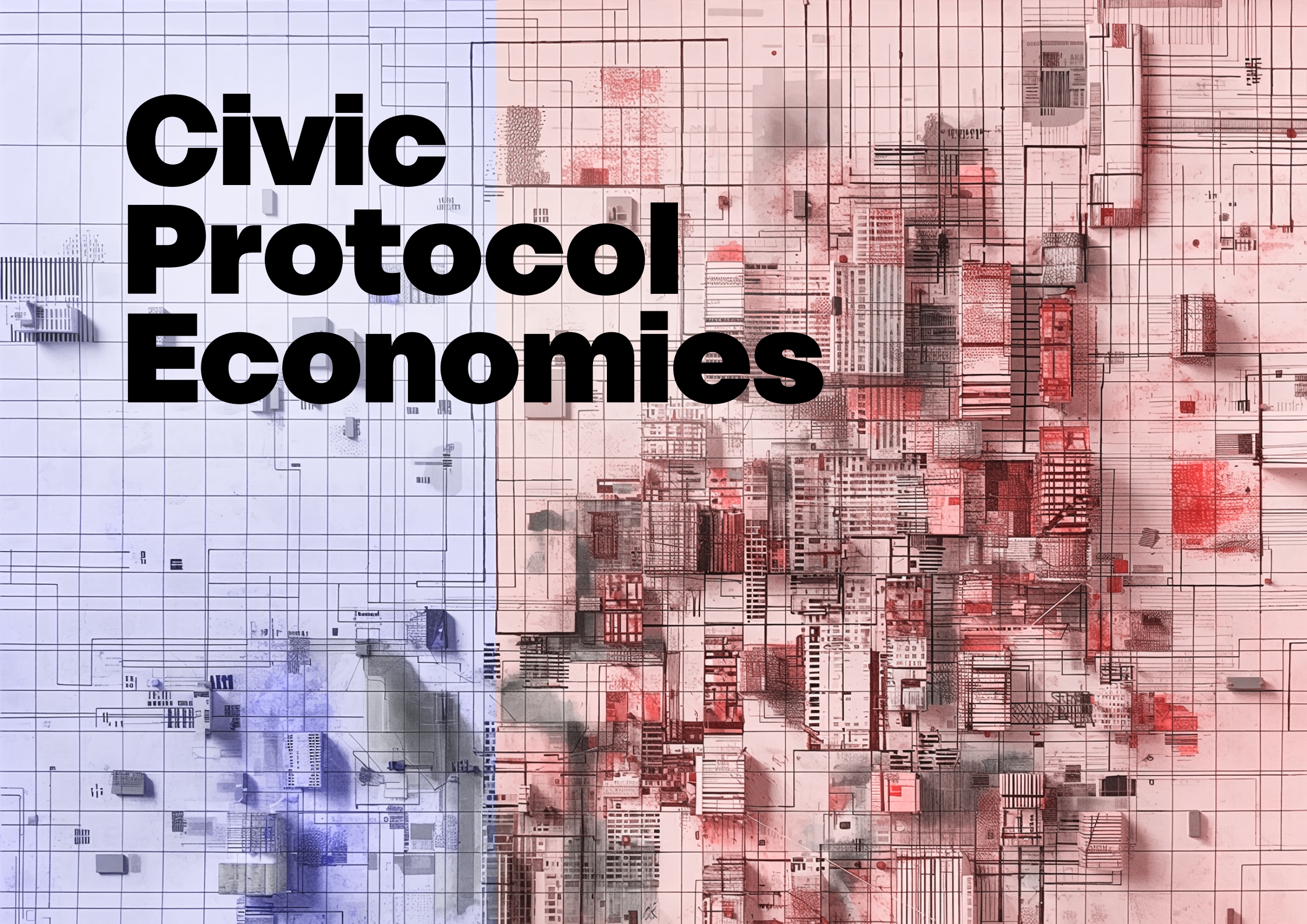

Civic
Protocol
Economies

Civic Protocol Economies

What happens when the civic economy meets the protocol economy?

May 2025

Contents

Preface

In an era of rapid technological advancement and growing concerns about economic equity and sustainability, two promising approaches have emerged that offer alternative visions for our economic future: the civic economy and the protocol economy.

The civic economy focuses on organizing economic activities that strengthen the collective well-being of local communities—through commons, citizen initiatives, energy communities, and the sharing economy. Its primary goal isn't profitability or extraction, but rather the integration of inclusive social and ecological welfare.

Simultaneously, the protocol economy (or Web3) represents an emerging development in the digital realm. This model enables local actors to encode agreements in smart contracts that execute automatically, with specific conditions that can incentivize positive behavior and discourage negative actions. Communities gain the power to establish their own rules.

In the commons world, many look hopefully toward the possibilities offered by the protocol economy—combining the benefits of digital platforms (coordination, administration, and reputation systems) with decentralized, democratic forms of governance where communities maintain control over their local economies. Yet critics caution that such systems might undermine community economies by translating social systems and informal interactions into formalized, digital economic transactions.

In 2024, the Civic Interaction Design lectorate, in collaboration with the Centre of Expertise Economic Transformation (CET), organized a research residency titled "What happens when the Civic Economy meets the Protocol Economy?" This initiative, led by researcher, curator, and technology strategist Iskander Smit, aimed to explore how these two significant economic and technological developments might complement and strengthen each other.

This report presents the findings of this exploratory research. It examines how communities pursuing non-profit, democratically-governed economic models might leverage the potential of digital platforms and Web3 technologies in responsible ways. In a field where blueprints, guidelines, and exemplary prototypes remain scarce, our research contributes vital insights into this emerging intersection.

We extend our sincere gratitude to the experts who generously shared their knowledge through interviews. Their diverse perspectives were instrumental in shaping our understanding of this complex and evolving domain.

As we navigate the possibilities and challenges of integrating civic and protocol economies, we hope this report serves as a valuable resource for practitioners, researchers, and communities seeking to build more equitable, sustainable, and democratic economic futures.

Martijn de Waal, March 2025

Executive Summary

This exploration delves into the potential synergies between civic economies and protocol economies, aiming to uncover new pathways for future research and design. The civic economy, with its focus on community, collaboration, and social well-being, offers an alternative to more extractive and profit-driven winner-takes-all economic models. Meanwhile, the protocol economy, leveraging decentralized technologies, presents novel approaches to value exchange and governance of economic systems. By examining the intersection of these two paradigms, we seek to envision a "civic protocol economy" that could potentially address complex societal challenges and foster more equitable, sustainable societies.

Our investigation has revealed an understanding of such a Civic Protocol Economy as consisting of

1. Relational (local) economic systems,
2. That are governed by their participants,
3. Who are represented through digital identities.
4. They take into account externalities,
5. And are partially managed and operated by digital agents (DAOs).
6. Whereas its development can be lined up with other policy goals, such as the 'digital autonomy' agenda.

First, the emphasis on relational economics over purely transactional models stands out as a fundamental shift. This approach prioritizes strengthening social relations and creating value for the commons, moving beyond the narrow focus on monetary transactions. It recognizes the importance of trust, care, and collective well-being in economic interactions, potentially reshaping how we perceive and measure value in our communities.

The second theme centers on governance by participants, a crucial aspect of both civic and protocol economies. This model envisions economic systems where decision-making power is distributed among community members, often through mechanisms such as Decentralized Autonomous Organizations (DAOs). The challenge lies in designing governance structures that are both inclusive and efficient, capable of handling complex multi-stakeholder decisions while maintaining active engagement from participants.

Representation through digital identities emerges as the third key theme. As economic activities increasingly move into digital spaces, the concept of identity takes on new dimensions. The civic protocol economy must grapple with creating digital identity systems that are secure, privacy-preserving, and reflective of the multifaceted nature of human identity. This includes exploring concepts like self-sovereign identities and disposable identities, which could offer new ways of participating in economic systems while maintaining personal autonomy.

The fourth theme addresses the critical issue of accounting for externalities. Traditional market economies often fail to consider the full social and environmental costs of economic activities. A civic protocol economy aims to revalue these externalities, incorporating them into decision-making processes and value calculations. This could involve developing new metrics and tools, such as "current-sees", to make hidden value flows tangible and inform more holistic economic practices.

Partial management by digital agents, including DAOs and potentially AI systems, forms the fifth theme. As economic systems become more complex, there's potential for digital agents to take on significant roles in management and operation. This raises important questions about the balance between human and algorithmic governance, the design of these systems to align with community values, and ensuring transparency and accountability in automated decision-making processes.

Finally, the sixth theme explores how the development of civic protocol economies can align with broader policy goals, such as the pursuit of digital autonomy. This alignment could potentially drive adoption and support for these new economic models, while also ensuring they contribute to wider societal objectives.

Building upon these themes, we finish by proposing a conceptual model, providing a framework for further exploration and design of civic protocol economies. This model illustrates the interplay between governance, resource management, value exchange, and participant agency within a protocol-based system. It serves as a starting point for more detailed investigations into how these elements can be practically implemented and scaled.

Looking ahead, this research opens up numerous avenues for future study and experimentation. Key areas for investigation include the translation of civic values into technological protocols, the design of systems that foster democratic participation and individual agency, and the development of mechanisms to account for externalities in economic decision-making. There's also a need to explore how trust can be built and maintained in decentralized systems, and how to balance the benefits of automation with the need for human oversight and intervention.

While the potential of civic protocol economies is significant, challenges remain. These include managing the complexity of these systems, ensuring true inclusivity and accessibility, and navigating the regulatory landscape. There's also a need to critically examine the role of technology in these systems, ensuring it serves as a tool for empowerment rather than a source of new forms of inequality or exclusion.

