MID-TERM DELIVERY

Kontribute - Web3 Storytelling

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1. INTRODUCTION

1.1 Glossary

Blockchain

A peer-to-peer network that maintains a record of transactions in a digital ledger, usually secured through distributed nodes, cryptography and using a form of cryptocurrency as a method of incentivisation to maintain the network.

ICP (Internet Computer Protocol)

An abbreviation for the Internet Computer Protocol blockchain. A new cryptocurrency technology launched in May 2021 that allows developers to build applications on top of it. It is faster and cheaper than other programmable blockchain alternatives.

Cryptographic authentication

A method in which a unique identifier is generated for a particular person/account using a particular hashing algorithm - most commonly used is Secure Hash Algorithm (SHA256). Usually a collection of words is inputted into this one-way algorithm to generate the identifier, in our case a biometric scanner generates the address.

Frontend

A term used to describe the user-interface code of a particular application, frontends display, query and input data - but they do not store data indefinitely.

Backend

A term used to describe the API (Application programming interface) code of a particular application backends can store, retrieve and process data. Backends cooperate with the frontend to make a “full stack application”.

Tamper proof resistant

When a particular system or application is protected against unauthorized access. Data in such a system cannot be changed without the appropriate access keys.

Permissionless

A term that refers to when users do not require permission from any centralized entity to access and use the features in an application.

MVP (Minimum Viable Product)

Usually refers to a version of an application that has all the basic necessary features that are required for it to function and convey the idea so that it can be put in the hands of early users.

Mint

When we use the term “Mint”, we usually mean uploading a piece of media data (image, gif, video, etc) to the blockchain. This then turns that media into a tradable asset. It generally means the asset is produced for the first time or made official.

Smart contract

Smart contracts are programs stored on a blockchain that run when predetermined conditions are met. They are typically used to automate the execution of an agreement. Our backend files of programming code are uploaded to and powered by a specific blockchain.

Motoko

Motoko is the smart contract programming language used for Kontribute. It bears similarities with other type-safe programming languages such as C++ and Rust.

Tokenization

Tokenization is a new concept in blockchain technology that refers to turning data into digital collectibles. These collectibles can then be stored safely on the blockchain and used for activities such as trading.

Cryptographic key

Like a physical key, a cryptographic key gives the owner the ability to unlock something, a cryptographic key is a string of characters used within an encryption algorithm that alters the data so that it appears random.

Immutable

Something that can not be changed.

1.2 Project description

Kontribute at its core is a creative writing and art application - meaning authors can come to the platform with their fictional stories and art to share them with a new audience. An example use case is an author selling characters from their fictional story as a digital collectible on the built-in Kontribute marketplace. Stories can also contain polls - giving authors the opportunity to ask a question to their audience and get feedback on a story while also giving users the opportunity to help shape the future of a story through voting.

Tokenization is incorporated on top of this idea i.e. authors and artists can sell digital collectibles and be encouraged to create quality content on the platform. Kontribute can facilitate this due to it being hosted on the ICP (Internet-Computer Protocol) blockchain.

Blockchains allow users to be more involved in how applications are run - meaning users can openly view the code being served to them and have more control over their personal data via smart contracts. Blockchains also allow virtual tokens to be transferred between users to pay for fees and services and exchange information and data. Examples of such tokens/assets on Kontribute could be characters from a story in the form of a digital collectible.

Users of Kontribute can trade these tokens with each other in the built-in marketplace on the application. Such concepts are not possible without operating on a blockchain. There are other benefits to being hosted on the ICP blockchain, such as increased uptime, high quality security, better transparency and better funding opportunities for small teams (as this is a relatively new industry). Kontribute takes advantage of blockchain technology to make sure user data is owned by the user themselves and the data and the structure of the code is immutable. The purpose of hosting our application on a blockchain is that it opens us up to a new world of possibilities that is just not possible in regular server hosting. We discuss this more in section 3.1 Technology infrastructure & architecture.

Creators can benefit from monetization rewards on Kontribute which will be based on the principles of a free market [1]. Meaning profits from an author's story will be determined by which stories users are enjoying and what is trending on the platform, in turn affecting the demand for their stories and digital collectibles. Authors receive monetary benefits from fans buying their digital collectibles or from voluntary donations (tipping), all through Kontribute's UI. You can view our Business Model Canvas (BMC) in our Appendix section - *Fig 1*.

User Scenarios

For a user interested in reading stories, participating in polls and trading digital art collectibles, they can explore the applications **Stories** and **Marketplace** pages in the application - see Appendix section - *Fig 4 & Fig 5*.

For an author looking to create stories on the platform they can visit the **Create story** feature and be presented with a text-editor. This page also has functionality for editing the author's profile and adding polls - see Appendix section - Fig 6.

For an artist looking to share their art work alongside a story - they can navigate to our **Mint** page, which allows them to upload their artwork, turn it into a digital collectible and sell it in the application - see Appendix section - Fig 7.

Kontribute MVP

Kontribute's minimum viable product (MVP) was launched pre-september 2022 and had already gained users - see section 2.3 Market size**.** The MVP included basic functionalities such as:

- Basic story creation.
- Digital collectible functionality with trading.

We aimed to carry out the following actions/features during this module. By completing these features and tasks laid out below during this module, we believe we will have a product that can excel once fully launched online.

- Conduct robust primary and secondary research.
- Improve the frontend user interface based on research and best practices.
- Implement a scalable backend to support an increase in platform users.
- Develop digital collectible relationships with stories.
- Develop a 'tipping' mechanism allowing users to donate to creators.

We will explain these features in more detail later on in the document in section 2.5.

2. INITIAL BUSINESS MODEL SUMMARY

2.1 Value propositions

Users will have a say in the outcome of the app's future and fully own their data. To do this, Kontribute will need to take advantage of blockchain technology to make sure user data is owned by the user themselves and data and the structure of the code is immutable. Various tokenization elements of digital collectibles on the platform give creators unique ways to raise funds.

We expect most consumers will find value in reading great fiction stories and browsing interesting art on the platform - consumers can speculate on art value (as they do in the real world) and support their favorite authors who are writing innovative and original content on the platform.

As for the content creators, they will find value in having a platform to engage with their audiences and share their creative works as well as potentially benefit from this financially. See *Fig 2* and *Fig 3* in the Appendix section to view our Value Proposition Canvases (VPCs).

2.2 Target users and customers

We believe we attract four customer segments: Authors, Artists (Content Creators) Readers and Art Collectors/Enthusiasts (Content Consumers). Authors will be creating short and novel type stories on the platform and engaging with the reader audience.

