Joona Justus Hallila

Improving a live streamer's community's engagement with use of blockchain applications: Development project for Juffu Streaming

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Tiivistelmä

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Tämä opinnäytetyö ja kehittämishanke tarkastelee sitä, auttavatko lohkoketjusovellukset, kuten Proof of Attendance Protocol (POAP) livestreamaajan yhteisön sitouttamisessa ja osallistuttamisessa. Tavoitteena oli suunnitella ja toteuttaa lojaliteetti- ja tasojärjestelmä livestreamaajalle, mikä yhdistäisi suoratoistopalvelu Twitchin ja keskustelualustan Discordin aktiviteetit, parantaisi osallistumista, olisi pitkäkestoisesti tallessa ja auttaisi erottautumaan muista kilpailijoista.

Kehittämishankkeessa käytettyjen sovelluksien valinta perustui viitekehyksessä tarkasteltuihin tutkimuksiin siitä, mikä motivoi livestreamaus-yleisön katsomaan ja osallistumaan. Tutkimuksista selvisi, että yhteisöllisyys oli varsinkin pienille streamaajille vahva osatekijä. Yhteisöllisyyden määritelmän ja teorian neljää komponenttia tarkasteltiin livestreamauksen näkökulmasta tutkimuksien ja pohdinnan kautta. Siitä ilmentyi viisi pääkysymystä, jotka ohjasivat kehittämishankkeessa käytettyjen teknologioiden ja lohkoketjusovellusten valintaa, mitkä olivat POAP ja social tokenit.

Neljä viikkoa kestänyt kehittämishanke näytti tuloksia sekä puolesta, että vastaan sovellusten hyödyllisyydestä streamaajille. Alkuperäiset seuraajat kokivat POAP:in käytön hankalaksi ja tulokset olivat heikot, osasyynä mahdollisesti sovelluksen käyttöön vaaditun lohkoketjulompakon asennushaasteet. Erittäin hyviä tuloksia löytyi kuitenkin laajentamalla sisältöä lohkoketjupelien maailmaan. Rarity pelin yhteisölle luotiin kattava uuden pelaajan opas, johon oli liitetty sisään myös POAP osallistumismerkki juhlistamaan lukijoiden valmistumista ns. peruskoulutuksesta. Oppaassa oli linkitetty streamaajan Discord palvelimen osoite ja ohjeet POAP:in hankkimiselle sitä kautta. Hänen Discord-yhteisönsä kasvoi pienestä 15 hengen yhteisöstä, eläväisemmäksi 128 käyttäjän Discordiksi oppaan tuoman uuden yleisön ansioista. Tulevaisuudessa on syytä vielä seurata, kuinka tämä uusi yleisö siirtyy myös Twitch:in katsojakunnaksi.

Avainsanat:	lohkoketjusovellus, livestreamaus, yhteisön aktivointi

Abstract

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This development project thesis investigated how blockchain applications such as Proof of Attendance Protocol (POAP) could be used to improve engagement for a live streamers' community. The main objective was to design a loyalty point and ranking system for his community that would interlink with Twitch and Discord, improve engagement, be securely stored, and differentiate him from his competitors.

The blockchain applications chosen for the project were influenced by the theoretical framework section deep dive into studies on what motivates engagement in live streaming audiences. For viewers of small streamers, a sense of community was found to be an important factor for engagement. Four key components of the definition and theory of sense of community were examined in the light of live streaming communities. From this, five key questions arose that would guide the decision for which blockchain application would be useful for the development project. These were POAP and social tokens.

The four-week development project showed results for and against the usage of blockchain applications for a live streamers' community's engagement. It was found to be very difficult to encourage and activate the core audience to adopt the usage of POAPs. This was likely due to the higher-than-normal technological use requirements such as the requirement for owning a blockchain wallet to claim the POAPs. Great results were seen from outside of the core audience and the usual content, by venturing into a blockchain game community and providing knowledge to them through a comprehensive guide. The guide included a link to the Discord server to claim a POAP participation badge themed as "Basic Training Complete" for reading the guide. Discord community size grew from a small community of 15 to a much livelier community of 128. In the future it is worthwhile to analyse how this new Discord audience translates into Twitch live stream viewership and engagement.

Keywords: Blockchain applications, Live streaming, Community engagement

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1   Introduction

This thesis is a development project for an entrepreneur and live streamer called Juffu, who uses sole proprietorship trade name Juffu Streaming, later referenced only as Juffu. For the sake of clarity, Juffu is also the same person as I am - the writer of this thesis and will be henceforth written as a third person when refenced.

Juffu uses Twitch platform to entertain, share information on video games and to DJ music to his audience in live video format, where the audience can chat with the streamer and each other in real time. He categorizes himself currently as a small streamer focusing on building a decent sized viewership and a strong community. His main form of interaction with the audience and community takes place live during streams and "offline" on his Discord server called "Juffu Community".

Juffu is looking for new ways to improve his community's engagement and viewership on Twitch livestreaming platform and on Discord group-communication platform. More specifically he has requested to find ways to implement loyalty point system and ranks for his community, preferably in a way that could also differentiate him from his fellow streamers. Twitch features, and numerous third-party extensions have been previously used to record Juffu's community's loyalty points and ranks, but after an incident where user error ended up deleting those records – there is a need for a more reliable way of record keeping.

In the theoretical framework chapter, I will dive into recent studies on what motivates a live stream audiences' engagement, be it viewership, chat activity or other forms of engagement such as monetary patronage though subscriptions and donations. From these findings the sense of community was found to be the key motivator for engagement in small streams. The theory of sense of community will be broken down to its main components. From this, areas of im-

provement in the form of several key questions were found and further examined at the beginning of the development project chapter, to find what technology and blockchain applications were chosen for the development project. Theoretical framework section ends with of the technology and applications chosen for the project, where they were further examined to understand their use in the development project.

The development project was planned and executed in a four-week timeframe, where the chosen blockchain applications were used for Juffu's Discord community and during live streams. During this time a Discord ranking system was designed, which was based on the attendance of memorable Twitch live stream events. Attendees of the live stream events were able to obtain a "badge of participation" that exists on a blockchain, and the more of these you had, the higher your Discord rank was. The complete project plan and report will be shown in more detail in the development project chapter. Key findings, challenges and further development ideas that arose from the project will be detailed in the conclusion chapter.

2   Live streaming and community platforms

2.1   Twitch

Twitch is a live streaming service and a platform, where streamers can share their content and experiences in a live video format to their audience and develop a community around the streamer (Twitch 2021a). TwitchTracker's statistics show that Twitch has averaged 2,5 to 3 million concurrent live viewers monthly in the year 2021 (TwitchTracker 2021a). In the August of 2021 there were 8 million active channels, which is defined as if a streamer streamed at least once a month. On average 96 000 streamers were live streaming concurrently, as shown in figure 1. (TwitchTracker 2021b).
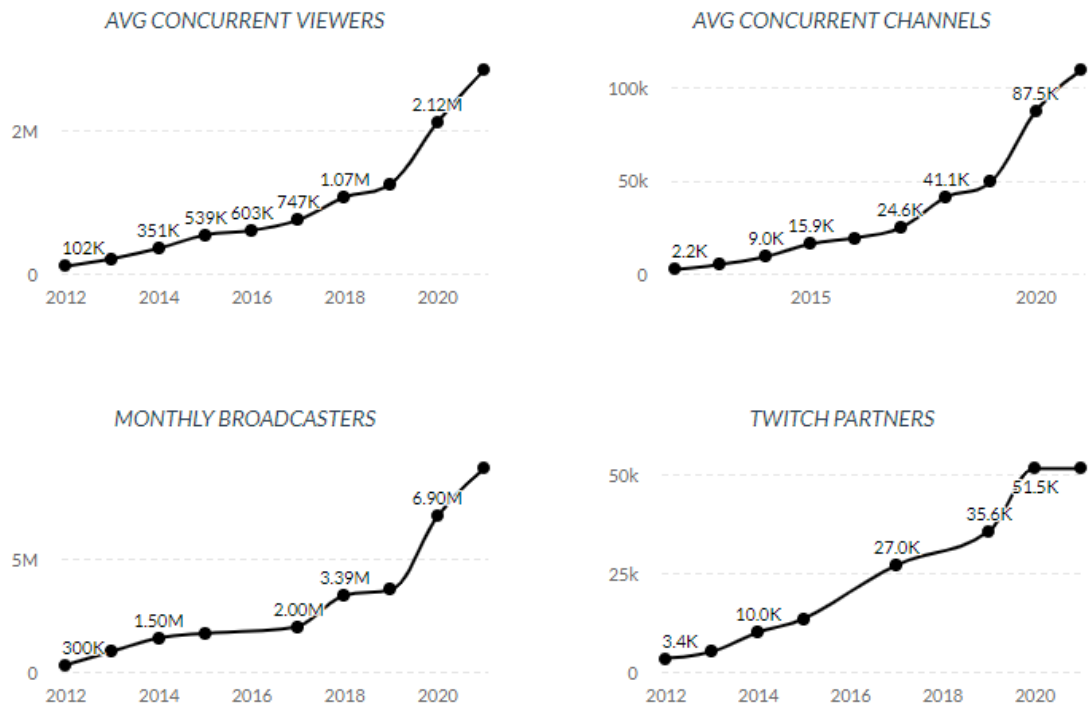
Figure 1. Twitch growth statistics (TwitchTracker 2021b.)

