Microdonations for public value?

MicroDonor final report: research into web monetization
and voluntary micropayments

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waag
technology & society

Contents

1. Introduction

"The internet is broken", Marleen Stikker argues in her book (original title: *Het internet is stuk*). The internet started out as an idealistic platform, that could bring individuals from all over the world together. But these individuals now seem to be on the losing side of history. In our increasingly digitised society, online spaces are often-times owned – or exploited – by large tech companies that seem to be disconnected from shared public values. We have become largely dependent on their digital services, and digital platforms or content creators are bound to their terms. 'Free' platforms, built on advertisement income, are the standard. In other words, we are constantly paying indirectly with our personal user data.

Fortunately, there is a growing group of content creators, open source developers, internet pioneers, and cultural institutions that take a stance for a public, value-based digital environment. These organisations and individuals try to offer their services or content on user-friendly terms. However, this is often challenging, as there is currently not one single safe, open, privacy-friendly business model for online productional activity, but instead, a disperse variation of models. The COVID-19 pandemic highlights that when many creative and cultural organisations were forced to move to the digital domain, they were faced with countless possibilities for financialal sustainability. Options ranged from crowdfunding to subscription-based models, to the rise of innovative tools such as **Blendle-buttons**.

Simultaneously, a digital 'creator economy' is emerging. Since 2010, anyone with a phone has become a potential content creator. Moreover, content has been improved with technological innovations (such as higher-resolution cameras and accessible video editing tools). The new creators have so far received little recognition – except in the form of 'likes' – but the tide seems to be turning. Influencers are more powerful, and increasingly demand for (monetary) recognition for their output. This in turn forces platforms to adapt their business models. There is more content than ever, yet platforms are competing harder than ever to showcase, and therefore to control the demand of, this content.[1] In addition to the shifting role of creators and distributing platforms, we live in times of an individualising landscape in terms of content consumption. People are more hesitant to commit to a single broadcaster or newspaper, and (sometimes) prefer the flexibility of being able to read a combination of individual articles from different platforms. This flexibility is complicated by the general orientation of current revenue models towards structural support, and oftentimes results in being blocked by a paywall.

1. Refer to *The Economist* **article 'The new rules of the "creator economy"' (May 8th 2021) for background reading**

These disruptive changes in our socio-economic landscape
demand research into new financial models that are based on
public values. Waag aims to emancipate citizens in their ever
digitising surroundings, first and foremost by enabling them to
navigate the internet safely and on their own terms. Open, fair and
inclusive technology is an essential part of this emancipation. The
Public Stack, developed as part of the Roadmap Digital Future, is a
model that reveals the techno-sociological layers behind any used
tech-nology – including the underlying assumptions and power
rela-tions. It is based primarily on shared public values, as
opposed to technology that is developed out of commercial or
surveillance principles. The 'public' in shared public values is
thereby under-stood as open, democratic, and sustainable, aiming
for inclusive technology that is truly human- and planet-centric.
Public Stack technology requires open and fairer revenue models.

Waag has spent the past months working on **MicroDonor**. Within
this project, we investigated whether a microdonations- or pay-
ments system is a suitable revenue model for open source devel-
opers, content creators, and cultural institutions who do not want
to monetise their users' buying potential. Web monetization means
internet users can transfer tiny amounts (micropayments) for
online content or services – powered by the Web Monetization
standard and facilitated by blockchain technology through the
underlying Interledger Protocol. Specifically, we evaluated the
standard in the context of the aforementioned Public Stack model,
and explored if and how the micropayments facilitated through this
technology could in fact contribute to a fairer, opener internet.

Concrete motivation for MicroDonor was the development of the
standard and of the underlying protocol, which culminated in the
million-dollar **Grant for the Web** fund that finances this project.
More broadly, it fits within our search for ways to sustainably
support Public Stack technology initiatives through a safe and fair
monetary infrastructure on the web that puts the user first. Within
the scope of the project, we focused on a *technical* and a *social*
research track. In the former, we developed a prototype for a web
extension that enables *microdonations* (as opposed to *payments*,
which are not voluntary), in order to empirically test technical
possibilities and requirements. Alongside this technical trajectory,
we went through a 'social' trajectory with the wider public and with
experts, in which we tested the concepts of microdonations spe-
cifically, and of web monetization in general for their feasibility.
During these sessions, we considered the various challenges and
societal implications of such a system.

This report thus has a dual aim: it presents the prototype for the MicroDonor web extension, and it is an analytical discussion of the way web monetization fits (or does not fit) in the Public Stack model based on these dual research trajectories – including recommendations and insights for a sustainable and fair web monetization practice. The outline is as follows: after this introduction, which includes a clarification of key terms, Chapter 2 will provide a background on the project and on web monetization. Chapter 3 focuses on the theoretical framework and used research methods, followed by a presentation of the MicroDonor web extension prototype in Chapter 4. The fifth chapter is a discussion of the broader findings in accordance with the Public Stack model, and chapter 6 iterates these findings as the main propositions for designing web monetization. The report ends with a conclusion and directions for further research.

Clarification of Key Terms

Web monetization: in a broad sense, the conversion of web traffic into revenue. Confusingly, it is also the name of the payment standard (API) used in the project, as provided by Coil. We generally use 'web monetization' in this second, more narrow sense, referring to the process of micropayments facilitated through the specific standard.

Micropayments: payments of very small amounts of money (think €0.0001), enabled through ledger-technology.

Microdonations: voluntary micropayments.

User: anyone who browses the internet, uses digital platforms or services, or watches online content. We try to refer to 'user' (or alternatively: 'consumer') without reducing a person to merely a passive actor.

Beneficiary: any organisation or individual that contributes to specific digital services or platforms, such as a content creator or an open source developer, and thus receives the micropayment. Alternatively referred to as 'producer'.