We expect to have a smaller community of artists creating content on Kontribute than authors but we suspect these will probably attract the large majority of users to Kontribute as visual art is more of an appealing way to onboard casual users and the general population prefer looking at images rather than text [2].

We expect Kontribute's initial main cohort of users to be from the ages of 18 to 30 years old. This is because blockchain technology and cryptocurrency is most popular with young adults - with 31% of people ages 18 to 29 having used it [3].

2.3 Market size

To calculate the total addressable market (TAM) for Kontribute we conformed to a bottom-up approach of analyzing current users of our Minimum Viable Product (MVP) we have already launched and the total market of users of similar products and apps. We have made our best effort to minimize assumptions and base our analysis on backed up data. The figures we have found from our research were calculated in dollars (USD), so we have decided to keep calculations in the same currency and not convert to euros.

Average Revenue per user (ARPU): An MVP generates little to no revenue, so we must base our data on existing apps that we believe offer products in the same market space as us. The first is the Web2 creative writing and storytelling app Wattpad, which generates an annual revenue of $40 million USD [4], with a user count of 94 million as of 2022 [5]. The second app is OpenSea, a digital collectible trading marketplace that encompasses many of the planned features of Kontribute. They have an extrapolated yearly revenue of $365 million USD [6] with a total user count of 1 million in 2022 [7].

Kontribute's initial MVP garnered 1060 users:

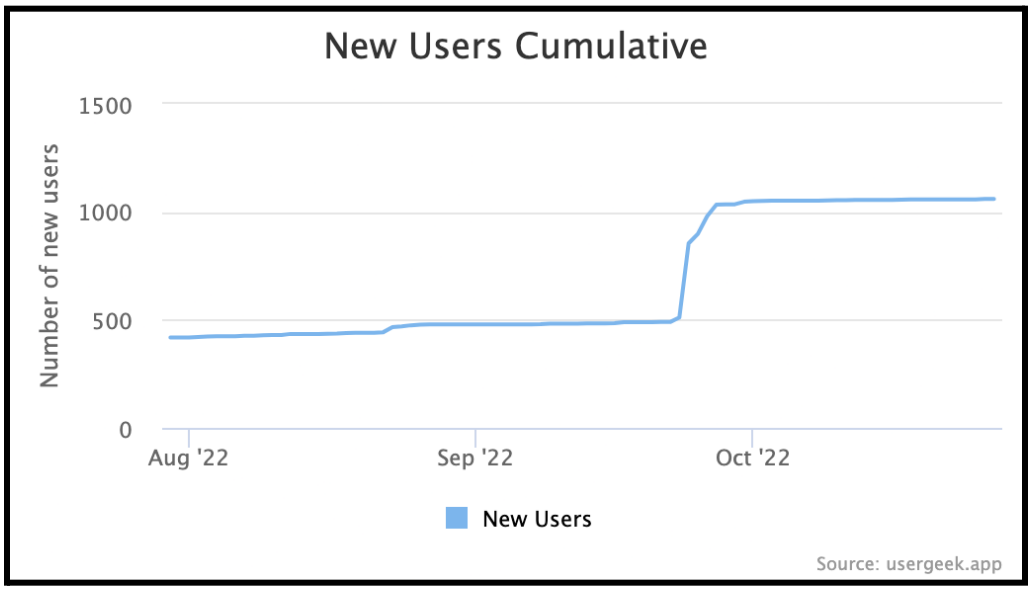

Fig 1: *Kontribute MVP New Users Cumulative*

We can estimate and extrapolate out our expected average revenue per user from this data with a simple equation. With average annual revenue per user for Wattpad being $0.42 USD and the average annual revenue per user for OpenSea being $365 USD. It's clear there is more revenue value in selling a speculative digital collectible (OpenSea) but more long stained and higher user growth in providing a fun social experience (Wattpad).

Given Kontribute's MVP's 1060 users and an expected growth of roughly 500 users per month (based on our primary research from MVP of +500 users per month) we can estimate a total user count of 6000 in the first year (adjustable thereafter based on current metrics). To calculate Kontribute's ARPU we have made two assumptions: that we reach 1% success of OpenSea's ARPU and 50% success of Wattpad's. That gives us an ARPU of $3.86 with an estimated annual revenue of $23,160 in the first year.

Total potential customers in market:

Combining the figures from the above two apps we get a total potential user count of 95 million. A recent study showed there were about 2.5 million active daily users in Web3 (Kontribute's target market) [8]. So we can estimate that in a best case scenario 2.5 million unique users of the total cap of 95 million come back to use the app everyday.

The TAM (ARPU * total potential customers in market) is:

$3.86 USD ARPU * 95 million total potential customers = **TAM $366,700,000 USD**

2.4 Revenue Streams

Currently over 250,000 readers, writers and artists that use creative writing platforms use apps such as Patreon to earn monetary benefits from fans of the content they create [9]. However, Patreon takes roughly $0.30 USD per transaction from their fans who support them [10].

Kontribute will have built-in functionality for fans to 'donate' or 'tip' authors and artists of content they enjoy that will undercut the transaction fees charged by apps like Patreon. This will drive more transactions through Kontribute's 'donate' system as fans will know more of their money will reach the intended party, bringing revenue from other applications to Kontribute.

We will also generate revenue through the built-in marketplace on the platform. The largest digital asset marketplace, Opensea, takes a cut of roughly 2.5% of each digital asset successfully sold on the platform [11]. At Kontribute, we will mimic this revenue stream also by charging a small percentage (roughly 2%) of each digital asset sold on the platform.

Additionally, Kontribute may decide in the future to allow limited advertising on the platform. We are considering a model where authors would pay to have their stories shown on the home page and the same can apply to artists who are launching art content on the platform. We would prefer this model rather than showing irrelevant advertisements from external sources to keep the platform an engaging experience for all users.

2.5 How the project has advanced in module

Since Kontribute had begun before the CA472 module, we are going to discuss what development work has been carried out since the module began. We have iterated towards a final version of the application - moving on from MVP and having completed various primary research (see Appendix section - Fig 9) and gotten feedback on several features, as such the Kontribute platform has progressed and we plan on demoing the following features at the project expo. Some of these features are still in their development and not fully completed, as per our Gantt chart in section 4.

Improved user interface based on research and best practices:

We have redone much of the user interface throughout the application, this follows best practices from resources such as Peter Coach's book "Don't Make Me Think, Revisited: A Common Sense Approach to Web Usability" [20]. See Appendix section - Fig 4 to Fig 7 for snippets of the new user interface.

Scalable backend to support more users:

The backend of the application has been completely redone to be more scalable as to handle more users. This upgrade included extra features such as adding views and like counters with stories, and also polls with votes and voting options. This behind the scenes work included re-doing most of the Motoko code in the applications backend.