In Twitch there are three different categories a streamer can belong to, called streaming levels. They are based on requirements such as follower count, time streamed, unique days streamed and average viewers per stream, as shown below in table 1. The levels are called: "Streamer" which is the starting level without any requirements, "Affiliate" and "Partner". (Twitch 2021a.) Juffu is currently at Affiliate streamer level.

In the year 2021 there were roughly 51 500 Twitch partners, which translates to 0,64% of all active streamers that have achieved the partner level. (Twitch-Tracker 2021b). Extremely low percentage of Twitch partners showcases that the competition is fierce and there is a need for differentiation to grow your audience. Discoverability and viewership in Twitch are also heavily weighted towards the partners and streams that have large live viewership numbers. (Ashenbubs 2021.)

Table 1. Twitch streaming levels and requirements. (Twitch 2021a.)

Requirements	Affiliate	Partner*
Time streamed (last 30 days)	8 Hours	25 Hours
Unique days streamed (last 30 days)	7 Days	12 Days
Average viewers per stream	3 Viewers	75+ Viewers
Followers reached	50+ Followers	-

As your channel grows, more features become available. Below I will list and describe each feature that is also shown in table 2, as it is relevant to understand what features Twitch offers to streamers and what it does not, which will be later examined in more detail.

- Following in Twitch is like what we are used to in social medias, you become more easily discovered by users and they can receive notifications when the streamer goes online. (Twitch 2021a.)

- Chat is a live chatroom that is shown alongside the live streaming content, where viewers can use emoticons (called emotes in Twitch and later referenced as such), and to chat in real-time to the streamer and other viewers of the stream. (Twitch 2021a.)

- Subscriptions are available once you reach the Affiliate level, and users can then subscribe to your channel at the cost of their choosing

from 5, 10 to 25 euros a month and receive additional perks customized by the streamer. These can be features such as unique subscription emotes and badges next to names in chat, subscription only-chat mode or live streams viewable only by the subscribers. (Twitch 2021b.)

- Emote Slots open the more your channel grows, which allow you to create custom emotes for your community to use in your and other streamers' chats. (Twitch 2021a.)

- Ad Revenue is shared to the streamers from running ads on their channel, streamers also have the option to disable ads for their subscribers. (Twitch 2021a.)

- Custom Cheermotes are animated emotes viewers can use in chat by using Bits, which are a virtual currency native to Twitch. Users can use bits as a monetary donation to streamers for perks like Cheermotes or to send a donation message to the live stream. (Twitch 2021b.)

- Subscribers to your channel can be given a unique customized badge that is shown next to a user's username when they use chat. How many months they have subscribed to the channel in total is also visible. (Twitch 2021a.)

- Verified Badge next to channels and streamers name. It is also a visible verification that the channel/streamer is at partner level. (Twitch 2021a.)

Table 2. Twitch features available by streaming levels. (Twitch 2021a.)

	Streamer	Affiliate	Partner
Follows	✔	✔	✔
Chat	✔	✔	✔
Subscriptions		✔	✔
Emote Slots		Few	Many
Ad Revenue		✔	✔
Custom Cheermotes			✔
Subscriber Badges		Few	Many
Verified Badge			✔

Alongside the abovementioned features there are also Channel points, which is a customizable point system available to Affiliates and Partners. Channel Points are gained by watching the live streams at a fixed point per minute ratio, more points are given for multiple viewing sessions, encouraging returning viewer-ship. Channel points can also be gained by other methods such as following the channel or gifting a subscription to another viewer, which means viewers can pay for other viewers' subscription to a channel. Streamers can customize how these points are spent on stream, the rewards could be anything from making the streamer sing a song, to making the streamer hydrate and take a sip of wa-ter. (Twitch 2021c). However, these points are designed to be spent, not col-lected, and as such are not an effective way to help rank your audience for viewership and engagement. Steamers also have no way of seeing how many channel points viewers, followers or subscribers currently have. (Ashenbubs 2021)

Other Twitch features for rewarding your viewers are focused on monetization of your audience through buying and gifting subscriptions, donating money, or donating bits to the streamer (Twitch 2021d). While these are great for the partner level and large streamers, smaller streamers will often rather focus on building more viewership and community growth, very similarly to many start-up companies who prefer growth first and monetization later. (Ashenbubs 2021.) Twitch does allow for third party extensions such as Streamlabs, which has a tool for loyalty point system that is based on viewership and allows for ranking and rewards based on these points. (Streamlabs 2019)

2.2   Discord

Discord is a free online community and communication platform with 140 million monthly active users in the year of 2020. (Techcrunch 2020) 19 million different communities around the world, all the way from gaming, art to programming use the platform as a central hub for the community to gather, communicate and discuss. (Discord 2021a).

Discord servers can be either public or private. Users can use voice, video, and text chat to communicate with each other in the discord servers for free of charge. Discord server owners and administrators can create different text channels ranging to any topics they desire and set up voice channels where users can use voice chat to talk to each other. (Discord 2021b). There are currently well over thousand public Twitch and streaming themed discord servers active. (DiscordMe 2021.) Streamers use Discord as a central hub for their community to gather and to be reached when the livestreams are offline. Streamer Discord servers are used in many ways, most commonly with announcement channel, where the streamer can announce when their next streams go live or if they have news to announce. Viewers can share video clips from streams, memes or pretty much anything that has a channel themed for it. Servers are administrated by the owner and a set of administrators the owner chooses, but other than that most activity in the servers comes from the community and they

usually evolve in time, based on what the community wants and needs. (Ash-
enbubs 2021.)

There are many ways to build and grow a Discord community. Server owners
can utilize Discord's own systems for community building, such as Discord
Roles. Users can be given customizable roles with their own names and colours
that are visible to all users in the server. Roles can also be used to give certain
permissions such as being an administrator for the server that is able to ban or
kick users from the server. Text and voice channels can also have access re-
quirements such as belonging to a certain role. With these simple tools it is pos-
sible to create hierarchies and ranks in the community and reward users, such
as giving certain roles and privileges to community members who are helpful,
active in the discussions. (Discord 2021c.)

3   Live streaming audience

3.1   Motivators for live stream engagement

First, I will investigate motivations and other driving factors that could explain
why people watch, engage, and give monetary patronage to live streamers. In a
study titled "Social motivators of live-streaming viewer engagement on Twitch"
by Hilvert-Bruce et al. (Hilvert-Bruce, Neill, Sjöblom, Hamari 2018, 59-65) exam-
ined eight different socio-motivational factors and their effects to live-stream en-
gagement, which they categorized as time spent, emotional connectedness,
time subscribed and donations.

Figure 2. Motivator factors for live stream engagement in the study. (Hilvert-Bruce 2018, 60)

The eight factors were entertainment, information seeking, meeting new people, social interactions, sense of community, social support, external support, and social anxiety as shown in figure 2. External support is defined in the study as a way for compensating the lack of community in real life, such as friends and family. Social support is defined as a way to receive online social support and involvement. Social anxiety is defined as removing barriers socially anxious individuals experience by having low-threat alternatives such as chatting in live streams. (Hilvert-Bruce 2018, 59)

Out of these eight factors, all but two factors, which were social support and social anxiety were found to significantly explain at least one indicator of live-stream engagement. From the six factors, desire for social interaction and a sense of belonging to an online community was found to be most consistent and strongest motivators for live-stream engagement. Between small (<500

viewers), large (5 000-10 000 viewers) and very large streams (>10 000 view-
ers), the small streams showed much stronger association between these two
social motivators and live-stream engagement. For small streams, the strongest
factors associated with time spent watching live streams alongside previously
noted social interactions were, entertainment and information seeking, which
the latter did not have significant association with large and very large streams.
(Hilvert-Bruce 2018, 63-64.)

Small live streams are great for socialising, and larger live streams are usually
great for the entertainment they provide. However, large live stream chats often
evolve into an ocean of emote and text spam, where it is harder for the
streamer and the audience to communicate to each other effectively. Due to
this, large streamers either must change their chat to subscriber only mode or
communicate to their audience as a crowd, often refenced by streamers as
"Chat". Small streamers have the benefit of being able to directly communicate
with the audience, sharing information, fostering social interactions, and building
a strong sense of community with the audience. (Ashenbubs 2021.)

