

# **— FABRK**

**A protocol for decentralized human networks**

Version 1.1

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## **A protocol for decentralized human networks**

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### OUR VISION

We believe in the power of human connection. There's a fabric that connects us all. It's not the desire to scroll endlessly or enjoy the special magic of internet ads. It's not *only* about the fun we're having together online. It's about real connections, real opportunities - it's about finally peering behind the curtain to see all the information available and all the content we've posted, on our own terms - and picking the single strand that takes us in the right direction. Perhaps it's about finding the technology tools that legitimately help identify these meaningful strands. Rather than connection for connection's sake, we envision a world where connections with your neighbors, colleagues across the world, unknown contacts, or family members create and deliver value with every interaction.

We believe in a world where users have the power to participate in the value they create, thereby bolstering and enriching the communities in which they participate. Humanity's digital access to knowledge and social connection is broken, moderated by platforms that have an incentive to hold information back and deliver information haphazardly, or even counter to users' and communities' interests. Today's dominant business model makes users the product more than it assures they are the beneficiary. Society is locked into a model that violates their basic human rights and diminishes their ability to contribute, earn, and share value.

We are on a quest to give these rights back to people. Rights in owning and protecting their data, privacy, and expression online. With people as the rightful owners of the data, the gates to data on social connections will open for companies so that they can create innovative products in service of their customers, both current and future.

*This means FABRK users have true ownership of data - not just rights and incomprehensible terms of service, but physical control over all personal data and content.*

On FABRK, you control your own data, and advertisers, employers, and other users send you value, directly, for anything you view or do. This is the fabric that holds us together.

This is the fabric of the future. FABRK: user-owned, users first, opportunities everywhere.

## **Abstract**

Data is the new oil. Over the past 20 years, the world's largest data-driven firms—Facebook, Apple, Google, Tencent—have come to dominate a sizeable share of human attention (multiple hours per day in the case of Facebook), primarily by building a moat around rich troves of their users' social and behavioral data. Users provide data, create content, and view advertisements in exchange for a services platform that allows them to communicate and share digital content with the people that they know.

There is only one human social network. Existing social platforms painstakingly create their own private, locked-down description of it, user by user and relationship by relationship. As of 2019, the largest of these is Facebook, which describes some of the relationships between ~2.2 billion people. This situation can be likened to the creation of telephone networks in the mid-twentieth century, or of rail networks in the nineteenth. The network effects of scale result in monopolization by a few key players - which is inevitably broken, either by private leasing, regulation, or fundamental disruption.

FABRK is an open source, blockchain-powered, decentralized social networking platform and people protocol where users own their data and earn cryptocurrency (FAB) for content creation and consumption, digital labor, brand engagement, and other common online behaviors. Developers will have access to FABRK's repository of user-shared social data, enabling an ecosystem of third-party social products built on the protocol.

The FABRK protocol can be thought of as a data brokerage that facilitates transactions directly between users and the social products they use, ensuring that data ownership is retained solely by users from which the data originated.

The FABRK protocol enables an extensible platform for the next generation of social products. FABRK allows its users to own and sell their own data, own and sell their own content, as well as get paid for viewing advertisements and engaging in other digital behaviors. Ultimately, this puts power, profits, and connectivity back in the hands of users.

The FABRK Protocol utilizes a multi-level Delegated Proof of Value (DPoV) consensus model, similar to Delegated Proof of Stake. Voting responsibility is distributed across participating users according to a combination of FAB token staking and a protocol-level metric representing the user's historical contribution to the social network. Distributing voting power in this way allows for good actors to direct the development of FABRK Protocol in a straightforward and decentralized manner. Delegate Nodes, who process transactions and maintain the FABRK ledger, can earn newly emitted FAB tokens.

FABRK is open to third-party developers. The FABRK Protocol manages privacy and verification so that product developers can focus on leveraging the data that users' have chosen to share, helping users discover the content, people and opportunities they are looking for. Our approach gives users and apps a standard protocol for monetizing and voluntarily exchanging data and attention while allowing users and product developers (rather than social platform owners) direct control over user experience.

## **WHY FABRK?**

Imagine if every smartphone manufacturer had to build their own cellular network in order to reach customers. This type of monumental hurdle is at play in the social media economy, where a platform's innovative features or interface are only as valuable as the platform's ability to acquire a critical mass of users. Incumbent social networks increasingly shut third-party developers out of their robust platforms for this reason - successful social apps could leak users to up-and-coming developers, organizations, or direct competitors. The state of social innovation, developer empowerment, and user enjoyment suffer as a result. Indeed, the viability of incumbent platforms themselves suffers in the long-term, as evidenced by social media incumbents' stock volatility, as well as claims that massive volumes of fake accounts prop up growth reporting, and evident disinterest in incumbent social platforms among the youngest generation of users.

Presently, any product developer that wants to leverage the power of social data to create innovative products must build their own network of users and a comprehensive social dataset from scratch. This enormous barrier to entry suffocates innovation and user choice and creates incentives for network owners to undermine user privacy in order to capture the entirety of the value that users create or bring to the platform. History demonstrates that network monopolies (railroad, electricity, telephone, etc.) eventually break and give way to either private leasing, public regulation, or fundamental disruption. Users are becoming aware of the exploitative behavior of centralized platform owners and have expressed serious concern, but have limited alternatives.

The goal of FABRK is to create the first social network protocol and user-base that is completely open to product developers, which will serve as a long-term technical foundation for the 21st-century OPEN social data economy.

**Facebook: 2 Billion Users, Less than 1 Million Devs, 90% Login and Ad-tracking**

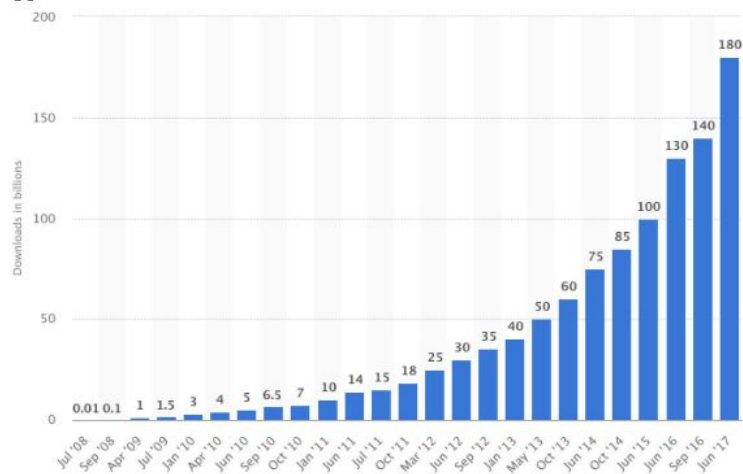
Facebook Daily Active Users  
% change, quarter on quarter



...A sharp contrast to open developer frameworks, that entice user growth and innovation.