Web monetization provider: organisation that facilitates web monetization and serves as intermediary between users and beneficiaries, distributing micropayments on the basis of certain criteria. Currently, the only web monetization provider is Coil.

2. MicroDonor and web monetization

Peer-to-peer payments and the valuation of content and services have a history in community currencies and are widely used outside the Western world (think for example of the tool Alipay). Modern times have seen the emergence of the creator economy: tokenisation aims to facilitate direct value for content creators and cultural institutions. The recent rise of web monetization models builds on these innovations by focusing on the conversion of web traffic into revenue. **Web Monetization** is a JavaScript browser API (Application Programmer Interface), developed several years ago, that goes a step further by facilitating micropayments directly from user to beneficiary. This standard runs through the **Interledger Protocol** (ILP), which enables the transfer of very small amounts of money (think €0.0001) by using blockchain technology – regardless of the specific ledger or currency used. The Web Monetization API enables organizations to act as web monetization 'providers', acting as intermediaries between users and digital service or content providers.

Coil is currently the only web monetization provider as such. The organisation is funded by Ripple, which works with XRP, a cryptocurrency mainly stemming from the financial sector. Coil works through a subscription model: users become members against a monthly fee of €5, for which they can install the Coil web extension (a small program that 'watches' along in your browser and identifies the platforms you visit). Organisations and content creators register with Coil by creating a wallet (a digital place to store money). They then include the Web Monetization 'metatag' in the html of their page. Subsequently, as soon as you visit Coil-affiliated platforms or content as a user, a dollar sign lights up on the Coil web extension – the counter has started running, you are on a 'monetised' website. Connected to how much time you spend on a certain platform, Coil then transfers a micropayment to the relevant beneficiary based on a fixed hourly rate of 36 cents per hour. Because it is facilitated by Coil, this transfer is in the form of XRP – while the protocol and standard offer the flexibility for other kinds of currencies as well.

In partnership with Mozilla Foundation and Creative Commons, Coil set up Grant for the Web (GftW), a $100 million philanthropic fund that focuses on advancing and experimenting with web monetization technologies. Waag is one of the grantees of GftW. Financially supported by GftW, we launched our MicroDonor project early 2021, seeking to investigate whether web monetization in the form of microdonations could fit in with Public Stack-thinking (i.e. whether such a model would work first and foremost according to shared public value(s) and whether its technological stack could be

made completely open). The initial aim was to investigate what it would take to operate as web monetization provider ourselves, as if it were an alternative to Coil. Over the course of the research trajectory this proved unrealistic, because of the financial requirements of operating as provider, as well as the lack of added value to our central question. Instead, we decided to develop (a prototype for) a second web extension alongside the Coil extension, that would provide more transparency to the user as well as empowering them in their choices and opportunities to monetise.

3. Methods and research process

The central research question in the MicroDonor project, spanning from January until June 2021, was whether a micropayments or -donations based model as facilitated by the Web Monetization API could fit within Public Stack thinking and could support Public Stack initiatives (read: initiatives that align with open, sustainable and democratic technology) accordingly. The Public Stack model thus was used as a theoretical framework for testing micropayments and microdonations. As previously explained, the process involved a dual research trajectory. On the one hand, the technical research and development of the web extension prototype. On the other hand, and equally important, the social aspect of the project: the 'testing' of the concept of web monetization amongst a wider audience and with experts during co-design sessions. This section will briefly explain the Public Stack model, and consecutively go over both the technical and social dimensions of the project.

A. Public Stack model as theoretical framework

Waag stands for open, fair and inclusive technology. In 2020, we presented the Public Stack model as part of the Roadmap Digital Future (commissioned by the Dutch parliament). The model aims to describe and further explore the design and development of this kind of technology, resulting in technological innovations that truly empower citizens and are built on public value(s). The Public Stack shows that technology is much more than the 'tip of the (technological) iceberg' that we as individuals usually see; it is the result of countless decisions and underlying assumptions, unavoidably intertwined with power relations and specific interests. Technology is not neutral, as Donna Haraway so fittingly states.[2] As such, the model proposes to begin with the 'actual' start and build up through the various layers of technological development: it moves from the foundation through the design pro-cess to the technology stack, to eventually end up in the citizen perspective (to view the complete explanation of the model, refer to the **Public Stack website**). Chapter 5 depicts each layer in more detail.

    If anything, the Public Stack highlights the complexity of technological development. It clarifies that if we want to move towards more open, fair and inclusive technology, we need citizen-centric business models. It furthermore underlines the importance of governance built on inter-stakeholder trust.

2. Refer to Haraway's "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century" in Simians, Cyborgs and Women: The Rein-vention of Nature, pages 149–181.

B. Technical research and development

Within the technical research trajectory, we initially experimented with web monetization without using Coil. We started designing an experiment, with a single test user (a Waag team member) acting both as user of the service and on behalf of the beneficiary. As a use case we took meet.waag.org, our own implementation of the open source video conferencing service Jitsi. We wanted to create a personal wallet for the test user and a beneficiary wallet through wallet provider Uphold. This raised a first hurdle regarding privacy, as creating a full account at Uphold requires highly personal data, such as a copy of an ID card and a selfie. Because of this we decided to use the ILP sandbox (or test network) with fake money for the experiment instead. Implementation resulted in a small web extension that parsed the web monetization metatag, subscribed to changes in the Jitsi API, and connected it to a mini-backend that would initiate payments in the Interledger sandbox. This 'naïve implementation' worked: the web extension automatically detected the end of a Jitsi session, upon which it transferred a fixed amount (of fake money) from the user's wallet to Waag's wallet.