The study by Gros et al. (Gros, Wanner, Hackenholt, Zawadzki, Knautz 2017)
titled "World of Streaming. Motivation and Gratification on Twitch" also found
entertainment and information seeking to be the main motivators for using
Twitch. They also found a link between the socialization aspect of live-stream
entertainment to have an impact on the decision to donate or subscribe on
Twitch. As most of the advantages of Twitch donations and subscriptions are
heavily socializing related, such as exclusive emoticons on chat and possibility
to communicate with the streamer through a donation message and subscriber
exclusive chat modes. (Gros 2017.)

Another finding was that the more time a user spends on the Twitch platform,
the more likely money will be spent through a donation or subscription. This
could either be due to feeling of wanting to give something back in form of mon-
etary patronage after consuming large amounts of entertainment. Or possibly

after obtaining information, for example valuable knowledge about the live streamed game. (Gros 2017.)

The study by Wohn et al. (Wohn, Jough, Eskander, Siri, Shimobayashi, Desai 2019) titled "Understanding Digital Partonage: Why Do People Subscribe to Streamers on Twitch" also found that most significant factors for initial subscription were the streamers personality, the way the streamer delivers content and a sense of community that the live streamer creates. Another interesting finding from the same study is that subscribers will more likely remain subscribed either because they want to offer continuous monetary patronage or based on what they get in return in terms of emotional or digital rewards, viewing it as sort of an investment. The latter group find value in digital artifacts such as emotes and badges that are visible in the chat next to their usernames. (Wohn 2019.).

3.2 Sense of community

In the previous chapter, social interactions and a sense of community were found to be a key motivator for engagement in live streams, especially for small streamers. In this chapter I will dive deeper into the definition and theory of sense of community and to studies on how it is applies to live streamers' communities

McMillan and Chavis define sense of community through four components: Membership, influence, fulfilment of needs, and emotional connection. (Mcmillan, Chavis 1986) There are also further studies done which expand on McMillan's and Chavis' theory of sense of community in the context of live streaming. Hamilton et al. (Hamilton, Garretson, Kerne 2014, 1315-1324) use these components as a basis for characterizing a viewer's conception of community in their study titled "Streaming on Twitch: Fostering Participatory Communities of Play within Live Mixed Media".

3.2.1 Membership

"The status of membership is developed through personal investment in the community, yielding feelings of the right to belong and community identity". In live stream communities the personal investment is their time and energy spent watching and engaging in chat. Another way to show personal investment is by supporting through monetary means such as subscriptions and donations. (Hamilton 2014, 1318.) Twitch currently has a plethora of ways to show and improve sense and status of membership through monetary ways such as subscriptions, bits, and donations. Streamers can also directly reward those who engage in chat by answering their questions and giving them recognition and attention during the live streams. The part where Twitch features often lack in, is in giving a sense of membership for those who only offer their time by watching the streams, but do not engage in the chat or through monetary ways such as subscriptions. Streamers often call this type of viewer a "lurker". However, while lurkers are often unengaged during live streams, they may still be active community members outside of the live streams, such as in the streamers' Discord server. (Ashenbubs 2021.)

The findings of Hamilton et al. also highlight the importance of regulars, the people who most frequently visit streams and who are key contributors of the community. "By regularly showing up, participants start to build a level of trust and recognition among other regulars, which is hard to develop any other way". Viewers who regularly show up, eventually become recognized community members. (Hamilton 2014, 1320.)

3.2.2 Influence

In live stream communities influence is shown by viewers preferring streams where they are recognized by the streamer and other participants, and the ability to participate and impact live stream activities through chat and off-stream by having impact on community and stream decisions. (Hamilton 2014, 1318)

There are also many ways live streamers can offer their viewers an opportunity to participate and have an impact, often involving polling the chat through emote voting, where the streamer can ask for thumbs up or thumbs down emotes as votes, or through actual online poll services. The same options can be offered on Discord, to let the community decide on questions such as what games to play or how to play them. Most of the time these polls are rather harmless, and the streamer usually holds full veto power on the decisions. Streamers want to give more influence to their community, but are often not willing to give a significant governance power over their live streams and content. (Ashenbubs 2021.)

3.2.3 Fulfilment of needs

Hamilton et al. describe fulfilment of needs and communal benefits to be a key part of a member's sense of community. This fulfilment could be achieved as emotional rewards such as socialization, the status of membership and success of the community. For live stream communities another communal benefit is the gaining of game knowledge and skills obtained from the streamer, viewers, or the community. Emotional rewards such as sociability can be achieved by chatting in the live streams. The status of membership in Twitch is often achieved through active participation in the chat, where most beneficial members of the community can be given moderator rights to the chat. Another way is through monetary patronage, often through subscribing, gifting subscriptions or donating. (Hamilton 2014, 1318.) Twitch offers leaderboards for users who have gifted the most subscriptions or donated the most with bits, and the number of months subscribed is seen by others in chat next to their usernames. (Twitch 2021b.)

3.2.4 Emotional connection

Lastly Hamilton et al. describe that emotional connection is developed through a shared history and identification with the other members. This comes from continued participation, the more positive experiences members have in the community, the greater their emotional connection. Key parts of enabling this is

building a community that welcomes newcomers with open arms and encourages participation of other members. (Hamilton 2014, 1318) In live streaming, the shared history and experiences are created during the live streams when memorable in-game or community events happen. Twitch offers tools such as clips, that allow any viewer to clip a part of the live stream and to share that to others. These are an excellent way to share experiences with the community outside of Twitch and when live streams are not online. (Ashenbubs 2021.)

3.3 Audience Management Practices for Live streamers

A study "Audience Management Practices of Live Streamers on Twitch by Wohn and Freeman (Wohn, Freeman 2020) introduced a couple interesting design recommendations that would help streamers better manage their audiences.

One of these was visual cues for audience categories. From qualitative interviews with 25 twitch streamers, they found that streamers do not categorize their whole audience as a single monolithic block. Instead, they categorize their audience into multiple categories such as family, supporters, lurkers and so on. This enables the streamers to not only rely on their memory when engaging with an audience member. They found it would be useful if users could be labelled with visual cues for easier identification of the audience members. With this information it would help the streamers to decide how, how much and when to engage during live streaming. While this is not as big of an issue for smaller streamers, the idea of making it easier for the streamer to categorize audience was found to be helpful by other streamers, as Twitch currently does not have such a system. (Wohn 2020.)

Another interesting design recommendation was engagement history. As audience grows for a streamer, it becomes more challenging to remember, nurture and engage with new members. It also requires the streamer to memorize each audience member and all their past engagements in the community and live streams. Currently Twitch viewers who subscribe, have a badge that indicates

how long they have been subscribed, but there should be more diverse methods of discerning different types of engagement from both paying and non-paying audience members. (Wohn 2020)

4 Blockchain applications

To answer Juffu's request for a loyalty point system that is secure and future-proof, I will investigate blockchain technology benefits and go deeper into certain blockchain applications for community building that could be effective tools for the development project.

4.1 Blockchain technology

Blockchain technology emerged in 2009 with the launch of the Bitcoin network that introduced the concept of blockchain to the world. In a blockchain the transfer of digital information takes place in a distributed network, which is independently maintained and managed by a large set of participants. Users can digitally sign and transfer their rights to this digital information to another user, and the blockchain records this transfer to in a public ledger. A sort of public logbook or balance sheet, allowing all participants of the network to independently verify the validity of the information that it contains. (Yaga, Mell, Roby, Scarfone 2018, 1-3.)

Blockchain technology is composed of four key characteristics that are tightly linked together, which also explain how trust is created in an environment, where users of the network cannot be easily identified, and no trusted intermediaries are necessary. (Yaga 2018, 2.)

- Ledger – Transaction history of information in blockchain is append only, meaning transactions cannot be overwritten or altered, only added to the ledger. (Yaga 2018, 2.)

- Secure – Blockchains are cryptographically secured, meaning that the information contained within the ledger cannot be tampered with, is irrefutable and easily verifiable. (Yaga 2018, 2.)

- Shared – The ledger is shareable among all participants of the network. This provides transparency and the ability for anyone to verify the information contained in the blockchain. (Yaga 2018, 2)

- Distributed – Blockchains can be distributed and are permissionless, as in open for anyone to use. This allows for scaling of participants in the network, also making it more resilient to attacks by bad actors. By increasing the participants who verify and secure the network, it becomes harder and harder for bad actors to impact or alter functionality of the network. (Yaga 2018, 3)

In summary blockchain technology is a widely distributed and secure ledger of information - that is transparent, permissionless, immutable and trust free. In other words, it is a secure storage for digital information that can also be transferred to anyone if so wished.