**iOS: 1 Billion Users, 20 Million Developers**

App Store Downloads



Presently, there is no direct competition between social products with respect to experience; no two products compete to deliver better value, given access to the same underlying social data. FABRK aims to change this. By taking away the platform owner's position as the sole

innovator in the ecosystem, and by shifting ownership of content back to creators, FABRK Protocol allows for a flourishing of social products that compete to deliver value to end users. FABRK is creating a decentralized protocol that makes it easy for users to control and monetize their data and activity. The FABRK Protocol also makes it easy for product developers to securely interact with user data in the ways users have specified, to help users discover valuable content or opportunities, and to facilitate user interactions with the rest of the social network.

Users have had enough and are already moving towards the exit when it comes to today's social media experiences. Unfortunately, there's currently nothing waiting on the other side.

FABRK is building a common infrastructure to access the universal social graph: access to users, data about who we are and how we're connected, and the distributed computing power to reliably process and serve this information. Today, this infrastructure is proprietary and is not available to third-party developers nor to users. The Cambridge Analytica scandal, the General Data Protection Regulation (GDPR), the Ad-block movement, and 2018 user adoption numbers are all additional signs that the time has come to disrupt the incumbent social network monopoly.

## **PROBLEMS IN THE SOCIAL ECONOMY**

Pertinent Points:

1. Users lack control over their own data, privacy, attention, and opportunity on social networks. Today users are the product, not the customer.
2. Today's social networks lack robust microtransaction frameworks, minimizing opportunities for value exchange, social incentives, and smart contracts online.
3. Users do not share in, let alone dominate, value earned within online social networks.
4. Today's social networks have a financial responsibility to investors to shut out developers (who platform owners see as competitive rather than complementary).

More than two billion people across the world are connected online through existing social platforms. However, much of the value created by this connection has been captured by centralized incumbents such as Facebook, Google, and Tencent, leaving users without sufficient influence or control.

*“Centralization, or control by a single authority or entity, is a common and pervasive form of governance. Governance refers to principles of organization and power. We must trust central authorities, like banks, governments, and other institutions to*

*maintain order and structure within the space they operate. This trust is broken when the central authorities cannot maintain that order and structure.”<sup>1</sup>*

Instead of creating an ecosystem where every individual captures benefit from their online activities, a mix of accident and intention gave rise to the modern, ad-tech business model, which removes consumers entirely from the exchange of value or money for the content they create as well as the content they consume. A small number of platform owners have now gained sufficient power to keep much of the value users create in their networks. Instead of accessing the tremendous power and potential for good that a large social network could have, these platforms were architected to extract value directly from our pockets, spread waste, vitriol, and set up empty artificial relationships. Instead of protecting its users from fast-spreading, false and manipulative stories that have dramatically eroded user trust, these platforms have created political discourse and conflict.

In addition, top content creators now reach billions of people, but they cannot capture the value they create:

*The top 3% of social influencers (those with over 1 Million subscribers) make less than minimum wage for their efforts.*

*The social ad market is \$75 Billion, the majority of revenue is captured by middlemen with technology that is bad for users.*

Ev Williams, Medium’s founder [wrote publicly](#) that the layoffs they recently experienced were inspired by Medium’s decision to move away from an ad-supported business model, because “people who write and share ideas should be rewarded on their ability to enlighten and inform, not simply on their ability to attract a few seconds of attention.”

In support of Williams’ announcement, one of Medium’s investors, M.G. Siegler at G.V., [wrote](#):

*“2 billion words written on Medium in the last year. 7.5 million posts during that time. 60 million monthly readers now. Page views galore. So step 2 is simply to slap some banner ads on the site, while step 3 is to profit, right? The reality — perhaps hard to see in the midst of such numbers — is that it behooves no one to simply continue down a path if you know the end result isn’t ultimately going to be successful. And so, the prudent yet extremely difficult move is to swallow your prideful metrics and course correct.*

*... Numbers — even insanely impressive numbers — can deceive. They can deceive when the goal is not actually to build the site with the most page views on the internet.... It’s not enough to simply be big. That’s part of the equation, to be sure. But just as vital is continuing to innovate on core product and experience while also*

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<sup>1</sup> <https://www.Consensys.net>



*building a sustainable model to make sure that all sides (publishers and readers) are deriving value — actual value — from the content, for the long-term.”<sup>2</sup>*

## Lack of Data Ownership and Rights

The FABRK protocol will eliminate platform ownership of data, serving instead as a data brokerage between sovereign owners of private data. FABRK will support peer-to-peer transactions of private data. The FABRK protocol is not only an extensible ecosystem for the next generation of social products but also a bridge that will allow traditional developers and applications to transition as quickly as possible. FABRK allows its users to own and sell their own data, own and sell their own content, as well as get paid for content consumption and other digital labor.

In incumbent platforms of today, algorithmic feeds and suggestions are not optimized for users, despite their importance in our social lives. The days of an “honest” PageRank algorithm that returns the same results for the same query are long gone. Today, two people can be standing next to one another, type the same search into the same engine and get very different results. Contrary to the cases that major platform providers are currently making in front of the EU courts and the US Congress, these differences are not innocent nor optimized for value to users, but rather the result of conscious choices to convince each of us to part with a bit more money and attention than we otherwise would.

To many users’ surprise, on many large incumbent platforms, you can’t see the entirety of your own personal network, let alone easily search it. Today’s leading platforms hold back search results to compel reliance on the feeds they’ve optimized for advertising.

*The FABRK Foundation believes that humanity has only scratched the surface of what is possible when billions of people connect on a common digital infrastructure. Additionally, we believe that this new world is best explored when essential data, such as the network of our personal connections, are liberated from the control of middlemen and all of the world’s 25 million developers can compete to deliver better ways for us to interact with them.*

The fundamental obstacle to competition for feed, search and discovery products is that the data you want, and interface required to view it, both tend to be wholly-owned and controlled by the same company. Developers shouldn’t need to acquire a billion users just to let you message all of your friends.

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<sup>2</sup>

<https://hbr.org/2017/04/imagining-a-social-media-platform-built-around-quality-not-scale>

## Centralized Control of AI and ML Training Data

The centralized machine learning models currently responsible for conveying (or not conveying) information to billions of individuals require massive, centralized storage of personal demographic and behavioral data that has inevitably resulted in ever-growing exposure and misuse. While requiring the processing of massive amounts of data is essential to many learning models, the centralized storage and even the exposure of personal data to model developers are not. That's why FABRK is ready for Federated Learning and AI, which allows users to invite (and be paid for ) models to train on their private data held locally in the node that they own. This involves sending back no raw data, but rather the transmission of a newly-trained, smarter model that is immediately and securely synthesized with many other individually-trained instances to create a sophisticated and highly-capable aggregate model.

## **OUR SOLUTION**

FABRK IS A SOCIAL PROTOCOL WHERE USERS EARN TOKEN(FAB) AND DEVELOPERS CAN CREATE TRUE SOCIAL PRODUCTS

- **Users Own Their Own Data** and can share it with brands to get paid. Users bring funds into the system or perform digital labor to earn.
- **Automatic Microtransactions** allow users to invisibly pay for each piece of content they view and get paid for each successful piece of content they create. Users obtain a small amount of fab .
- **Zero Out of Pocket Costs** means that users who create successful content can offset their consumption costs through content creation, while less-prolific users are shown enough advertising or earning opportunities to break even or net a profit.
- **Developers Can Finally Make Truly Social Products** because FABRK provides direct access to every part of the social graph, given user approval. Feed algorithms, privacy control apps, match-making, etc. are types of social apps competing for users' tokens.