In conclusion, this exploration lays the groundwork for more in-depth studies and practical experiments in civic protocol economies. By combining the community-focused principles of civic economies with the technological innovations of protocol economies, we have the opportunity to reimagine economic systems in ways that prioritize collective well-being, sustainability, and equitable participation. As we move forward, it will be crucial to engage diverse stakeholders in this process, ensuring that the development of civic protocol economies reflects a broad range of perspectives and serves the needs of all community members.

Introduction

In an era faced with large transformations and complex societal challenges, we ask ourselves: *What happens when the civic economy meets the protocol economy?* This exploration delves into the potential synergies between these two paradigms, aiming not to provide definitive answers, but to open up directions and questions for future research and experiment.

The promise of the civic economy is that, through its focus on relations rather than mere transactions and collective wellbeing rather than individual profit, it could foster a stronger society, robust neighborhood structures, and enhanced livability. Yet, in order to function at scale, such civic economies need systems for value exchange, administration and governance. The promise of the protocol economy is that, through decentralization of governance, automation via smart contracts and its affordance to accommodate multiple forms of value-storage and exchange, it could make its economies more relational and enhance communities' agency to set their own values and rules.

We therefore see the protocol economy as a possible approach that could provide directions for the needs of the civic economy. Yet at the same time, we also acknowledge that that same protocol economy - when left to libertarian and anarcho-crytpo-captilalist interpretations of it - could also strongly undermine the potential of our economies to become more civic, plural and relational. Our guiding questions are therefore twofold:

1 – Could the mediation and automation of value exchange and the governance systems of the protocol economy drive the further development of civic economies, and make them more scalable, spreadable or adoptable?

2 – The protocol economy is also on a pathway to develop further according to the libertarian extractivist logic of shareholder capitalism. How can we infuse it with public and social values?

As there are obvious crossovers between the two approaches, it is important to start experimenting how these can be made productive. This exploration aims to inspire such experiments, laying out directions, dilemma's and research questions and opportunities to do so.

Point of departure: the civic economy

The term "civic economy" can be described as a collection of economic activities that are **local, participatory, and driven by people rather than systems** (Thompson, 2023). It is an approach to economic development that emphasizes the importance of community, collaboration, and social well-being over traditional economic models that prioritize profit and efficiency (Van Leeuwen, Singh, 2024; Thompson, 2023; de Waal, Choi, 2022).

Here are some key characteristics and concepts related to the civic economy, based on multiple sources[1]. The key characteristics are:

Focus on social relations and values: The civic economy prioritizes social relations and values, rather than technology and efficiency. It emphasizes the importance of ethical negotiations and interdependence.

Plurality of economic forms: It recognizes a diversity of economic forms, including non-market and unpaid activities. It moves beyond a singular view of the economy as a capitalist system and acknowledges the existence of various forms of economic organization, exchange, and ownership.

Open and inclusive communities: The civic economy is based on the idea of open and inclusive communities where coexistence is the basis for belonging.

Democratic governance: The civic economy is often governed democratically, with local institutions making decisions about how resources are distributed and organized. It emphasizes participatory and democratic processes.

Emphasis on the commons: The civic economy is linked to the idea of the commons, which are shared resources that are managed collectively. It promotes the idea of "becoming in common" which promotes collaboration and fluidity in the use of resources.

Ethical and political vitality: The ethical and political vitality of the civic economy depends on how community and economy are understood. It involves a continuous renegotiation of the terms of human and more-than-human coexistence.

Values beyond the market: The civic economy recognizes value beyond the market and money. It takes into account plus-sum behaviors such as care, trust, gifting and collective knowing. It can include things like local identity, social ties, and community well-being. Externalities are discussed, particularly in the context of market failures, sustainability, and the need for alternative economic models.

Use of technology: Technology can play a role in enabling new forms of civic engagement, collective action, and self-organization. It can be used to build new sense-making and learning capabilities, and help to align actions among multiple stakeholders.

1 Thompson, M. and Lorne, C. (2023), Designing a New Civic Economy? On the Emergence and Contradictions of Participatory Experimental Urbanism. Antipode, 55: 1919-1942. https://doi.org/10.1111/anti.12962
van Leeuwen, G. E., & Singh, A. (2024). Towards Design Fiction for Human-Centered Energy Transitions: Imagining Infrastructures and Worldbuilding. *PAD Pages on Arts & Design*, *17*(26), 48-65.
de Waal, M., Choi, J. (2022) Civic Interaction Design Activities 2022-2024
Yi, I. (Ed.). (2023). *Encyclopedia of the Social and Solidarity Economy: A Collective Work of the United Nations Inter-Agency Task Force on SSE (UNTFSSE)*. Edward Elgar Publishing. https://doi.org/10.4337/9781803920924
Healy, S., Heras, A. I., & North, P. (2023). Community economies. In *Encyclopedia of the Social and Solidarity Economy* (pp. 12-18). Edward Elgar Publishing.
Radicle Civics—Building Proofs of Possibilities for a Civic Economy and Society | by Dark Matter | Dark Matter Laboratories. (2023).
Ward, B., & Lewis, J. (2002). *Plugging the leaks: Making the most of every pound that enters your local economy*. New Economics Foundation.
Dittrich, K. (2019). *Circulaire waarde(n)modellen: Een multidisciplinaire benadering voor het verduurzamen van mkb-bedrijven in de maak- en voedingsindustrie : openbare les*. Hogeschool Rotterdam.

Focus on local level: Civic economies are often focused on the local level and aim to revitalize local economies and make them more resilient. It involves a move away from a centralized, vertically organized economy to a more lateral, decentralized, and circular one.

In summary, the civic economy is an alternative to traditional economic models that prioritizes community, participation, and social and environmental well-being. It is characterized by a plurality of economic forms, democratic governance, an emphasis on the commons, and a focus on local needs and values. It also emphasizes the importance of ethical considerations and the need to renegotiate the terms of human and more-than-human coexistence.

The European Commission is recognizing the positive role a social economy can play in embodying a fair, inclusive, and green economy, as defined in the Social Economy Action Plan[2]. The characteristics of the civic economy can be used as principles or guidelines when designing concrete practices and instruments to achieve these goals.

Related models that inspire civic economies

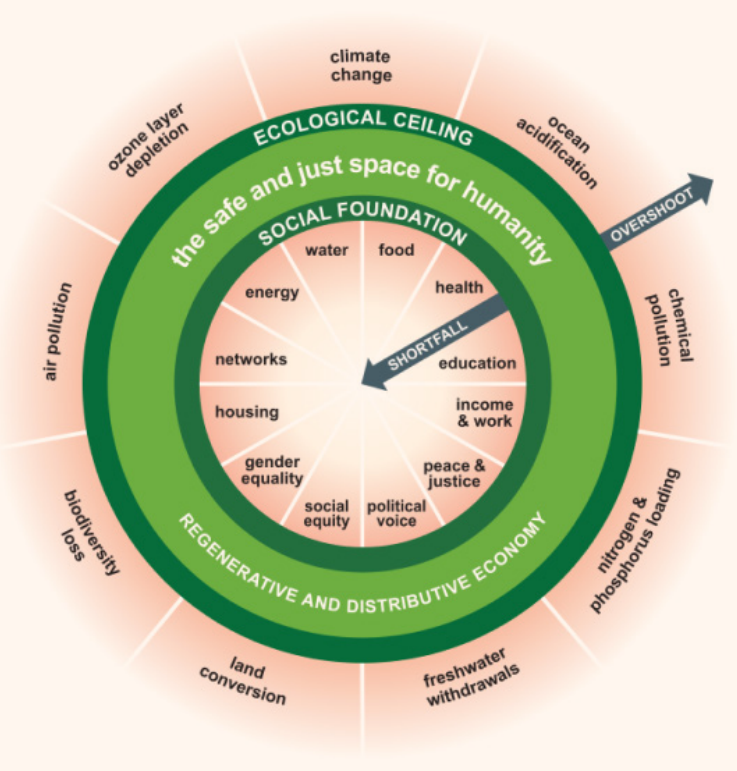
The Civic Economy is also described as the Social and Solidarity Economy (SSE), as both approaches prioritize collective well-being and shared purpose rather than individual profit maximization. SSE is also framed as community economies (Healy, 2023).

Both SSE and the Civic Economy also party overlap with approaches to the (new, urban) commons. The latter revolve around 'resources in the city which are managed by the users in a non-profit-oriented and prosocial way.[3]'

2 Social Economy Action Plan - Building an economy that works for people. (2021). https://ec.europa.eu/social/BlobServlet?docId=24986&langId=en

3 Dellenbaugh-Losse, M., Zimmermann, N.-E., & De Vries, N. (2020). *The Urban Commons Cookbook: Strategies and Insights for Creating and Maintaining Urban Commons*.

Another related model is the Doughnut Economy. This model visualises a balanced form of economic activities between the boundaries of a socially just foundation and ecological ceiling. "Between these two sets of boundaries lies a doughnut-shaped space that is both ecologically safe and socially just: a space in which humanity can thrive."