Most commonly the information in blockchains is a form of digital unit of currency such as bitcoin, but more recent blockchains have found ways to transfer and store almost any type of information that can be represented as numbers or text. This information is also possible to be programmed and executed in various ways, introducing programmability inside blockchains, also known as Smart Contracts. (Ethereum 2021a.) This has allowed applications, "decentralized apps" also known as "dapps" to be built on blockchains. The backend, as in the actual execution of the code is running on a blockchain, and the frontend that users see, can be accessed for example through an internet browser. A simple example of dapp could be a sort of digital vending machine. You use a website to input how many funds to insert and what item to select. The smart contract in the backend will execute on blockchain, then request your approval to transfer the funds, and then the code will execute on the blockchain to see if correct

amount of funds were sent for the selected item. And finally gives you the digital item you have selected. (Ethereum 2021b.)
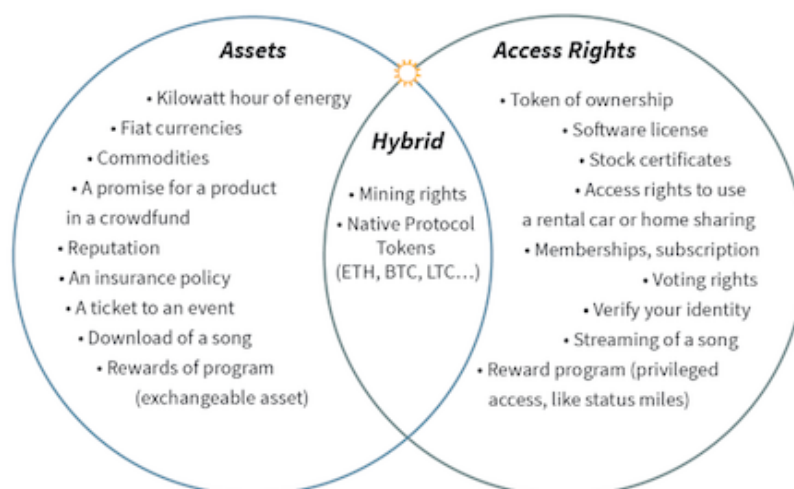
4.2   Tokens

Next, I will dive a bit deeper into the terminology and capabilities of blockchains. First it is important to understand what tokens are, and what types of tokens there are, such as fungible and non-fungible tokens.

Traditionally tokens can represent any form of economic value. Be it seashells or paper money which allow access rights to some underlying economic value or assets. Tokens can also be casino chips and loyalty program points which are used as access rights to the property or services of someone else. Crypto-graphic tokens can be either of these or even combine both the concepts, which native protocol tokens such as bitcoin is, as shown in figure 3. below. These cryptographic tokens represent a set of rules, that are coded into a smart contract which is known as a token contract. Each token contract can have different rules and logic for how they work. These tokens can be accessed, owned, transferred, and consumed by the users of a blockchain at will, within the rules of the token contract. (Blockchainhub 2019.)

Application Tokens

From the Book "**Token Economy**" by Shermin Voshmgir, 2019
Excerpts available on **https://blockchainhub.net**

Assets
- Kilowatt hour of energy
- Fiat currencies
- Commodities
- A promise for a product in a crowdfund
- Reputation
- An insurance policy
- A ticket to an event
- Download of a song
- Rewards of program (exchangeable asset)

Hybrid
- Mining rights
- Native Protocol Tokens (ETH, BTC, LTC…)

Access Rights
- Token of ownership
- Software license
- Stock certificates
- Access rights to use a rental car or home sharing
- Memberships, subscription
- Voting rights
- Verify your identity
- Streaming of a song
- Reward program (privileged access, like status miles)

Application tokens can represent any asset or access rights or a combination of both. They can have simple or complex functions.

Figure 3. Examples of token use cases. (Blockchainhub 2019)

There are two types of tokens. Fungible tokens and non-fungible tokens. Fungible tokens are like euro's, your euro is equal to my euro, they are interchangeable with each other in terms of value. Non-fungible tokens also known as NFTs are not interchangeable with each other, they are more like a unique digital file stored on blockchain, such as a certificate of ownership for digital art or a digital item on a computer game. There can be multiple copies of a single NFT, such as POAP participation badges which will be introduced in the next chapter. A certain event could have well over 1000 copies of that event's POAP badge, but they are still non-fungible as every single NFT still have a unique ID and ownership history. NFT's have multiple use cases such as digital art, collectibles, ticketing, and fashion, and it seems more and more uses cases are discovered as the technology grows with usage. (Los Angeles Times 2021.)

4.3 Proof of Attendance Protocol - POAP

Proof of Attendance Protocol, further refenced as POAP is a blockchain dapp service built on a blockchain called Ethereum, that utilizes non-fungible tokens. POAP is also a digital collectible "participation badge" created as an NFT, that enables a new way of keeping long-lasting records of life experiences and events. They are a reliable way of keeping record of attendance for example to prove who attended your event. POAP has seen huge growth in users during 2021 as seen in figure 4. below.
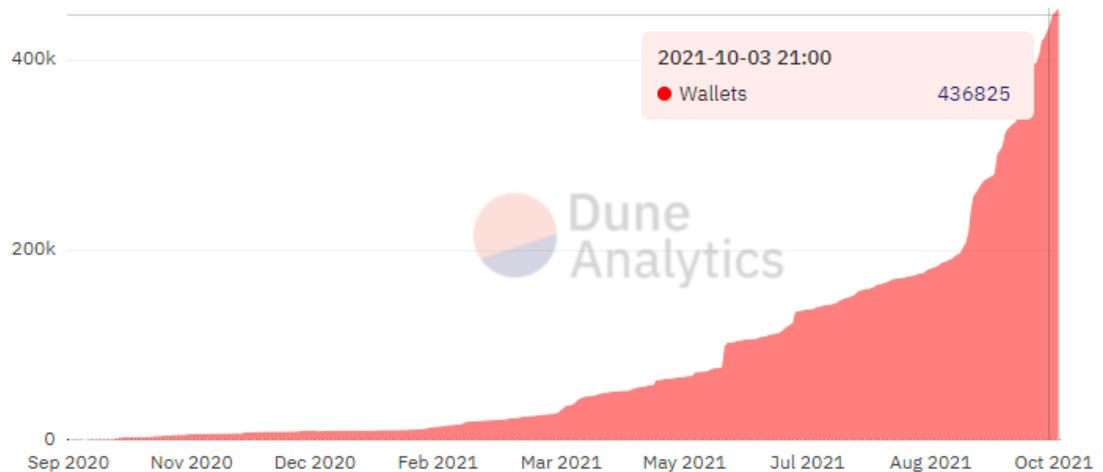

Figure 4. Number of wallets with POAPs. (Dune Analytics 2021)

Attendees of events can collect a unique "badge of attendance" that is stored to blockchain as a cryptographic record of information. POAP by its simplest use case is simply a participation badge containing details of the event, which lives on blockchain and thus shares the benefits of blockchains: security, transparency, immutability and shareability. These badges can then be further used in plethora of use cases, such as access to private chat rooms, raffles or simply kept as a collectible, allowing users to show off their collection and as the name suggests, to show a proof of their attendance. (POAP 2021a, POAP 2021b.)

POAPs can be created by anyone for free and event hosts can issue and distribute a POAP to attendees in multiple different ways. A single POAP contains unique event ID, image file, title, date, type of event and description of the event. Issuers can choose how many POAPs are initially supplied, how and how long they can be claimed for. POAPs can be distributed either through unique codes, secret words, direct links or though Discord bots. Most common way is to share a code or a direct link during the event for attendees to claim the POAP themselves, and the code is valid for the length of the event. Issuers can also distribute POAPs to attendees after the event by gathering their Ethereum wallet addresses or their email addresses. Users can then claim and receive the POAP to their Ethereum wallets. (POAP 2021b.)

Figure 5. POAP issued by EthStaker community. (POAP 2021c).

Shown above in figure 5. is an example POAP issued by a community called "EthStaker", which held a YouTube livestream event and issued a POAP for the viewers of the livestream. In the figure, "Supply" is the amount of POAPs claimed. "Power" is the total amount of POAPs that all claimers of this POAP have. "Transfers" is the total amount of times the POAP has been transferred, if this number is higher than "Supply", it means some of the POAPs have been transferred to another wallet after they have been claimed. (POAP 2021c.)

Possible use cases for POAPs include companies, brands and communities rewarding and incentivising attendance to their events, whatever they may be. POAPs can also be represented as tickets for exclusive content or raffles and giveaways. POAPs can also be created for any event in the world, for example anyone could create a POAP celebrating the birth of a new royal baby, however it is up to each community and individual to value the collectability and legibility of a POAP not issued by the actual stakeholders of the event. As such there are no limits to why, what, or even when the event happens for a creation of POAP. (LogicBeach 2021.)