Develop digital collectible relationships with stories:

Tieing in the digital collectibles with the stories was also included and part of this was allowing artists to mint (upload to the application, See Appendix section - Fig 7) images and sell them alongside their story. This turns them into a digital collectible and makes them tradable in the application. Collectibles can be viewed alongside a story.

Develop a 'tipping' mechanism allowing users to donate to creators:

We've created a mechanism that allows users or fans of creators on the platform to directly donate to creators of their choice. We take 2% of each donation as a service charge. See Fig 8 in the Appendix to view how it currently looks.

3. FUNCTIONAL SPECIFICATION & TECHNICAL DESCRIPTION

3.1 Technology infrastructure & architecture

Kontribute will be a decentralized application (dapp for short) - meaning its code will be hosted and served from a blockchain, specifically the Internet Computer Protocol blockchain (ICP) [12] - The main benefits of this include:

- Fast cryptocurrency payments.
- Authors own their data making Kontribute a fully democratized alternative to other writing applications.
- The application is secure, there is no need for firewalls.
- Accounts are anonymous for users using cryptographic authentication.
- ICP is one of the cheapest blockchains to use for computation and storage.

React JS

Our applications frontend is built with React JS - a JavaScript library for building user interfaces [13]. React JS is a component based frontend library that is highly modular and makes code very reusable. It uses concepts like pure functions (a functions input returns the same output if the same arguments are passed) and declarative code (essentially meaning React JS abstracts away some of the more complex elements of web development).

Motoko

Our backend of the application is built with Motoko [14], a new smart contract programming language developed specifically for the ICP blockchain. The smart contracts will essentially be our data layer in our architectural design where everything is stored and how all transactions will be processed through Kontribute. Smart contracts by design are inherently more secure than traditional backend infrastructures because cryptography is used to secure transactions, the data on the blockchain is available for everyone to see - there is no room for mis-interpretations and middle-men are cut-out [15].

3.2 Application hosting

As mentioned previously, Kontribute will be built on a blockchain, this is an extremely new concept in application development - but what we mean is that essentially our application code will be served from the blockchain and be accessible from any browser.

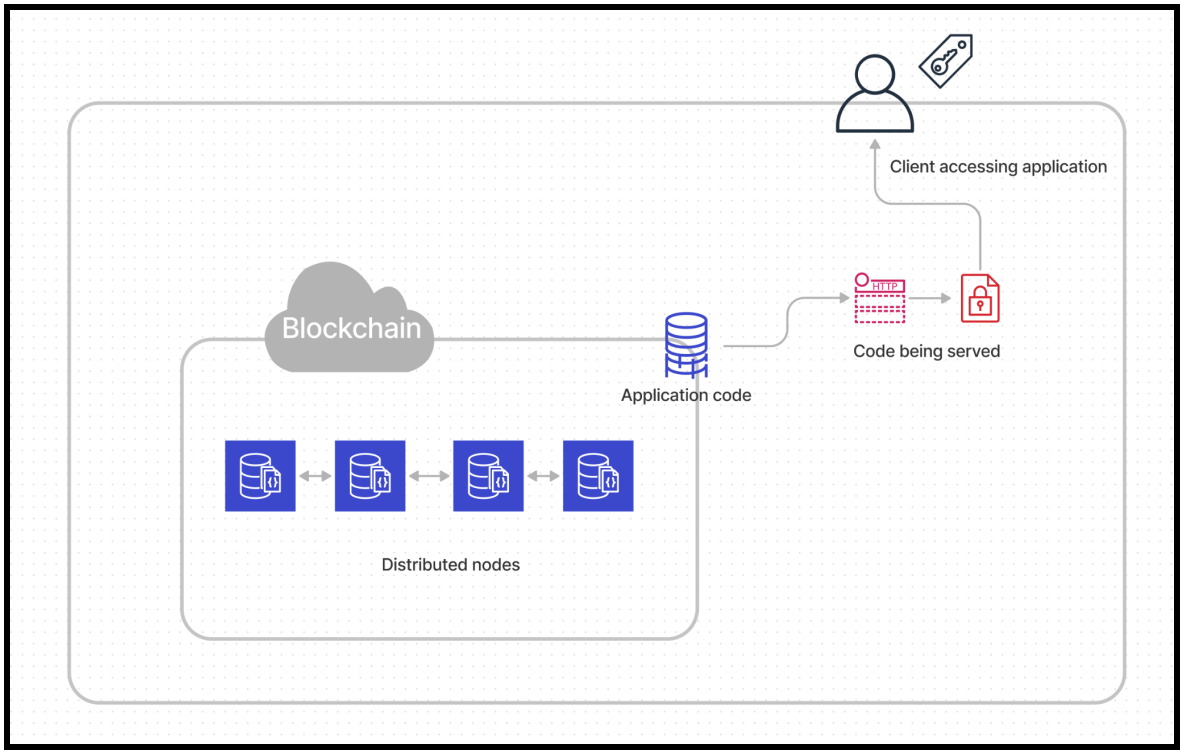

Fig 2: Kontribute's system architecture

Applications are traditionally hosted in centralized cloud hosting or private local servers. The benefits of hosting your application on a blockchain when you have many international users, is that essentially it opens up new paradigms of giving users more control, ownership and insight into the applications they are using. We are serving our code from the blockchain. By doing so, we are being more transparent to our users - all the code is reviewable to all users of Kontribute. Something rarely seen in a traditional application unless it is specifically open source. Blockchains by design are distributed - meaning Kontribute will be more tamper proof resistant and permissionless.

Our goal here is to develop trust between the development team and the end-user, while also utilizing some of the unique features that cryptocurrency protocols open up to us. There are trade-offs here, meaning longterm the application will be more expensive to host (although we have chosen one of the cheapest blockchains to use). Transactions and data updates are also slower than a traditional database and application.

3.3 Authentication

The application intends to allow all users to be anonymous or to provide optional pseudonyms. This is a key feature for Kontribute which further ensures the application will not be collecting any data from its users and thus will always remain data compliant with the various data protection laws around the world. We can do this by assigning a unique cryptographically generated wallet address to each user.

There are various ways to do this, however we are taking advantage of ICP's specific authentication system - Internet Identity [16]. Essentially, we will be generating anonymous addresses based on a user's specific device or biometric scanner - an example of a biometric scanner is a modern mobile phones fingerprint scanner or facial recognition (face ID), however by choosing this login method this doesn't give us access to any of the users personal data, simply the biometric scanner generates an anonymous cryptographic key - which we have access to.

