

# **Stimulus**

By Studio-7

## **Documentation**

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# Abstract

A Stimulus backed by incentives for individuals to create, review, and consume news. The primary innovation of blockchains is a verifiable and cryptographically secured global ledger that can lead to new types of incentive structures. Developers can take advantage of the Ethereum blockchain to build applications that are not only architecturally and politically decentralized, but are underpinned by tokens of value. We propose a network in which writers produce news content that is reviewed by fact-checkers before being published on the network without the risk of being taken down. All parties involved in publishing a factual article will be rewarded with tokens in a self-sustaining environment that thrives on tangible activity and accuracy of content rather than on advertising revenue and corporate interests.

## Legal Disclaimer

Stimulus have no known potential uses outside of the Stimulus Platform. This Whitepaper does not constitute a prospectus or offering document, and is not an offer to sell, nor the solicitation of any offer to buy any investment or financial instrument in any jurisdiction. Stimulus should not be acquired for speculative or investment purposes with the expectation of making a profit or immediate resale. No promises of future performance or value are or will be made with respect to Stimulus, including no promise of inherent value, no promise of continuing payments, and no guarantee that Stimulus will hold any particular value. Do not participate in the Stimulus token sale unless you are prepared to lose the entire amount you allocated to purchasing Stimulus.

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**Please note that Studio-7 is in the process of undertaking a legal and regulatory analysis of the functionality of Stimulus. Following the conclusion of this analysis, we may decide to amend the intended functionality of Stimulus in order to ensure compliance with any legal or regulatory requirements to which we are subject. In the event that we decide to amend the intended functionality of Stimulus, we will update the relevant section of this Whitepaper and upload the latest version of our Whitepaper to our website.**

## Problem

All in all, while the bureaucratic establishment decides how to set the tone, the media frequently helps dictate it through large donations in exchange for political favors. This creates an endless cycle of powerful corporations and politicians passing the baton between one another, as they all enrich themselves further. These big bets are initially made by media companies so they can continue to consolidate their power, uninterrupted. In turn, their news becomes very skewed and one-sided in order to appease the political establishment and avoid a conflict of interest. The core values and principles of journalism are subsequently compromised in favor of biased and sometimes blatantly false coverage, that perpetuates the political atmosphere the media wants to cultivate.

Most importantly, the issue of 'fake news' has increased with each passing day. With the growth of social and blogging platforms, as well the internet as a whole, publishing has turned into an act that is both simple and instantaneous. At the same time, the lines between what is fake and what is real have blurred, as we race to distinguish fact from fiction. Publishing is now a fully democratized action, turning everyone into an editor, which is equally as powerful as it is potentially dangerous.

## Echo Chamber Of Social Media

Over the past decade, there's been a big shift in the way people stay informed. Americans looked to daily newspapers and television for much of their news;

however, this behavior has significantly shifted elsewhere. In the U.S., 62 percent of adults rely on social media for news.

Among social media providers, Facebook has become a rival to the big suit-and-tie networks like CNN, Fox News, ABC, and NBC. Facebook has become a gatekeeper for much of the news that Americans consume online. Many traditional news outlets have morphed into being the so-called content pipelines for Facebook's news factory.

Truthful and fact-driven news has been forsaken in favor of clickbait headlines and digital ad revenues. The general public's understanding of current events has been immensely distorted. In fact, there are a large number of websites whose sole purpose is to drive the spread of flimsy and groundless stories. For them, integrity is derived primarily from click-rates and impressions, rather than factual reporting, as reported by The New York Times just after the 2016 presidential election.

Reporters have come under increasing pressure to produce "clickbait" articles that pander to readers' increasingly short attention spans. Content that is sensationalist and exaggerated attracts more eyeballs and clicks than stories presented in a more accurate, thorough fashion. Partisan contributors share completely fabricated stories from fringe and alt-news websites, lending to confirmation bias. In some ways, social media, rather than improving, is contributing to political polarization and a lower quality of open conversation on the internet. According to Pew, 23 percent of Americans say they have shared a made-up news story, with 14 percent saying they shared a story they knew was fake at the time and 16 percent having shared a story they later realized was fake. Almost half said government, politicians and elected officials bear a great deal of responsibility for preventing made-up stories from gaining attention.

The order and visibility of posts in Facebook's news feed is governed by a sophisticated proprietary algorithm, which has the ability to decide which posts to showcase over others. This amounts to the power to manipulate which posts consumers see. The platform tries to choose posts that people are likely to read, like, and share with friends. Facebook hopes this will induce people to return to the site. This has the dangerous effect of turning the platform's feed into a tabloid that sucks users in and gives them a place to continue reading the same type of content. "Filter bubbles" is a term referring to this phenomenon.

Simply put, our viewpoints, when combined with the personalized tailoring of social media, give rise to echo chambers in which we are mainly exposed to beliefs and facts that are consistent with those we already hold. Consequently, this leads to confirmation bias and we unconsciously surmise that many others share our perspectives on issues of the world. A well-known Forbes experiment called Blue

Feed, Red Feed delves deeper into these echo chambers that we all inhabit on Facebook.

Much of the news content in the feed consists of the most attention-grabbing headlines, regardless of whether the articles are factual or important. Facebook's algorithm, as clearly witnessed with the recent glut of fake news, doesn't take into account whether a particular story is accurate or not. If it generates a lot of engagement, in the form of likes, shares, and such, it automatically gets moved to the top of the feed. And often, a sensational and blatantly inaccurate story will generate more engagement than a story that accurately explains an issue without exaggeration.

As a result, bigger news organizations are swayed negatively. Businesses trying to maximize the traffic to their articles are made aware that sensationalism attracts clicks and impressions, while accuracy does not. This huge demand for clickbait created by Facebook creates a false incentive for reporters, thus warping what we read and making us apathetic in the absence of facts. Close to two billion people around the world utilize Facebook as a major source of information and the network is exerting a substantial degree of control over the news we access on a daily basis.

## **What Is Stimulus?**

Stimulus is a news platform that combines news creation with decentralized networks as a means to delivering factual content, curated by a community of readers, writers, and reviewers.

Stimulus will harness the power of the Ethereum blockchain to create an infrastructure that is virtually impossible to infiltrate or take down. Since Stimulus is not centralized, it does not suffer from having a single point of failure. The platform's core purpose is to present news as accurately as possible, free of any corrupt incentives or hidden agendas, which plague most news corporations.

The Stimulus platform will focus on facilitating the dissemination of balanced and factual observation of current newsworthy affairs.

Stimulus's mission is to create news content that is both empowering for its readers, as well as representative of the integrity of its writers. Stimulus aspires to become the most trusted and democratic news alternative to the mainstream media.

## **How The Blockchain Can Help**

The Stimulus will introduce a compensation model built on incentives and made possible by the Ethereum blockchain. Stimulus removes the need for advertisers

because the platform will not source revenue from display ads. Stimulus will run as a network, fueled by the Stimulus token. Each action, which includes the writing and reviewing of an article, will be made possible by these tokens and linked to the Ethereum network. Stimulus's system works to incentivize writers and reviewers, in a self-sustaining and autonomous environment that leaves no room for corporate bias. Compensation is derived from the community's engagement, rather than external revenue streams such as native ads. In turn, there is no opportunity for corporate interjection, whether it is through sponsored content or elsewhere.

Furthermore, with the blockchain providing the foundation for the platform, Stimulus can transparently display how money is made and transacted behind the scenes, and for what reasons and to which parties tokens are distributed. Ideally, the platform can create a new kind of transparency, dictated by a truly open and contributor-controlled environment for information sharing and consumption. By persisting the contents of published articles to a decentralized file datastore, and making references to these articles directly in ethereum smart contracts, we can ensure that every article is as immutable and everlasting as the ethereum network.

A blockchain-based news media platform such as Stimulus's has the ability to democratize traditional news media for several reasons:

Since the blockchain contains data in time-stamped blocks that chain together, being continuously added and archived, it becomes nearly impossible for outsiders to manipulate existing data or information within the distributed ledger.

Next, the blockchain decentralizes authority to publish content on Stimulus. There is no single source that controls the message and feel of published works, which is something that is all too commonly witnessed with traditional media. Stimulus is not tethered to any special interests or political agendas, nor is it vying for a substantial chunk of ad revenue, which puts it in a category separate from most publications that are tied down to a bigger entity.

Lastly, the blockchain's core value rests on trust. The technology achieves a state of implicit trust, thereby securing a system where contributors don't need to know one another or be associated with a third-party intermediary to verify or confirm a transaction. It is implicit and autonomous blockchain is the gatekeeper and enabler of all contributors' incentives on Stimulus.

## **How Will Stimulus Work?**

### *Overview of key actors on the network*

Stimulus is a decentralized platform built on top of the Ethereum blockchain, that allows anyone to submit articles that will be reviewed by a handful of quasi-selected



and anonymous contributors that coordinate without the need for explicit trust. During review, contributors check articles to ensure that they are in accordance with the network's public set of editorial standards. Each piece of news published on Stimulus is replicated across a series of community-hosted nodes and made available to the public. Readers, writers, reviewers, and publishers earn tokens in proportion to the amount of positive contributions they make to the platform.

Stimulus is comprised of four types of actors that each have key roles and contributions that together, make up the underlying functions and framework of the network:

## **Writers**

Writers, or reporters, are individuals who submit news content in the form of articles. Whether freelance journalist, casual blogger, or an average consumer of global news, anyone can contribute to the Stimulus.

However, since anyone can submit articles to Stimulus, getting published is not guaranteed.

To increase the chance of getting published writers should ensure that they closely comply with the Stimulus content guidelines to mitigate the chance of reviewers rejecting their piece due to infractions.

The Stimulus content guidelines are a set of agreed-upon best practices for constructing pieces that are both comprehensive in scope and that convey the facts clearly and concisely. Articles that are submitted to Stimulus go through a series of stages before being submitted.

## **Miners**

Reviewers, or editors, read and vote upon submitted articles before an article is available for public consumption on the Stimulus's article feed. The review process includes basic tasks such as noting grammatical errors, pointing out inaccuracies and questionable statements, as well as content classification.