4.4   Case: How POAPs fuel Thales community growth

Thales platform is a dapp used to create, trade and exercise binary options in the Ethereum network (Thales 2021a). Thales found community growth to be critical in their efforts to scale their project to a wider audience and decided to use POAPs to fuel that growth. Another benefit they found was that POAPs could serve as a communication facilitator with specific individuals who attended their events and opened direct communications channel with their users to receive feedback. They were able to differentiate strategic parties from each other, such as investors, original community members and other early-stage users. They were also able to differentiate the individuals who were willing and wanting to engage with the community. (Thales 2021b.)

Thales started off with issuing POAPs to users who joined their first community call event and distributed unique "OG Community" Discord roles for the POAP holders. The community response was well received and so they continued with more events. Then they distributed a retroactive POAP called "Early Supporter" to participants of their closed beta testing. The distribution was found to be easy for this one, since users were already required to fill out a form that also included their Ethereum address. 274 POAPs were delivered manually and retroactively to these Ethereum addresses. (Thales 2021b.)

Next up was a community event held in Thales Discord server. Community members were able to participate and align themselves with one of four Discord

channels that represented 4 different ancient Greece figures. Members submitted their "quests" to the Discord channels, sharing investment stories, memes, and improvement ideas. Top 3-6 comments were chosen by the community by voting and the winners received a POAP and a unique role within the Discord server. (Thales 2021b.)

The last POAP distribution came from Thales' second community call live event, where attendees received a POAP and the "OG Community" Discord role that was also given in the first event. Attendees of both events and POAPS were able to receive a unique "OG Titan" role, to recognize those who were with them since day one. (Thales 2021b.)

Thales' key takeaways from the use of POAPs are as follows. They recommend manual distribution of POAPs if possible, while it can be time consuming depending on the amount of POAPs to distribute, there are benefits such as being able to see the collections of your community members and get to know them better. Asking your community for their addresses opens a communication channel with your community, where you can thank them for participating and ask for feedback. Manual distribution also removes any chance of bots from automatically claiming POAPs without being in the actual event. A good way to confirm and register attendees' participation at an event is to either ask them to fill a form or do a specific action during the event such as writing in a special channel during the event. You can then later manually distribute the POAPs to eligible participants. (Thales 2021b.)

Thales also gave out examples of more use cases for POAP holders, such as creating polls that are only accessible by certain POAP holders, creating a raffles or giveaways to POAP holders or creating a painting party with your community, where POAP holders can paint in a shared canvas pixel by pixel to create a community made shared piece of art, an example shown below in figure 6. (Thales 2021b.)
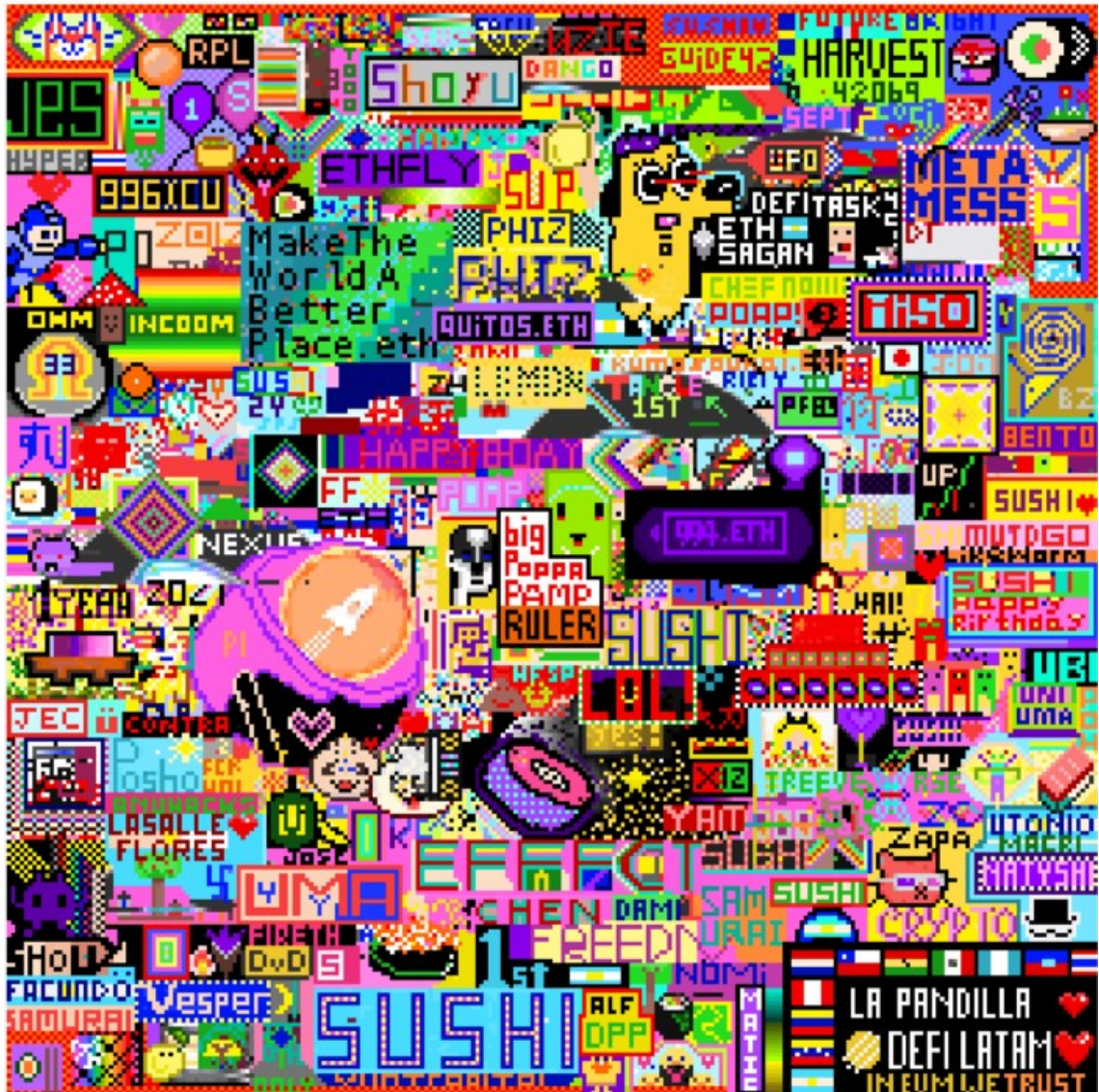
Figure 6. Example of a painting party art piece. (Thales 2021b.)

4.5 Social Tokens

Social tokens can be created by individuals or communities by deploying a to-
ken contract or by using dapp services. Social tokens can be defined further as
either personal tokens or community tokens. Personal tokens, sometimes called
as creator tokens, are centred around individuals, be they creators, artists, or
entrepreneurs. Community tokens are centred around communities such as us-
ers of a subsection of communal forum like Reddit, centred around a certain
topic or interest. (Baeriswyl 2021.) Let's look further into social tokens, more

specifically creator tokens and how they may be used to give value to the creator and their community.

Social tokens are fungible tokens that can be used to co-own a community. Content creators can distribute a token to their community that can be then used for multiple different ways such as: (Yang 2021)

- Community benefits. Owners of social tokens can be given private communication access in Discord servers and channels. It is up to the creator to decide what benefits are given, it could anything such as voting privileges. One example is a well-known NFT collector known as Whale, whose social token $WHALE owners can rent NFT's from his collection, access a discord community with crypto art experts and receive Whale merchandise. (Yang 2021)

- Co-own assets. Token owners can have shared ownership of properties or assets, for example NFT's owned by a digital artist. The $WHALE social token is also used for co-ownership of his NFT collection. (Yang 2021)

- Co-own future income. Token owners can be given a share of the future income of a creator. A music artist could give out a percentage of revenue from royalties to their social token owners. One example is Alex who is an entrepreneur who raised money via his social token $ALEX to support his move to San Francisco and used the money to co-found Showtime, a social network for NFTs. Token owners receive 15% of Alex's incoming, paid out quarterly, and other community benefits. (Yang 2021)

Social tokens do possess some risks for creators, as they can be viewed by regulators as some sort of hybrid of a security or a company share. The creator's brand and community are also at a risk if the venture fails. It is a long-term commitment in a still relatively new and unventured space, which requires heavy commitment for the creator while potentially risking their brand and community image. (Yang 2021)

If a creator decides to use social tokens as a tool for community benefits, with no direct monetary incentives here some ways how they can be used:

- Transacting: Users can transfer social tokens in forms of tips, donations, or rewards to each other or even to the creator. A community member could have an excellent idea for let's say a t-shirt merchandise, but lacks the skills to execute it, they could offer a reward in social tokens to a community member who possesses these skills. (Loomly 2021)

- Holding: Some users could decide to hold on to their social tokens as a sort of collectible asset that represents their support and loyalty to the creator. Creator could then hand out loyalty rewards and community benefits to such users. (Loomly 2021)

- Earning: Creators can reward loyal fans or community members by initially distributing or later rewarding social tokens to them, however they see best fit. (Loomly 2021)

Creators without smart contract deployment skills can use services such as rally.io (Rally 2021) coinvise.co (Coinvise 2021) or Roll (Roll 2021) to deploy and issue social tokens to their community.