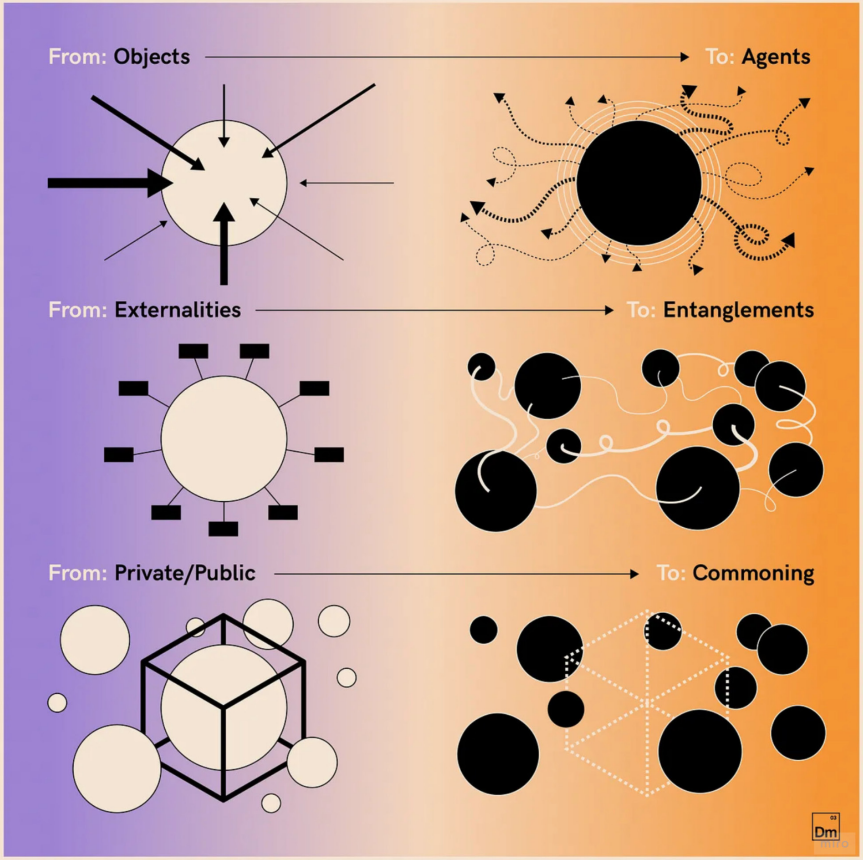
The model of the Doughnut Economy, developed by Kate Raworth (2017). Published at Wikipedia under creative commons.

Point of departure: the civic economy

Doughnut Economics proposes an economic mindset that is not a set of policies and institutions, but rather a way of thinking to bring about the regenerative and distributive dynamics that this century calls for. Drawing on insights from diverse schools of economic thought - including ecological, feminist, institutional, behavioural and complexity economics - it sets out seven ways to think like a 21st century economist in order to transform economies, local to global.[4]

Radicle Civics, developed by Dark Matter Labs[5], is a concept focusing on building new civic infrastructures that recognize the entanglement of humans and more-than-humans and centers interdependence, care, and deep democracy. In essence, Radicle Civics is a framework for reimagining civic life that moves beyond traditional structures and focuses on interdependence, care, and collective thriving. It leverages technology to enable these goals and explores practical examples to demonstrate the possibilities of a new civic economy and society.

The radicle civics thinking can be seen as hinting towards civic futures, building upon the civic protocol economy we are exploring. The three worldview shifts that are introduced reflect these futures: (1) from objects to agents, (2) from externalities to entanglements, and (3) from private/public to commoning.



Three critical shifts in worldview as described by Dark Matter Labs in 2023.

4 Last derived from the website https://doughnuteconomics.org/about-doughnut-economics, 10 January 2025

5 Described in this Medium post https://provocations.darkmatterlabs.org/radicle-civics-building-proofs-of-possibilities-for-a-civic-economy-and-society-ee28baeeec70 and also as theme page: https://radiclecivics.cc/

Point of departure: the protocol economy

Simon Kim first introduced the term Protocol Economy as a moniker for the next big transformation.[6] Others, like Franklin Templeton and Economic Space Agency, have also used the term. Sangeet Choudary has layed out an insightful overview from an economical perspective, introducing it as a paradigm shift, representing a fundamental reimagining of how economic activities are organized and value is created in the digital realm.[7]

To fully appreciate the significance of the protocol economy, it is essential to contextualize it within the broader evolution of digital economic models. Choudary delineates three distinct phases in this evolution: the pipeline model characteristic of the Web 1.0 era, the platform model that defined Web 2.0, and the emerging protocol model that is also refered to as Web3.

The pipeline model focused primarily on digitizing information and services, creating linear value chains. The subsequent platform model, exemplified by social media giants and e-commerce behemoths, facilitated user interactions and capitalized on network effects. In this model, platform owners operate as mediators, bringing suppliers, consumers and third parties such as advertisers together in multi-sided markets, playing an important role in setting the rules of engagement for all participants. Big data and algorithms play an important role in this match making process. This has brought out a platform economy, governed through the mechanisms of 'surveillance capitalism' and the centralist tendencies of 'Big Tech'.

The protocol model represents a departure from these centralized structures, moving towards decentralized, community-driven economic systems. It revolves around communities whose members come together to agree upon a common goal, and setting up a system of rules and rewards incentivising internal and external actors to contribute to the goal. These rules and rewards are translated into protocols, taking the form of so called 'smart contracts' - scripts written in computer code that can automate actions based on conditions that the community has set.

Tokens play a key role in these systems. A token can be used as stores of value, and granting holder specific rights. They can facilitate ownership, access control, and voting in governance systems. Additionally, tokens can reward community contributions or function as a form of currency.

Tokens and smart contracts are administered on a blockchain, a distributed ledger system that records transactions and keeps track of who owns which tokens in a transparent and immutable way.

These protocols can be combined by a community to set up a DAO: a decentralized autonomous organization. These DAOs consist of smart contracts that can carry out particular tasks (like buying or selling a resource depending on particular conditions, rewarding an actor with a token, or giving someone access to a resource once a condition is met). Community members also receive tokens that allow them to vote about particular issues, for instance on changing the conditions or setting the goals.

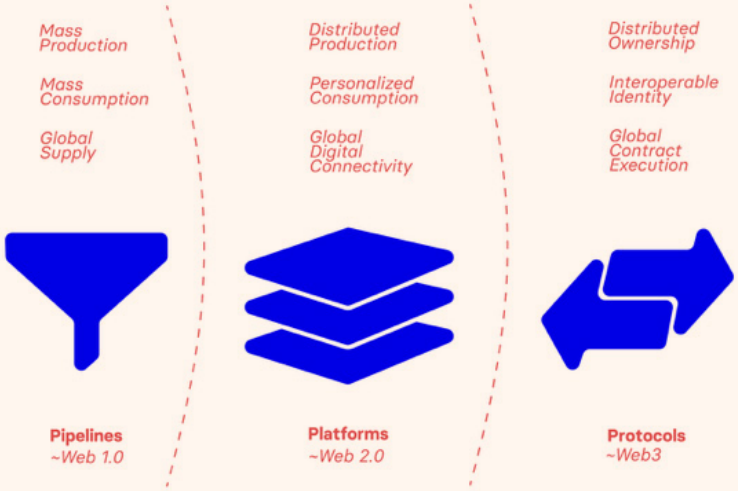
To summarize, as Choudary writes:

> *"The protocol economy is an economic system where individuals or groups can participate in economic activities and earn rewards according to their contributions. In this economic model, the community is the key component. And, in order to run this community seamlessly, an 'overarching yet sustainable token model is needed that could encourage benevolent actions and curb malevolent actions".*

6 Derived from https://www.koreatechdesk.com/will-protocol-economy-be-the-next-big-global-transformation/

7 https://medium.com/bosonprotocol/pipelines-to-platforms-to-protocols-reconfiguring-value-and-redesigning-markets-548b1fffc84

Point of departure: the protocol economy



Development towards a protocol economy, by Sangeet Choudary (2022)

The promise of this approach is that it is providing agency to communities, as communities can set their own rules of engagement. Communities in Web3 are seen as self-organized and self-governed through DAOs, tokens, and other Web3 tools. Web3 promises to shift power to the users, offering a more democratic way of organization.

This focus on communities is amplified by a shift away from centralized control by large corporations towards distributed systems. DAOs are a manifestation of this idea, enabling communities to self-organize without traditional hierarchies. Value creation and capture are distributed among participants, contrasting sharply with the platform model where value is predominantly accrued by the platform owner.

Leveraging decentralized technologies, the protocol economy introduces new approaches to value exchange and economic governance.

Point of departure: the protocol economy

An important condition for this is that Web3 is based on open protocols and interoperability between different systems. A Public Digital Infrastructure (PDI) is an example of a protocol-based economy where smaller, interoperable solutions can emerge.[8] The system would be governed on the basis of a shared set of rules and protocols for, for example, interoperability, data sharing and online identity management.

The potential impact of the protocol economy extends across various sectors. Currently experiments with web3 and protocol economies can be found in several artistic and idealistic applications[9], as well as in the more libertarian movements that see Web3 as a means to detach from government structures. In finance, decentralized finance (DeFi) protocols are already demonstrating novel models for lending, borrowing, and trading. The content creation industry could see a shift towards more direct creator-consumer relationships, potentially disintermediating traditional middlemen, however the protocols can become an intermediary in a different form, especially when agents will play an important role. In the energy sector, tokenized communities could revolutionize production, consumption, and trading practices. Governance models, particularly through DAOs, present new paradigms for organizational decision-making and resource allocation. The current examples are still in their infancy. Initiatives as Unify.energy "internet of energy" seems still speculative[10], whereas others are focused on small scale neighborhood collaborations.[11]

What could the protocol economy look like? An EU program that explores scenarios for managing future energy networks, informed the following scenario:[12]

A Protocol-Driven Energy Revolution

In 2035, citizens have come together to create an energy community consisting of a a protocol-based system that manages their energy needs. It can buy or sell energy to the larger grid, and also intervene in processes such as charging electric vehicles or altering the thermostats in people's homes, balancing their personally set preferences with the needs of the community at large. This approach proved its worth during a severe heatwave. The protocol orchestrated a community-wide response:

- Adjusted thermostats and EV charging schedules
- Dispatched stored energy from residential batteries
- Sold excess power to the grid, benefiting the community

When the system detected that a critical care facility needed uninterrupted power, it alerted human operators who intervened, showcasing the protocol's ability to recognize its own limitations. The protocol-based energy system not only averted blackouts but also reduced carbon emissions, demonstrating the power of community-driven, intelligent energy management.