Because of the privacy-issues that setting up an individual user wallet brought up, in addition to the financial and organisational complexity, we at this point decided to develop a web extension alongside Coil instead of trying to function as a provider ourselves. Partly based on the input gathered during the public evening event (more on this in the following section), we made an inventory of the technical requirements that such an extension would ideally and realistically encompass. We then started with a mock-up, which was in turn finetuned on the front-end and back-end side to eventually result in the final version of the MicroDonor web extension as presented in section 4. This second, complementary web extension aims to make web monetization more user-friendly. Its added value is twofold: it provides transparency by revealing the entire beneficiary stack behind a platform or content; and it gives the user more power to set their own terms and conditions, through a combination of added functionalities.

C. Out into the open

Alongside, and complementary to, research into the technical aspects of the web extension, the project entailed a crucial social side. Through various formats, we 'tested' the concept of web monetization amongst a wider audience and collaboratively worked out the best way to shape such a model with different kinds of experts.

Blog series – Throughout the project, we documented our research in the form of a blog series. These blog posts were meant to truly take the public along during our exploration of web monetization. This was an especially relevant process, not only towards a wider audience, but also on our own behalf: as Waag we were formerly largely ignorant on the topic of micropayments and microdonations, so publishing regular blog posts on our research was a useful way to analytically translate our activities into a learning process. We disseminated these blogs both through our Waag website and through the web monetization community page, the latter of which also provided a gateway to other inspiring projects and GftW grantees. A compilation of these blog posts, which can also provide helpful insights on specific steps in our project, can be found on **our website**.

Public events – In March 2021, we hosted a first public event – digitally, needless to say. At this point, after a steep learning curve, we had gotten the hang of the basics of web monetization (more or less), so it was time we actually 'tested' the concept in an interactive way. We invited someone from a public broadcasting company, two people from the cultural sector, a journalist from an independent news platform, and a software programmer who had experimented with XRP and tipping models himself. Moderated by Waag, the group held a panel discussion based on a few statements, in addition to active audience input through the chat. Because of its diverse character, with experts from various backgrounds represented, all participants could truly speak from their own (organisation's) unique experience. The evening proved helpful to distinguish initial challenges, especially in the social domain.

To finalise this part of our research on microdonations – though not necessarily our research into it! – we will present the Micro-Donor project at a larger public event hosted in July.

Co-design sessions – In April and May we organised three co-design sessions. These sessions started out as more general brainstorm sessions, identifying and discovering key opportunities and challenges much like during the public event in March, and gradu-

ally narrowed down to a more solution-focused tackling of concrete challenges, eventually jointly designing the 'ideal web monetization model'. In each session, the group varied from six to eight participants. We generally started with an 'interactive' introduction round and knowledge tester ('interactive' in these pandemic times meaning some physical movement was required behind the screen) and then used the Miro board tool, either in break-out rooms or plenarily, to brainstorm together.

These co-design sessions once again highlighted the incredible value of putting an interdisciplinary group of people in one (albeit virtual) room. With the expertise ranging from community currencies to tokenisation and cryptocurrencies, a good balance between scepsis and enthusiasm, and some participants joining only one session and others recurring, we eventually came up with a couple of key insights that we would never have touched upon if we had decided to keep our research purely internal at Waag. The unexpected benefit of having to arrange these sessions virtually was the geographical dispersion of the participants, from the UK to Thailand and from Kenya to Canada.

Throughout the co-design sessions, we came to realise that this project was in fact much bigger than the web extension only. Yes, the extension aims to align web monetization with Public Stack values to a larger extent than it currently is, by tackling and capturing some of the challenges that came up. Yet it fails to address most of the findings the research led us to. The following sections thus present a dual result: firstly, the final prototype for the Micro-Donor extension that we have developed the past months. Subsequently, we enlarge the scope and look further, presenting concrete propositions on web monetization based on our social and technical analyses.

4. MicroDonor web extension

This section presents the prototype for the MicroDonor web exten-sion, as functioning on our own Waag website. Unfortunately, part of the experience is lost because of the static nature of this report, but these screenshots nonetheless provide a good impression. This chapter is purely a visualisation of the extension, with its various features highlighted. The extension will be referred to and expanded on in the following chapter, especially explaining its various technical features in the Technology stack. The complete history of the prototype design, including the first mock-up, can be found in the **GitLab repository of Waag**.

operates alongside Coil web extension

Option to favor individual beneficiaries, or switch off/on completely

Option to cap donations per beneficiary: per visit, per day or per activity (e.g. for the duration of the call or at 0.10 XRP per visit)

View total donated amount – As the extension is linked to Coil, the donations run in XRP
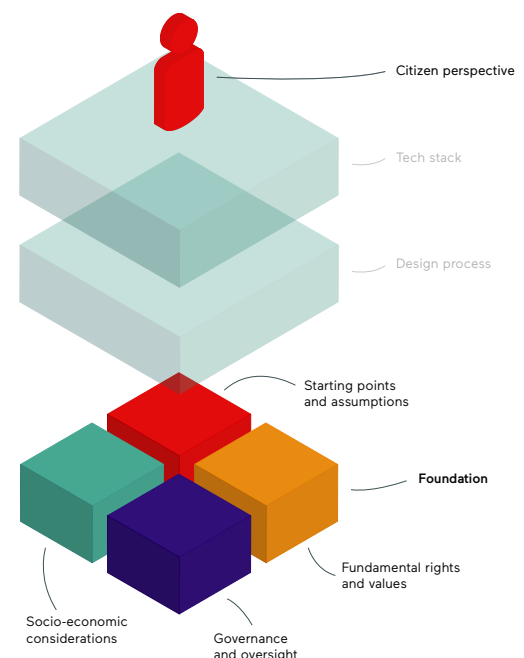
Displays beneficiary stack

5. Micropayments in the Public Stack

The central aim of our research project, as stated in the research question previously, was to investigate whether a web monetization system – as enabled through the standard in question – would fit in with the Public Stack model of citizen-centric technology. We soon realized that functioning as a monetisation provider ourselves was not realistic, so instead we focused on developing an additional web extension that would to a larger extent align micropayments with Public Stack-thinking – in the form of microdonations. We also decided to expand our scope and take on a more future-oriented design approach: what would web monetization ideally look like (read: in order to align with the Public Stack), regardless of current structural legal, social or economic constraints?