5   Development Project

5.1   Project background

Multiple notes and questions came up while researching and writing the theoretical framework for this thesis. These eventually guided me towards the ranking system design and blockchain applications chosen for the project. In this section I will examine these points further to introduce important background information relating to the project.

On third party Twitch extensions with ranking systems such Streamlabs the following points were discovered. Juffu has used these extensions, but has encountered many issues and downsides:

- Completely deleting his audience's loyalty points and ranks by user error.

- Community only being able to see their ranks during livestreams by typing a chat command.

- General challenges with combining these Twitch ranks to ranks and roles on Discord.

This makes blockchain technology a great option for Juffu's challenges with loyalty points, providing secure storage for many years and with no requirements for trusting a third party, or him for the record keeping.

Furthermore, on large streams where the chat becomes an unreadable spam, I discovered one important point. Viewers will often either donate or subscribe to be noticed by the streamer or the community. However, I have not noted the same in smaller streams, as being the direct interaction and being noticed in the streamer are much easier in streams with no chat spam.

Similarly, on the design recommendations for Audience Management on Twitch with visual cues for audience categories, another point was found. I believe well designed Discord community ranks can help small streamers to better categorize and memorize community members. Such groups could include early supporters and close friends, regular viewers, superfans and new members of the community.

Finally, on the design recommendations for Audience Management on Twitch with an engagement history for non-paying members, last point was found. The only method currently that discerns non-paying audience is the amount of channel points they have received by watching the streams for long durations. However, these are consumable points and provide no ways for the streamer to see

how many points each viewer has. Perhaps there are other methods to help streamers recognize and even reward participation in live-stream events. This can also be tied into discord roles that already have visual cues and allows categorization of audience members based on their participation. A sort of participation badge and levels, that would help small streamers to categorize and see viewers previous engagement and participation.

5.2 Key questions

Several key questions that were relevant to the development project arose to me from the previously examined study. The questions came from the four key components of the sense of community, and how each of these individual components could be further improved. For sense of membership few questions arose, first one was centred around the issue on how to give sense of membership to viewers who prefer not to actively engage in chat or give monetary patronage.

- Question 1: Are there ways to improve sense of membership for lurkers?

Live stream online media has an issue with regulars having difficulties in spotting each other, unlike in the real life. If you are not active in the chat, you are essentially invisible. The same applies for discord communities. If you are not active in the discussions, you are unnoticeable. I would define a regular regardless of their activity, long as they show up often to view the live streams. This brought up the second question:

- Question 2: Are there ways to help with the identification of regular viewers?

Influence section left me wondering why many streamers do not give their community more ways to impact the outcomes of the community and streams. Perhaps the reasons for this comes with inefficient and untrustful voting systems, lack of effective governance ways such as weighted voting power or even elected committees? This led me to the third question:

- Question 3: Are there ways to improve the community's governance methods to enable more meaningful ways of influence over the streams?

In the fulfilment of needs section, the status of membership in Twitch was explained to come from either active participation in chat or through monetary ways. These statuses of membership are however very challenging to reflect in Discord and outside of Twitch. There is another possible improvement to be found here, perhaps there are other ways to improve status of membership, one that would be linked with Twitch and Discord and possibly would not even require any monetary efforts.

- Question 4: Are there ways to improve status of membership, which is non-monetary and connected between Twitch and Discord?

In emotional connection sections it was described how emotional connection is developed through shared history with the members of the community. I think it would be interesting to find more ways to expand on this shared history, perhaps with some sort of records of history and participation, that would be visible and shareable among the community. For example, a band T-shirt can show that you participated in a certain concert and is an excellent way to also show off to other members your community. Combining this to important live stream events could also bring the effect of "fear of missing out" which could also improve viewership in the community.

- Question 5: Are there ways to improve shared history with systems like event tickets and concert t-shirts. To prove, share and show off your participation to others.

These notes and questions lead me to research into blockchain technology and applications. Two potential applications were found, the first of them - POAP sounded like a great fit and the Thales case reinforced my view that using POAPs seems to be a good way to reward the community members that love to participate in events and to encourage more engagement in the community.

Combining POAPs from live stream events to Discord roles would be an interesting way to differentiate from other streamers and to reward and encourage community members to engage in live streams to grow their community rank on Discord.

Social tokens seemed like a good way to build on top of the POAP and Discord ranks system. They could provide a strong loyalty point system, with many other potential and interesting use cases, such as community benefits redeemable with tokens and better tools for governance and voting. Some thoughts on additional risks did come to my mind. Even if a creator issues a social token completely free to their community, all tokens on the blockchain are transferable which could lead to future speculation and a market where they are being traded for real value, even though it is not the intent, or even if the creator publicly states the tokens hold no underlying value except certain community benefits, such as private discord and voting power in governance decisions. Thus, it is up to the community how they value these tokens and the benefits they give. Loyalty points and programs are not uncommon to brands and creators, this is but another interesting way to implement them, combined with the benefits of the blockchain technology. For many smaller creators and brands, a loyalty point program service can be very expensive and difficult task to set up and maintain effectively, perhaps social tokens could be cheaper and easier.

I will now examine the usability of POAP and Social tokens for the development project and reflect on the previously listed questions.

"Question 1: Are there ways to improve sense of membership for lurkers?"

Lurkers are often in it for the entertainment, more passive onlookers than active participants. Nothing implies that lurkers would not want to be part of a community and I believe POAPs could be good way for a lurker to achieve sense of membership, by simply being there, attending and watching live stream events

and receiving a badge of attendance for it. Not all lurkers will bother with them, as it does require some effort, but a certain portion could enjoy collecting them.

I do not see social tokens as an answer to this question, however they can indirectly help by being linked to POAPs given out during events, through the initial distribution of social tokens. It is quite common that a portion of the initial distribution of social tokens are given out to your community, and this can be done quite easily to those who hold certain POAPs, as all the user's wallet addresses are known in the public ledger. Tokens can then be directly distributed to these wallets.

"Question 2: Are there ways to help with the identification of regular viewers?"

The more POAPs a person holds that are related to a streamer's events, strongly implies that the person is a regular viewer. Showing these to another users on Twitch or Discord is however too hard as it would require linking to your individual POAP gallery. This can be tackled by linking Discord roles and ranks to the amount of POAPs a person has collected, this will allow for easier identification of regulars, by the streamer and the community. Another good benefit from this system is that it only requires event attendance from the regulars. This is a great way to reward viewership instead of monetary patronage and include more people to your community such as regular lurkers.

"Question 3: Are there ways to improve the community's governance methods to enable more meaningful ways of influence over the streams?"

This is where social tokens to potentially be a very effective tool, as it would be possible to hold polls and other governance decisions with weighed voting power based on how many social tokens each voter has. Not all that different from company voting rights through shares. It is also possible to hold these votes on blockchain smart contracts to ensure fair and trustful voting process.

I do not see POAPs completely answering this question, but it will allow better categorization of a community, enabling the streamer to better choose what polls and powers to give to which part of the community. Perhaps the less impactful polls can be open to anyone who holds a single POAP, but more impactful polls can be given to regulars, early supporters, or social token holders.

"Question 4: Are there ways to improve status of membership, which is non-monetary and connected between Twitch and Discord"

This question was partly answered in question 2, but I believe this could be a good tool to bind together viewership and attendance on Twitch to Discord roles and ranks where status of membership could be based on a viewer's attendance of live stream events. "Earn them in Twitch, see them in Discord."

Social tokens could be used to further enhance this ranking system. Earn POAPs through attending and watching live stream events, create Discord ranks based on the amount of POAPs held, and later distribute social tokens based on the Discord ranks. These tokens could be used for governance and community benefits.

"Question 5: Are there ways to improve shared history with systems like event tickets and concert t-shirts? To prove, share and show off your participation to others."

POAPs seem to be an excellent way to build, share and store shared history in a community, and the technology is well suited for showing off your participation to others and to the streamer. Ideally at some point the community would self-issue POAPs for streamer's eventful experiences and leave the shared history building to the hands of the community.

5.3 Project plan

Juffu is looking for new ways to improve his community's engagement and viewership on Twitch and Discord. He has also requested for a way to implement a loyalty point and Discord rank system that is secure, futureproof and would help him differentiate from his fellow streamer.