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a00b8f555f7b02edaf9854ea727e83adb7e6b84cca023f784d70369e5223cfd5
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Fig 3: *Example of a cryptographic address*

3.4 Story functionality

This functionality allows the user to create stories within the application - stories will be inputted via a text editor on the frontend and stored in a smart contract on the backend, with stories tied to the unique generated user address and visible in the author's profile if they are authenticated. It is not enough to only put, query and display stories so we are proposing extra features that tie in here to enhance the story interactivity and reading experience. Stories will have:

- Title
- Sub-title
- Genre
- View counter
- Like counter
- Polls with voting options

As such stories will be interactive with voting options. We are also proposing connecting digital collectibles with the stories, which we will discuss in more detail in the next section. With the combination of these features, concepts like LIT-RPGs [17] - short for Literary Role-Playing Game, which combines the experience of digital role playing games with traditional narrative plotlines can be explored by authors in the application.

3.5 Digital collectible functionality

Non-fungible tokens (NFTs) or digital collectibles as we will refer to them, are essentially a unique piece of media (image, gif, video, etc) that is stored on the blockchain [18]. We are proposing intertwining these with our stories around the idea of creating visual art pieces of characters, accessories, locations or anything else - to sell alongside a story.

We believe this functionality will make stories on our platform more engaging to our users. This means we need to enable the storage, creation, trading and transferring of these art pieces, as such the proposed functionality for the digital collectibles is as follows:

- Wallet for storage
- Minting (uploading the meta-data to the blockchain)
- Marketplace for selling and trading

A single digital collectible will have the following functionalities:

- Set price and show on marketplace
- Transfer to another wallet
- Burn (destroy)
- Used for voting in a story poll

As such these art pieces will be tied into the stories via the polls - meaning if an author wishes, only those who own their collectibles can vote on their polls.

3.6 Constraints

Some of the constraints from the proposed features include scalability, UX and complexity.

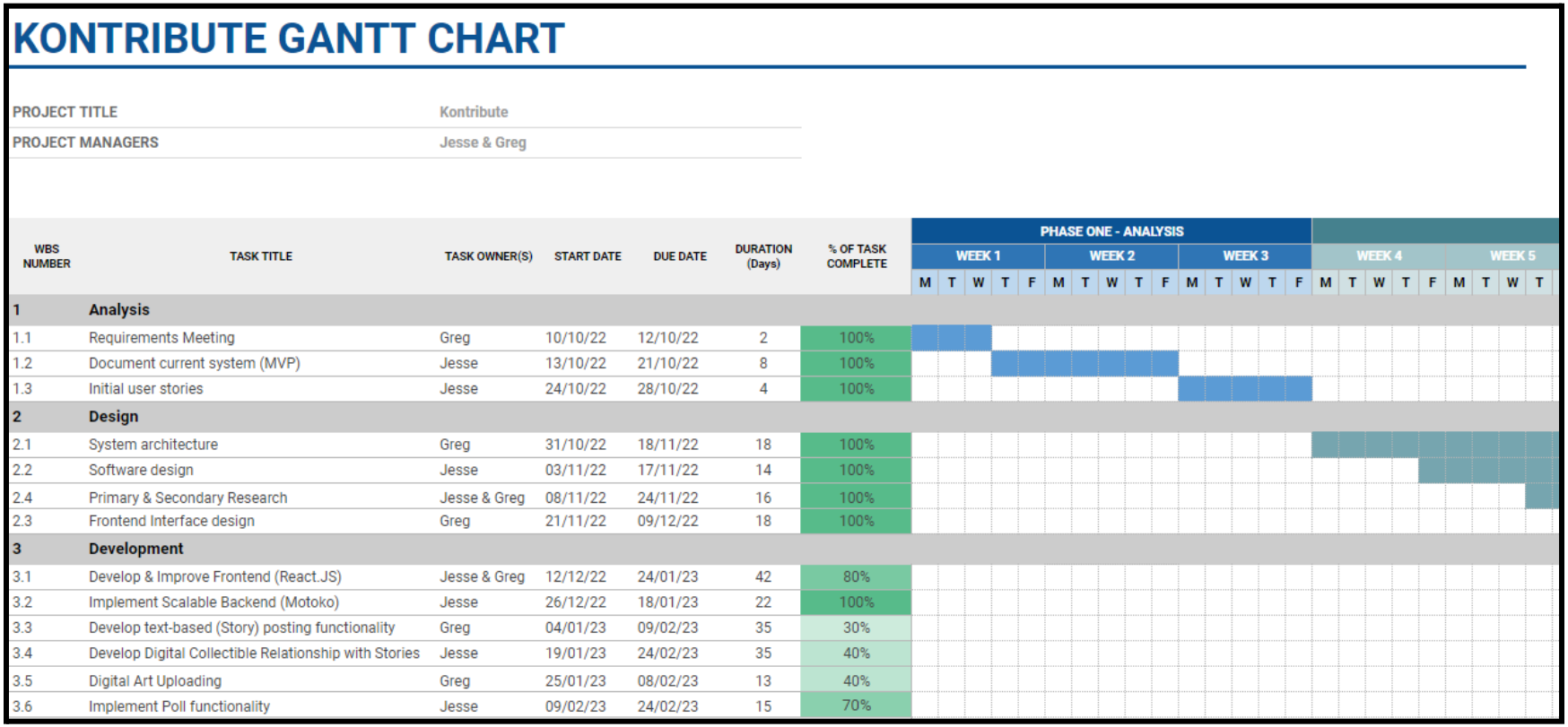
Smart contracts are inherently not scalable, meaning we will need to come up with a solution for this, however some solutions exist such as open-source smart contract libraries which will allow us to scale out. We are currently considering a potential solution of each user being assigned their own smart contract.

In general, blockchains are slower and latency may occur when updating data as such flows like minting your digital collectibles and uploading your stories may take around 2-4 seconds. It's important to us that this does not hinder user experience. This can be overcome with user interface updates, asynchronous function calls and optimistic updates [19].

In conclusion, we are proposing building features on a very new technology stack and as such there will be a learning curve to build these features and some coding complexity. Due to the relatively young age of this technology there is a lack of documentation and resources to guide the development as compared to a traditional technology stack but we look forward to this challenge.