Most important, however, is that reviewers ensure articles adhere to the Stimulus content guidelines.

Reviewers do not have the ability to modify articles, but rather can accept (i.e. vote to have content published) or reject (i.e. vote to prevent content from being published) any written piece. To make sure that no single reviewer has the final say on whether or not an article should be publicly incorporated into the network, the

network will assign seven random reviewers to validate the article. The seven reviewers are chosen in a process called the Review Selection Bid.

All seven reviewers are completely unaware of one another's identities; they vote and leave feedback in complete isolation to avoid groupthink or any form of collusion.

## Readers

Readers are news consumers. Readers can comment, add notes, share, tip, bookmark articles of interest, and denote articles they deem questionable. Unlike readers on traditional news platforms, readers on Stimulus play an active role in helping to shape the news they read, which includes participating in Reader Suggestions whereby article topics are put forward by you, the news consumer. Readers pay for access in Stimulus tokens. As Ethereum continues to improve scalability with additions like sharding, state channels, and plasma, an ideal way to implement a subscription model, a pay-per-article model, or a combination of the two will be explored.

## Publishers

Unlike readers, reviewers, and writers who are human actors of the network, publishers are server nodes which act as a proxy between human contributors and the Stimulus network residing on the Ethereum blockchain.

Specialized open source software consisting of the complete Stimulus contributor-interface and network interface, is bundled and installed on each publisher. Publisher nodes are responsible for replicating published articles and ensuring that the Stimulus network remains available in the face of coordinated attacks.

Publisher nodes communicate with one another through a peer-to-peer protocol that makes use of the same cryptography behind Bitcoin and Ethereum. Using this peer-to-peer protocol, publishers are able to relay details about their state to nearby node hosts.

The main purpose for publishers is to provide an attack resistant transport for the Stimulus software, rather than host the Stimulus software on a centralized server, which introduces a significant point of failure.

Storing Stimulus's software on a decentralized network also allows the community to run and manage it without the need for an external facilitator or trusted intermediary.

## Overview Of Stimulus Token Economy

### *Brief Introduction to token economy*

Tokens are a core component of decentralized platforms like Stimulus. In Stimulus's case, tokens serve two purposes: to reward for contributions, and to carry out actions. For people who are new to cryptocurrency platforms like Ethereum, the idea of dealing with tokens may seem a bit far-fetched and unnecessary. To most people, the immediate benefit of using tokens will not be as apparent as using a more ubiquitous fiat based currency like the US Dollar. As a result, it is quite common for people to ask questions such as: how can I use tokens to pay for real-world things?

Where exactly do tokens come from? How do tokens get their value? To answer these questions, a deeper understanding about what tokens are and how they work in the context of a decentralized network, will first need to be acquired.

Broadly speaking, tokens are digital keys that grant access to a particular service or resource, which has been made possible by the technology that enables the Ethereum blockchain.

Depending on the platform, the amount of tokens that are available can be fixed or infinite, each of which affects the value of a token.

To better conceptualize tokens, think of them as you would seat tickets at a sports game. Tickets enable you to reserve access to an available seat (i.e. interact or gain access to the event). Put another way, for every available seat in the arena, there will be one ticket accompanying it.

Depending on where the event takes place, the tickets will be priced in a local fiat currency (e.g. USD or EUR). A person who has a ticket is free to sell their ticket for a price that is greater than or less than the going rate. Since tickets are limited, the cost of the ticket will increase as less tickets become available.

In the same way tickets give you access to seats in a sports arena, tokens enable you to interact with various aspects of the network. Tokens can also be sold or exchanged with other people who would also like access to the Stimulus network — much in the same way sports tickets or any scarce asset can be sold or exchanged

# Writer & Reviewer Guidelines

## Stimulus Content Policy

Stimulus has three core content rules that make up its policy:

1. Verifiability
2. No Unsourced Content
3. Faithfulness to Sources

Together, these three content rules determine the style and quality of material that is acceptable and should not be viewed separately from one another.

Writers and reviewers on the network are strongly encouraged to familiarize themselves with all three policies. Stimulus's content policy is non-negotiable and cannot be overridden by editor or writer consensus.

### Verifiability

Verifiability in Stimulus means that other people, whether readers, writers, or reviewers, can trace the information contained in any given article back to its original source. Every definitive statement, presented as fact, has to be backed by a reputable and published source, thereby granting readers the freedom to look through a writer's source material.

Stimulus will not publish material that lacks proper sources. Our news content is mainly determined by information that has already been published and is not to be based solely on the personal viewpoints of writers. This also means that anonymous sources cannot be utilized since they lack a publicly visible point of origin.

Regardless of whether or not writers are sure that a certain aspect is indeed true, it must be verifiable by the audience before they can include it in their final piece.

Many times, reliable sources can be in conflict with one another; in such cases, it is essential for writers to maintain accuracy and an objective perspective by simply presenting what all the sources state, while also citing the corresponding place of origin.

All material in Stimulus, including articles, lists, and captions, must be verifiable. The onus to prove verifiability is the responsibility of the writer who includes the material, which means the reporter must be comfortable with providing attribution that can back the corresponding content directly and effectively.

Anything that is quoted, as well as any content with verifiability that is being debated or could end up being debated, needs to have an inline citation present that directly supports it. The attributed source material must visibly support the content as shown in the piece.

Additionally, any passage in an article that clearly requires a source but has not been given one, may be subject to scrutiny by reviewers on Stimulus. In such cases, this may lead to rejection for the writer, if the reviewer deems that the passage needs to be adequately backed up by a reference.

Condescending or malicious content about living or well-known individuals that are not sourced or is poorly sourced, is subject to immediate rejection by Stimulus's reviewers.

Reliable sources include:

- University-level textbooks
- Books published by reliable publishing houses
- Books published by university presses
- Magazines
- Peer-reviewed journals
- Mainstream newspapers
- Reliable and accurate blogs

At times, writers must exercise caution with certain sources, since they may not have been scrutinized during their organization's normal fact-checking processor may have been published in error.

### No Unsourced Content

Stimulus articles must not contain unsourced content. Unsourced content on Stimulus refers to content such as theories, allegations, and ideas, that cannot be traced back to any reliable and published sources.

This also includes analysis of published material where a writer attempts to reach or imply a conclusion that is not stated by the source material. For writers to show that they are indeed not including unsourced content, they need to be able to cite reliable, already published sources that are directly related to the topic of the article and directly support the content within.

Despite attributing content to its source material, writers need to be cautious to not plagiarize said content. Instead, writers should write the material in their own words through paraphrasing while still keeping the original source meaning.

By actively barring writers from including unsourced content in their work, Stimulus can place limits on the degree to which writers present clear falsehoods within articles. In turn, this also becomes a supporting pillar for accuracy on the platform.

For Stimulus's writers, research that consists of gathering and shaping content from existing, previously published sources is important to writing a factually accurate article. Ideally, the best practice for writers on the platform would be to research the most reliable and significant sources on a given subject before summarizing what is said in his or her own words, while clearly attributing statements to their correct sources. Source material needs to be carefully paraphrased and structured while continuing to retain its original meaning. Writers should not interject and deviate from what is contained in the sources by implying or directly stating things that were not otherwise stated. This includes positioning the content out of its primary context. Simply put, content on Stimulus must stick to the nature of its sources and never stray .

### Faithfulness To Source

All news content existing on Stimulus that is attributed to sources must be consistent with said sources. This means that any piece of content must fairly and accurately represent the perspectives that have been already published by reliable sources on a given topic.

Additionally, sourced information should be presented in such a way that editorial bias is mitigated, even if only a little. In essence, while writers are allowed to maintain a voice in their writings, articles on Stimulus need to be clearly supported by evidence. It is the job of reviewers to validate and publish articles that present information with clearly attributed sources and without editorial manipulation of the sourced content.

To achieve this, a writer must critically and meticulously analyze a variety of reliable sources before attempting to portray to the reader the information contained in them fairly, proportionately, and with as little bias as possible. Listed below are the following principles to achieve the level of both faithfulness and fairness to sourced content that makes Stimulus purposeful:

- Do not state opinions as facts. Many time, articles will contain information conveying important opinions that have been expressed about the subjects at hand. However, these opinions should not be stated in the writer's voice. Instead, they should be accurately attributed in the text to those particular sources, or where sensible and acceptable, described as widely held views, minority views, etc.
- Do not state seriously debated/questionable assertions as facts. Sometimes, two or more reliable sources may conflict with one another. Writers should

treat such assertions as opinions rather than facts, and not present them as direct statements, otherwise, this would give rise to bias.

- Do not state facts as opinions. Factually-backed assertions that are uncontested and uncontroversial, as well as made by reliable sources should usually be directly stated on Stimulus. Unless a particular topic specifically deals with a disagreement over otherwise uncontested information, writers would not need specific attribution for such assertions, although they may add a reference link to the source in support of verifiability. Most importantly, any passages containing information about factual assertions should not be worded in any way that makes them appear to be debatable.

## Future Plans

As Stimulus goes beyond its eventual beta and commercially-ready product, there will be a number of things that can be done with the platform in the future, including:

- Building a system granting contributors the ability to create community generated polls
- Letting writers pay in tokens to 'boost' their articles in the main feed, with a percentage of those tokens being circulated amongst Stimulus's readers
- Creating a Stimulus Foundation which will have access to a portion of the tokens to pay for writers, cultivate reviewers, promote and maintain the network
- Growing the network internationally with different languages and regional news
- Building end-to-end native applications on iOS and Android, containing the full functionality of the network, instead of just a portion
- Live streaming important events

# Software Requirements Specification

## 1. Introduction

### 1.1. Purpose

The purpose of this project is to build a decentralized platform for free and fair sharing of news. The current systems are centralized. These systems can alter

the articles and censor them if needed. We trust the central authority to deliver articles that are real. We want to abolish this central structure and replace it with a decentralized structure where all the participants of the platform take care of the platform and are incentivized for the same. We want to create a self-sustaining platform.

## 1.2. Scope

Stimulus is a decentralized news platform. Journalists can upload their articles to the network without the fear of censorship. Their identities will be protected by public-private key cryptography. The articles themselves will be stored on IPFS which is a decentralized hosting solution. A record of all the articles will be stored on the Ethereum blockchain as a proof of existence, to prevent modification or deletion of articles.