The development project will aim to improve Juffu's community's engagement and sense of community using POAPs, which are akin to digital participation badges stored on blockchain, achievable by participating in his live stream events, joining the Discord server, and entering a secret sentence revealed during the streams into a specific text channel on Discord. Discord roles will be based on the amount of POAPs a community member holds, each new POAP gained will let the member rise in ranks. Goals for the use of POAPs in the development project are as follows:

- Give lurkers a way to achieve sense of membership through participation in live stream events.

- Allow ways for the community to have influence and impact to the streamers and community's decisions.

- Allow ways for the community affect their status of membership through non-monetary ways, tied only to attendance in events.

- Give tools to enhance the community's shared history by creating POAPs from memorable events and allowing community members to show off that they have attended and were part of it. Alongside with tool to let them better identify one another through POAPs held and ranks gained in Discord.

POAP system further enhanced by allowing fair distribution of social tokens to the community, to those who have attended and hold POAPs issued by Juffu. These tokens can be later used for more fair and weighted governance in polls,

and to gain different community benefits, as a reward for engagement through watching events and collecting POAPs.

Key metrics for the project are as follows:

- Discord server member size.

- Discord server engagement and discussion.

- Engagement on live streams: viewership, follows, subscriptions and donations.

- POAP holder amount.

- Social token user amount and usage.

The timeline for the project is 4 weeks during the weeks 36-39 in 2021. Below shown in table 2. is the project calendar and tasks for each week.

Table 2. Project calendar and main tasks.

Week 36	Week 37	Week 38	Week 39
• Test POAP functionality • Create first POAP • Create Discord channels and guides for POAPs • Apply to Social Token services and design community benefits • Announce next POAP live streaming event	• Announce next POAP live streaming event • Do live streaming event • Distribute POAPs to attendees • Assign new Discord roles.	• Announce next POAP live streaming event • Do live streaming event • Distribute POAPs to attendees • Assign new Discord roles	• Do final live streaming event • Distribute POAPs to attendees • Assign new Discord roles • Distribute Social tokens • Create community benefits

The first week is the preparation phase. Test the POAP functionality by creating a first POAP titled "Juffu Early Supporter" and learn how the service functions.

Use POAP service to create the POAP, design and create image, title, and description. Receive unique claim codes by email from the service for later distribution.

Create Discord channels for POAPs one channel to explain what POAPs are in a frequently asked questions format. One channel for a guide on how to receive these POAPs. One channel for gallery, where users can share their POAP collections to each other. One channel for questions and discussion related to POAPs. One channel to explain the rank system and how to advance in ranks by collecting more POAPs. One channel for claiming POAPs, where those who wish to claim one will type the correct secret sentence revealed during live stream events. Once users have typed the right sentence within the eligible timeframe, I will be able to distribute unique POAP claim links to each individual by directly messaging them and at the same time updating their Discord rank.

Approach social token dapp services for access to their service and decide on which service to use based on the features available to me. Once three POAPs events have finished, distribute social tokens to POAP holders and design community benefits such as private channels and polls for token holders

Announce the early supporter POAP in Discord and share the secret sentence. Distribute early supporter POAP to all Discord members who have joined before the date of 14.9.2021 and who has typed the correct sentence on #poap-claim channel. Create unique Discord role "Early supporter" and a private text channel that can only be accessed by holders of the POAP. Lastly, design and announce the next week's live streaming event where the first event related POAP will be distributed. Create and design image, title, and descriptions for the POAP and receive the unique claim links by email.

In the second week, do the live streaming event and reveal the secret sentence during the stream, which will be available to claim only during the day of the event. Distribute the POAPs to users who typed the correct sentence in the claim POAP channel. Create and assign Discord role and rank to those who

claim their POAP from the event. Design another live stream event for next week and announce it on Discord server.

Third week will repeat the previous weeks tasks. Create another live streaming event, distribute POAP, assign Discord roles. Design and announce the last week's POAP event in Discord server.

The fourth and last week of the project will hold the last live streaming event. POAPs will be distributed, and Discord roles assigned to attendees. During this week also announce the social token in the Discord server. Distribute the social token to all users who have claimed a Juffu POAP from the previous events or is an early supporter. Distribution will be weighted by the amount of POAPs held. Create Discord channels related to social token in similar fashion as was done for POAP channels to explain and answer any questions that might arise from the community. Create private text channel for social token holders. Design polls where only social token holders can vote, either directly on the private channel using Discords poll options or through a blockchain related service using the social tokens as weighted votes. The development project will end after the fourth week, results will be then analysed, and development will continue outside the scope of this thesis.

5.4   Project report

Week 1 started off as planned. The "Early Supporter" POAP was created, and Discord channels for POAPs with guides and information were constructed. A surprise came quite early though, as I had misunderstood that it would be possible to claim POAPs by using only an email address. In the claim process of the service, it is possible to enter your email address instead of your Ethereum address, however by entering your email address the only difference is that you will simply get an email with directions on where to enter your Ethereum address. This was an oversight on the planning part and introduced a quite a big hurdle and step for those who do not have an Ethereum address and are not familiar with them. This led me to edit the FAQ and guides to include the creation process and best practices for creating an Ethereum wallet with an address.

Figure 7. Juffu Early Supporter POAP.

Early supporter POAP was announced on Discord server and members of the server were able to start claiming their first POAP, shown in figure 7. There was quite a confusion among most of my core audience, as this technology was completely new to them and likely sounded somewhat risky, based on what they've heard about blockchains and scams. Despite these challenges, 7 discord members out of the 15 claimed their POAPs. Close to 50% engagement rate was a surprisingly good result for me. However, the users on the discord server at the time were long-time supporters, thus I couldn't expect as good results from the live stream event POAP that was coming up next week. The manual distribution method seemed to be a good way to deliver POAPs while at the same time updating their Discord ranks. If I would have used some other method such as a specific code that users can claim a POAP with themselves, I would have had no way of combining their POAP to a Discord rank, without asking each one to share their Ethereum address that holds the POAP. It was also a nice moment to personally thank them and ask direct feedback, just as the Thales POAP case suggested.

At this time, I also reached out to the social token dapp services and was faced with another challenge that I overlooked in the planning phase. It turned out that these services currently had quite high standards for entry into the service, and I was turned down from them for having a too small following. This also came

as a surprise and poked some holes in the plan. Thankfully social tokens were not the key part of the project and would've instead simply further enhance the designed rank and loyalty point system. Due to this I decided to scratch the idea and focus solely on POAPs and made all voting rights and community benefits be based on the Discord ranks and POAPs held. In hindsight this was probably for the better to not bring more complexity to an already technologically confusing system for my core audience.
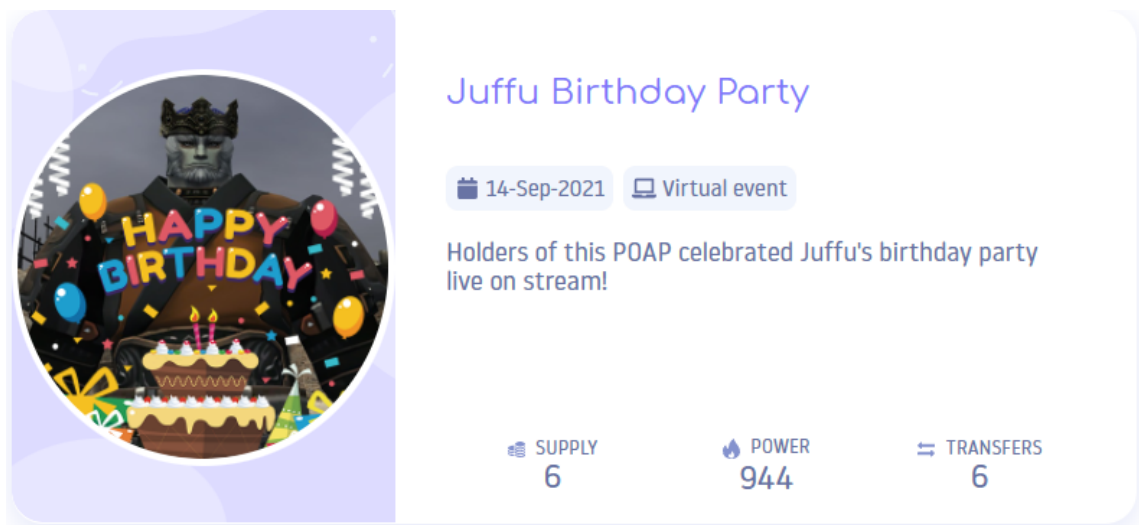

Figure 8. Juffu Birthday Party POAP.