4. PROJECT TIMELINE (GANTT CHART)

To view the whole chart follow this link: Kontribute Gantt Chart



KONTRIBUTE GANTT CHART

PROJECT TITLE	Kontribute
PROJECT MANAGERS	Jesse & Greg

WBS NUMBER	TASK TITLE	TASK OWNER(S)	START DATE	DUE DATE	DURATION (Days)	% OF TASK COMPLETE
1	**Analysis**					
1.1	Requirements Meeting	Greg	10/10/22	12/10/22	2	100%
1.2	Document current system (MVP)	Jesse	13/10/22	21/10/22	8	100%
1.3	Initial user stories	Jesse	24/10/22	28/10/22	4	100%
2	**Design**					
2.1	System architecture	Greg	31/10/22	18/11/22	18	100%
2.2	Software design	Jesse	03/11/22	17/11/22	14	100%
2.4	Primary & Secondary Research	Jesse & Greg	08/11/22	24/11/22	16	100%
2.3	Frontend Interface design	Greg	21/11/22	09/12/22	18	100%
3	**Development**					
3.1	Develop & Improve Frontend (React.JS)	Jesse & Greg	12/12/22	24/01/23	42	80%
3.2	Implement Scalable Backend (Motoko)	Jesse	26/12/22	18/01/23	22	100%
3.3	Develop text-based (Story) posting functionality	Greg	04/01/23	09/02/23	35	30%
3.4	Develop Digital Collectible Relationship with Stories	Jesse	19/01/23	24/02/23	35	40%
3.5	Digital Art Uploading	Greg	25/01/23	08/02/23	13	40%
3.6	Implement Poll functionality	Jesse	09/02/23	24/02/23	15	70%

PHASE ONE - ANALYSIS

WEEK 1 | WEEK 2 | WEEK 3 | WEEK 4 | WEEK 5

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Fig 5: Gantt chart of project tasks