8 Nesta report for NGI "Towards a Public Digital Infrastructure" https://www.nesta.org.uk/project-updates/towards-public-digital-infrastructure-a-proposed-governance-model/

9 Examples are Black Swan DAO (https://blackswan.support/) and The Spere (https://www.thesphere.as), both as artistic projects. Find more examples in the publication by Inte Gloerich https://networkcultures.org/blog/publication/artists-activists-and-worldbuilders-on-decentralised-autonomous-organisations-conversations-about-funding-self-organisation-and-reclaiming-the-future/

10 https://www.unify.energy/home-new-1

11 A few examples: https://www.hier.nu/ , https://buurtwarmte.energiesamen.nu/, https://sonnengroup.com/sonnencommunity/ , https://www.brooklyn.energy/

12 European Commission. Directorate General for Energy., Fraunhofer Institute for Systems and Innovation Research ISI., Guidehouse., McKinsey & Company., Toegepast natuurwetenschappelijk onderzoek., Trinomics., & Utrecht University. (2022). Digitalisation of energy flexibility. Publications Office. One of the cases is energy communities and peer-to-peer trading. Based on this report we came up with this scenario, assisted by NotebookLM and Claude, prompted to use the lens of protocol-based systems. https://data.europa.eu/doi/10.2833/113770

Civic and protocol economy compared

In the conceptualization of the protocol economy by Choudary, it is described as an economic system where participation and contribution form the basis for rewards, with the community serving as the central pillar setting the rules and goals of the system. This has a lot of similarities with the principles of the civic economy. Comparing their core concepts, they easily merge: decentralization, distributed ownership, community-driven, commons-based, interdependence and care, focus on values and ethics, new forms of values, public digital infrastructure, technological citizenship, beyond state and market, participation and co-production, ownership and control of data, interoperable identity. These concepts are derived from diverse theoretical sources on the civic economy and web3. In the diagram below the overlapping concepts and technologies are mapped.

Civic economy and Web3 concepts compared

However, the drivers of the protocol economy and Web3 technologies are not always clearly focused on collective wellbeing. There seems to be a thin line between aiming for collective goals and disconnecting from public and societal responsibilities. The technologies can be applied both to empower complex commons structures as well as to build speculating, disconnected communities. We should acknowledge this when we are using the technologies as materials for building commons, being very clear in the principles and application. This is one of the key topics to shape design principles and guidelines.

Redefining the protocols in protocol economy

The evolution of the concept of the protocol economy is closely linked to new ownership models and decentralized governance, driven by Web3 technologies such as blockchain, smart contracts, tokens, and DAOs. This feels as a solid foundation but it can also distract from more fundamental issues. As Venkatesh Rao formulated it at the introduction of the Summer of Protocols 2024: *Protocols are not a class of technology. They are a way of doing and seeing technology in relation to humans and the environment.*[13]

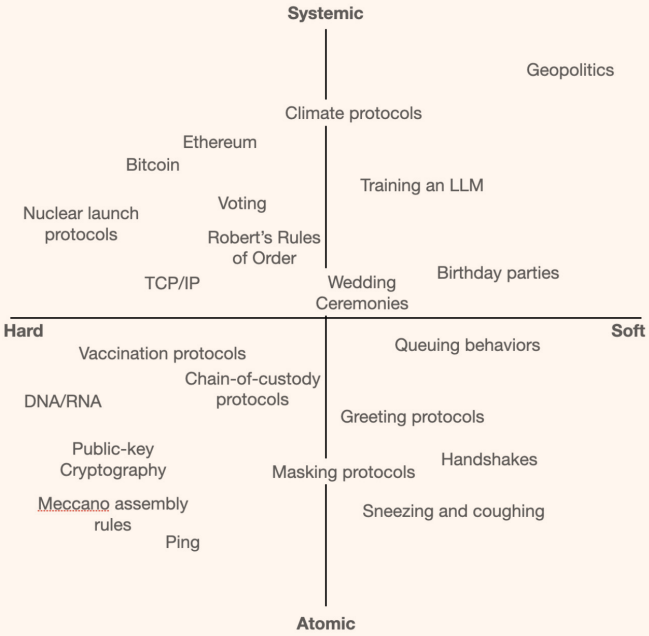
13 As presented in Plenary Talk 2024 Protocol Symposium https://youtu.be/ycSPyh8-G94?feature=shared

Civic and protocol economy compared

What then are protocols? Back to the basics, the definition of a protocol is: "a system of rules that explain the correct conduct and procedures to be followed in formal situations"[14]. Protocols serve as a framework for structuring relationships, making activities both open for input and predictable and manageable. Protocols are shaping a framework for conversations, for mutual understanding and shared goal setting. In another article made for the Summer of Protocols 2024[15], the capabilities and characteristics of protocols are introduced. The authors use this definition for protocols:

> *A protocol is a stratum of codified behavior that allows for the construction or emergence of complex coordinated behaviors at adjacent loci.*

Two basic dimensions are introduced: hard to soft and atomic to systemic. Hard protocols are rigid, not able to adapt to the situation, while soft protocols are more flexible both in judging and over time. Atomic protocols are mono-functional, have only one job to do, while systemic protocols are in fact a bundle of co-working protocols. In the figure below are some examples plotted:



A sampling of protocols based on two characteristics[16]

14 https://www.britannica.com/dictionary/protocol

15 Published online https://venkatesh-rao.gitbook.io/summer-of-protocols "The Unreasonable Sufficiency of Protocols"

16 Taken from https://venkatesh-rao.gitbook.io/summer-of-protocols

Civic and protocol economy compared

Protocols can have different applications, take different roles. In a cultural setting protocols describe habits, ways we do things and what we expect from others. These protocols can change over time as they are interpreted differently depending on the situation or interaction.

A second category of protocols can be described as legal rules, as formal contracts that we use to structure our societal behavior, that have a governance structure with neutral third parties like judges.

The third category is the most rigid: protocols that run systems and form the code of the software. If these protocols are not followed or are broken, the system's function will fail. Once in use, these protocols are non-negotiable and typically defined for long periods.

The article builds ten dimensions of sufficiency for protocols, to recognize the complexity and adaptability of protocols, but also indicating how much the design of a protocol system matters. These dimensions and the questions they incur, can be a helpful framework for diving deeper in designing protocols that support civic economic behavior.

1. Generative; *What determines the generativity of a protocol, and how does that generativity change over time?*
2. Legible; *What are the best metaphors for talking about protocols?*
3. Stewardable; *What are general principles of good protocol stewardship?*
4. Evolvable; *Can protocols be made evolvable enough to keep pace with the problems they target?*
5. Legitimate; *What makes a protocol legitimate?*
6. Constrained; *What are the important limits and constraints of protocols, and to what extent can these limits and constraints be significantly shifted over time?*
   Learnable; *What makes for a strong culture of literacy around a protocol, and how can one be created around a new protocol?*
7. Ludic; *How do protocols create meaning through play?*
8. Defensible; *What is the nature of the balance of power between attackers and defenders of a valuable protocol, and what maintains it?*
9. Mortal; *Can protocols be immortal, and if not, what determines their natural lifespans?*

The authors see protocols as a key way of understanding and designing for society, with currently a particular momentum for digital protocols. Their design will induce shifts in behaviour and ownership in our society, with both challenges and opportunities to support civic economies.

Programme for a Civic Protocol Economy

How then, do we go about designing a civic protocol economy? To explore that question, we have carried out a high-level literature review supplemented with expert interviews, and a roundtable discussion to gather diverse perspectives on emerging Web3 technologies and their potential civic applications. From these explorations, a 'programme for Civic Protocol Economies emerged'.

In this programme, Civic Economies are understood as:

1. Relational (local) economies,
2. That are governed by its participants,
3. Who are represented through digital identities.
4. They take into account externalities,
5. And are partially managed and operated by digital agents (DAOs).
6. Whereas its development can be lined up with other policy goals, such as the 'digital autonomy' agenda.

1 Relational economics

Introduction

All economic activities have both a transactional and a relational character. Proponents of a civic economy argue that conventional market systems reduce participants to abstract economic actors driven by profit, with market value taking precedence in transactions, often resulting in exploitative practices. In turn they propose to restructure economic activities around alternative values, including the strengthening of social relations between the participants in an economy.

Shifting the focus from transactional to relational drivers in economic systems emerged as a central theme in the interviews and roundtable discussions. It also serves as a guiding principle in the civic economy and shapes protocol-based value exchanges. These various ideas align well with the notion of plurality in economics.

Plurality in economics

The notion of plurality in relation to the civic economy emphasizes the plurality of economic forms of life, recognizing that economies are always plural and contain diverse forms of economic organization, exchange, remuneration, finance, care, and ownership. In the collaborative project and book Plurality, a model is built for "a future of collaborative technology and democracy". Compared to the plurality in economics described by Gibson-Graham as diverse economies, this perspective emphasizes non-capitalist systems, alternative market activities, and alternative finance. In other words, plurality in economics, according to the diverse economies approach, is not just about the presence of different economic activities, but also about the active recognition and valuation of these activities as meaningful and potentially transformative alternatives to the dominant capitalist system.