We gradually became convinced that web monetization definitely has potential, especially with the flexibility offered by the Interledger Protocol; nonetheless, a couple of critical issues need to be tackled in order for it to fully align with our values of an open, fair and inclusive internet. We scrutinised separate aspects of these challenges and tried to provide concrete propositions on how to address them. This section presents the key opportunities and challenges we encountered during our research. It uses the layers of the Public Stack – although not always exhaustively – to cluster various findings, referring back to the MicroDonor extension proto-type when relevant. Setting up the foundation, design process and technology stack while taking into account the considerations outlined below would then hopefully result in a citizen's perspective of web monetization as being transparent, privacy-friendly, inclusive and democratic.

Foundation

At the basis of the development of web monetization is the need to make key drivers, interests and stakes explicit: are we doing this for the right reasons? The motivation behind the development of such a model is clear: current revenue models for online content and services are either not privacy-friendly and run on user's buying potential, or do not provide sufficient income for content- and platform-creators that cannot, or do not, want to be a part of a model based on user data. The 'public' loses, whether as user or as creator. A system of micropayments should align more with people's rights, in terms of privacy, and people's values, such as transparency and control; in short: truly put the user at the center. An assumption is that we want to turn web activity into a monetisable resource and provide users and creators with insight into the distribution of revenue. This can be a positive development, in the sense that 'makers' such as developers and content creators receive the recognition that they deserve. Value that is usually

Citizen perspective

Tech stack

Design process

Starting points and assumptions

Foundation

Fundamental rights and values

Socio-economic considerations

Governance and oversight

unseen or left unmonetised is in this way **appreciated** – think also of not-for-profits or cultural organisations that usually struggle to make ends meet based on current revenue models. Moreover, in a time where people are increasingly hesitant to commit to a single broad-caster or newspaper, it enables the user to consume on a more flexible basis, being able to visit various websites while still sup-porting all of them with small **amounts**. Such an explicit price tag on digital platforms requires a change in mentality on behalf of users to start paying for services and content that was formerly 'free' – even if 'free' in practice meant paying with your buying potential.

On the other hand, monetising everything with money explicitly could also be problematic, because a system of web monetization assumes that monetisation is more fundamental than other, non-monetary forms of recognition and thereby could close the door towards less individualistic systems based on sharing or commoning.

Moreover, a micropayments (or microdonations, for that matter) system could decrease the connection between users and content or service providers. It strengthens the notion of individual, pay-per-use consumption, while in fact some users may want to sup-port a platform more structurally on the basis of what it stands for, regardless of its single outputs. Ultimately, this may result in the scenario that all (as of yet not capitalized) public goods are subject to the question of supply and demand. Through thought processes, exacerbated during the co-design sessions, we concluded that **web monetization** should be an additional model to other revenue models, such as subscription models, instead of completely replacing these other models. Further considerations highlight this: on the beneficiary side, the amounts (currently) gained through web monetization are simply too small to serve as only income; and on the user side, a web infrastructure purely run on micropayments could eventually exclude users who cannot afford to pay for all digital services and content, undermining the idea of the internet as open sharing space.

Apart from the underlying assumptions and starting points, we tested web monetization in light of its socio-economic considerations. The micro in micropayments is possible because Interledger Protocol – the name says it – works through ledgers. Some of this ledger-technology, or blockchain, requires huge amounts of energy for the validation process. What about the environmental consequences of using web monetization? Moreover, Coil is coupled to one specific cryptocurrency, namely XRP. This currency works through trust-based validation, so it does not require the

Quotes from co-design sessions:

"Reduce the noise, amplify the signal"

"It enables micro-membership or micro-patronage"

Proposition Nr. 1

Web monetization should be an additional model to other revenue models, such as subscription models, instead of completely replacing these other models.

"We should not be pena-lised for providing high-quality, low-[web-traffic] volume content. Our members want to support us because they stand for our values."

– An independent journalistic platform

energy-consuming process of 'mining', as goes for non-permis-sioned blockchains, but it does raise its own questions. Additionally, the use of different currencies through the Web Monetization standard is not always a transparent process. With respect to this case: the Coil extension's (indirect) owner is Ripple; what does its revenue model look like and what underlying interests are at stake?

This links to the issue of trust, key when it comes to governance. Web monetization proposes an entire new infrastructure for valuation of online services and content. This entails a new playing field, a new arena open to different kinds of actors. Users take on a more active role in valuing what they consume, especially in the case of micro-donations. Beneficiaries have the opportunity of a more flexible, fair revenue model, and will undoubtedly also want to help shape the form of such a system. In addition, the strict divide between users as consumers and beneficiaries as producers has long been **dissolving** (think of social media platforms). With shifting roles, what parties do we want to set up and govern a monetary structure that could have far-reaching social and financial implications?

A possible role regarding the question of trust is that of web mone-tization provider, currently embodied in Coil. The benefit of such an intermediary party is in terms of privacy (the payment does not flow directly from a user to the content or platform it visits), but how transparent is such a system? What party do we trust sufficiently to take on such a role? Another stakeholder group is the designers of the standard and protocol. What are their interests? It is crucial for the further upscaling of web monetization that there is sufficient transparency of the network of interrelations and interests of dif-ferent stakeholders, as well as a formal way to influence its design.