5. APPENDIX

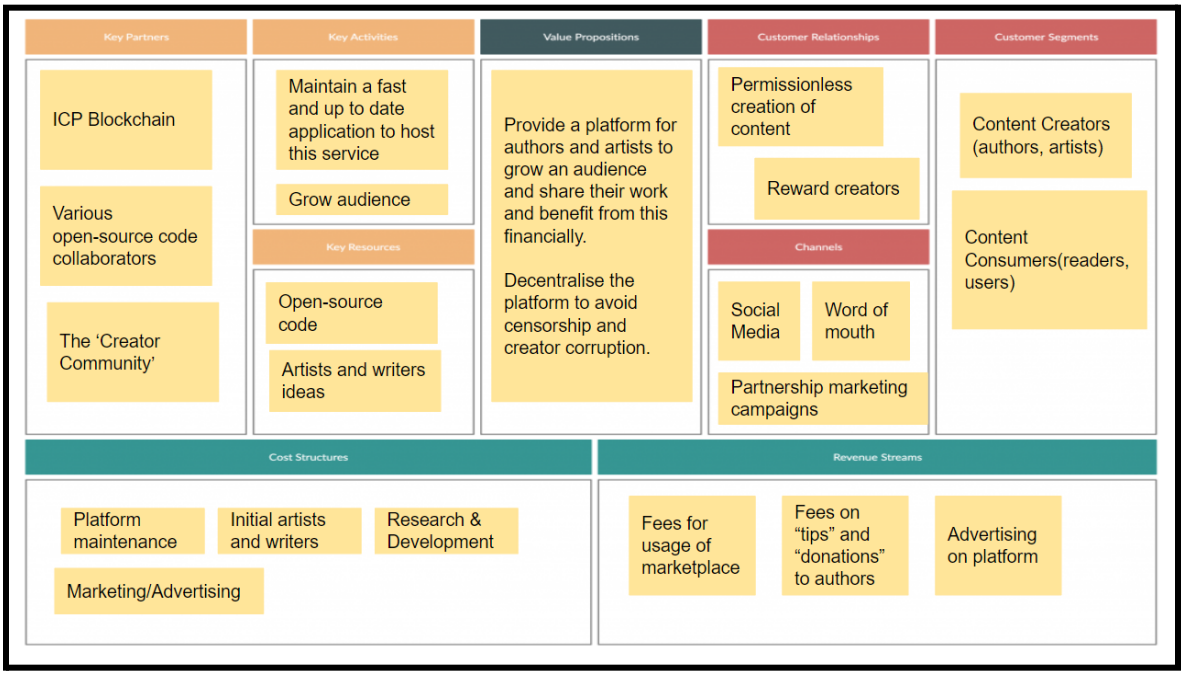

Fig 1: *Kontribute Business Model Canvas (BMC)*

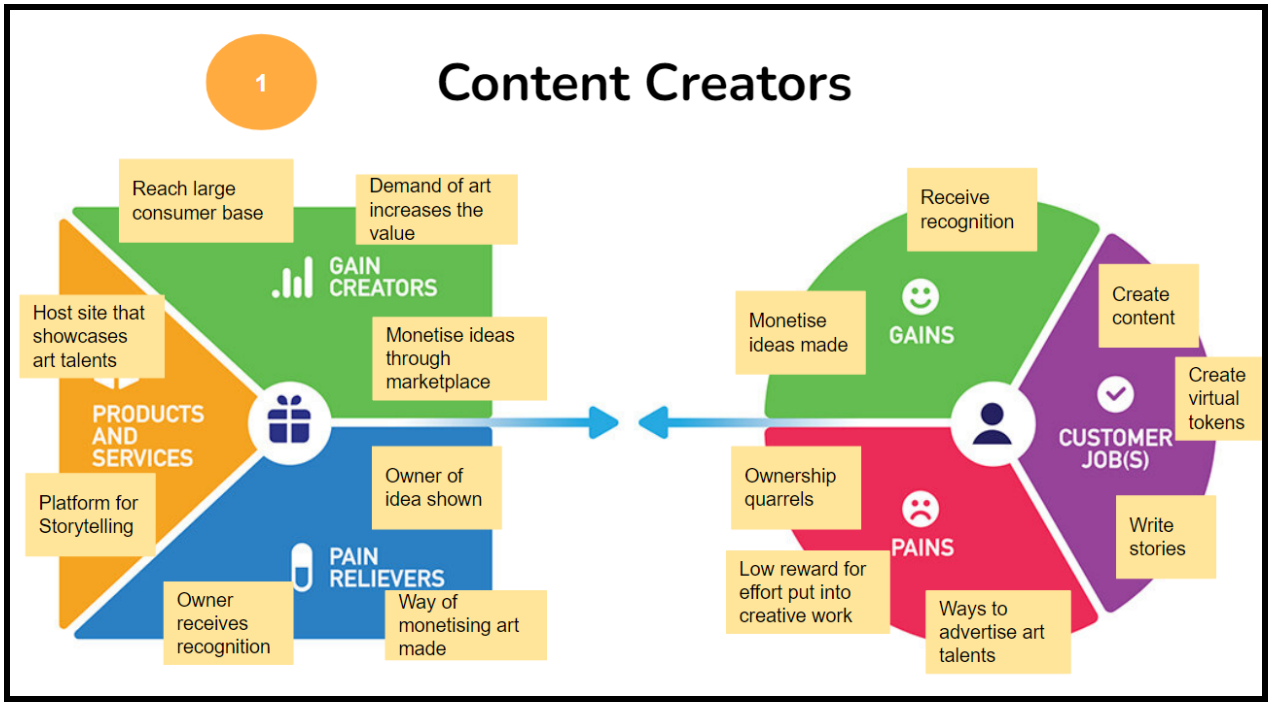

Fig 2: *Value Proposition Canvas (VPC) for Content Creators on Kontribute*

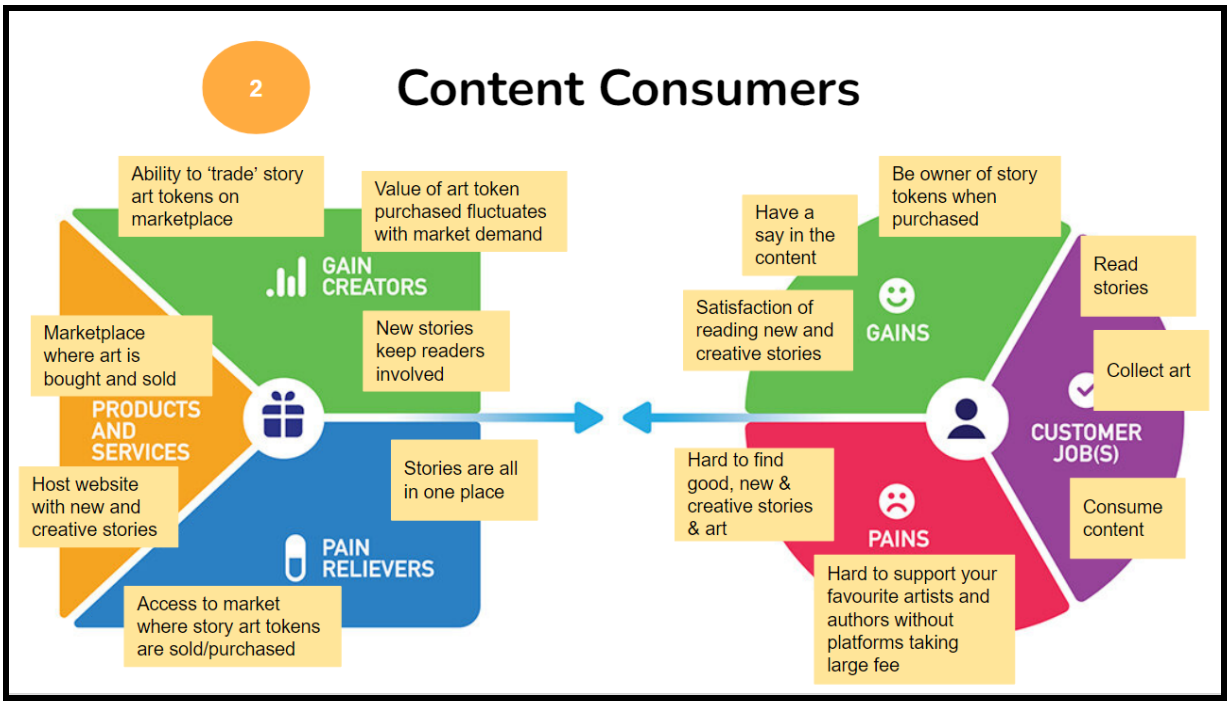

Fig 3: *Value Proposition Canvas (VPC) for Content Consumers on Kontribute*