The authors argue that plurality is not just a social or political concept, but also an important economic one. A civic economy, according to these sources, should be built on the principles of collaboration, diversity, and participation, and should utilize technology to empower communities and promote shared prosperity. The concept of plurality is presented as a framework for creating a more inclusive and democratic economy that serves the interests of all members of society.

Mandelas versus machines

There might be an insightful link from plurality with a concept Venkatesh Rao is writing about in an essay in which he reflects on two viewpoints to approach current society: mandelas and machines. "Mandalas, exemplified by Thai society, prioritize human relationships and care, while machines emphasize knowledge acquisition and technological advancement." A healthy society balances these two. In the neoliberal market economy the machine is a dominant concept. The Mandela is rooted in old social traditions and based on 'humanics'; values derived from relationships, conflict, honor, harmony, and social stability. For Rao, building societies based on Mandelas are preferable, but it also comes with scaling problems. Therefor a new machine is needed that has a balance baked in:

> *"The new societal machine should be seen as a "contraption," a complex, imperfect, and constantly evolving Rube Goldberg machine, rather than a monolithic, perfect entity."*

These systems should strengthen community bonds and create common value by prioritizing relationships over mere transactions

Tension in relational and transactional practices

Different interviewed experts mentioned the tension of transactional and relational practices when aiming for community and commons based systems. TU Delft is involved in several applied research projects located near the Johan Cruijf ArenA. In one of them they explore building a digital currency system in collaboration with providers of a social currency. The LIFE project (Local Inclusive Future Energy) is experimenting with LEMS (Local Energy Market Systems) and experiments are performed on creating a local market with tokens, aiming to stimulate relational giving. With the tokens specifically energy services can be 'paid', based on activities. There is an aim in the case to build a relational energy ecosystem, through connecting energy actions as a form of giving services within the neighborhood. The (local) tokens can be used for receiving energy (discounts), supporting local activities and potentially discounts on local goods and services. The researcher observes that, in the evaluation, individual transactional motivations may still play a significant role. Achieving the intended community-based outcomes depends on careful design that addresses the needs of vulnerable residents and fosters a sense of collective purpose and benefit.[17]

One of our respondents pointed out that such systems could also contribute to a social divide. Especially when it is mostly low-income groups who are rewarded for their volunteering work through a social currency, and it is mostly high-income groups who take part in the energy community. She hopes there is a way to solve energy poverty through real social structures. She sees a model for relational based systems with transactional systems in the background as a preferable solution.

17 Details on the case can be found in the master theses of Victoria Toellner, via https://repository.tudelft.nl/record/uuid:51f0b20d-da6c-4ae7-b467-ae3f1c3af490

2 __That are governed by its participants

Introduction

In civic protocol economies, the community members have the agency to set the goals, values and rules of engagement for their systems. The governance model consists of the protocols that allow for this power. Inspiration for their design can come from various existing governance models that support democratic takes on collective well-being, such as those found in the commons.

Ownership

One of the key design questions for civic protocol economies is ownership. What resources in the economy are privately owned, and which ones are collectively owned and managed? Commons are organized around shared resources that are collectively managed and governed, but they do not exist outside of private ownership or markets. In its most archetypical form, the meadows are governed as a collective resource, but the sheep that graze there as well as their yield (meat, wool, milk) are privately owned and can be exchanged at the local market.

Another angle is a new legal organizational model that is based on the beliefs of post growth entrepreneurship (PGE) and fills in the role of steward ownership. PGE and steward ownership will become an official legal entity in the Netherlands[18], opening up possibilities to organize companies with other -mostly public benefiting- goals, within an overarching market economy.

Deliberation and decision making

Another question revolves around the actual process of decision making within a civic protocol economy, and the opportunity for organising a public debate around the themes involved. Various parties have experimented with quadratic voting as a tool for both decision making and informing the debate. In a quadratic voting system, participants can express their preferences for or against various options by allocating a number of credits towards that option.

Once a decision is made, the question is how mutable it is. Which decisions are hard coded into smart contracts, and can they still be changed at a later stage? What options are there to negotiate, or contest a particular protocol in play?

Scale

Commons are leveraging powers for local economies and the combination of commons can make great impact in realizing necessary transformations like in energy systems. There is always one potential drawback that prevents systemic application of commons; the complexity does not scale easily in commons governance structures. This is where we hope to have civic protocol economies play an enabling role to create a difference.

One of the promises of the protocol economy is that it can scale up civic economies, by automating certain interactions and relations into protocols, but to what extent does such a scaling up undermine the social dynamics of a community at a local level?

18 https://wearestewards.nl/motie-rentmeestervennootschap/

3 __ Who are represented through digital identities

Introduction

With the use of digital technologies to support the dynamics in a civic economy, the concept of digital identities need to be discussed. What is the role of identity in a civic economy, and what will happen when more complex systems require a form of delegation and automation of decision making?

In a civic protocol economy, actors are represented through one or more digital identities. These identities can be linked to wallets, containing tokens representing rights and values that enable participants to act, or the other way around: tokens can be earned through particular activities.

Digital identity systems must balance security, privacy, and human complexity while enabling new forms of economic participation that preserve personal autonomy.

Digital Identities, disposable identities

In a new civic economic system, where individuals are not merely economic subjects and have ownership over shared resources, we must find ways to separate economic identities from real identities. However, to foster community engagement, this separation should not be too extreme. There are methods to create temporary identities (disposable identities), and in automated systems the concept of Self Sovereign Identities (SSI) is mentioned as an approach that becomes a standard for ensuring data ownership and control by individuals. SSI are creating a personal data vault that can be used for providing only the necessary credentials for identification[19]. Lastly, it is very relevant to create a structure where identities can be both human and non-human, as also no-human actors need to be represented in the civic protocol economy, both as active agents, or to protect negative externalities on their behalf.

We need a form of disposable identity that is aimed both at securing individual agency as supporting collective goals. The book on Plurality views digital identity as a complex issue requiring a move away from centralized, monolithic systems toward a more pluralistic, decentralized, and networked approach that recognizes the multifaceted nature of identity. It advocates for systems that can both establish identity securely and protect privacy and that are rooted in social relationships and communities, not just technological solutions.

The book proposes a pluralistic approach to digital identity that leverages the concept of intersecting social circles and relationships. This approach emphasizes that individuals are not just biological beings but also sociological beings: identities are multifaceted and should not be reduced to a single point of verification.

19 https://en.wikipedia.org/wiki/Self-sovereign_identity describes the concept. Application examples are https://www.tno.nl/en/technology-science/technologies/self-sovereign-identity/ https://twinds.org/

4 — They take into account externalities

Introduction

The literature suggests that externalities are a major flaw in the market economy, which fails to account for social and environmental costs. The civic economy, with its focus on community, collaboration, and sustainability, offers a way to revalue these externalities and create a more just and balanced economic system. This requires a shift in values, new forms of economic organization, and an emphasis on collective well-being rather than individual profit.

Instead of viewing externalities as separate costs, value could be seen as relational and entangled with the world. This means recognizing the complex system of relationships, such as the value of a tree as a habitat, and incorporating these values into the mechanisms steering economic activity. Because the costs of externalities are not included, the product is likely destroying more value than it creates.[20]

20 Indy Johar of Dark Matter Labs is referring to this value issue in public speaking like a podcast "A Deep Dive" https://www.thedeepdivepod.com/209. In the article on Radicle Civic the concept of externalities as entanglements is explored https://provocations.darkmatterlabs.org/radicle-civics-building-proofs-of-possibilities-for-a-civic-economy-and-society-ee28baeeec70

Various types of externalities

In "introduction to common economics" the authors investigate the hypothesis "in commons-based economics, value does not derive from scarcity or labor input (commodity-driven), but from contributions to common value for humans and the web of life"[21]. They introduce four types of externalities as part of developing more contributory accounting mechanisms. The four types can be criticized, but open up thinking.

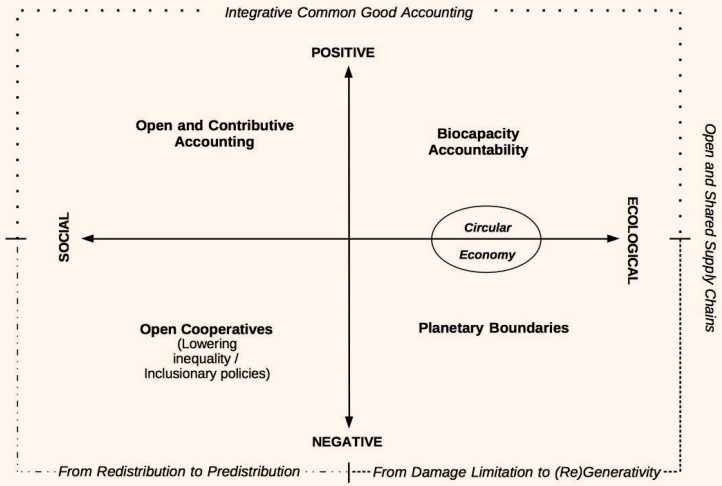
Positive social externalities: Like community-maintained open source software that creates value beyond their direct contributors, in community based economic systems, let's say an energy commons, the knowledge developed within the community can benefit other communities.

Negative social externalities: The erosion of community resources and social fabric when creating local commons-based systems. For instance, ride-sharing platforms replacing community-organized transportation alternatives while externalizing worker security costs onto society.

Positive ecological externalities: Commons-governed natural resources that generate broader ecosystem benefits. For example, community forests managed through traditional commons arrangements that maintain biodiversity and carbon sequestration services and benefit the wider society.