Design process

Much of the potential of web monetization comes down to the way its technology is designed. What actors are involved and how, what functionalities are included or omitted? This section goes through the design process of web monetization, the 'designing of the technology stack' of micropayments. As mentioned previously and repeatedly underlined during the co-design sessions, the design process involves finding a balance between designing within cur-rent legal, social and economic frameworks, whilst also thinking past these boundaries and **designing for where we would ideally be.**

The user

User-friendliness in the design of web monetization is key in its adoption from a user-perspective. This will also contribute to the paradigm shift that *explicit monetization* will require. In this light,

"We need to embrace the omnidirectional perspective, as the assumption of a one directional relationship is changing. The act of consumption is increasingly part of production."

Citizen perspective

Tech stack

Design process

Foundation
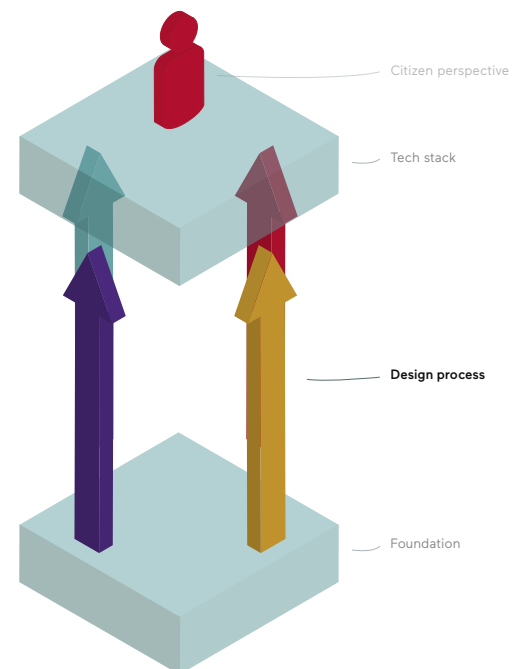
"The technology is there; we need to use the potential of current technologies by stacking existing innovations to form something new."

microdonations instead of micropayments have potential, as they offer the user more control over their payments by enabling them to change settings and set the conditions for monetization – such as setting a donation cap per beneficiary or favoring one beneficiary over another. As demonstrated in the previous chapter, this is in part what the MicroDonor extension aims to do. It also enables the user to turn payment completely off, **a feature that the Coil web extension omits**. Yet what our current prototype for the extension offers is not enough: managing a web extension remains a technically complex hurdle for many users. Browsers could play a crucial role in simplifying the user experience, for instance by providing positive nudges towards actively controlling the extension (people could otherwise 'forget' about its existence, so that it perpetually absorbs micropayments). Eventually, web monetization could be embedded within websites or browsers – while still ensuring the user has the agency and control.

Taking this a step further, users should not only be in control of their individual payments but should also be engaged in the payment infrastructure as a whole. Web monetization should be developed in such a way that users and beneficiaries are also present in the governing process, ensuring not only co-creation in its design process (such as facilitated through the sessions within this project) but also co-ownership in its implementation. Through built-in feedback channels, web monetization could ideally become a self-regulating system, iteratively adapting to changes in the legal or societal landscape. This co-creation and co-ownership calls for further elaboration, but in any case requires trust in and close coordination with the process surrounding the ILP and the Web Monetization API, making their design an open, transparent process.

The aforementioned approach entails catering to changing needs of individuals. Expanding on the idea of web monetization as supplementary model (proposition 1), its technology needs to be designed so that it provides flexibility in usage. Users should be able to easily combine single-use microdonations, structural subscriptions, and 'micromemberships' (or 'micro-patronage') through long-term micropayments. This also involves being able to support an individual [content creator or designer] or a platform, either once only or structurally. In addition, 'users' should not necessarily be considered one individual; think for example of an organization that jointly wants to support a content creator, or that wants to offer all its members access to a certain digital service. Furthermore, 'content' itself also comes in all shapes and sizes. **Only rarely is content one static object**, especially in the digital

Proposition Nr. 2

Microdonations are more user-friendly than micropayments

This forces the user to use creative 'hacks': one participants during a co-design session explained that he would only visit monetised websites in certain browsers.

"What about donating to a social movement?"

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domain. The MicroDonor extension aims to capture some of this user-centric design, but is only the start; it could for instance accommodate different kinds of content and services to a much larger extent.

Beneficiaries

Regarding the design of web monetization from a beneficiary perspective, various challenges and potential thought directions came up during the co-design sessions. These especially have to do with potential perverse incentives; how do we design web monetization technology in such a way that it does not work to reinforce some of the dark patterns that are currently ubiquitous when it comes to content and services on the web, such as click-bait and addictive nudges?

Oftentimes, **there are several parties involved in the creation of one single digital service or piece of content.** Currently, in many cases not all individuals that contributed to the end result are formally recognized (in terms of revenue), or in any case recognition and valuation of beneficiaries is disproportionately distributed amongst beneficiaries with the exploiter or 'sharer' of content receiving more than the initial creator. Lessons are also to be learned from the tokenization world of NFTs (non-fungible tokens); it is key to prevent parties profiting from content that is not theirs. Web mon-etization should be designed in such a way that it provides trans-parency and insight into the **granularity of beneficiaries.** The MicroDonor web extension also aims to capture this by displaying the entire beneficiary stack.

An issue that came up repeatedly was the risk of clickbait. Espe-cially because the Web Monetization standard inherently involves a time parameter because it is coupled to streaming, there is a looming risk of micropayments reinforcing the attention economy – precisely the kind of system it was aiming to tackle in the first place. Content hence becomes driven by quantity over quality, undermining its inherent value and reducing the user to passive, exploitable consumer. A number of technical interventions were proposed during the sessions (further explained under the 'tech stack'), mainly on reconsidering the design of the payment rate. The rate could for example be decoupled from streaming time, or be based on a public value assessment or on **underlying motivation** instead of exclusively on **clicks and attention** – ideas of which the technical implementation requires further research.