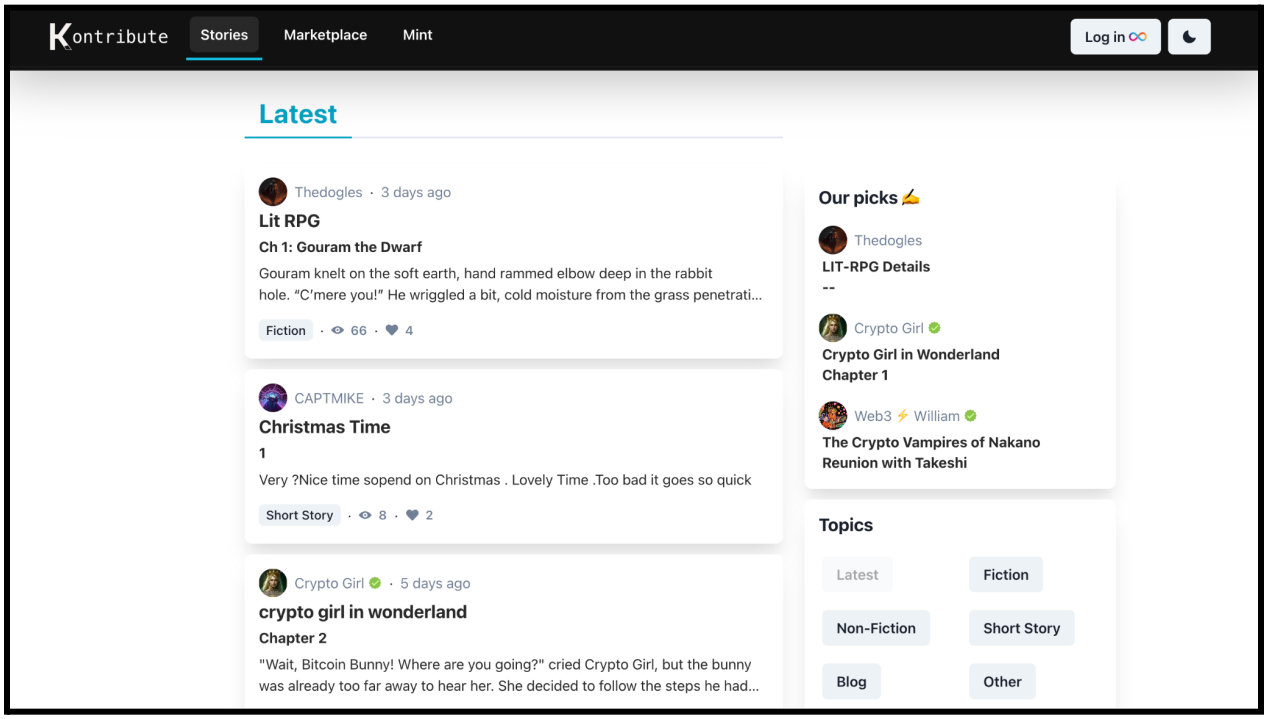

Fig 4: User interface of *Kontribute Stories page*

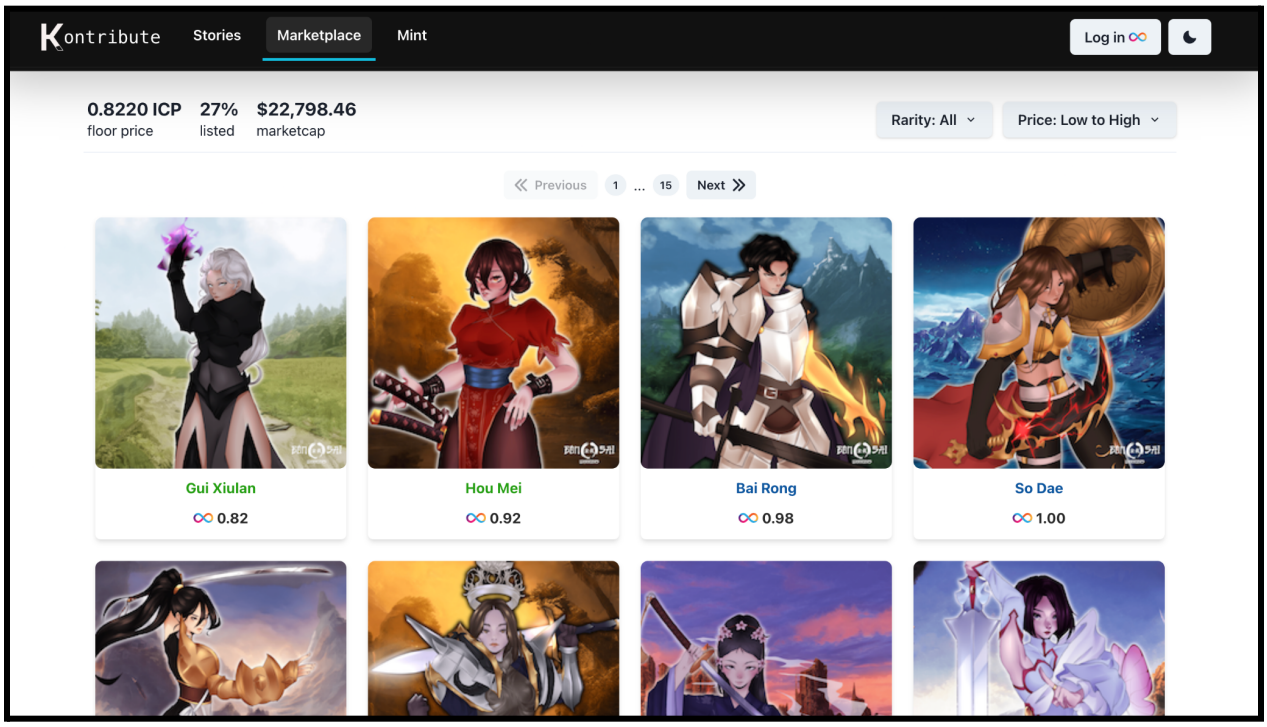

Fig 5: User interface of *Kontribute Marketplace page*

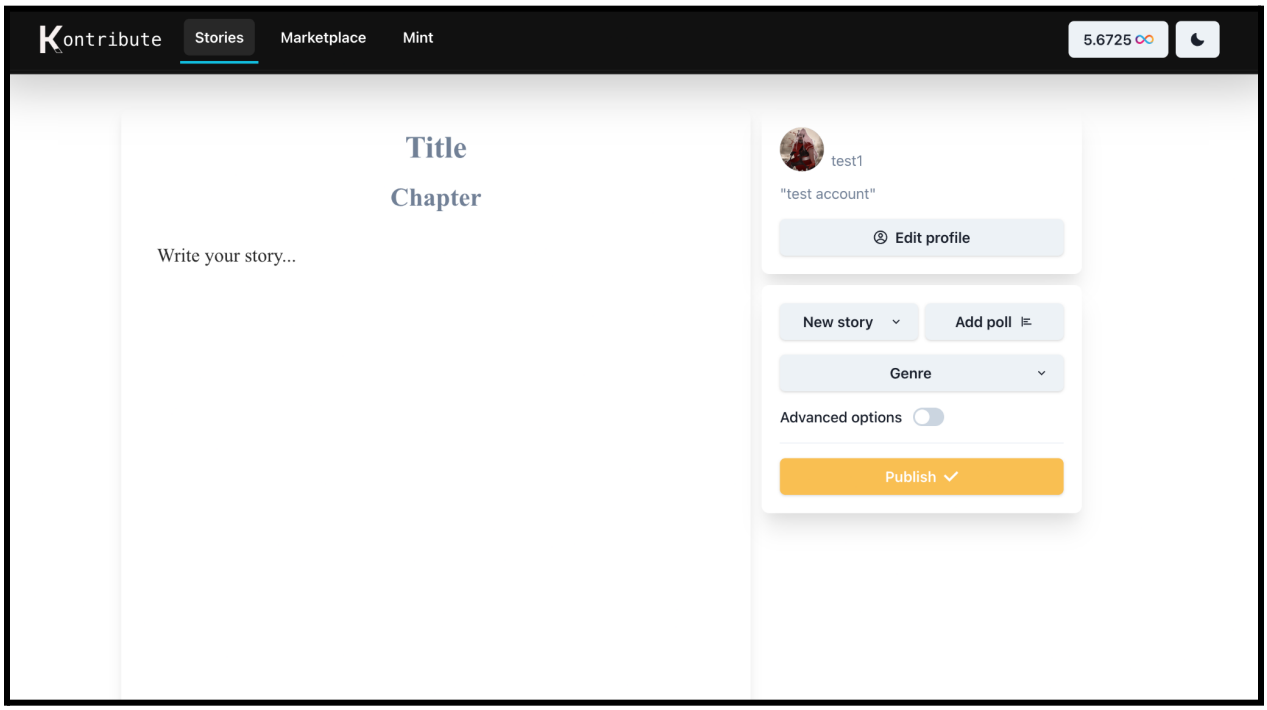

Fig 6: User interface of *Kontribute Create story page*