Negative ecological externalities: The depletion of common-pool resources when systems fail to account for ecological limits. For instance, when community-managed fisheries maximize short-term yields while depleting fish stocks that had been sustainably managed under commons governance for generations.

21 https://wiki.p2pfoundation.net/Introduction_to_Commons_Economics



Four kinds of externalities and the position of the civic economy according p2p foundation[22]

Current-sees to capture structures and flows

A promise of the lens of protocol economy to the civic economy is the possible addition of a layer of management data that is shaped for insights in value flows. This should especially work for mastering the externalities. The concept of current-sees can be taken as a point of departure to develop a way to make the hidden flows of value exchange tangible. Current-sees can be understood as status indicators or tokens that describe the actual state of a system or an actor in it, in comparison to an ideal state. E.g. the current-see of a rivier could express the water quality and its ability to foster a diverse ecology of various creatures.

Such an indicator could be incorporated into the mechanisms of civic protocol economies, making the costs of externalities visible, incentivising positive contributions to a desired goal.

In Arthur Brock's Medium article, "The MetaCurrency Myth", a fictional narrative is introduced, describing a future where humanity overcomes environmental and social crises. The story highlights the development of "current-sees", new forms of currency beyond money, which facilitate cooperation and resource management. In "Community Currencies", Marcus Petz is defining current-sees as offering a framework for understanding and managing the movement of various capitals within a community or commons. He emphasizes the importance of transparency, community involvement, and ecological awareness in creating resilient and sustainable economic systems. They are also described as the way that agreements are embodied for what is valued and how people interact around that value.

Elements of current-sees are: flows, visibility, mediation, community focus, ecosystem, commons, pattern language, monitoring and balance, transparency, community of use.

22 https://wiki.p2pfoundation.net/Introduction_to_Commons_Economics

4 — They take into account externalities

The current-sees can be used as a lens on the flows of value in a system like commons. (Petz, 2023). It feels like a concept for supporting the thinking about civic protocol economies, and we will explore a bit more in the next chapter. It is one of the key elements for future research and design activities into a solid civic protocol economy.

In a provocation on the future of governance[23], Johar is describing the current-sees as a collective sensing capacity. He describes a learning infrastructure, "perpetually learning from its interactions, recalibrating its protocols, and iterating its processes in response to new insights, emergent challenges, and unforeseen consequences." This connects to the fifth of the five orders of design of Mortati[24], a learning environment of human and non-human actors. Combining these actors opens up the thinking about the role current-sees can play in understanding the civic economy that is catering for 'radical plurality' as Johar frames it. Bringing this home into a workable suite of protocols to support civic economies, might be the primary goal.

Civic protocol economies incorporate externalities into decision-making through new metrics like "current-sees", making hidden value flows visible and enabling holistic economic practices.

23 Johar, I. (2025, 01). Governing Tomorrow Outlining the Long Arc of Governance.

24 Mortati, M. (2022). New Design Knowledge and the Fifth Order of Design. Design Issues, 38(4), 21–34. https://doi.org/10.1162/desi_a_00695

5 — And are partially managed and operated by digital agents

Introduction

Automation through agents plays an important role in the civic protocol economy. Currently this is manifested in the emergence of DAOs (Decentralized Autonomous Organisations): sets of automated protocols that are governed by a community. But this automation brings out a number of design considerations that will become even more complex with the rise of agentic AI. It introduces new questions; will such agents force the individual interests that are so present in current society, or can they become a proxy for collaborative and common based governance?

Agentic management and operations

Delegation of agency is a key element in all kinds of managed services. This is not exclusive to the new development of agentic AI, or to DAOs. The relation of the client and the advisor in financial services can be seen as a signature model of delegation levels, that is part of every service level agreement, and is played out both in human as in automated financial services. In financial services, three levels of delegation in decision making are distinguished.[25] The levels are (1) fully self-directed by the client, (2) fully delegated to the advisor, and (3) the validator, decision making in dialog between advisor and client. To define the level of delegation, the need and wishes are translated in scripts and standard forms. This framework can be translated to the model of decentralized autonomous organizations, as it is in automated financial services. The relation with the autonomous organisation is played out in the voting system.

An important draw-back of these DAOs is so-called voting fatigue; the members need to make too many decisions and feel less engaged. Agents might be introduced to delegate the decision making too, as an extra delegation layer.

Delegation plays on another level than agency or ownership. Agency and full delegation seems contradictory, but are very possible if we can trust the agents to consult us when needed. We need trust in the systems, especially if we are delegating more and more to the execution. What if we can delegate personal interests to a self-directing AI replacing or steering the autonomous organizing behavior?

The concept of contestability in AI[26] can inspire us to think on building trust in agentic management. Contestability is defined by Alfrink as AI that is open and responsive to dispute, throughout the system lifecycle, establishing a dialogical relationship between decision subjects and system operators. In line with his latest insights on "beyond contestability", there seems to be a direct relationship with civic goals: "design systems that shift AI from individual consumer products to collectively governed public infrastructure."[27] Which links to multistakeholder actors and decision makers in decentralised autonomous systems.

25 The original source for this widely used "Forrester Classification of Self-Directedness" is hard to find, but well described in this master thesis: https://research.tue.nl/en/studentTheses/customer-acceptance-of-interactive-recommendation-agents

26 Alfrink, K., Keller, I., Kortuem, G. et al. Contestable AI by Design: Towards a Framework. Minds & Machines 33, 613–639 (2023). https://doi.org/10.1007/s11023-022-09611-z

27 Alfrink, K. (2025, March 6). Contestable AI: Building Democratic Control Over Public Artificial Intelligence [Invited public lecture]. CMDonderdag. Communication and Multimedia Design Amsterdam. The Netherlands. https://contestable.ai/wp-content/uploads/2025/03/contestable-ai-hva-cmd-cmdonderdag-20250306-compressed.pdf

Multistakeholder actors and decision makers

What is the preferred path and role for the potential appearance of agents? Especially in complex civic economy structures that deal with multi-stakeholders and layered services, like energy services, it will become the default that non-human actors take their own role in the ecosystem. This can be designed as an extension of the human role, but another option is that these agents will create their position, represent other stakes or even get a self-regulating role. The balancing of all interests in a civic economy will be even more complex, and with that, more interesting for designers to develop a way to model these agentic actors.

Scale and complexity of the domain is therefore an important driver. The protocol economy is shaped with rather abstract concepts that can provide delegation of certain mechanisms. This only makes sense for complex systems and communities of larger scale that feel the need to delegate decision making to be able to handle systems of resources and services based on social relations.

As we have seen in the introduction of protocol economy, the mechanism of an organisation is translated into automated executed protocols, with guardrails based on agreed rules and priorities. It tries to capture complex organisational structures into technology, creating ownership from hyper transparency in decision flows, and using derived concepts as self-sovereign identities. If executed with the right intentions it could create a just governance system and execution, but it will introduce complexity as an unavoidable offset. Design can help, but it is key to build in not only embedded guardrails and contestability systems, but also and especially make it tangible and easy to grasp and master for all involved in the community.

Non-human agents

The role of non-human actors has become more and more important, something that has been happening for a longer time, but is now becoming a hype with the focus on agentic AI. Agents can not only be specific functions that deliver output, agents can also be representatives of other voices that are often unheard. Both human as non-human. The adaptation of current-sees (see above) is one way in which non-human actors can be provided with agency in a civic protocol economy.

A potential future direction in this process is the agentic role of the resource. A resource itself could play an active part in the process. Adding a service layer to the resource that plays out the interactions between the resources. Credit systems that stimulate use of resources are a first possible example. The resource's level of self-direction may become a reality sooner than expected. The thinking of this system as a protocol economy helps to create governance that is built on dynamic 'contracts', protocols that describe the expectations and promises.

Digital agents and DAOs manage increasingly complex economic systems, raising critical questions about human-algorithmic governance balance and ensuring value-aligned, transparent, automated decisions.

6 __ Its development can be lined up with other policy goals, such as the 'digital autonomy' agenda

Introduction

This explorative research started with the question what the civic economy and protocol economy would look like when the foundational principles are connected. One of the first conclusions was that the protocol economy can be considered in different ways. Point of departure was the lens on a new iteration of the internet infrastructure, both in technology as in governance. Interest in Web3 technologies surged after COVID and became a major topic among technology thinkers in 2022. However, attention shifted as generative AI, particularly transformer models and large language models, took center stage with the late-2022 launch of ChatGPT, making AI widely accessible. It turned out that this shift has had more societal impact than the decentralizing and new ownership models that Web3 is promoting. The technology is still there though, and has been developing while used by specific groups of users. The opportunities for decentralized structures and communities are supported by technologies that organize ownership and governance differently.

The experts on web3 technologies and applications agree that there was a boom of interest in the promises of the technology around 2022 and the technology is now more in the background. While cryptocurrencies and their role in the financial system receive significant attention, particularly due to political developments in the U.S., the focus here is on long-term shifts toward the read/write/own economy and its supporting technologies. If we would follow the framing of the Gartner hypecycle, Web3 would be over the peak of inflated expectations, and also passing now the trough of disillusionment, potentially on the verge of entering the slope of enlightenment. There is no guarantee for entering that phase and it is just as likely that the technology as a concept on its own will not succeed as earlier technologies that drove web 2.0 and 1.0.

Challenges for adoption

The reason the technology has not taken off yet is its complexity and the fact that it is hard to understand. The complexity is even more problematic as it creates a paradox; the goal is to bring more engagement via ownership to the communities by its members, and at the same time, people in the community find it hard to grasp what barriers their engagement. A key part of Web3 principles is the organizational governance structure of a DAO, a Decentralised Autonomous Organisation. Multi-stakeholder decision-making is important for trust in an institution. This was the promise of Web3, but there are not many top-of-mind examples.