The network will have “miners” who will validate the content published by the publishers to allow only real and quality content to be published. All the participants of the network would be incentivized based on their contributions using cryptocurrency tokens.

## 1.3. Definitions

<b>Publisher</b>	A person/organization that hosts a node and publishes news articles.
<b>Miner</b>	A person who validates published content before being delivered to the readers.
<b>Reader</b>	A person who consumes news articles and interacts with the articles by commenting/liking.
<b>Decentralized</b>	No central authority for validating requests.

## 1.4. References



Zyskind, Guy, and Oz Nathan. "Decentralizing privacy: Using blockchain to protect personal data." *Security and Privacy Workshops (SPW), 2015 IEEE*. IEEE, 2015.

<https://ipfs.io>

<https://www.ethereum.org/>

<https://dnn.media/>

[https://marketing.binary.com/crypto/Binary.com\\_WhatIsBitcoin.pdf](https://marketing.binary.com/crypto/Binary.com_WhatIsBitcoin.pdf)

## **2. Overall description**

This section will give an overview of the whole system. The system will be explained in its context to show how the system interacts with other systems and introduce the basic functionality of it. It will also describe the type of stakeholders that will use the system and the functionality that is available to each type. The constraints and assumptions for the system will also be presented.

### **2.1. Product perspective**

The product will consist of 2 parts mainly the client side and the backend. The client side will consist of an Android app and a website. The backend will be decentralized with a gateway to route the traffic.

The incentivization has been talked in detail in the subsequent sections.

### **2.2. Product functions**

Publishers will need to host a node. The node software can be deployed on any cloud provider such as GCP, Amazon Web Services, Heroku etc. Once the node is uploaded and initialized by the publisher, it will talk to its neighbouring nodes to cache items.

Publishers publish their articles to their nodes. Other nodes replicate the data for redundancy. Once an article is published, it will be sent to the miners and a time limit for evaluation will be set. Miners validate the content. After the time limit expires, once verified, the articles are sent to the readers who are subscribed to that publisher's channel.

### **2.3. User characteristics**

There are mainly 3 types of users who would participate in the network.

News publishers: - Publish news articles through their registered channel.

Readers: - Access the validated news articles available in the feed section of the app.

Miners: - Verify the credibility of a news article

### **2.4. Constraints**

The mobile application will be constrained by the lack of availability of native libraries for peer to peer communication. Decentralized apps are new and communication with dApps would be a vital issue. There is no standard architecture for dApps and this project would have to come up with protocols for authentication and data sharing in dApps.

The design should be in such a way that the users feel like they are accessing a normal application, all the complexities have to be hidden.

### **2.5. Assumptions and dependencies**

The platform requires users to sustain itself. A major element of this project is crowdsourcing. We shall assume that there are good number of users available initially for sharing and validating content.

### **2.6. Apportioning of requirements**

In the case that the project is delayed, some requirements would be transferred to the next version of the application.

## **3. Specific Requirements**

## 3.1 External interface requirements

### 3.1.1 User interfaces

#### *Login screen:*

Users would have to authenticate themselves by signing up or logging in by giving their username and password details.

It would also contain a "Forgot My Password" button which would help users reset their password after thorough authentication.

#### *Feed:*

The user feed would contain scrollable news cards of all the channels that s/he has subscribed to.

It would display some suggestions of news publishers which they may follow.

For miners, the feed would have a special section that would contain all the articles that s/he needs to validate.

#### *Content view(R4):*

When a news card is clicked upon, the content of the same would be displayed in a separate view where the user can fully interact with the post.

### 3.1.2 Hardware interfaces

There are no specific hardware requirements for this project. We would be using GCP or any similar cloud service provider for hosting.

### 3.1.3 Software interfaces

The publisher nodes will be providing the news articles and communicating amongst themselves to replicate content. The android app and the website will get the data from these nodes through a gateway and populate the respective views.

### 3.1.4 Communication interfaces

The underlying communication with the nodes and clients will include HTTP, RPC and REST APIs.

## 3.2 Functional requirements

### *Authentication(R1):*

Users need to create their account in order to read or to publish news articles.

### *Reader interactions(R3):*

Readers can use their tokens to subscribe to available news channels.  
They can donate tokens to the publishers.

### *Administrative functions:*

Users registered as miners, check the credibility of a news article.  
The news articles which are validated by the miners are displayed in the feed section of the application.

### *Publisher interactions(R12):*

Publishers can publish new articles.  
Same article cannot be published twice(R13).

### *Search(R8):*

The user can search for news and other users

### *Reputation(R9):*

*Publishers:* Publishing quality content increases reputation. If the article published by the publisher is validated by the miners, their reputation increases. Reputation will be directly proportional to the articles accepted and inversely to the articles rejected.

*Miners:* Casting correct votes, while validating a news article, increases their reputation. Inversely proportional to incorrect votes.

*Readers:* If the suggestions given by the readers are accepted by the publishers, then the reputation of the reader increases.

### *Incentivization(R10):*

A certain amount of tokens will be minted everyday. The total supply of token is fixed. These minted tokens are distributed to the users based on their contributions between the previous and the current payout.

*Publishers:* Publishers earn tokens by writing articles. The tokens earned will be directly proportional to their reputation.

*Miners:* Miners validate the published article and earn tokens proportional to their reputation.

*Readers:* Readers can make suggestions and if selected by author, can earn tokens based on their reputation.

*Mining(R11):*

Miners can see a mining section in their feed on both, the app and the website.

Mining section contains all the articles that are published but not yet circulated to the readers. Content view for mining articles will include 2 buttons - yes and no. Miners can verify the content by simply selecting yes or no in the content view.

*Android App:*

- ☐ The android app will be used to browse through the articles.
- ☐ Miners can validate content through the app.(R5)
- ☐ Publishers cannot publish articles through the app.
- ☐ All the users can access their token information such as balance and previous transactions via the app.(R6)
- ☐ Readers can donate to the publishers via the android app.(R7)

### 3.3 Software system attributes

#### 3.3.1 Reliability and Availability

Data created in the system will be retained for a number of years without the data being changed by the system. There will be no single point of failure as all the content will be replicated across a bunch of peers and removing one

would not affect the availability of information. The records of the existence of the information will be written to the blockchain for persistence.

### 3.3.2 Security

Public-Private key cryptography will be used to validate and authenticate users. This would prevent identity thefts.

#### *Regulatory -*

The concept of miners i.e. users who would help authenticate the content would act as the only regulatory body for the network without the need of a third-party regulatory organization. **There would be no centralized authority to run the network.**

Information that is blatantly untrue or lacks a clear origin can usually be detected in the fact-checking process by weighing said information against its source. Essentially, such problems should be rectified when possible through the normal review process.

Certain material should only be removed if there is good reason to believe that it misinforms readers in ways that cannot be addressed by rewriting it. This would automatically be achieved by the miners.

### 3.3.3 Maintainability

While Stimulus has established baseline rules for how content should be reviewed, the company intends to pass governance down to the community, once the platform's development has reached its final stage.

Community members will be able to hold voting periods, to assess the overall effectiveness of the guidelines and to propose potential amendments for greater positive impact.

The core team will not hold exclusive ownership of the platform's content policies, in order to allow the community to have a more significant presence.

# Feasibility Study

## Technical Feasibility

This project is decentralized. All the frameworks and components used in this project are open source projects in active development.

### Ethereum Blockchain -

Ethereum is an open source cryptocurrency project. The Ethereum blockchain can be used for developing “Smart Contracts” using a programming language called Solidity. Blockchain is a distributed ledger that uses public-private key cryptography to verify the identity of its users. Here, in the context of a decentralized news publishing platform, each action, which includes the writing and reviewing of an article, will be made possible by tokens linked to the Ethereum network.

Since blockchain contains data in time-stamped blocks that chain together, being continuously added and archived, it becomes nearly impossible for outsiders to manipulate existing data or information within the distributed ledger.

The entire project is well documented with a large community of developers. This will be used for establishing a decentralized authority without the need for a central server or database.

### IPFS -

For creating a decentralized storage network that is fault tolerant and efficient in communicating with the nodes, we will be using IPFS which stands for Interplanetary File System. IPFS is an **open source** project in **active** development and it was built for the purpose of creating a decentralized web. This will be used for storing all the files. There are a lot of free, volunteer nodes on IPFS that can initially be used to host the website for free.

HTML

CSS

Bootstrap

NodeJS  
MongoDB  
Android (Java)  
Solidity  
Meteor (JavaScript)  
Truffle Framework (JavaScript)  
Golang

All these technologies are freely available and are well documented and tested. The learning curve is not too steep and manageable. It is clear that the project is technically feasible.

## Resource and Time Feasibility

The resources required to develop this project are -

Laptop (Programming)  
Android phone (App development)  
Hosting (Free tier hosting on Heroku or Google Cloud Platform)  
Storage (To be done for free on IPFS)  
Programming tools (Open source and free tools available)  
Programming individuals

This project is not resource heavy and all the resources can be easily acquired. Hence the project is feasible resource wise.

The tentative completion schedule would be -

**Backend** - Complete by Mid-October  
**Frontend** - Design to be finalized by 20th September  
**Website** - October 1st week  
**App** - October 3rd week  
**Testing and User documentation** - End of October  
**Changes and Performance Tuning** - November 1st week

The alpha version of the project can be completed before November 2nd week. Hence the project is Time feasible.



## Financial Feasibility

Being a web application, the software will have an associated hosting cost. The system will follow the freeware software standards. No cost will be charged from the potential customers. Bug fixes and maintenance will have an associated cost.

At the initial stage, the potential market space will be people of the age group 18 - 70 (basically all adults) for whom reading news is a daily activity.

Besides the associated cost, there will be a lot of benefits for the users (especially news publishers and miners). Publishing and rating the quality content up will increase their incentives which can be exchanged for monetary currency.

From this it's clear that the software is financially feasible.

## Risk Feasibility

Estimated size of the product in terms of lines of code

Being a web application with a large number of users, the software will contain significant amount of lines of code.