## **FEATURES**

True user ownership of data, not just rights, but physical control

FABRK's unique node, ledger and hosted distributed app architecture allow for the benefits of centralized targeting and learning in a decentralized and consensual fashion that dramatically reduces personal data exposure. Say, for example, you are in the market for a particular product and you would like an advertiser to pay you for the opportunity to pitch their latest and greatest. In the traditional, surveillance-based ad market, the advertiser would pay a platform, who would use massive, centrally-stored behavioral and demographic data to target the ad to you, then take nearly all of that payment as profit. On FABRK, the advertiser responds to the inbound interest with a small contract that runs on your node processing local, private data, but returning only a simple score to both you and the advertiser, indicating how much they are willing to pay you for your attention. If this price is agreeable (based on your existing settings) the content and payment will be delivered to you.

### Federated AI Provides Intelligence *and* Privacy

Massive, centralized stores of personal demographic and behavioral data combined with economic incentives that do strongly incorporate value to users are the recipe for the disasters we see playing out on a weekly basis with large, incumbent social data and content platforms. To this end, FABRK is ready for Federated Learning, a machine learning discipline in which, similar to the example in the section above, data model can be sent to a user node (with their permission), where it processes private, local data, becoming a bit smarter before the model (but not the data) is returned to the developer. The greater number of individually-trained models the developer can synthesize, the more sophisticated and capable the resulting model. Combine this with the FABRK ecosystem's open market for feeds and suggestion products, and you have a recipe for products that compete to deliver user value while protecting user data.

## OPEN MARKETS FOR ESSENTIAL DIGITAL PRODUCTS

Algorithmic feeds, suggestions and search engine results are humanity's window to the world, whether that's the world of opportunity, of social connections, or the shared body of human knowledge. Developers shouldn't be incentivized to hoard obviously public data like place names, or need to acquire a billion users just to help you search your own personal

network. These essential AI-driven interfaces must be open to competition within datasets, not just across them. To that end, the FABRK protocol opens that same social graph data (respecting user restrictions) to competition among the entire market of developers and creates a new market for feeds, search and other ways to discover the content created in the FABRK ecosystem.

## Web 2.0 Developers can Build Decentralized Products Now

There are 25 million developers in the world, but only 80,000 know blockchain.

Typical distributed app development has extremely high barriers to entry. The FABRK Software Development Kit and API allow 2.0 devs to get started quickly. FABRK Software Development Kit transpiles to FABRK Core, allowing devs to build distributed apps with familiar languages like JavaScript and Python. The FABRK API makes available federated identity, reputation and micropayment products to existing apps, increasing users, devs and network activity.

## NOVEL APPROACH TO USER NODES FACILITATES PRIVACY AND DATA OWNERSHIP

Sign up for the "lay" user has been built for speed and simplicity. A familiar sign-up on the front-end entails default node setup and content storage via commercial cloud infrastructure on the back end, the simplest way to ensure maintenance-free uptime. Applications read data addresses and keys from the blockchain while content and applications are served off-chain. Advanced users are welcome to host content and set node parameters however they wish.

## VIEWERS PAY AND CREATORS EARN AUTOMATICALLY WITH MICROPAYMENTS

- The viewer of the post silently pays a tiny amount without worrying about the cost
- Creator gets paid for all views allowing the average user to break even or profit
- Influencers can earn real money by positioning additional pay-per-click or subscription content while creating valuable brand engagement
- Content creators have the flexibility to mix subscriptions, purchases, and automatic fees
- Creators and brands use smart contracts to make it easy to share revenue in clever ways
- Viewers can earn by sharing and retargeting content within social cliques, with content-creators automatically sharing the revenue in exchange for smart dissemination

## USERS HAVE MANY WAYS TO EARN

- **Users Can Accept Ads** directly from brands and ad-serving marketplaces. Users may increase the value of their ads by engaging further with brands, selling follow-on demographic and purchase information directly to advertisers and data aggregators, or brand evangelizing.
- **Digital Work** includes rich media curation, dissemination, retargeting, and related opportunities. By carefully grading content and potentially disseminating to trusted friends, users bolster their reputation, while sharing in the content creation/content dissemination profit stream.
- **Discovery Rewards** are just one marketplace where users' digital work captures value directly. Users review, forward, track, and ultimately fulfill matching opportunities, sharing in a bounty.
- **Influence is Finally Valuable.** Whether an influencer is a makeup tutorial maven or a political commentator, she is seeking to earn directly through gated content. Even low-level influencers and everyday users can use FABRK to take their audience seriously and grow revenue through a direct relationship with followers.

## Delegated Proof of Value (DPoV) and the Hardest Problems in Human Networks

Content quality and user trustworthiness currently bedevil some of the most valuable companies on earth.

Here we introduce a novel governance algorithm, Delegated Proof of Value (DPoV), to aid in solving these problems. Through network analysis of the spread of content, DPoV can reward valuable contributors to the network. By looking at a node's voting share as determined by DPoV, one can assign an indirect measure of quality of content and authorship, assisting in solving two of the hardest problems in modern human networks (the FABRK team considers the problem of determining "content quality" synonymous with "content moderation", and "authorship quality" synonymous with "reputation" for our purposes). Content creators that are widely-read across many network cliques will enjoy higher supplementary vote share than those whose interaction across cliques is more limited. In other words, it's substantially more challenging to design quality content for all cohorts of users than it is to do so for a single cohort. Additionally, once a user has read your content once, they become attached to your local network neighborhood and the value of subsequent reads is decreased.

Delegated Proof of Value (DPoV) means that the weight of a node's voting rights are determined, in substantial part, by the value they add to the network. This allows the community to leverage intelligence about user trust and quality with every transaction added to the chain.

$$v_t^i = f(v_{t-1}^i, v_{t-1}^j, E(\Lambda_{t-1}))$$

This simple, yet elegant, formula underpins our broader model, incorporating the existing DPoV scores of interacting users  $v_{t-1}$  and their relationship within the network graph of user-interactions.  $\Lambda$  to provide a basis on which to apportion voting weight to nodes. Please see Section 2 - Technical Considerations, DPoV for further explanation of terms, and the [FABRK Technical Memo V1](#) for an in-depth discussion of DPoV as well as our development of the infrastructure necessary for data markets for machine learning on blockchain.

## What Does DPoV Make Possible?

### Moderation of Modern Human Networks is the Most Complex Problem Humanity has Ever Faced

Moderation of content quality in billion person-networks is an extremely challenging problem. Even the world's best capitalized and most appropriately-positioned companies admit that their development teams cannot meet popular expectations for filtering content in their own networks. FABRK takes the position that this problem is too big to be solved in-house. Only a healthy marketplace of products competing to deliver value to users can solve this problem. In order for developers to compete for that value, platform owners must be displaced as the store of network content value and the vertical integration of social data and the interface used to view it must be broken. DPoV provides an essential basis for developers to test and evaluate many different approaches to content quality and reputation. In the FABRK ecosystem, developers don't need to acquire a billion users before they can offer a competitive interface to help you discover content from your friends or the broader community.