Next POAP that was distributed was given out during my birthday live stream event, shown in figure 8. which lasted for several hours on Twitch. Secret sentence and links to Discord were achievable through chat link and I frequently talked about the POAP to the audience as most of them were new to it. Viewership and engagement on chat for the stream was slightly above average, with duration of 8 hours, 15 average concurrent viewers and 185 unique followers, 5 new followers and 1 subscription. Despite these results, they did not reflect well to POAP claims, as only 6 users claimed the birthday POAP that day. The results were bit of a disappointment and made me realise just how difficult introducing something completely new was to my audience. This led me to the first conclusion that a large part of non-crypto native users, are not interested in claiming and finding out more about the POAPs. It would likely require a long time to get my usual core audience to jump aboard to this new technology to

see any results. Due to this I wanted to find out how a crypto-native audience would react to the POAPs. This had one rather big challenge ahead, as I didn't stream crypto-related content, neither were I part of any of these communities. I would have to build something from the ground up with the few weeks I had left.
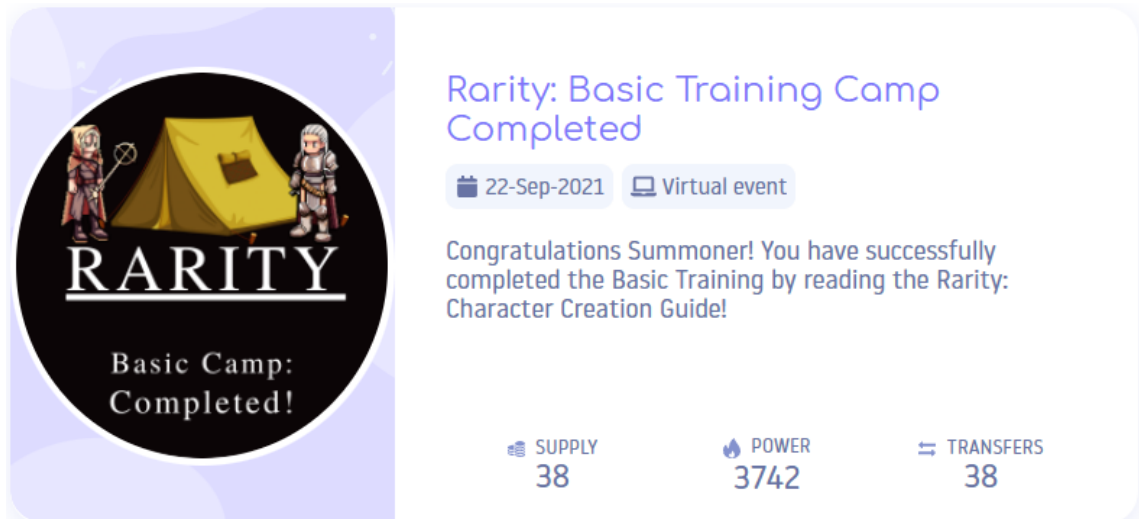

Figure 9. Rarity: Basic Training Camp Completed POAP.

Luckily, I happened to stumble upon an interesting blockchain game called Rarity. It was based on the famous tabletop role-playing game called Dungeons & Dragons, which I had played, and I also had some previous knowledge about it. I spent time learning about the game and how it works with the blockchain technology and noticed that the official Discord server were filled to the brim with users who had no idea how to play the game, how to build their characters or how to play Dungeons & Dragons. There was a clear demand for content and information to help new players play the game, and this gave me the idea to build a comprehensive new player guide for the game. This took me about a week, and the initial reception seemed excellent. Once it was completed, I created a POAP called "Rarity Basic Training Complete" for players to achieve from reading the guide and shared it inside the guide with a link and instructions to join Juffu Discord to claim the POAP, shown in figure 9. The floodgates were open, and readers of the guide started to pour into my Discord. In two weeks, 113 new users joined the server and 38 of them claimed the POAP. This also brought energy to the previously quiet Discord community with discussions about the

game and the guide. I believe a key part of this success was that all players of the game already had an Ethereum wallet, and some were already familiar with POAPs, as in some crypto Discord communities they have become quite popular.

New plan for the final week was to live stream Rarity gameplay while updating the guide with new gameplay content, to see how well this new Discord audience would translate to live stream viewership and engagement on Twitch. Previously new content had been released in just a few days of intervals. The game at the current state was very basic and it didn't have enough content to live stream for my standards, without something fresh to see and do. Sadly, the development paused to a halt for weeks and nothing new was added during the development projects timeframe. Regardless of this, during the week I spent time improving the guide and being active on the official Rarity Discord server, helping new players and promoting the guide. These efforts did help bring more people to my Discord and to claim the POAP.

This is where the development project ended. The Discord server grew from a small community of 15 users to a decent size of 128 users in four weeks, with 40 unique users holding ranks based on POAPs they claimed during these weeks. The project could have gone better with better planning, but I'm happy with the end results despite the pivotal changes to the plan and lack of live stream on the last week. For more learnings, it would've been great to see results on how the new audience would affect Twitch viewership and engagement numbers.

6 Conclusion

6.1 Key findings and analysis

It was very difficult to introduce this new system to my audience. Requiring an Ethereum address was too big a of step for many of them to go through and they also had issues understanding what the POAPs were about and why they

should care, despite my best efforts trying to educate them. Better communication and a longer time frame would help tackle these issues.

Crypto-native game community was surprisingly enthusiastic about the POAPs, and it proved to be a very effective way to get new members onto my Discord server. A portion of these new members can more likely turn into regular viewers of live streams.

When looking at the questions that arose in the project background section and how POAP technology could answer them, I do still find it to be a good tool and addition for improving sense of community. The continuous use of POAPs allows new and regular twitch viewers who prefer lurking, to gain a sense of membership by collecting POAPs. Through Discord ranks based on the POAPs, regular viewers can be identified more easily by me and other regulars. It is much easier to memorize and categorize the community with the new Discord rank system. POAPs also proved to be a good way to let the community grow their status of membership by attending Twitch live streams in non-monetary related ways. It was also a good tool for combining the Twitch and Discord community, with Discord ranking system based on Twitch viewership and attendance. With the new Discord rank system, it was possible to create private text channels for the actively engaging audience and a way for them to have a say and impact on future content and live streams with polls. While a month ended up being too short timeframe to make concrete conclusions on the effectivity of the POAP system, I believe it can also improve the shared history building of the community, as the POAPs are tightly connected to memorable events in my streaming journey. As time goes on, early community members have ways of showing, sharing, and remembering the previous events through their POAP collections.

6.2   Challenges

As for challenges, it was already noted that non-crypto native audience will require much longer time frames to get them to adopt the use of POAPs. I do believe the adoption curve will be exponential as the community starts conversing

and sharing their POAP collections. The more careful members will be more and more intrigued to participate themselves, once they see a large portion of the community adopting it.

Distribution of POAPs can be difficult and requires for the issuer to decide on the best form of distribution for them. For smaller issuers, manual distribution is excellent, but as you scale up it becomes more and more tasking to manually distribute POAPs and Discord ranks. Once the numbers go from tens to hundreds, it would be best to distribute POAPs through use of single secret code that users can use to claim POAPs themselves. This does have to be done in a way where bots and "POAP hunters" won't be snatching them at mass. A good way of distribution would be to verbally say the code during live streams and keep the claim window within hours, not days.

Issuers also must find a good balance on the rate of POAP events, as too many too often can dilute the effects of POAPs and become too stressful for the community to keep up. It would be best to keep POAP events at a weekly or monthly timeframe when issued by the creator. It should also be encouraged for the community to create their own POAPs relating to memorable community or live stream moments.

6.3 Further development and opportunities

As the Discord community grows, updating the ranks of community members can become too tasking. I would recommend changing the manual distribution of POAPs to a secret code based, this however leads it to be much harder to combine the Discord ranks to POAP holders, since you can't do it at the same time you distribute the POAP and direct message the Discord user. To tackle this challenge, there are likely Discord bots available that can enable rank distribution based on the amount of eligible POAPs held, and users will connect their Ethereum wallet once to the Discord bot, so it knows which wallet and POAPs belong to which Discord username. This would automate the system and make it more futureproof and scalable for the content creator.

While the social token dapp services turned down Juffu due to small community size, for other creators and to Juffu at some point this could be a good addition on top of the current POAP system. It could enable better governance methods, community benefits and potentially a way for community to invest into the future of the creator, perhaps even to a share of their income generated through live streaming.

Live stream content creators quite often hold giveaways for their merchandise or community benefits such as play sessions with the live streamer. Holding these giveaways through POAP service for users that hold eligible POAPs could be a great way to reward the more active community members and incentivize the community to attend events and claim more POAPs for their collection.

6.4   Final thoughts

In conclusion the development project delivered Juffu a long lasting and differentiating community ranking system, which is based on the event attendance of Twitch live streams. The usage of POAPs also improves the sense of community for his audience, giving sense of membership, a way to impact on the future content of the streams through polls, giving a way to affect their status of membership and helps build emotional connection through shared history. The full effects of the designed system on the viewership and engagement on Twitch remains to be seen later. However, it was already noted to be an effective way to increase the size of his Discord community. Juffu will continue to use and improve this system for his community in the future.

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