Estimated size of the product in terms of number of programs

Though the application supports many users, it will be constructed as a single Web application with a single login page rather than having many number of sites. For different users. Depending on the access rights, the contents will be shown

Size of database created or used by the product

The main database is the Ethereum Blockchain. Secondary database (if required) will be MongoDB for local caching.

**Amount of reused software:**

Though the main logics are implemented throughout the project, the software will use some libraries and open source frameworks along with the ethereum blockchain.

## **Business Impact Risk**

### **Effect of this product on the news industry**

These days, the news that we see is somewhat controlled by the power (both political and financial). The number of incentives for posting a fake/semi-fake news are far greater than the number of incentives for posting a true news. This software reverses the situation and thus more quality content without ads and clickbaits would be available.

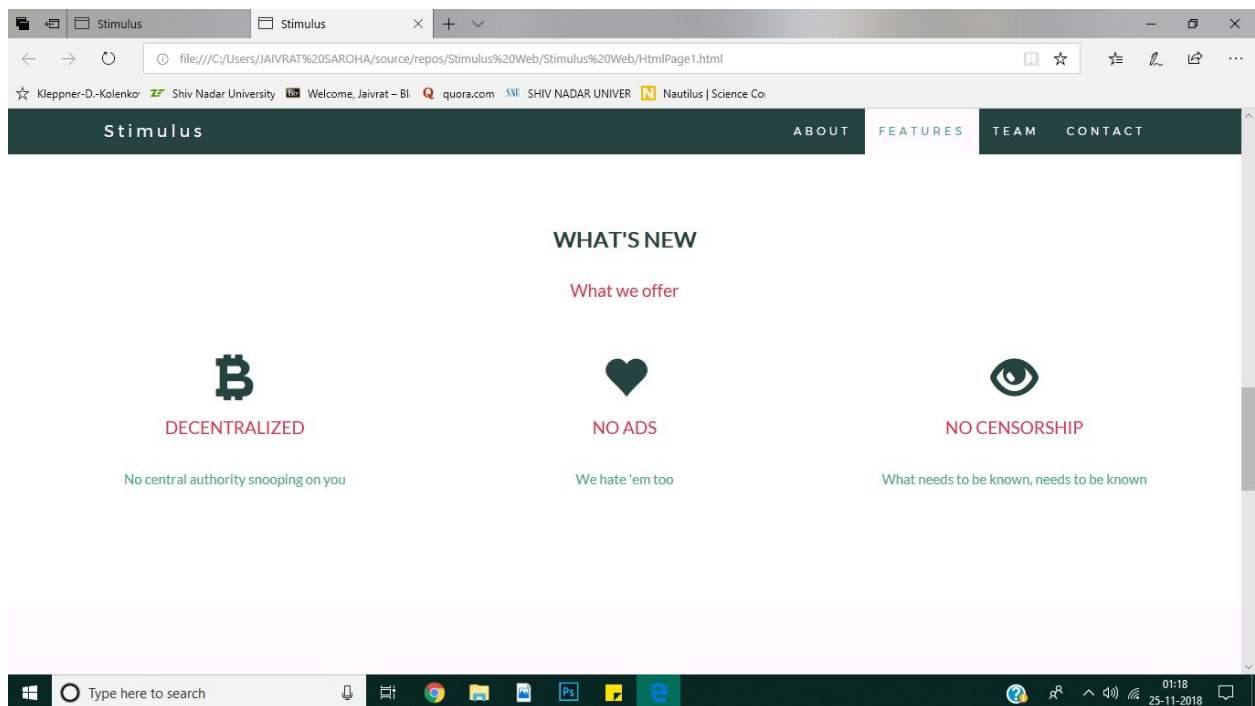
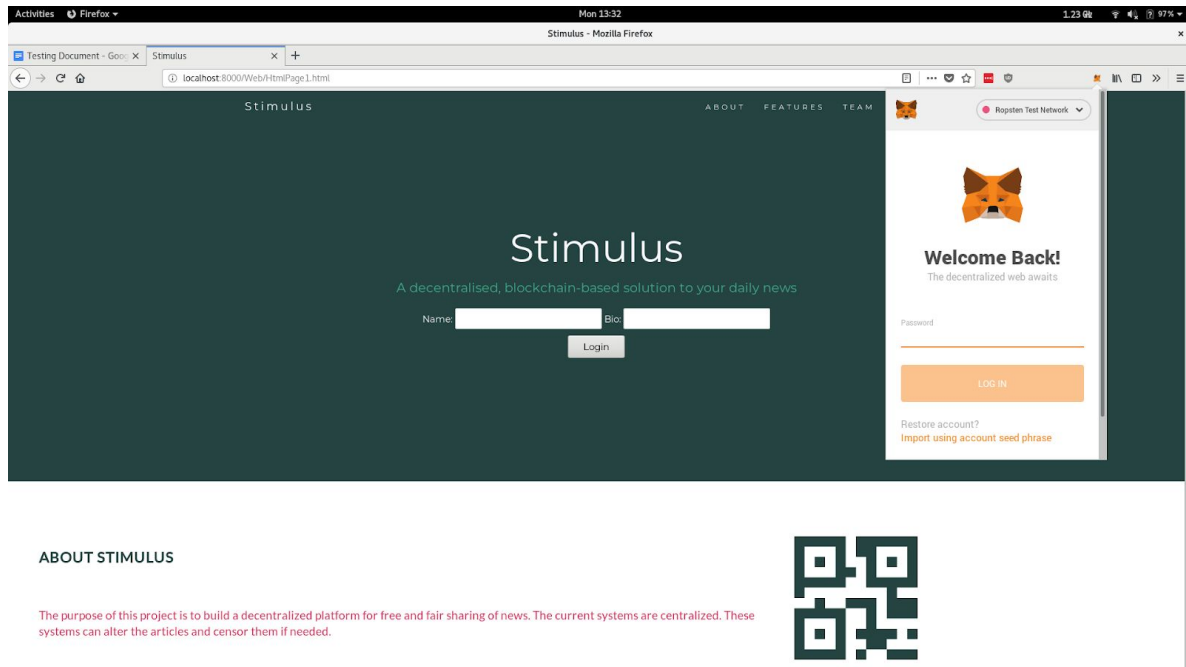
### **Legal Feasibility**

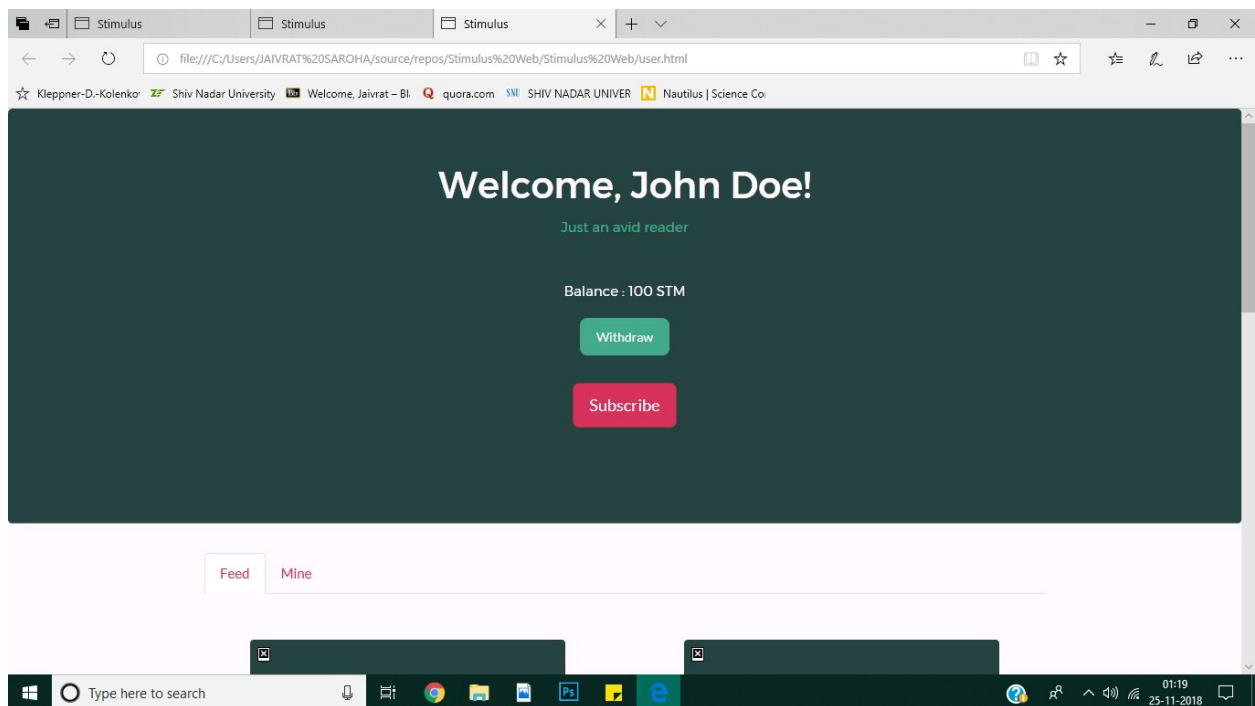
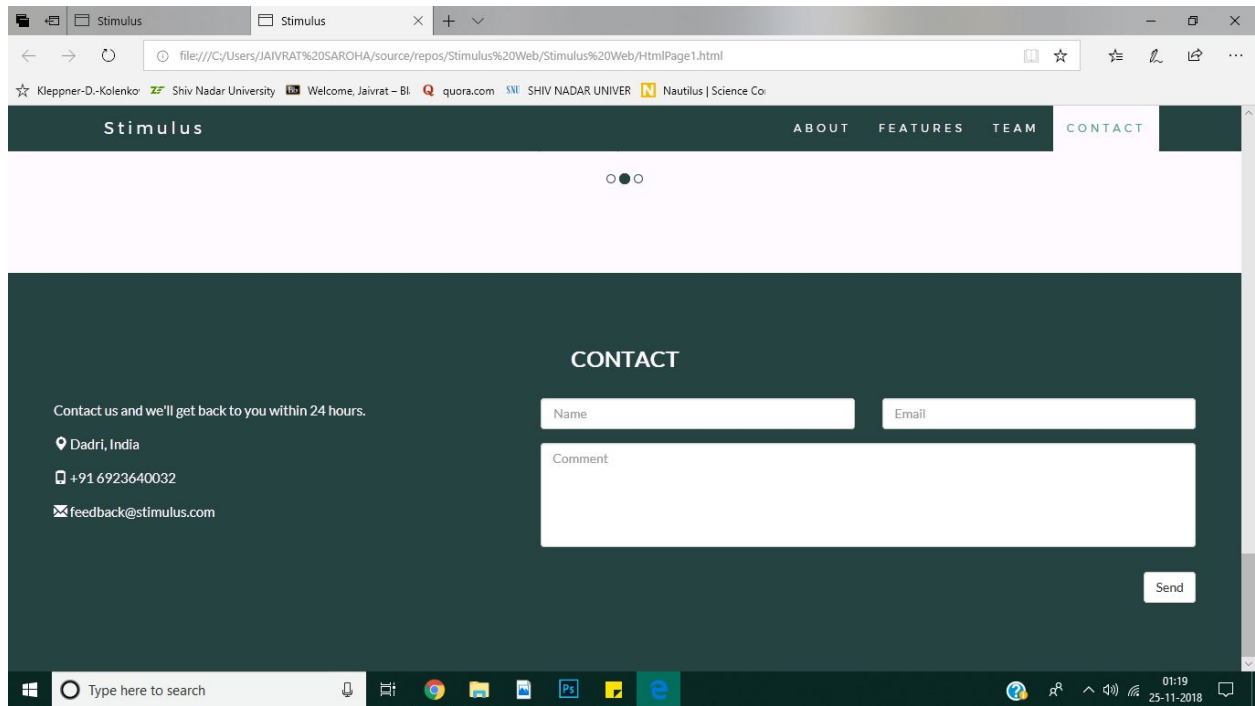
Cryptocurrency is a controversial topic. Many countries have banned the use of cryptocurrencies. This is mainly because of the use of bitcoin and other such tokens for illegal activities.