Some of the principal challenges of moderating the quality of content in modern human networks stem directly from the incentives generated by the fact that ad placements make up the bulk of the financial transaction volume on the network. In the FABRK ecosystem, eliminating the platform owner means that the bulk of transaction volume occurs between users through the creation and viewing of content. This changes the balance of incentives between creation and consumption, as well as allowing developers to provide, and charge for, feeds and filters that optimize for things other than crude attention maximization and

minimal legal compliance. If a feed that promises to provide ideas that improve the quality of one's content creation lives up to its promise, value is created which can be shared between the user and the developer, with the split being constantly adjusted by a competitive market for such products.

## New Kinds of Positive-Sum Social Interactions

Recursive incentives embedded in human networks are capable of solving problems that machines can't.

In the 2009 DARPA Red Balloon Challenge, recursive awards helped The Human Dynamics Lab at MIT find 10 giant balloons strewn across the US in less than 72 hours. Unlike some of the other entrants' strategies, which involved self-driving cars, massive analysis of satellite data and other time, resource and compute-intensive solutions that had been operating for nearly a month, the winning strategy involved a simple website that provided a referral link that people could share with their network and took only three days. A participant passed on their referral link to anyone they thought might find a balloon and shared in the prize money if they did. These recursive incentives, or "Discovery Rewards" are incredible engines for solving complex, compute-intensive tasks by leveraging the distributed intelligence of human networks.

### **Example: The 200 Billion Dollar Job Recruiting Market**

"I'll pay my first month's salary to find my dream job: Architect in NYC."

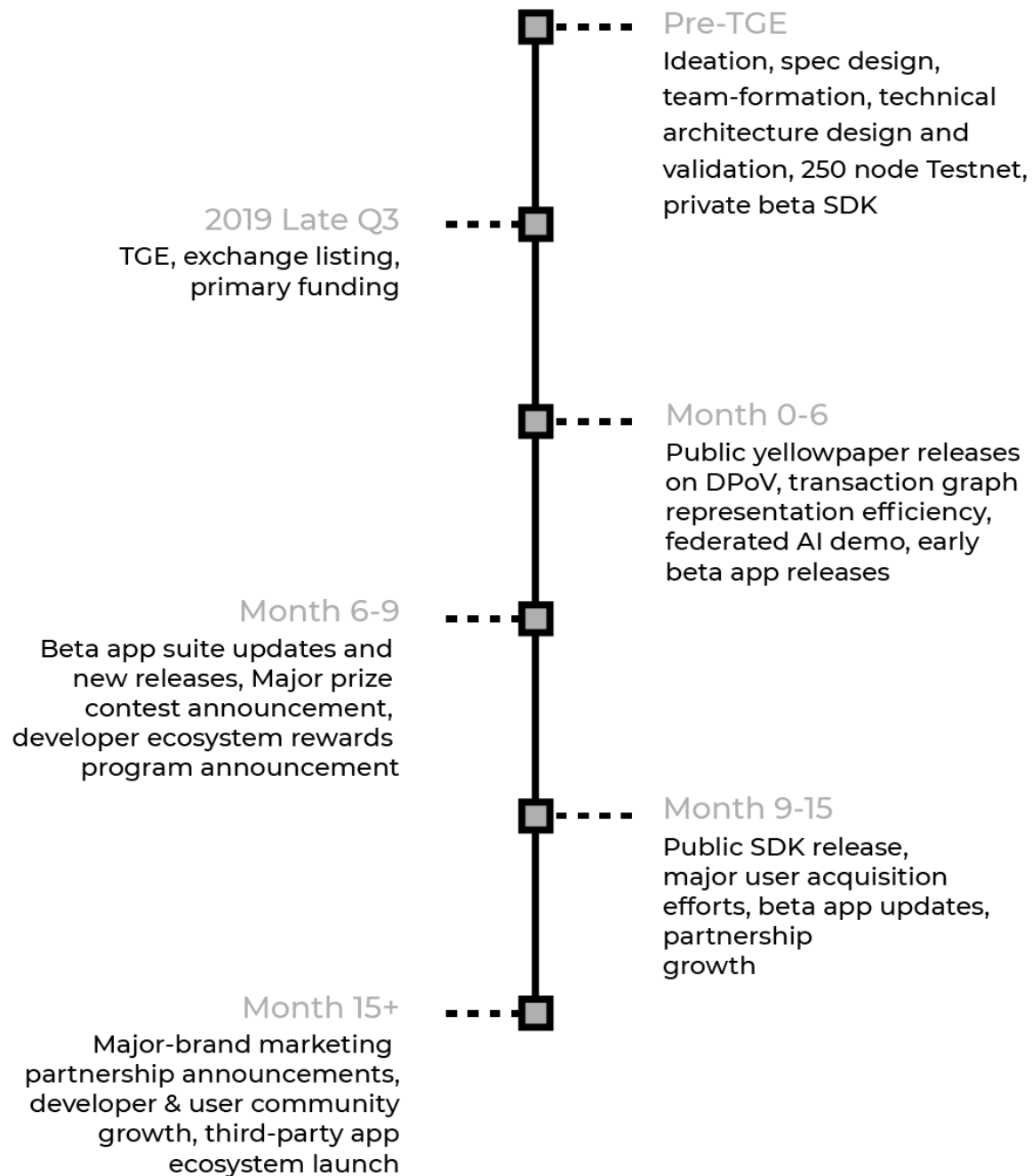
FABRK makes it easy to create simple smart contracts via link-sharing, even with people who aren't yet on the network, so that this user can now recruit everyone who might know someone, who might know someone, etc... who might have just the right job. When the job is found, everyone in the referral chain automatically gets a share of the bounty.

## **FABRK Roadmap**

At the FABRK Foundation, we aim to bridge two generations of social networks. Each phase of the roadmap consists of a major milestone, will require a substantial contribution from both team and community, and must be executed in a careful and considered manner. We acknowledge that in designing a system of interrelated technologies as complex as the protocol, SDK and API we intend to build, obstacles will inevitably arise that require us to rethink our assumptions and potentially find alternate strategies to achieve our goal of building a sustainable foundation for truly decentralized human networks that can support the product-quality expectations of the average consumer in 2019 and beyond. As such, this roadmap should be understood as a living document, reflective of the progress of our

understanding and the robustness of our solutions. It will be updated methodically as our success and sophistication grow.

In the following roadmap, we outline approximate dates for various key milestones and prior work that motivates our approach. This roadmap will offer insight into five stages of FABRK development, from ideation to projected growth trajectory.





# Team



## **Nadeem Mazen, Chief Executive Officer**

Nadeem is an award-winning serial entrepreneur and MIT graduate, with over a decade of experience in viral marketing and interactive software.



## **Ace Moghimi, Chief Operations Officer**

Ace Moghimi is a globally recognized leader in innovation and entrepreneurship. He holds an MBA from the F.W. Olin School of Business at Babson College and Executive Certificate from MIT.



## **Yasin Ozcan, Ph.D., Chief Strategy Officer**

Yasin Ozcan is a Ph.D. strategist out of MIT Sloan School of Management with years of experience advising C-Suite tech executives in multi-billion-dollar investments.