In addition to clickbait, another key challenge that arose in parallel during the public sessions and the technical research is the ques-

"The curator/mediator also deserves credits!"

Highlighted during a co-design session by someone who shares content openly across the web.

Proposition Nr. 3
Web monetization should be designed in such a way that it provides transparency and insight into the granularity of beneficiaries.

"Rate takes into consideration intent in addition to attention"

"The payment rate is built on more than just clicks and attention, but instead works as community pricing"

tion of findability: how do you 'become' a monetized beneficiary in the first place? This essentially refers to the disparity between larger organizations or individual creators that provide high-profile content and services, and smaller, less visible organizations or individuals who cannot or do not necessarily want to **mold their content to fit the mainstream offer.** How do we set up a more fair, diverse digital space? This is of course a fundamental question that does not only relate to web monetization; nonetheless, micropayments or -donations should be designed in a way that accounts for this disparity. We stumbled upon this question of findability early on in the technical development of the extension prototype: how do platforms or individuals 'sign up' to be monetized, and how can this process be (at least partially) automated to lower the threshold? We gradually formulated the idea of an **'ethical registry'**, a database of all beneficiaries and register of contributors to a website or piece of content. 'Ethical' here refers to the fact that such a registry could highlight the beneficiaries deemed fit to be monetized on the basis of Public Stack values. Gatekeeping to such a registry could be done through a curating organization or as peer-to-peer, bottom-up validation – or through a combination of the two.

During the course of the project and with help of participants in the co-design sessions, we tried to elaborate on this beneficiary question in terms of equity, and progressively moved towards a concept of **'collectives'**. By bundling forces and collectively offering services or content along certain shared parameters, organizations and individuals could reach a wider audience and jointly share their services through 'content pools'. This model of 'package branding' essentially exists currently in vertical form under a single organization, such as within newspapers: articles with higher visibility cover the (research) costs of labor-intensive, low-profile articles.
Collectives around web monetization would be organized horizontally, as 'sectoral collectives' or as 'content unions', with collective ownership (a 'commons' governance model).

Such a model is based on solidarity of high-profile websites towards smaller parties, but is also built along a common set of themes or **values**. There needs to be a balance between competition and collaboration within these collectives: revenue distribution would be in part **meritocratic** (as in based on the actual output in terms of micropayments – based on clicks), but would also be dependent of input: revenue is distributed according to the amount of work spent (albeit difficult to quantify). This involves some technical interventions regarding the provenance of a piece of content.

"We as an independent journalistic platform put enormous effort into a small amount of long, high-quality articles that do not necessarily speak to a wider audience".

Proposition Nr. 4
An 'ethical registry' serves as database of endorsed beneficiaries.

Proposition Nr. 5
By bundling forces and collectively offering services or content along certain shared parameters, organisations and individuals could reach a wider audience and jointly share their services through 'content pools'.

"Content type is irrelevant; it's about shared goals".

"We need to build in a 'measure of success' from the start".

Governance is key in such a model. In line with the train
of thought regarding the ethical registry, the gateway to the bene-
ficiary collective could be a combination of peer endorsement and
validation by a curating organization. Potential risks with a system
of this sort include reinforcing existing content or interest bubbles
and the risk of larger, more powerful groups combining resources
and dominating the supply. The notion of collectives thus requires
further investigation.

An intermediary?

The endorsement process for beneficiary process including a
curating organization links to the role of intermediaries more
generally within web monetization. In theory, micropayments or
-donations would run directly from the user to the beneficiary, in
a P2P-manner. However, such a system would hamper with the
privacy of users: the receiving beneficiary would know exactly
how much attention was spent on what kind of content. Moreover,
every user would have to set up a digital wallet, a process (as
currently structured) which requires unnecessary personal data
– as demonstrated under Chapter 3. The added value of an inter-
mediary organization is thus its privacy-preserving function in
distributing micropayments, due to its financial buffer that allows
moving away from one-on-one transactions. Such a role involves
significant trust, requiring a party that can guarantee transpar-
ency and that handles first and foremost out of the public good.
As to Coil, the ideals of Grant for the Web (open, fair and inclu-
sive) directly align with Waag's and the Public Stack ideals; how-
ever, its background as linked with Ripple makes it prone to
changes in the cryptocurrency landscape. In any case, it would be
fruitful for setting up a healthy system of web monetization to
have some diversity in providers; **otherwise Coil itself could start
impacting the kinds of services and content that is provided.**

To move away from a single intermediary party, we continued our
conceptualization of a dual process (similarly to the double
endorsement process for beneficiaries). In order to reduce finan-
cial influence on the content or services offered, the financial and
curating aspects could be decoupled. This results in **an infrastruc-
ture with two kinds of intermediary organizations:** 'transactors' that
facilitate user subscriptions and handle financial transactions (of
streaming micropayments), and 'curators' that define the grounds
on which revenue is divided amongst beneficiaries. This dual
model is essentially what we propose through the current project
by running two web extensions alongside each other, albeit a bit
clunky: the Coil web extension serves as 'transactor', and the Waag
MicroDonor extension serves as 'curator' through its ethical registry

During the first public event, the analogy with Netflix was made: it plays a similar role in distribution as Coil does. Netflix highlights that new models can gain acceptance, and can in fact gain the power to influence the way in which content is created.