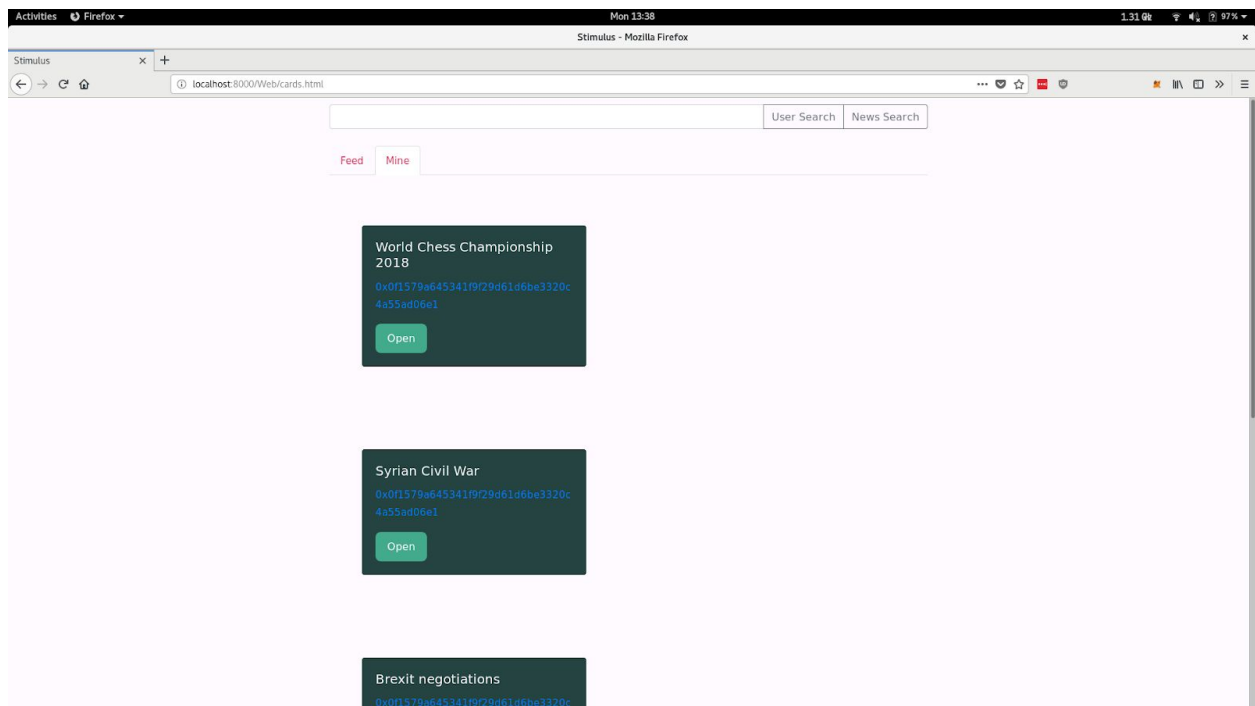
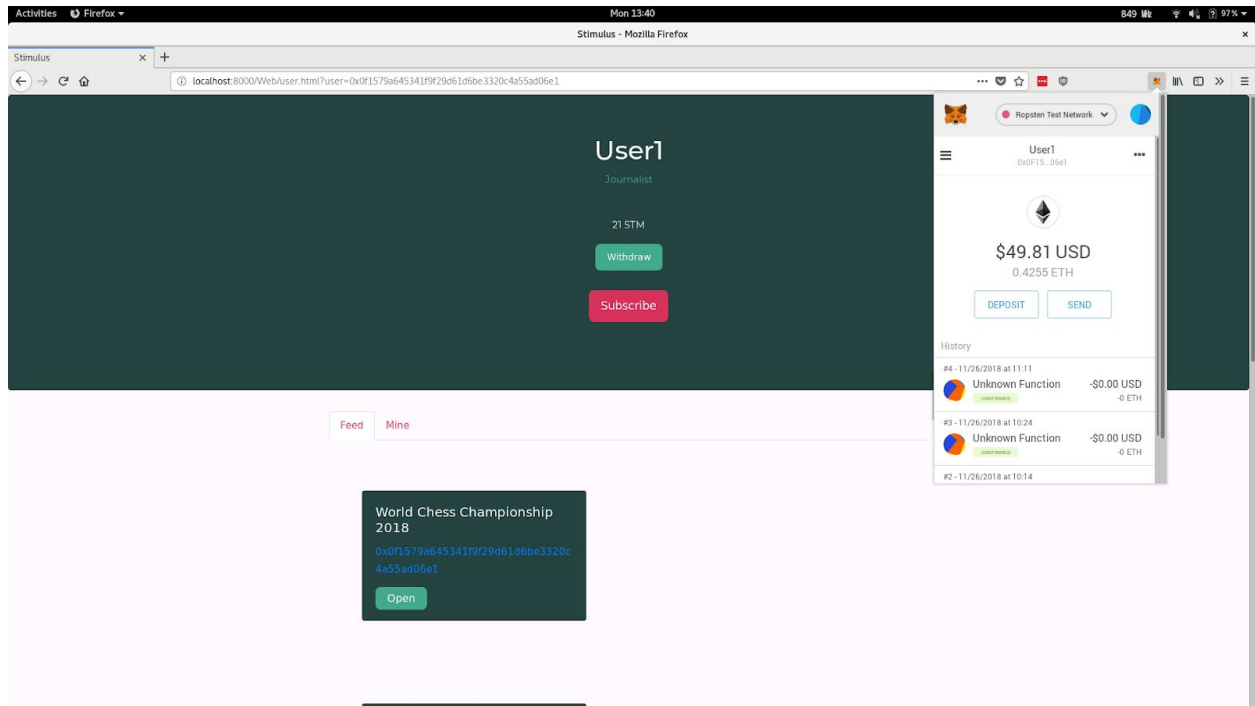
We would have to convince the users that our tokens are utility tokens, they can only be used to access services provided by our platform.