## **James David Moffet III, Chief Technology Officer**

James is a successful software developer, designer, data privacy expert and holds an M.S. in User Experience Design from Harvard University.



**Ilir Capuni, Ph.D. Technology**

Ilir is the head of the Advanced Computation Research Center and holds several patents related to human networks and distributed digital rights management.



**Gautum Sampathkumar, VP, Engineering**

Gautum is a Silicon Valley veteran with 15+ years of experience in engineering building some of the most scalable systems used today for companies like Bloomberg, Paypal, and Cisco.

**Advisors**



**Navroop Sahdev**

*Economist | Fellow at MIT*

Navroop Sahdev is a pioneering economist and futurist in emerging tech.



**Mohammad Ghassemi, Ph.D.**

*Ghamut/Connect | S&P*

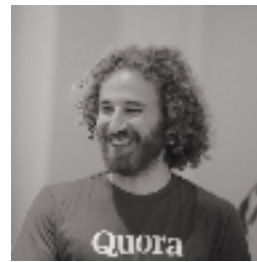
Mohammad Ghassemi is an award-winning scholar and successful social media entrepreneur. He holds a Ph.D. from MIT in computer science.



## **Babak Kia**

***Boston University***

Babak is a talented engineer, crypto expert, and investor. Aside from teaching Blockchain and software engineering at BU, he spends his time mentoring and advising startups in the Boston ecosystem.



## **Osman "Ozzie" Osman**

***Parlio | Quora***

Osman "Ozzie" Osman is a successful social media entrepreneur having sold his venture Parlio to Quora in 2016. A computer scientist by trade, Ozzie received his B.S. from MIT and his MBA from Harvard Business School.



## **Pawan Deshpande**

***Founder | Curata | Investor***

Pawan is the CEO & Founder of Curata, a content marketing technology company, used by 1,000+ enterprises including 20% of the Fortune 100. He earned patents at Google and Microsoft in the areas of social networking and machine learning.



**Abraham Elmahrek**

***Former Engineer, Cloudera,  
Blockchain/crypto entrepreneur***

Abraham built software products at Cloudera to facilitate large scale decentralized data storage, search, and processing. He is a successful blockchain entrepreneur and expert.



**Basier Aziz**

***Former Engineer, Cloudera***

Basier developed software products as a Product Manager in Silicon Valley for Oracle and Cloudera before starting his current work at a startup at the nexus of Aerospace tech and Machine Learning.



**Sahrawi S. Chaib, Ph.D.**

***MIT, LBL, Hawa Analytics, Kaust***

Sahrawi is an entrepreneur, award-winning scientist, and scholar. He holds a Ph.D. from MIT and is a recipient of the Presidential PECASE and NSF award.



**Waikit Lau**

***Telaria, Scanscout, MIT***

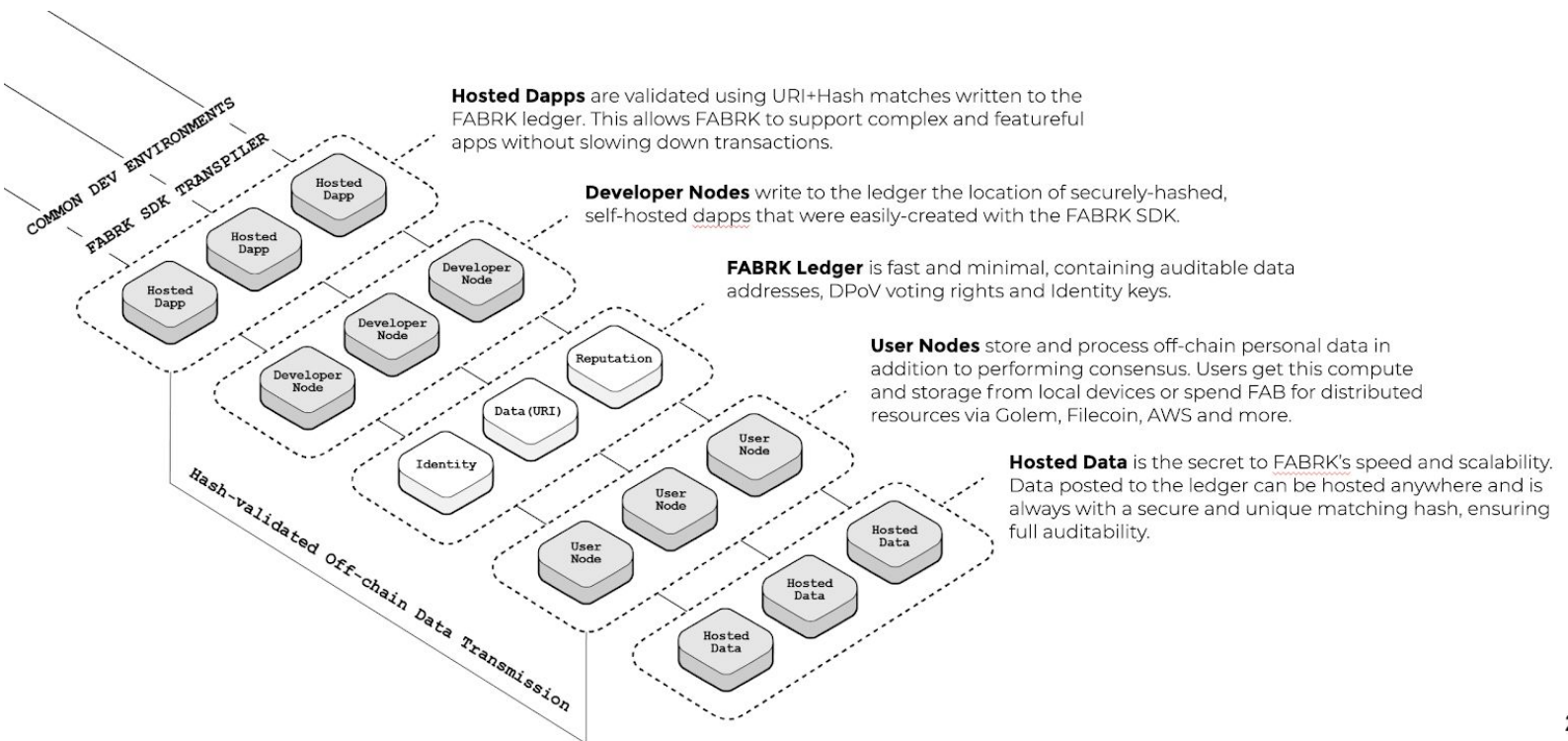
Waikit is a serial entrepreneur who founded two machine learning-based companies, one that was acquired and one that he helped take public. He is currently a VC based out of Boston, MA.



Smith + Crown is the world's leading blockchain research organization with a focus on cryptoeconomics, asset intelligence, and industry analysis. Smith + Crown produces a range of independent research, advocacy, and educational work for institutions and governments, and engages in bespoke advisory work around crypto-economics and blockchain strategy.

# **02 Technical Considerations**

# FABRK Protocol



To power FABRK, we are building a common protocol for discovering other users and exchanging value with them, the missing “people protocol” of the internet. This extensible protocol is like HTTP, but for people and their data, instead of hypertext documents.