Proposition Nr. 6

The intermediary role could consist of two kinds of organizations: 'transactors' that facilitate user subscriptions and handle financial transactions, and 'curators' that define the grounds on which revenue is divided amongst beneficiaries.

and beneficiary granularity. The implementation of such a system on a larger scale does raise a few questions: what institutions are trustworthy enough for a role as intermediary, either as transactor or as curator? For the former role, could established financial institutions like banks be a possibility? And for the latter role, could an organization like Waag act as curator in certain domains (e.g., for collectives based on digitization or in line with our values)? How do we organize the curating role so that it does not become an arbitrary position?
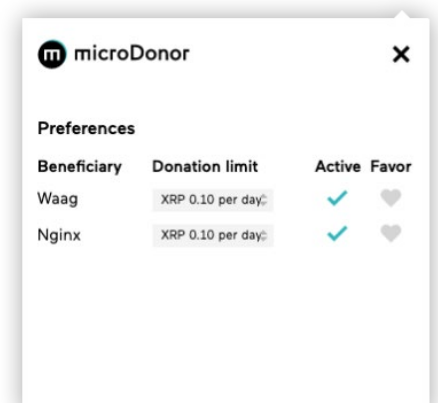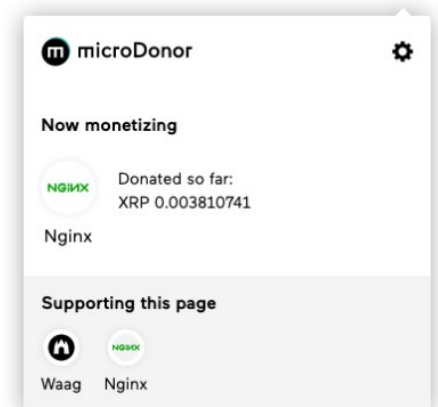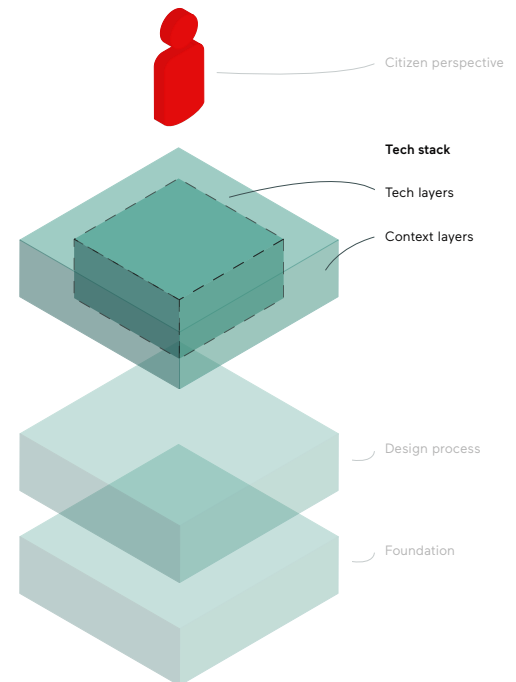
Tech stack

Under *Foundation* and *Design process*, we outlined what should at the least be taken into consideration when designing web monetization and what starting points should be at its basis, resulting in a number of key propositions. This leads to concrete technological interventions, some of which we have been able to implement through the MicroDonor web extension and others that remain as recommendations for further development.

Previously presented under Chapter 4, the MicroDonor web extension includes the following technical interventions to accommodate some of the challenges encountered during our research:

- In order to display the granularity in beneficiaries, it displays the stack of all involved parties. This is of interest to the beneficiary (all parties receive recognition) as well as to the user (provides transparency).

- To empower users, the extension enables them to set the conditions of monetization for changing contexts, by setting a donation limit per beneficiary, favoring certain beneficiaries over others or completely deactivating donations. This furthermore allows for flexibility in adjusting monetization to fit changing user needs and wishes: it becomes easy to structurally support a specific organization, for instance.

- The option of a donation limit (or complete stop) additionally lowers the risk of clickbait, as there is no longer an endless amount of attention to be gained from users.

Although we tried to tackle some challenges and risks with the MicroDonor web extension, there is much more that remains to be implemented in the design of web monetization. As briefly mentioned previously, the available technical infrastructure currently consists of two aspects: the Standard (or API) and the Protocol (ILP). The standard is coupled to specific cryptocurrencies and

Citizen perspective

Tech stack
Tech layers
Context layers

Design process

Foundation

m microDonor   ⚙

Now monetizing

NGINX   Donated so far:
XRP 0.003810741
Nginx

Supporting this page

Waag   Nginx

m microDonor   ✕

Preferences

Beneficiary	Donation limit	Active	Favor
Waag	XRP 0.10 per day	✓	♥
Nginx	XRP 0.10 per day	✓	♥

generally more narrow than ILP, that preceded it. As such, we believe that where the Web Monetization standard has already been designed in such a way that it is possibly too limited and does not completely align with Public Stack thinking, ILP provides the flexibility to be designed in a more user-friendly manner.

Therefore, we propose a number of additional technological interventions to be considered in the design of ILP. The following technological interventions provide a first overview:

- To enable the granularity of beneficiaries and for the functioning of a collective system: need to be able to distinguish provenance of content in order to distribute benefits. Required for this: proper and granular measure of authenticity.

- To enable the 'ethical registry' and be able to display the granularity of beneficiaries: need to be able to detect the beneficiary stack of a certain webpage. This could either be a manual process (beneficiaries supply information on their contributions) or a semi-automated process (e.g. by detecting open-source software in the code of a webpage).

- To discourage clickbait: decouple payment or donation and streaming time. Or more gradual: system of "diminishing returns" (the longer the visit, the lower the donation), flexible payment rates. Have payment rate be based not only on clicks/attention (web activity) but on public value assessment (idea of collectives) or underlying motivation (idea of provenance).

- To diminish divide smaller and larger beneficiaries: small providers can charge more per 'unit' than larger ones, resulting in varying payment rates.