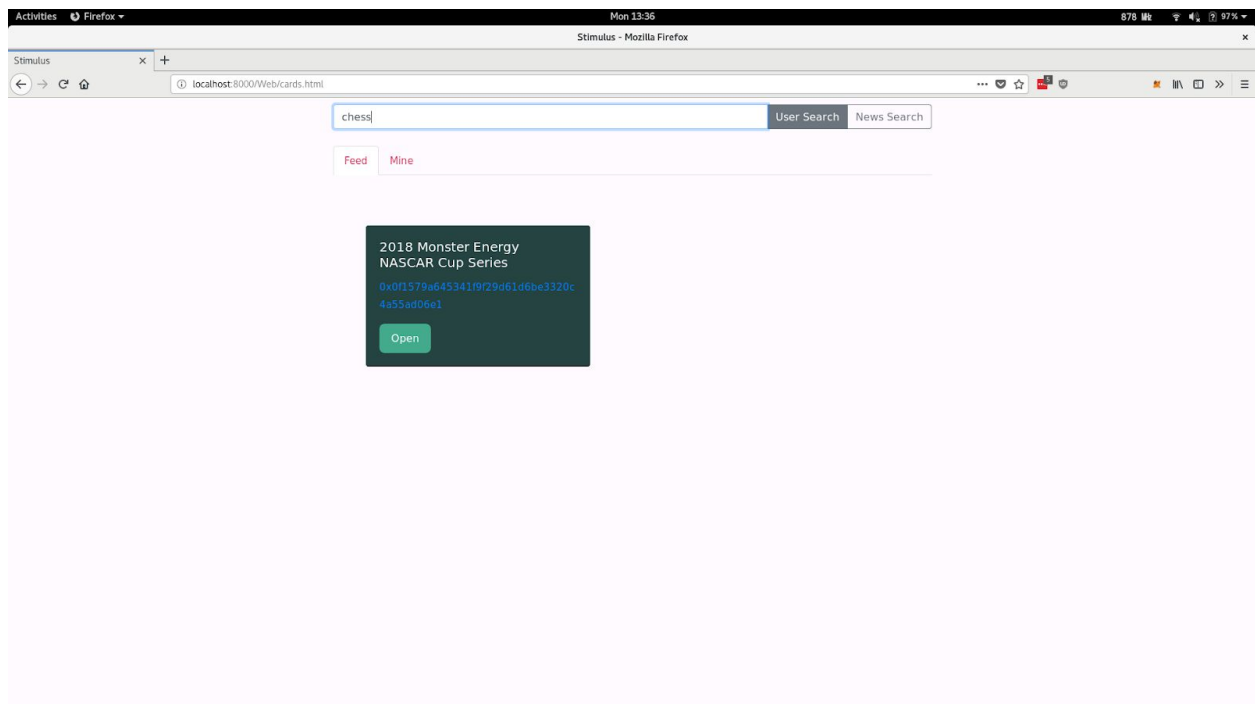
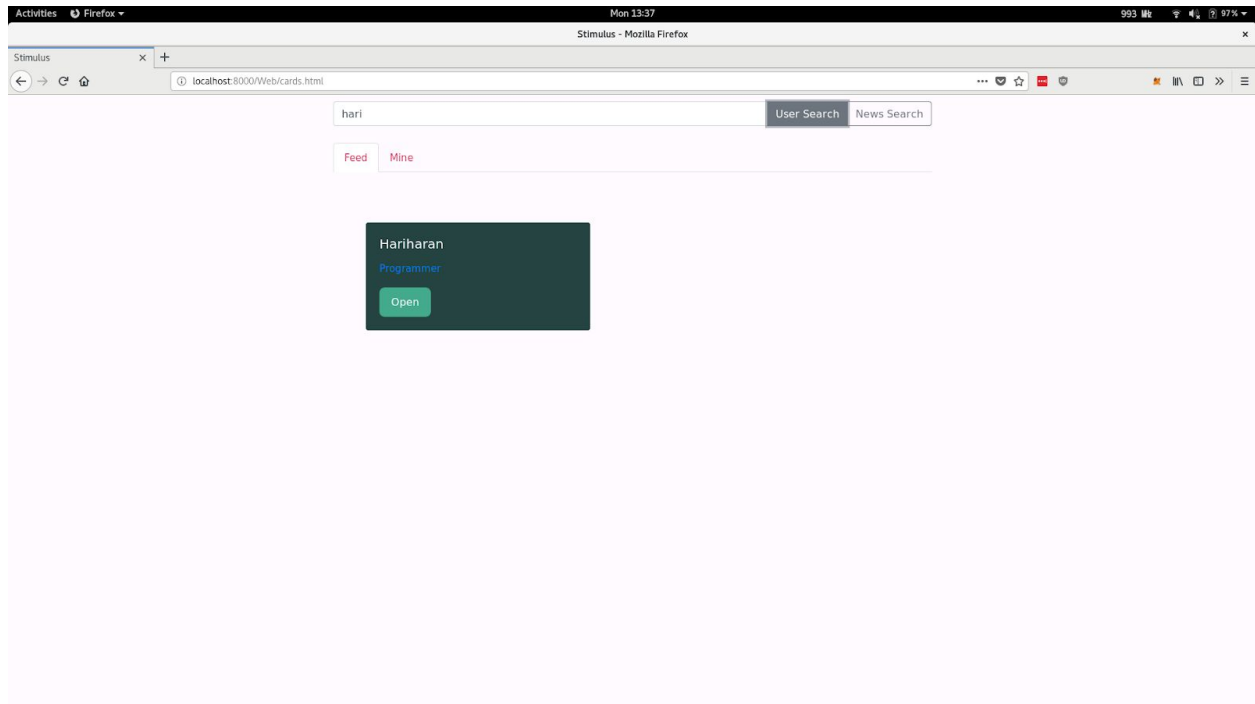
Tokens can be converted into other tokens such as Ether, but this conversion is heavily monitored by government authorities. This would prevent an illegal use of Stimulus tokens.

Web app:

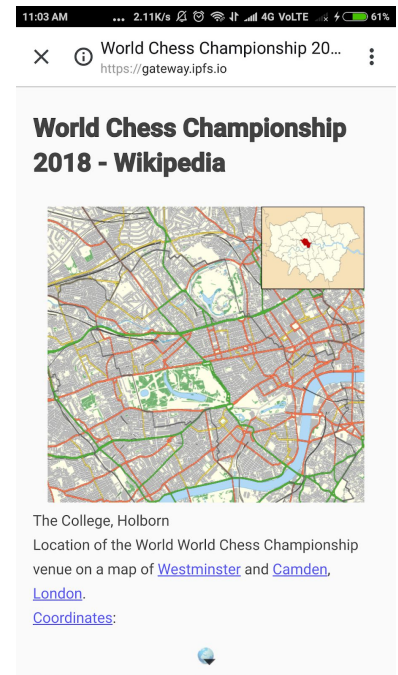
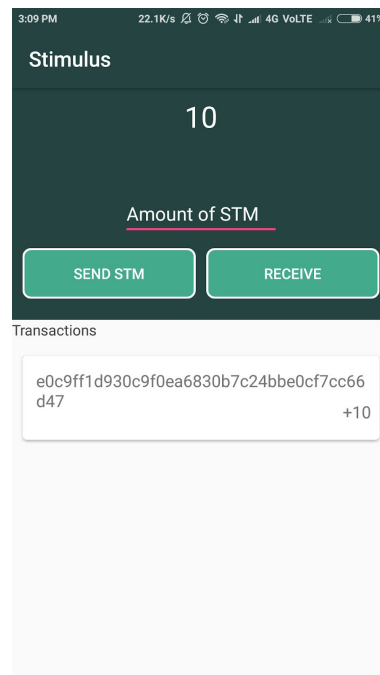
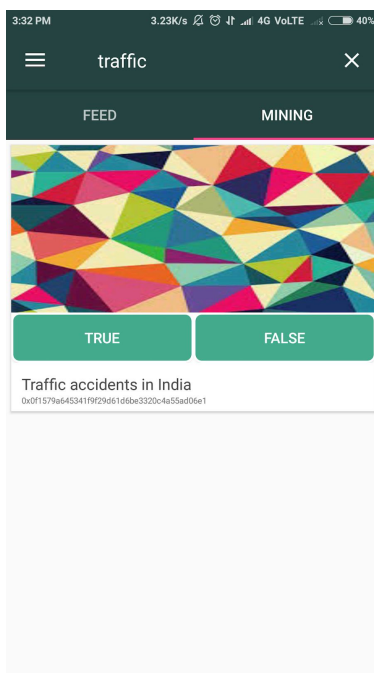
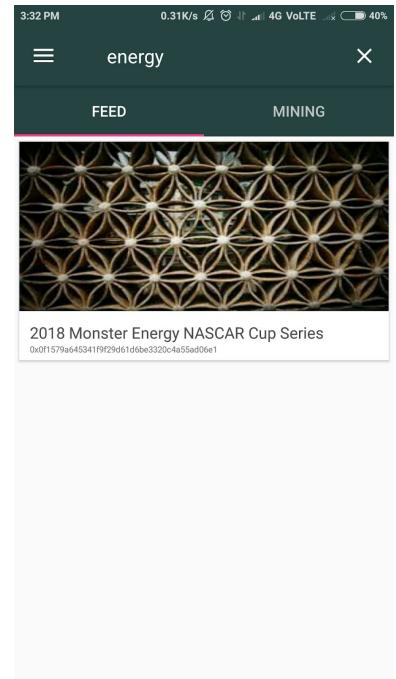
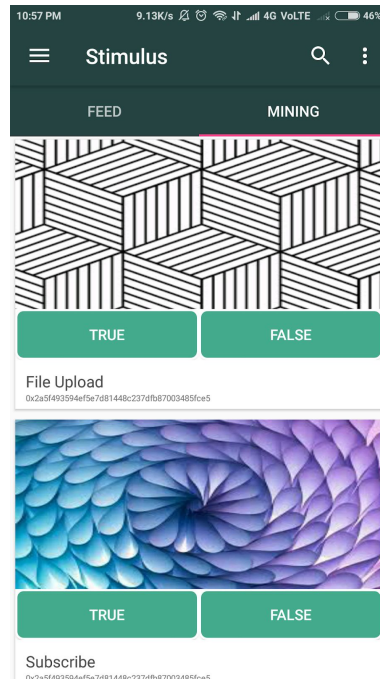
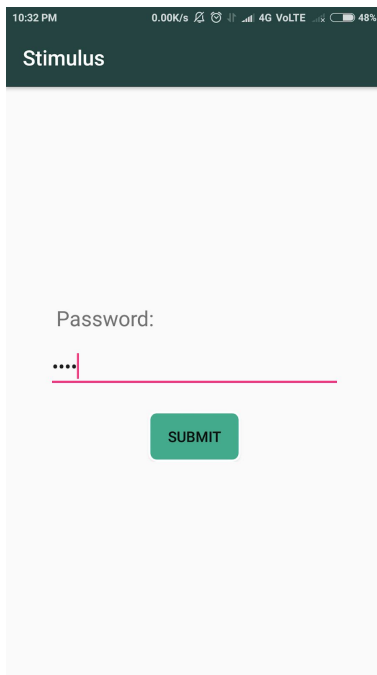








Android app:



# Cost Estimation Analysis

## Software Model

### Agile Software Development -

Agile software development is an approach to software development under which requirements and solutions evolve through the collaborative effort of self-organizing and cross-functional teams and their customer(s).

Agile development advocates -

- Adaptive planning
- Evolutionary development
- Early delivery
- Continual improvement,
- Encourages rapid and flexible response to change.

### Kanban Model

Kanban is a popular framework used to implement agile software development. It is a visual system for managing work as it moves through a process. Kanban visualizes both the process (the workflow) and the actual work passing through that process.

The goal of Kanban is to identify potential bottlenecks in your process and fix them so work can flow through it cost-effectively at an optimal speed or throughput.

