public procurement challenges)

<https://www.youtube.com/watch?v=C-YRSqaPtMg>

The new hanse blueprint, governing urban data for the public interest

https://thenewinstitute/media/pages/documents/529e984do2-1698245881/the-new-hanse_blueprint_governing-urban-data-for-the-public-interest.pdf