6. Key propositions

The core result of our research is dual: we developed the Micro-Donor web extension to provide more transparency and agency for the user; and we developed a number of concrete theoretical propositions and recommendations that aim to tackle central challenges and can serve for the further development of web monetization. These propositions are reiterated here:

1 Web monetization (as proposed by the current standard) as additional, comple-mentary model to other monetary and non-monetary forms of valuation. Micro-payments provide flexibility as a pay-per-use, 'micromemberships' model, but should not undermine systems such as subscription models that offer uncondi-tional, structural support for a platform or individual content creator. It is a matter of finding the balance between recognition through some form of valua-tion on the one hand, and monetising everything with the risk of reducing broad public value to a capitalised resource on the other hand.

2 Designing web monetization as microdonations instead of as micropayments: more user-friendly. Web monetization in the form of microdonations offers the user more control (various functionalities that you can change) and ensures that certain groups of users are not excluded from content. It additionally diminishes the risk of clickbait, as donations to specific beneficiaries can be easily capped.

3 Revealing granularity of beneficiaries: unraveling the entire stack of contrib-uting parties and showing this to the user. Both in interest of the beneficiary (all parties receive recognition) and the user (provides transparency, and user can choose preference). Both propositions 2 and 3 are partly encapsulated in the MicroDonor extension.

4 Set up an 'ethical registry' as database of individual beneficiaries. This registry facilitates the detection of creators, developers and organisations to be monetized through a semi-curated, semi-P2P endorsement process.

5 Building on proposition 4, beneficiaries could start operating in collective format to increase their findability and distribute revenue in a more equitable manner. These 'content collectives' are based on a shared value statement or similar content and services. Endorsement is again a semi-curated, semi-P2P process.

6 To enable the previous propositions (especially 4 and 5), an intermediary is currently necessary in terms of privacy (e.g. as web monetization provider). To create a trustworthy position for the intermediary, this role can be shaped as dual infrastructure: the 'transactor' (financial institution) facilitates transactions from user to beneficiary and has the monetary buffer to do so, and the 'curator' (public value-driven institution) determines the grounds on which revenue is distributed amongst beneficiaries and is responsible for oversight.

7. Conclusion and next steps

MicroDonor took us – and hopefully the experts and audience that joined along with our project – on an immense learning journey. Through diving headfirst into the technology and brainstorming with a diverse group of people, we distinguished the opportunities and risks of a micropayments system as facilitated by the Web Monetization API. We developed a prototype for a web extension to work alongside the Coil extension, a first step towards user friendliness and empowerment. We furthermore came up with a number of conceptual propositions for the 'Public Stack-proof' design of web monetization; in other words, how to develop the technology so that it works from a people-first perspective and stands for open, democratic and sustainable value. Our central learning: if the protocol and standard are designed in a way that makes them easily accessible to everyone and transparent in the underlying drives, then micropayments and -donations indeed have substantial potential to function as a complementary revenue model for online services and content. The infrastructure should thereby be designed as open, so that the development of web monetization remains an iterative process that can include feedback and play into the changing social, legal and economic landscape.

Our research has led to a number of further research directions. Here we present a non-exhaustive overview:
- The first proposition advocates for a micropayments system as complementary to other (online) revenue models. It would be interesting to investigate whether subscription models (amongst other models) could become a component of a future web monetization infrastructure, perhaps in combination with the content collectives.

- The latter three propositions ('ethical registry' for beneficiaries, 'content collectives', a bifold intermediary structure) require further research:

  - What does an ethical registry, that aims to lower the threshold for beneficiaries and on the basis of certain parameters automatically detects content creators and service providers to be monetised, technically entail?
  - What does the governance of content collectives look like? How to prevent the risk of operating in bubbles of similar kind of content or values? Could a curating organisation play a role in admitting organizations based on the shared value statement?[3]
  - What institution is suitable as 'transactor' (banks?) and what institution is suitable as 'curator' (Waag-like organisations)?

3. Existing collectives centered around certain values, such as the Public Spaces Coalition, could provide interesting insights.

- In this report, we have considered 'users' mostly as individuals. What could web monetization look like for larger parties, such as organisations that wish to transfer microdonations on behalf of a group of individual users (employees)?

- To design a fair and open playing field, users and beneficiaries should take on a prominent role in decision-making processes and governance of the web monetization infrastructure, with intermediaries playing a more passive, facilitating role. The idea of a truly 'self-regulating' system, co-owned by users and beneficiaries, requires further research.

- On the back-end of the technology, the payment rate itself requires finetuning:

    - What is a fair rate in the first place? A public value assessment provides perspective. Another research direction is a role for an intermediary or the overarching platform: this party sets a 'ballpark recommendation', on the basis of which the individual content provider sets their individual rates.
    - What kind of design is required to enable flexible, differentiated rates that differ per beneficiary and are (partly) decoupled from streaming time?

- Cryptocurrencies seem to be the necessary enabling technology for web monetization. At the same time, cryptocurrencies are a controversial topic; there is an ongoing debate on their safety and openness, amongst other regulatory issues. Could this pose a potential risk to the adoption of web monetization?

- Much of the technology is already out there, it simply needs to be 'stacked' in useful ways. What existing innovations provide opportunities for web monetization? These innovations have to be critically assessed for their potential value.

    - Possible role of DAOs (Decentralized Autonomous Organizations) and smart contracts in aggregating content
    - 'Quadratic matching' (as used for instance with Ethereum) as a potential method to establish a fair price for (digital) public goods

- What is the role of web browsers in setting up a micropayments system? And how can browsers take on a role in incentivising the user to actively manage their micropayments or donations (e.g., through nudges towards capping the donation after a certain amount)? Eventually, web monetization could move beyond a web extension to encompass a larger scope; what would this look like?

Overall, the project has been close to our hearts and much in line with our work on safer, more open revenue models on the web. We are eager to pursue our research into the potential of micro-donations, especially within the domain of digital public spaces.

8. Colophon

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