Three Principles of Kanban Model are:

- Visualize the workflow
- Limit the Work In Progress (WIP)
- Continuous measure and improvement of the life cycle

### Advantages of Kanban Model

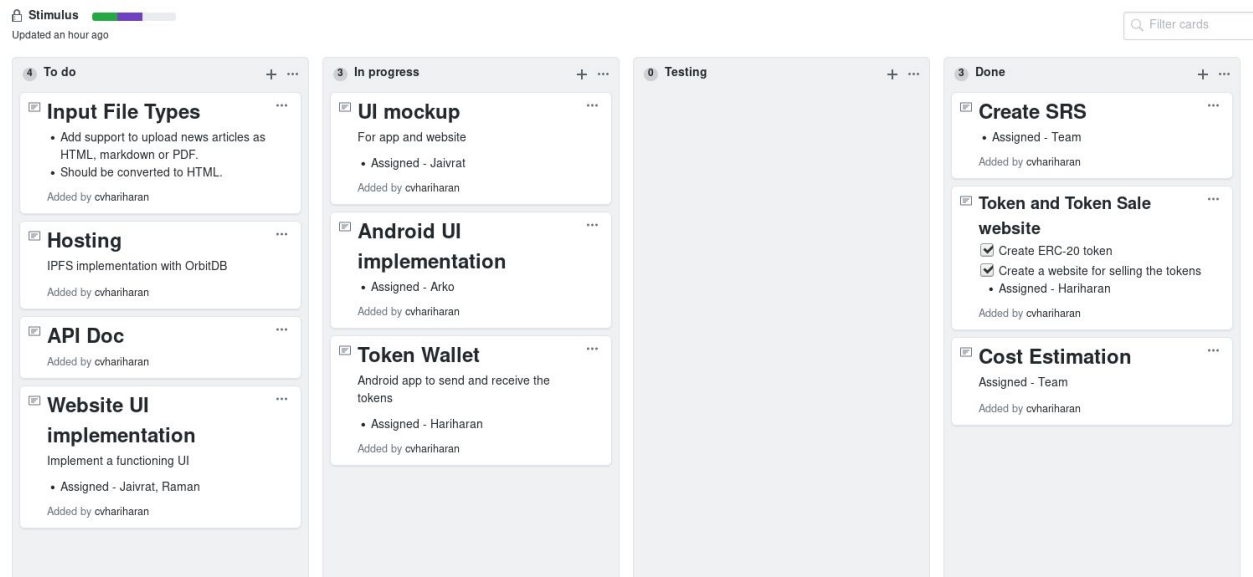
**Versatility** - It is universally applicable. Its versatility makes it simple for team members and projects to move seamlessly across functions.

**Continuous Improvement** - One of the guiding principles of Kanban is that everyone should be focused on continuous improvement. Kanban visual system of project management makes it easier to review processes and make improvements that cut waste and reduce overhead.



**Increased Output** - Kanban encourages teams to limit how much work they have in progress at any time. Limiting WIP encourages teams to work together to move work across the finish line, eliminating the distraction of multitasking as much as possible.

## Software Model



Function Point	
☐	User inputs
☐	Auth
☐	Name
☐	Description
☐	Channel name
☐	Channel description
☐	News
☐	Suggestions
☐	User outputs
☐	Transactions
☐	Normal News articles
☐	Mining News articles
☐	Personal info

## Function Points

A function point is a "unit of measurement" to express the amount of business functionality an information system (as a product) provides to a user.

### Why use Function Point Analysis?

- No project related history
- Early project planning
- Independent of the programming language, technology, techniques
- Creation of more function points can define productivity goal as opposed to LOC

Help		Simple	Average	Complex
?	Number of User Inputs	3	2	2
?	Number of User Outputs	1	2	1
?	Number of User Inquiries	4	2	1
?	Number of Files	1	1	1
?	Number of External Interfaces	1	1	2

Step 2: Assign a value of importance to each question. The range is from 0 to 5. Zero being of low importance to five being of high importance.

Does the system require reliable backup and recovery?	2	Are there distributed processing functions?	2
Are data communications required?	4	Is performance critical?	0
Will the system run in an existing, heavily utilized operational environment?	0	Does the online data entry require the input transaction to be built over multiple screens or operations?	4
Does the system require online data entry?	3	Are the master files updated online?	1
Are the inputs, outputs, files, or inquiries complex?	3	Is the internal processing complex?	1
Is the code designed to be reusable?	3	Are conversion and installation included in the design?	2
Is the system designed for multiple Installations in different organizations?	0	Is the application designed to facilitate change and ease of use by the user?	5

Compute the FPC as follows:

$$FPC = UFC * (0.65 + (\text{sum}(GSC) * .01))$$

The number of function points for your project is **133**

Courtesy: <http://groups.umd.umich.edu/cis/course.des/cis37>

## COCOMO Model

The Constructive Cost Model (COCOMO) is a procedural cost estimation model. The model parameters are derived from fitting a regression formula using data from historical projects.

Basic COCOMO computes software development effort and effort as a function of program size.

Program size is expressed in estimated thousands of source lines of code (KLOC).

COCOMO applies to 3 classes of software projects -

- Organic Projects - Small teams with Good experience working in a 'not very rigid' environment.
- Semi-Detached Projects - "Medium" teams with mixed experience working with a mix of rigid and not so rigid requirements.
- Embedded Projects - Developed with a set of "tight" constraints. It is also a combination of Organic and Semi-Detached projects.

VL - Very Low

L - Low

N - Normal

H - High

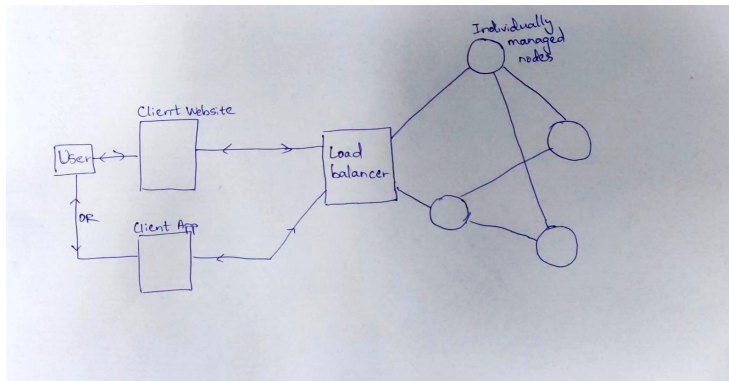
VH - Very High

XH - Extra High

## COCOMO Results

COCOMO RESULTS for Stimulus								
MODE	"A" variable	"B" variable	"C" variable	"D" variable	KLOC	EFFORT, (in person-months)	DURATION, (in months)	STAFFING, (recommended)
organic	2.2525239391199996	1.05	2.5	0.38	3.990	9.631	5.912	1.629
<p>Explanation: The coefficients are set according to the project mode selected on the previous page, (as per Boehm). The final estimates are determined in the following manner:</p> <p><b>effort</b> = <math>a \cdot \text{KLOC}^b</math>, in person-months, with KLOC = lines of code, (in thousands), and:</p> <p><b>staffing</b> = effort/duration</p> <p>where a has been adjusted by the factors:</p>								

Courtesy: <https://strs.grc.nasa.gov/repository/forms/cocomo-calculation/>



## API Doc

POST /upload

*Content-Type: multipart/form-data*

### **Params -**

upload (File) : File to be uploaded

title (Text) : Title of the article

signature (Text) : Keyphrase signed by the user using her/his private key

Keyphrase (Text) : Randomly generated string of 32 characters

### **Output**

`{"hash": "7639heuhafi78u9er", "author":`

`"0x2a5f493594ef5e7d81448c237dfb87003485fce5"}`

GET /news/:authorHash

### **Params -**

*authorHash (Text): public key of the author*

*(optional) mined (bool): Set to true to get mined articles. Default false*

### **Output**

`{"news": [{"_id": "QmVncwUQQgiQm6Vxmf8fLP9a8kEfcHTxDoWNRCPcshaPJw",`  
`, "title": "File`

`Upload", "author": "0x2a5f493594ef5e7d81448c237dfb87003485fce5", "Mined":`  
`: false, "Published": false}, {"_id": "QmbTP6hhHnvVJjXZ4u5ouiEzoNj6iKHB1SP2jB`  
`yC4LVpCp", "title": "Index", "author": "0x2a5f493594ef5e7d81448c237dfb87003`  
`485fce5", "Mined": false, "Published": false}]}`

POST /channel/subscribe

Content-Type: multipart/form-data

**Params -**

phrase (Text): Randomly generated 32 character string

signature (Text): Phrase signed by the user's private key

channel (Text): The address of the author to subscribe to

**Output**

```
{"channel": "0x2a5f493594ef5e7d81448c237dfb87003485fce5", "subscriber": "0xc5997a09f080e5abb045fd3967f1a0b5e2b14a7d"}
```

POST /news/getNews

Content-Type: multipart/form-data

**Params -**

phrase (Text): Randomly generated 32 character string

sign (Text): Phrase signed by the user's private key

(optional) mined (Text): Set to 'true' to get mined articles. Default 'false'

**Output**

```
{"news": [{"_id": "QmVncwUQQgiQm6Vxmf8fLP9a8kEfcHTxDoWNRCPcshaPJw", "title": "File Upload", "author": "0x2a5f493594ef5e7d81448c237dfb87003485fce5", "Mined": false, "Published": false}, {"_id": "QmbTP6hhHnvVJjXZ4u5ouiEZoNj6iKHB1SP2jByC4LVpCp", "title": "Index", "author": "0x2a5f493594ef5e7d81448c237dfb87003485fce5", "Mined": false, "Published": false}, {"_id": "QmZUVnK4Fd4juz5BmeGPhToWBiWgMZk34ggakaCoEtYvhh", "title": "Test screenshot", "author": "0x2a5f493594ef5e7d81448c237dfb87003485fce5", "Mined": false, "Published": false}, {"_id": "QmUfcJYYxBZpMGGKKuh9TAjZuJaKJY3cVd9nquMZ8t19m1", "title": "screenshot", "author": "0x2a5f493594ef5e7d81448c237dfb87003485fce5", "Mined": false, "Published": false}, {"_id": "QmZwsGKPtyY2uUhviBu1VcV6pPHxrmQmFfPtXPSNS6GjFu", "title": "Test", "author": "0x2a5f493594ef5e7d81448c237dfb87003485fce5", "Mined": false, "Published": false}, {"_id": "QmZgeEgwyacDGWo8f45soZQhy1oHwJGaWmbWDSwM1o1yyK", "author": "0x2a5f493594ef5e7d81448c237dfb87003485fce5", "Mined": false, "Published": false}]}]
```