The protocol economy built on delegation to automated and agentic systems is not without its challenges. Regulatory uncertainty looms large, as the decentralized nature of many protocols challenge traditional regulatory frameworks. The technological complexity of these systems presents a steep learning curve for average users, potentially limiting widespread adoption. Moreover, as with any new economic model, questions of equity and the potential creation of new forms of inequality must be carefully considered.

As Choudary astutely observes, "For all the talk about decentralization, this shift is less about equity and more about value. We're still in the early innings of a massive shift. One thing remains certain; the new value will be created, configured, and captured differently from the old." This observation underscores the transformative potential of the protocol economy, suggesting a fundamental reconfiguration of value creation and distribution in the digital age.

As the examples show, the civic component is not automatically linked to a different ownership structure and agency model. The protocol economy might represent a paradigm shift in how we conceptualize and organize economic activity in the digital realm. Its potential impact extends beyond locally organising resources like energy commons, but potentially reshaping industries and redefining and rebalancing the relationship between individuals, communities, and economic value. That is at least the ideal often linked to building

6 — Its development can be lined up with other policy goals, such as the 'digital autonomy' agenda

new societal infrastructures upon technologies and concepts associated with Web3. As we navigate this transition, it is imperative to carefully consider both the opportunities and challenges presented by this new economic paradigm, ensuring that its development aligns with broader societal goals and values. The protocol economy may well be the harbinger of a new era of digital economics, one that prioritizes community, contribution, and decentralized value creation. This might be seen as the logical result of introducing the new iteration of web3 infrastructure proponents; it still needs a deliberate design of the protocols.

As we concluded, viewing the protocol economy through a different lens offers valuable new perspectives. The power of protocol-thinking lies in reimagining commons-based economics, making them more resilient in complex systems, scaffolding governance in digital ecosystems, and providing insights into value flows through concepts like current-sees. Building a toolkit to support a civic protocol economy requires the right blend of protocol design and enabling technologies that facilitate community collaboration. Beyond the tools offered by Web3—such as DAOs, digital identities, and token economics—the rise of agentic actors in the commons presents an opportunity for further exploration and development.

A societal driver in the short term from both users as politics, is the attention to digital autonomy on multiple levels. The discussions in both national debates and programs, as in the EU[28], can foster the need for robust civic protocol economies that define human and non-human autonomy in commons-based societal structures. This works both ways, as the agenda towards digital autonomy will benefit from the (future) developed recipes for the civic protocol economy.

Aligning civic protocol economies with broader policy goals can drive adoption while ensuring these models contribute to wider societal objectives.

28 The digital commons has special attention, which is an aspect of what we discussed here. https://openfuture.eu/publication/from-open-access-to-collective-governance/

Designing a Civic Protocol Economy

How could design contribute to the establishment of civic protocol economies? The question we address is not so much how to apply the technologies specifically, but to think about civic protocol economy from a design perspective. That means understanding civic economy as a system of interacting components that each can be designed from a values-based perspective, but always with consequences for how the other elements will function.

Based on the conversations and literature, we created a draft model establishing the various components of a civic protocol economy, as well as highlighting their relations. It is a functional sketch of an engine for civic protocol economies, applied by communities that are operating within that economy.

Modeling concepts and components

Point of departure for this model are the following principles:

- The civic protocol economy serves a community, consisting of human and non-human actors, and includes a number of resources or services that are produced and/or consumed by the community.
- This system interacts with external actors and communities with various logics (e.g., that of the market or the state).
- The community has defined the base values, rules & rights that underlie the mechanisms of their civic protocol economy. These mechanisms consist of (automated) protocols that afford exchange and (de)incentivize behavior contributing to the system's goals.
- These mechanics operate automatically until their democratically defined thresholds are reached, triggering a new decision-making process.
- Actors are represented in the system through one or more digital identities.

The model consists of concepts that are also present in a 'normal' (platform) economy: the core process of bridging supply (resources) and demand (needs). Traditionally, an economy is usually described with the metaphor of the 'invisible hand' where market mechanisms match demand and supply, and currencies are used for the valuation of products and services as well as a medium of exchange, and value storage. Of course, in reality, the hand is not completely invisible. Free markets are designed too, as they keep to certain rules and are regulated by various institutions, who can set conditions about what is and is not allowed, and sometimes also set minimum or maximum prices, or levy tariffs (e.g., excise duties). Externalities, however, are usually not taken into account, unless the regulator includes them in the market conditions.

The civic protocol economy is more complex, with value-based mechanisms explicitly set by the community at its initiation, which influence the 'invisible hand' matching supply and demand. The model also includes third parties, in different roles. Some may act as facilitators or mediators, others may suffer (or benefit) from the externalities produced by a transaction. More importantly, the transaction is not only mediated through a currency, but also through additional media such as tokens that administer rights, and 'current-sees' that indicate the current status of the actors involved. When we take this apart, we see the following elements: communities with actors, agents, transaction protocols, governance protocols, values, currencies, tokens, and current-sees.

Communities and their members

The civic protocol economy aids a particular community in organizing their economic activities from a perspective of communal welfare, based on their own values. This community can be pre-existing to such a system or emerge from it. It can be closed or open, and both humans and non-human actors can be members of a community. In most cases, there will be protocols in place for new members to join the community, and the criteria for that also need to be established by the initiators. Members of the community are represented through one or more digital identities, taking on various roles. For instance, a human participant can have various digital identities, one for his professional life, another as a volunteer, and yet another for his private life.

Agents

When engaging with the system, we can think of community members as agents with a specific role, represented by their digital identities. Every transaction has at least three and sometimes four agents involved, and they can be both human and non-human. The first two are those who have something on offer, or contribute to the system (supply), and those who may need or want something (demand). The third and fourth types of agents are external parties. They can be affected by the transaction and suffer or benefit from its externalities. They can also play a facilitating or mediating role, for instance, a doctor who can refer a patient to a particular care provider, or a person who is qualified to vet a transaction by some preset criteria. Think of it as the protocols in an economy that are not set in code, but need an intervention from a human agent with a specific expertise, official role, or other quality.

At various moments in time, participants in the system can take on any of these agentic roles. Sometimes a participant may want to make use of a service like a shared car, and at other times, they can offer their time to the local community center. Similarly, a local forest or park can offer its services - e.g., as a place to hold a festival. Still, it can also be a third party that is affected by exhaust fumes from cars, or a contextual factor, e.g., renting boats is only allowed when the water quality in the river is up to a certain standard.

Transaction Protocols

The transaction protocols describe the primary rules for exchange within the system. For instance, they describe the conditions that need to be in place for a transaction to take place, or the maximum or minimum rewards that can be gained from a transaction. For example, a particular product or service can only be sold to agents in a set identity category, or a service can only be offered when a particular external condition is met (e.g., regarding the ecological state of its surroundings). Particular agents can be given priority, or priority or discount tokens may be earned by contributing particular kinds of voluntary work, etc. These are typically programmed at the onset of a new system, based on the values of a community. Within such frameworks, agents may be given the power to adjust the settings within protocols based on their individual preferences, e.g., they only accept rides in a car that is charged by renewable energy. Or their service is only available at particular times in the week. These transaction protocols can be coded in such a way that the system makes use of intelligence and data gathered by the system. For example, based on previous activities, the system could predict when energy demand is likely to be high or low. Or it could estimate what upcoming weather conditions could ameliorate possible environmental pollution, and adjust the system accordingly, by adjusting pricing, rewards, or demanding specific right-tokens.

Governance Protocols

While many of the conditions may be designed into the protocols of the system, others may be deliberately left open. When such a situation occurs, the system could invite agents to take a vote. For this, voting-right tokens can be distributed by the system; these could automatically be administered to all agents, or they could be earned through their participation in the system, or the effect that the system has on them. These governance protocols can take many forms, from one-person one-vote to representative systems to quadratic voting.

Values

Both transaction and governance protocols are value-driven and aimed at collective welfare. What differentiates the civic protocol economy from the protocol economy at large is that communities have the ability to set their values and embed them in the transaction and governance protocols that govern their economic system.

Currencies

Just as in the ‘normal economy’, civic protocol economies make use of currencies that serve as a storage of value, an indicator or expression of value (the price of a product or service), as well as a medium for exchange. It is possible that there are multiple currencies that may or may not be convertible to one another. E.g., volunteering work could earn a participant a number of points that can only be spent on certain activities, holiday home-exchanges could be administered in guest points that are only redeemable for other home-exchanges, etc.

Tokens for regulating rights

Next to currencies, a (civic) protocol economy could also distribute tokens that represent particular rights or privileges. These could be the right to vote, to gain priority, to use a particular resource under a particular exemplary condition, etc. These rights may or may not be distributed equally to all participants, earned through certain activities or conditions, and/or traded for currencies. Regardless of the price expressed in a currency, transactions can be programmed to only take place if one or both of the participants hold or spend a particular rights token. Similarly, such tokens will give participants a right to take part in the decision-making process coded into the governance protocols.