## The Basics

The FABRK ledger itself will act as an encrypted map of where user data is stored throughout the network. Users store their own data off-chain, including their own content and any personal data. They may host and serve data locally, or via a hosted, or distributed environment. The FABRK protocol allows user nodes to securely manage integrated third-party storage solutions, should users choose to use them.

- FABRK intends to launch with a two-tier node architecture. Each user will run a ‘User Node’ that is responsible for off-chain storage and processing of personal data. This allows for secure ownership of personal data, as well as for developers to perform federated learning and secure match-making.

- The second set of nodes, called Delegates, will process transactions and maintain the FABRK ledger. The blockchain will store transaction data and a map of all off-chain content served by the User Nodes or their integrated storage solutions. User nodes will elect Delegate Nodes through a process discussed in greater depth below.
- Accessing data stored off-chain requires a *de minimis* exchange of value from the reader to the writer. The baseline cost of storing and serving data across the network will be calculated on a rolling basis by Delegate Nodes. The baseline cost of read operations will be priced as low as possible while still ensuring that infrastructure cost for a user to store and serve that data can be recouped by that user. In other words, even if users choose not to charge additional fees for their content, they will nonetheless automatically break even if a piece of content they are serving goes viral and is read many times. The *de minimis* charge for reading content is automatic, is set by Delegates, and is enabled by default. For users that access the same amount of content as they serve, the net balance of these automatic micro-transactions will be zero.
- All other prices are subject to contracts between users. Users may choose to charge an arbitrary amount for access to any data they write to the ledger. Users and developers may adjust these values programmatically through the use of smart contracts. The FABRK foundation intends to use some of its initial FAB allocation to attract trusted individuals and institutions to create automated privacy, spending and monetization policies that users will have good reason to trust and that they can import in a “one-click” fashion.
- FABRK will use a small (~15-45) set of Delegate Nodes as block producers to facilitate a high-performance blockchain.
- Marketplace: FABRK will create long overdue marketplaces for products that are essential to the future of human networks. These marketplaces will allow users to enjoy, for the first time, competition between feeds and search engines within the same social network dataset. FABRK will ensure that these marketplaces are attractive to new products and developers by creating an exceptionally-low technical barrier to entry, both from other blockchain ecosystems and from traditional web applications.
- Developers of social apps on FABRK can let users see and message all of their friends instantly, eliminating the need to acquire the majority of a given population to become truly useful. Of course, this means that FABRK must acquire a critical mass of users - a major focus for our team, covered in the User Acquisition section of this paper. However, on FABRK, this user acquisition must only be done once and can thereafter be enjoyed by an entire competitive economy of social apps and products.

- **Selective sharing of data:** In the FABRK network, users retain complete ownership over their data and how it is shared. They will typically derive value from advertisers and other users for access to data they choose to share. The FABRK protocol facilitates transactions directly between users and the social products they use, ensuring that data ownership is retained by users from whom the data originated.
- **App Layer:** Typical App development has extremely high barriers to entry. FABRK's SDKs allow Web 2.0 developers to get started quickly. FABRK SDKs will be made available in multiple languages, such as JavaScript and Python (Q4 2019), allowing devs to build Apps with familiar languages and software design patterns. FABRK Delegate Nodes may also serve APIs that make federated identity, reputation and micropayment products available to existing Web 2.0 products, thereby increasing user and developer adoption and network activity.
- **DPoV Algorithm:** Content quality and user trustworthiness currently bedevil some of the most valuable companies on earth. FABRK uses a novel governance algorithm, Delegated Proof of Value (DPoV), to aid in solving these problems. Through network analysis of the consumption of content, DPoV can reward those who contribute value to the network. By looking at a node's voting share as determined by DPoV, one can assign an indirect measure of the quality of content and of the reputability of content creators, forming building blocks of solutions to two of the hardest problems in modern human networks (reputation and content moderation).

## **User Nodes**

When users join the network, they set up a node that stores their personal data. The node can be local—on their own machine—or hosted remotely, per user preference. The node will consist of a lightweight software package that communicates with the main FABRK ledger, connects securely to distributed applications and can manage integrated storage solutions.

- Users set their own permissions around who can access the data, at what price, and under which circumstances.
- The FABRK Foundation will help bootstrap the network by making this process easy for users offering one-click options for creating virtualized node instances on both centralized and decentralized cloud infrastructure, in addition to traditional local-hosting options.

Users own their data, control its storage and may define others' access per their preferences. Note that the locations of user data are stored on the FABRK ledger, not the data itself. This decision mitigates the challenge of transmitting and storing a large chain, while also protecting user privacy and control over essential personal data. In addition to local storage on users' own devices, the FABRK protocol will integrate with distributed storage options,



both centralized and decentralized, such as IPFS-based storage services like Filecoin, as well as centralized providers such as AWS and Google. Early users on the platform will have distributed storage costs offset by token incentives for joining the platform, as well as ad-viewing, content creation, and other digital value creation. Users will retain full control of their data, both legal and physical, and may change storage solutions at any time. In addition to the familiar local-hosting options offered by most blockchain products, the FABRK SDK will facilitate onboarding by offering low-cost, one-click creation of user-owned nodes on virtualized compute devices. FABRK will work to establish options for automatic payment, in cryptocurrency, to these providers. These may be an attractive option for lay users, compared to the challenge in setting up a node and hosting it themselves on a local device. Over the long-term, as savvy in these technologies grows, and as always-on, always-connected devices proliferate, we expect to see a trend toward self-hosting and away from centralized compute and storage providers.

### **Data storage on User Nodes**

Data storage on the node will be structured for two primary purposes.

- Low latency, fast retrieval structures such as Hashes and Key-value lookups for real-time access to User Data from single-use URIs stored on the ledger.
- Denormalized flat file structures locating user data and associating it with appropriate metadata for local processing of Federated AI workloads.

### **Permissioned Access to User Node Data**

FABRK nodes serve off-chain data via single-use URIs, encrypted to other users' public keys. The encryption and expiration of these URIs serve as the primary permission layer that controls access to user assets. Users may publish to the ledger a single or multi-use URI, encrypted to another user's public key, in exchange for tokens. For multi-use URIs, the User Node will build a hashtable that is a representation of "allowed access" to a piece of content. Each value stored in the hashtable which will be akin to a digest of a combination of the purchasing user's ID + content ID.

When a user tries to access a piece of content, they are either given access to it in the case of content that is not priced, or a quick lookup is performed on the permission layer to see if that combination of the user ID + content ID written during a purchase exists or not.

### **Delegate Nodes**

Delegate Nodes perform the raw computation for processing transactions.

- Delegate nodes are compensated with block rewards through the set annual inflation as described below.

- Delegate nodes are also tasked with maintaining the FABRK ledger which is comprised of transactions as well as computed hashes (Merkle roots) of the graph representation of the network, DPoV scores per user and user FAB token balances. Storage for non-transactional data will be facilitated by a modified version of the UTXO storage method used by Bitcoin nodes to maintain the current state.
- The core operations of the chain will consist of maintaining a history of data additions and updates, data requests, token transfers, and voting records.
- Additionally, Delegate nodes will maintain a current state graph representation of the user network and will provide both this representation and the DPoV scores that are derived from it, as a service to the community.