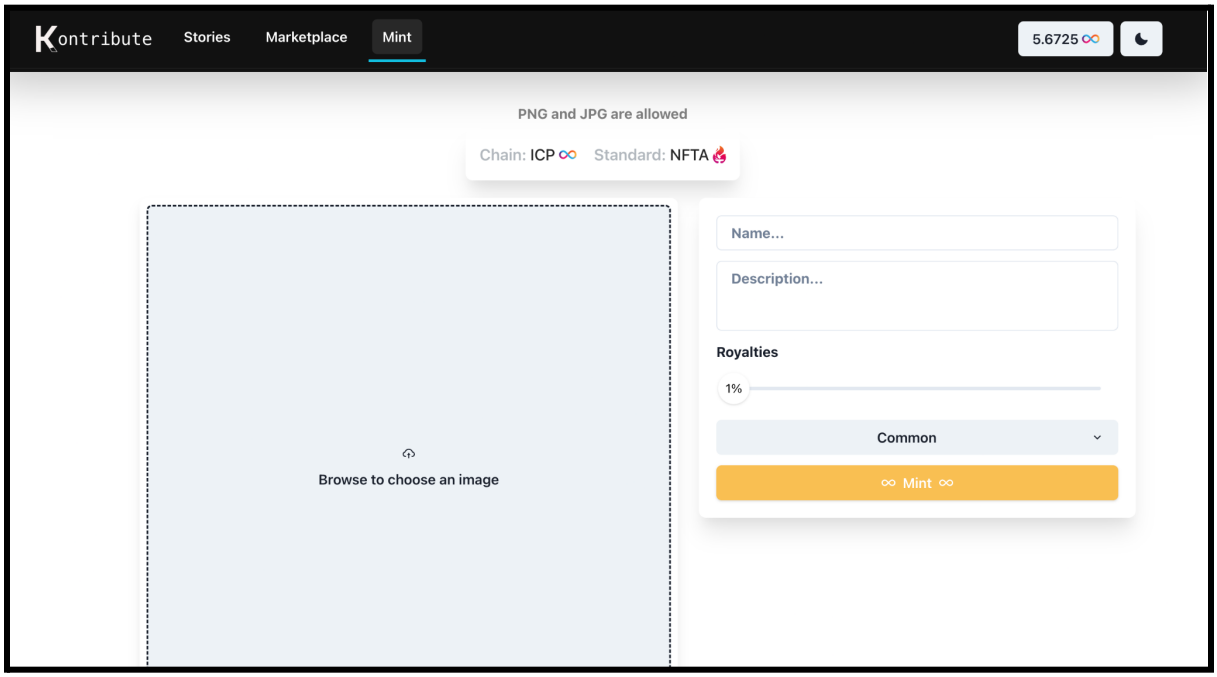

Fig 7: User interface of *Kontribute Mint page*

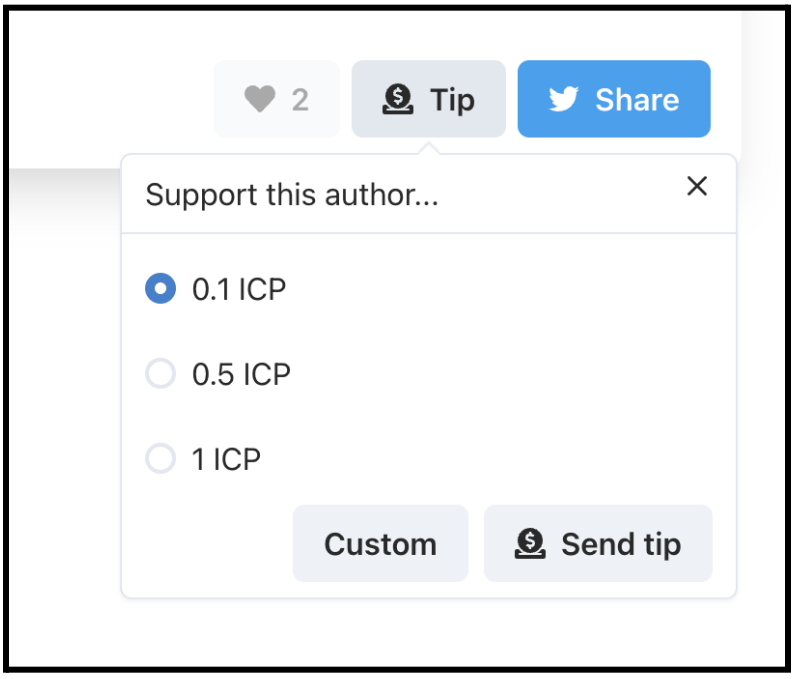

Fig 8: User interface of tipping mechanism

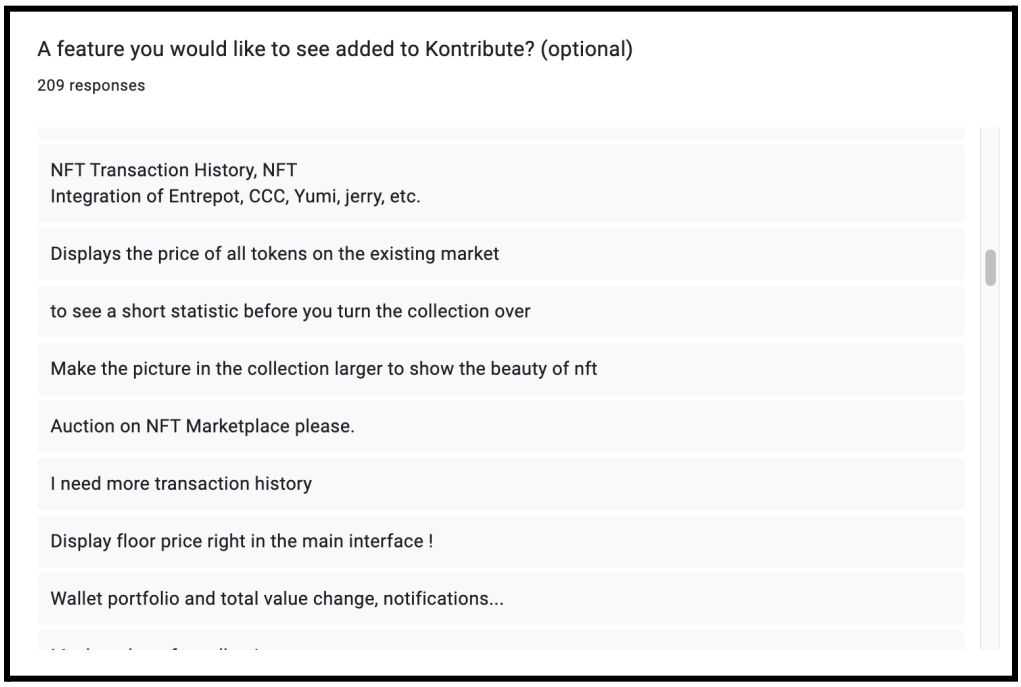

Fig 9: Results from an anonymous google form of *Kontribute users*

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