Current-sees

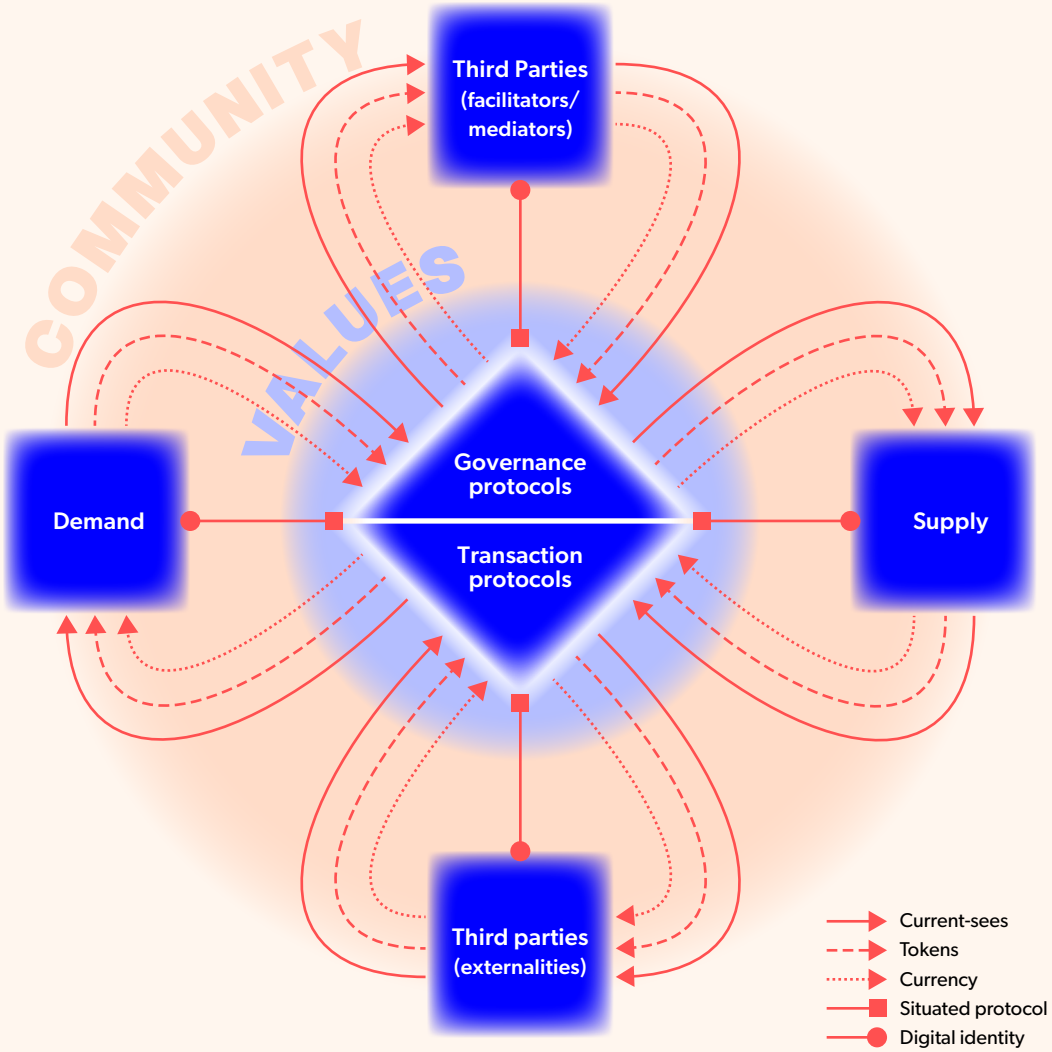
Current-sees are a third parameter or medium in civic protocol economies. Current-sees register the status of an agent or resource, and this status can be compared to a threshold or ideal level. They can be informed by sensor data, by input from agents in the system (as in reputation-systems), or by an analysis of previous behavior. They could be introduced as indicators of the degree to which the system operates at a desirable level. These could include predictive capabilities, showing the direct consequences of decision-making by automated and human-made decisions. As such, current-sees can be operationalized as steering data informing decisions or incentives. For instance, when a local park needs maintenance, the system can start rewarding participants who are willing to take care of the park, either through a reward in a currency or in right-tokens.

The civic protocol economy: an active evolving system

This model represents the core principles of exchange of value, in combination with the means for steering on civic values, operationalizing token economics to have a thriving community that is generating value for everyone participating, as well as external stakeholders.

In the mechanics of the civic protocol economy, the protocol is the point of departure for the execution, built upon value exchange and continuous insights. The mechanics use rules & rights as defined by the community, operationalized through the tokens connected to actors. The value exchange is represented through currency. Activities create the feedback loop into the mechanics, and through the status messages, insights are updated and translated into current-sees that can be used in execution and reference for the protocol.

Modeling concepts and components



Community-initiated value mechanisms and diverse operational 'media' create a rich complexity in civic protocol economies that transcends traditional economic models.

Design considerations

As a point of departure we have translated the discussed themes in a couple of design questions to shape the civic protocol economy.

Relational economies & their mechanisms

- **How can we design economic systems that prioritize relationality and care over purely transactional practices?** This involves shifting the focus from profit-seeking motives to strengthening social relations within an economy.
- How do we translate the principles of a civic economy, such as **collaboration, diversity, and participation, into technological concepts?**
- How do we **translate values into protocols, mechanisms, and interfaces?** This includes exploring tokenization, current-sees, reward systems, reputations, and rights within the system.
- How can a civic protocol economy make use of the **mechanics of plurality in an economic system**, combining the human condition, in a connected society, with technology for collective diversity? What makes technology become a stimulus for collective diversity?

Governance

- How can we design agentic systems that enable and stimulate **democratic governance and participation** in decision-making processes? What role play new forms of ownership, that are collective and managed through new forms of governance?
- How do we design systems that **foster trust** in both human and non-human actors?

Representation & digital Identities

- What kind of **digital identities** should be implemented to represent participants in the system? How can these identities be used to both establish identity securely and protect privacy?

Externalities

- How do we design systems that can account for and **manage externalities**, particularly social and environmental costs that are often ignored in market economies? What role can the concept of **'current-sees'** play to make hidden flows of value exchange tangible?
- How can we create systems that **balance the interests of multiple stakeholders** and make decision-making tangible and easy to grasp and master for all involved?

Design considerations

Automation & Agents

- What is the role of **digital agents and DAOs** in managing and operating a civic protocol economy? How can these agents be designed to promote collaborative and common-based governance?
- What are the best ways to **design for agency**, considering the action perspective for individuals within the context of collective interests?
- How do we address **the tension between the agentic ontology** of the protocol economy and the **relational qualities** that are central to the civic economy?
- What will be the impact of voting technologies on the openness of the communities? What will new technologies as **prediction markets** or **quadratic voting** mean in a commons context?
- Could **AI agents** play a role in facilitating more flexible and adaptive governance structures? Just as AI assists doctors in making more informed diagnoses, could it help communities navigate complex decision-making processes, breaking down barriers and reducing the need for overly rigid structures?

Agenda-setting

- What are the **key functionalities and building blocks** needed for a civic protocol economy, and what is the roadmap for its development?

To conclude

When taken together, these questions highlight the need for a holistic approach to designing civic protocol economies, considering the interplay between technology, social values, governance, and economic principles.

What they also highlight, is the need to now move from theory to experiment. We hope that this exploration provides some inroads into the development of prototypes that further explore the viability of a civic protocol economy.

Appendices

Additional reading

Along the exploration we collected several reports, articles and more that can be a start for further exploring and reading.

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List of organizations

During the exploration we kept track of all examples of initiatives or organsiations that can inspire elements of a civic protocol economy. We think it is valuable to have this listed here.

For reference we added categories per listing. The list is not exhaustive, and the categorization is not based on deep research, but is aiming to give a first guidance for browsing. In potential future research special attention should be given to map the ecosystem of civic protocol economies.

Research (institutes, programs, etc)

Berkman Klein Center – protocol economy
TU Delft energy research – energy
AMS Institute – energy

Interest groups, experts, communities of practice

Distributed AI Research Institute – fair technology
Commons Network – knowledge, interest group
Consitutie voor de Commons – commons, tools
EUR Institutions for Collective Action Institutions for collective action
Collectieve Kracht Collectieve Kracht
Cooplink – cooperatives
New Economics Foundation
Alles over web3 – web3
2Tokens – tokenomics
Dutch Blockchain Coalition – web3
Web3 ImpactHub – web3
Disposable Identities – DID
Sarafu – commons
Crypto Nomads – web3
Datafood – community

Cases commons, DAOs, alt currency

Waag MicroDonor – currency
Blackbird – web3
Groene Hub – service
Disco – DAO
The Sphere – DAO
Finsbury Park – community
Terra – DAO
World – currency
Sonnen Group – energy
Brooklyn Energy – energy
Atelier – energy
Energie Samen – energy
Unify Energy – energy
Hier – energy
Inter Ledger – currency
Bristol pound (discontinued) – currency
Berk Shares – currency
Flow Carbon – currency
2 Ping – currency
Civic – DAO
Regen – commons
Polis – ecosystem

Tools, services

Purpose Bound Tokens – service
BCNL foundation – web3
Power Ledger – web3
Near – web3
Topicus – community
Stipo – community
Crowdbuilding – community
High Five – web3
Energie Partagee – energy commons

Government

DNB register – web3

Colophon

Report and interviews
Iskander Smit

Editor
Martijn de Waal

Design
Studio BLT – Barbara Lateur

In conversation with
Abhigyan Singh – TU Delft
Anne Helmond – UU
Deborah Tappi – HvA CET
Denis Roio – Dyne
Inte Gloerich – HvA/UU
Joachim Meerkerk – HvA
Lex Dekkers – NL AI Coalitie
Lorna Goulden – Twinds
Marloes Pomp – Dutch Blockchain Coalition
Melanie Rieback – Radical Open Security/UvA
Nazli Cila – TU Delft
Rob van Kranenburg – Council
Sophie Bloemen – Commons Network
Toon Maassen – HvA/Ceuvel

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Contact
Civic Interaction Design
Amsterdam University of Applied Sciences
civicixd@hva.nl
civicinteractiondesign.com

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