POST /login

Content-Type: multipart/form-data

**Params -**

name (Text): Name of the user

bio (Text): User description

phrase (Text): Randomly generated 32 character string

signature (Text): Phrase signed by the user's private key

**Output**

```
{"author": "0x0ba3e2754aac1589f45b13c9b03905060d597679", "result": "Welcome!"}
```

GET /news/search/:keyword

**Params**

*keyword (Text)*

**Output**

```
{ "news": [{ "_id": "QmZUVnK4Fd4juz5BmeGPhToWBiWgMZk34ggakaCoEtYvhh",  
  "title": "Test  
screenshot", "author": "0x2a5f493594ef5e7d81448c237dfb87003485fce5", "Mi  
ned": false, "Published": false }, { "_id": "QmZwsGKPTY2uUhviBu1VcV6pPHxrmQm  
FfPtXPSNS6GjFu", "title": "Test", "author": "0x2a5f493594ef5e7d81448c237dfb8  
7003485fce5", "Mined": false, "Published": false } ] }
```

*GET /news/users/search/:keyword*

**Params**

*keyword (Text): Name of the user to search*

**Output**

```
{ "users": [{ "_id": "0x2a5f493594ef5e7d81448c237dfb87003485fce5", "name": "  
Hariharan", "bio": "Programmer", "channel": [ "Channel1", "Channel2", "0x2a5F493  
594eF5E7d81448c237dFB87003485fce5"], "reputation": 0 } ] }
```

*GET /:user*

**Params**

*user (Text): User's public key*

**Output**

```
[ { "_id": "0x2a5f493594ef5e7d81448c237dfb87003485fce5", "name": "Harihara  
n", "bio": "Programmer", "channel": [ "Channel1", "Channel2", "0x2a5F493594eF5E  
7d81448c237dFB87003485fce5"], "reputation": 0 } ]
```

## Testing

Testing the android app:

ID	Test case	Steps	Expected	Actual	Pass/Fail
1	Login without password (R1)	Click on the submit button without entering	Login denied	Login denied	passed

		any password			
2	Login with the wrong password (R1)	Enter an incorrect password and click the submit button	Login denied	Login denied	passed
3	Login with correct password (R1)	Enter your original password and click on submit button	Login successful	Login successful	passed
4	Search articles with keyword (R8)	Click on the search icon in feed section of app. Enter the search keywords and click the search button.	Filter articles to display the appropriate result.	Filter articles to display the appropriate result.	Initially failed passed
5	Closing the search option (R8)	Click on the cross button to close the search option in the action bar.	Display the original list of unfiltered articles.	Displayed the original list of articles.	Initially failed passed
6	Sending token without entering the amount of STM (R7)	Click on the 'make transaction' section in the navigation drawer to go to the	Transaction denied	Transaction denied with message stating 'STM cannot be empty'	passed

		transaction activity. Click on 'SEND STM' button without entering STM amount.			
7	Sending STM without sufficient balance (R7)	Enter an amount exceeding the STM balance and click on 'SEND STM' button.	Transaction denied	Transaction denied	passed
8	Display user Information	Click on the 'My Account' section in the navigation drawer.	Display details of logged in User	No response on click	failed

## Testing the Smart Contracts

Stimulus uses smart contracts deployed to the Ethereum blockchain to track the articles and allow the users to mine them. The "Mining" contract takes care of the mining aspects by consolidating votes and determining if the article should be published or not. It is responsible for paying tokens to the publishers.



```

contract('Mining', {accounts}) => {
  it('Checks initial reputation', async function() {
    return Mining.deployed().then(function(instance) {
      return instance.getReputation(accounts[3]);
    }).then(function(repu) {
      assert.equal(repu.toNumber(), 0, "Initial reputation");
    });
  });

  it('Adds files', async function() {
    return Mining.deployed().then(function(instance) {
      instance.addArticle(ipfsHash, 1);
      return instance.getVotes(ipfsHash);
    }).then(function(votes) {
      assert.equal(votes[0], 1, "Yays set");
      assert.equal(votes[1], 1, "Nays set");
    });
  });

  it('Voting test Yay', async function() {
    return Mining.deployed().then(function(instance) {
      instance.vote(ipfsHash, true);
      return instance.getVotes(ipfsHash);
    }).then(function(votes) {
      assert.equal(votes[0], 2, "Yay vote re")
    });
  });
});

```

```

it('Checks reputation after voting ends', async function() {
  await timeTravel(80);
  return Mining.deployed().then(async function(instance) {
    instance.VotingEnded(function(err, res) {
      // console.log(res.args.ipfsHash);
    })
    // instance.ReputationUpdate(function(err, res) {
    //   console.log(res.args.reputation.toNumber());
    // })
    await instance.checkDeadline(testFileHash);
    return instance.getReputation(accounts[3])
  }).then(function(repu) {
    console.log(repu.toNumber());
  });
});

it('Checks balance after submitting an accepted article', async function() {
  return Mining.deployed().then(async function(instance) {
    return instance.getPendingBalance({from: accounts[3]});
  }).then((bal) => {
    console.log("Pending balance: "+bal);
  })
})

```

```

it('Fake Voting', async function() {
  return Mining.deployed().then(async function(instance) {
    instance.addArticle(testFileHash, 1, {from: accounts[3]});
    instance.vote(testFileHash, true, {from: accounts[0]});
    instance.vote(testFileHash, true, {from: accounts[1]});
    instance.vote(testFileHash, false, {from: accounts[2]});
    instance.vote(testFileHash, true, {from: accounts[4]});
    instance.vote(testFileHash, true, {from: accounts[5]});
    return instance;
  });
  // return instance.getVotes(testFileHash);
});

it('Double voting', async function() {
  return Mining.deployed().then(async function(instance) {
    return instance.vote(testFileHash, true, {from: accounts[1]});
  });
});

it('Voting after deadline', async function() {
  await timeTravel(100);
  return Mining.deployed().then(function(instance) {
    return instance.vote(ipfsHash, true, {from: accounts[2]});
  });
});

```

We have used a framework called 'Mocha JS' for testing the smart contracts. It is bundled with Truffle framework which has a development blockchain for testing.

9	Initial Reputation of users (R9)	The reputation of a user before publishing any articles	0	0	passed
10	Adding files (R12)	Adding the IPFS hash of the file to the blockchain	Set votes yes =1 Set votes no=1	Yes = 1 No = 1	passed
11	Voting yes (R11)	Voting that the article is true	Increment votes yes by 1	Yes votes incremented by 1	passed
12	Voting after deadline (R11)	Voting should not be allowed after deadline	Voting denied	Voting denied error	passed

13	Double voting (R11)	Same user cannot vote twice	Voting denied	Voting denied	Initially failed passed
----	---------------------	-----------------------------	---------------	---------------	----------------------------

## Testing Token Contract

14	Sending tokens (R3)	Call contract's transfer function	Send the required tokens to the receiver	Receiver receives the tokens	passed
15	Sending tokens with balance less than the tokens to be send (R3)	Call contract's transfer function	Should not send the token and throw an error	Throws an insufficient balance error	passed
16	Transfer from a different account if approved	Call contract's transferFrom function	Send the required tokens to the receiver from the account holder and not the caller	Receiver received the tokens	passed
17	Transfer from a different account if not approved	Call contract's transferFrom function	Should not transfer and throw error	Throws error	passed

## Testing the Website:

	Test Case	Steps to Produce	Expected	Actual	Pass/Fail
18	Sign up without name and bio (R1)	Click on login button without name or bio filled up	User should not be created	Creates a new user with blank name and bio	Failed

19	Login without using metamask (R1)	Metamask turned off or not installed	Login Denied and show a prompt	Login Denied no prompt	Partially failed
20	Show published articles (R3)	Click on feed tab	Show articles published by followed users	Shows published articles by followed users	Passed
21	Article Search (R8)	Click on the search button in the feed section of the website. Enter the search keywords and click the search button.	Filter articles to display the appropriate result	Filter articles to display the appropriate result	Passed
22	User Search (R8)	Click on the search user button in the feed section of the website. Enter the search keywords and click the search button.	Filter articles to display the appropriate result	Filter users to display the appropriate result	Passed

23	Show articles to be mined (R11)	Click on the mine tab on the content page	Display the feed containing news articles to be mined	Display the feed containing news articles to be mined	Initially failed Passed
24	Upload new article	Fill out the details and	Upload the article and	Adds to the network and	Passed

	(R12)	upload a HTML file in the upload page	prompt the user to write to the blockchain	metamask pops up	
25	User payout (R10)	User can view his/her own page after logging in and withdraw the pending balance	Withdraw the pending balance and deposit into the user's account	Withdraw's pending balance	Initially failed passed
26	Upload a copied article (R13)	Upload an article already uploaded by someone else	Should throw an error while writing to the blockchain	Throws an error	Initially failed Passed

R1	Authentication using public private key encryption
R3	Reader interactions - Display news
R4	News card should display in a separate view for mining and reading
R5	Miners can validate content through app
R6	Users can access transaction details from the app
R7	Readers can donate tokens to publishers
R8	Search news and users
R9	Incentivize the publishers based on their reputation

R10	Incentivizing the publishers using tokens
R11	Miners can see mining section
R12	Publishers can upload new articles
R13	Same article cannot be published twice

## Maintenance

- Corrective Maintenance - This includes modifications and updations done in order to correct or fix issues, which are either discovered by user or concluded by user error reports
- Adaptive Maintenance - This includes modifications and updations applied to keep the software product up-to date and tuned to the ever changing world of technology and business environment.
- Perfective Maintenance - This includes modifications and updates done in order to keep the software usable over long period of time. It includes new features, new user requirements for refining the software and improve its reliability and performance.
- Preventive Maintenance - This includes modifications and updations to prevent future problems of the software. It aims to attend problems, which are not significant at this moment but may cause serious issues in future.

Maintainable code written; Comments and Good documentation is necessary.

Analyze User behaviour statistics upon release to see the bugs that the users are fixing and fix them accordingly.