## Delegated Proof of Value (DPoV)

Blockchain technologies secure and manage distributed data structures using a variety of consensus algorithms. The predominant approaches particularly relevant to FABRK are:

- Proof of Work (e.g. Bitcoin) - where computational power determines the influence
- Proof of Stake (e.g. Ethereum after the intended Casper upgrade) - where token holdings determine the influence
- Delegated Proof of Stake (e.g. EOS) - where token holdings indirectly determine influence via the election of Delegate nodes that maintain blockchain integrity

These approaches ultimately place the network in the control of those with the most resources: either to purchase computing power or to purchase tokens.

The mission of FABRK, to provide a platform on which developers can build apps that users can trust, demands a new approach to securing and managing data on the blockchain.

Reputation is at the heart of any social network, digital or analog. It is a proxy of social worth or contribution to the community. It is no mistake that the term ‘social capital’ has entered common parlance. It is intuitive that social recognition of contributions can comprise a form of ‘work’ with the capability to play a role in moderating the network. However, operationalizing these contributions on-chain is not a trivial task, and we have learned from projects that have attempted similar structures.

### Insights from EOS

In EOS, token holders elect a set of 21 block producers that confirm transactions and have authority over the state of the ledger. While this approach allows for a more scalable smart contract platform, it is also a relatively centralized network that has been subject to various vote-buying attacks throughout its history. Discouraging vote-buying through an informal

constitution has not proven effective; networks considering a similar architecture must either codify bans on vote buying, which is inherently difficult with various off-chain mechanisms or recognize vote-buying as a feature and work to make it more transparent while minimizing its side effects.

### **Insights from NEM**

NEM implements a protocol called ‘Proof of Importance’ that gives more voting power to users of the network who both stake NEM and contribute significantly to the NEM economy. NEM operationalizes the concept of contribution or ‘importance’ by valuing transaction history according to transaction frequency, transaction counterparty, and transaction size. The algorithm produces a network topology identifying certain nodes who seem to play a significant role in connecting the rest of the economy. In NEM, there are two types of nodes. One type (Harvesters) aims to gain positive ‘Proof of Importance’ reputation scores by demonstrating frequent and high-quality transaction activity on the network, and then lend that earned reputation to another type of node (Supernodes) which actually process transactions and create blocks. The probability that a Harvester/Supernode pair will be selected to produce the next block is a function of both the number of tokens they’ve staked (mimicking Proof of Stake’s approach) and also the Harvester’s earned ‘Proof of Importance’ reputation score. The decisions over which types of transactions to value more than others, and how persistent user importance scores are, are complex and the exact parameters may not be relevant to a growing social network, but this paves the way for contribution-rich, but stake-poor, users to meaningfully participate in governance and consensus.

### **DPoV**

FABRK’s approach to integrating network reputation into the consensus algorithm is to build a DPoS system that is modified by the value a user generates by using apps built on FABRK to influence that user node’s weight in selecting Delegates. The Delegated Proof of Value algorithm is similar to the general Delegated Proof of Stake (DPoS) approach: community members vote for delegates that secure and manage the blockchain. But unlike DPoS, where token holdings fully determine voting power, DPoV assigns a voting power,  $v_i$ , to each individual  $i$ , that is a recursive function of the voting power of all of the users consuming their output, modified by network distance between partners, with an emphasis on nodes who receive requests from distant readers. For example, the value that a user acquires for posting a picture depends on:

1. the number of users requesting the picture (e.g. number of times seen),
2. the value of users requesting the picture (e.g. celebrities vs. spam-bot), and
3. the network distance between those users (e.g. do they belong to the same neighborhood or clique).

All read activity on the platform (e.g. requesting URIs that grant access to information served by a user node or its integrated storage) involves a small transfer of value to the user that has served the data. This baseline cost of a read operation allows users to recoup the cost of storing and serving data. This baseline cost will be calculated and updated periodically by Delegate Nodes. DPoV uses this record of data exchange to reward not those with the greatest stake, but those with the greatest positive impact on the platform through the readership of their content.

*DPoV means that FABRK can distribute voting power based on the shape of users' network behavior. The shape of users' network behavior is determined by who has viewed their content, their DPoV score and how their messages have flowed through the network. As we have learned about the power and speed of digital false rumors, it has become clear that more content and more readers are not always good. This is why DPoV takes into account the shape, and not just the size, of users' network behavior.*

In general, the interaction of these factors can be expressed as:

$$v_t^i = f(v_{t-1}^i, v_{t-1}^j, E(\Lambda_{t-1}))$$

When content belonging to user  $i$  is accessed, the DPoV of the user,  $v^i$ , is updated. This is followed by an update to the distributed ledger. We consider the network of node interactions in the distributed ledger  $\Lambda$  as a weighted, directed graph where users form the vertices  $V(\Lambda)$ . A directed edge  $e_{ji} \in E(\Lambda)$  has an integer-valued weight corresponding to the number of times that user  $j$  has accessed the contents of user  $i$ . When  $j$  first reads  $i$ , i.e.  $e_{ji} = 0$ , the PoV update considers the  $j$  to  $i$  distance as the length of the shortest directed path in  $\Lambda$ . If user  $j$  frequently accesses the content of user  $i$ , then  $e_{ji}$  is heavily weighted and the asymmetric distance  $d(j, i)$  is low. For multiple prior reads,  $e_{ji} > 0$ , the distance is the reciprocal of the edge weight  $1/e_{ji}$ .

At a high level, the implementation seeks to account for the following factors in order of importance:

1. DPoV of the user prior to the read operation,  $V_{t-1}^i$
2. DPoV of the reader at the time of reading,  $V_{t-1}^j$
3. Distance in time from writer's last DPoV update
4. The ledger graph  $\Lambda$ 
  - a.  $j$  to  $i$  distance in the ledger graph

- b. The weight the edge  $e_{ji}$  as the number of  $j$  to  $i$  read operations
- c. The local topology of  $i$  in  $\Lambda$ , discussed further in our [technical memo](#)

### **Node responsibilities**

FABRK blocks will be divided into cycles that execute serially. Each cycle can have any number of threads in parallel. It is the responsibility of the Delegate Node to ensure that there are no two transactions in the same cycle that operate on the same scope (described above). The Delegate Node will, therefore, take all of the transactions and parcel them into cycles without conflicting scopes.

In addition, validation will need to be performed at the transaction level to ensure that the needed signatures/authorizations are included and the Contract code/scripts to be executed are whitelisted/match their hashes.

The Contract code itself is then executed and state transitions recorded to the blockchain.

Finally, Delegate Nodes maintain a representation of the graph state including DPoV scores for all users. They will be required to provide a high throughput API for distributed apps that wish to query a user's current DPoV score. Additional API provisioning responsibilities may be added to their plate as needed.

### **DPoS becomes DPoV**

Given how nascent and potentially concentrated the initial network will be, FABRK will likely launch with a hybrid of DPoS and DPoV, with the network value score muted relative to FAB stake. The long-term intent is to allow token-poor but social-value-rich users to participate in governance, but the network will need time to grow large enough—and the core parameters of DPoV, discussed in a forthcoming technical memo, will need to be tested—before DPoV can stand totally on its own.

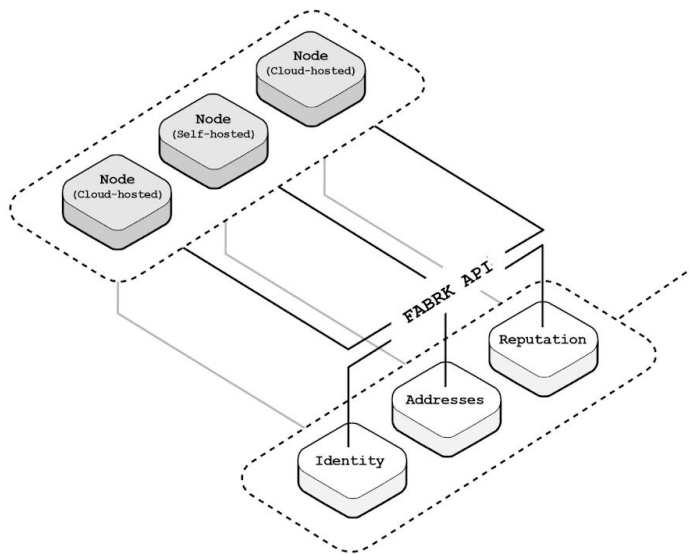
### **DPoV Selection and Rotation**

FABRK will provide both command line (for advanced users) and GUI tools (similar to the Greymass Voting tool for EOS) for token holders to participate in the delegate selection process. Users will be allowed to allocate their votes to a fixed number of delegates and the weight of each vote cast will decay over time. Users may reallocate their votes at any time.

### **DPoV Score is a Global Resource**

A user's current DPoV score will be available as a public resource provided as an API service by Delegate Nodes. Additionally, Delegate Nodes will similarly provide as a service a compact graph representation of nodes' DPoV scores as well as their number of read operations from other users. These two services form building blocks that allow Layer 2 developers to provide sophisticated content and user reputation services to the community.

## A Fast and Minimal Ledger



### FABRK Ledger stores:

- **Data:** URIs whose payload can be validated by fast, unique hashes
- **Reputation:** voting rights based on Distributed Proof of Value
- **Keys** in the form of public cryptographic keys and cross-chain tokens

Transactions are paid with block-rewards split between Delegates, for performing consensus, and ecosystem rewards for user and developer growth.

## Transaction details

A transaction on the blockchain is recorded with the following information:

**expiration:** a transaction is only valid if it's included in a block before expiration.

**refBlockNum, refBlockPrefix:** Is used to control where the transaction can appear. Ensures that the transaction can only be included in forks that build off of the reference block.

**scope:** Controls the range of data that can be read from or written to. Transactions that do something outside their scope will fail. This allows for parallelism. Transactions can be processed in parallel as long as they don't deal with the same scope.

**messages:** Transactions can have one or more messages that must be applied in order and atomically. For example, a message may specify that it is executing contract code and transferring money from user A to user B, with authorization from user A. Messages will also include votes for delegates.

**graph\_merkle\_root:** A hex representation of the Merkle root of the graph representation. This is needed for block producers to achieve consensus as to the current state of the graph-representation data structure.

**data:** A key-value object containing a hexadecimal representation of the data required to execute contract code, URI pointer data, hash required to validate payload at a given URI and public keys to which data values may be encrypted.

**signatures:** An array of all the signatures needed to authorize this transaction, in the case above, user A's signature.

The FABRK protocol supports on-chain smart contract code, hash-validated code linked by URI, as well as off-chain authenticated computation by oracles such as Town Crier<sup>1</sup> in order to obtain two primary advantages: a faster and lighter ledger than “full-service” ledgers such as Ethereum; and a lower barrier to engineering and testing by FABRK developers that currently operate on other chains or on web 2.0.

When a transaction is recorded and URI data is included, the data that is served from that URI, including smart contract and app code, is securely hashed and the hash is included in the data object of that transaction, allowing the contents to be publicly audited. Creators can easily update secure content without weighing down the chain by simply submitting a new transaction with the same URI and an updated hash. Delegate Nodes may provide data-addressing services that watch prior uploads for changes in hash-validation status.

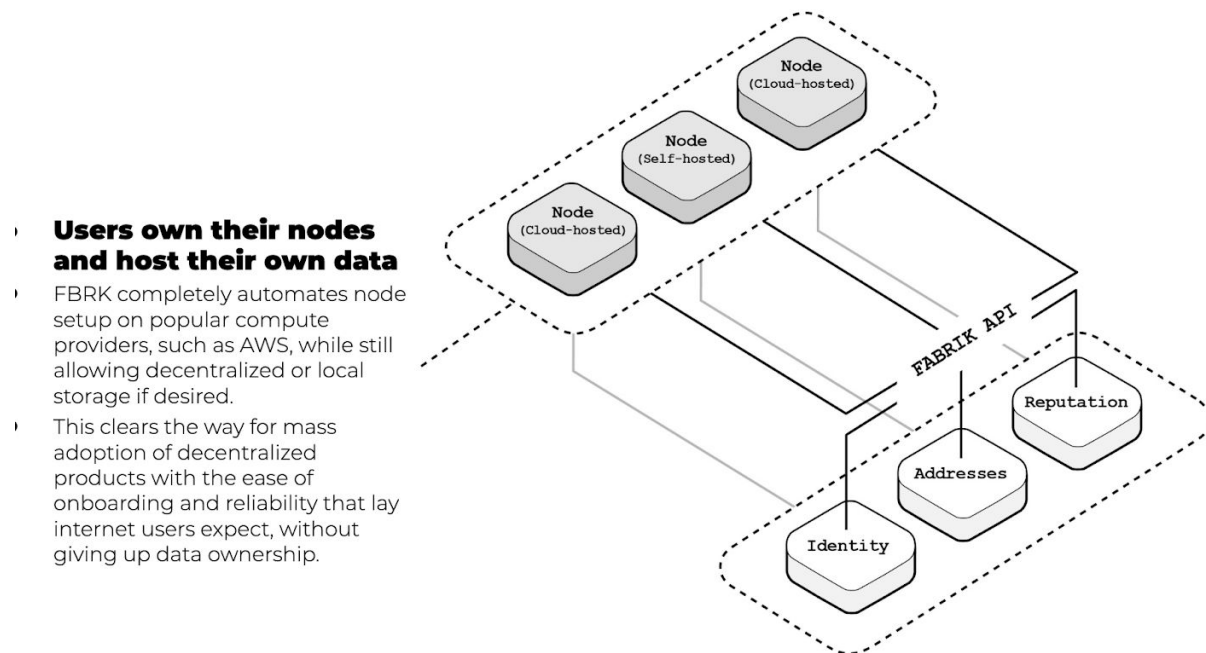
## Tracking Data Requests

It is critical to the design of the system that the FABRK ledger accurately track data requests. This enables transparency into the economics of storage and access: each read operation has a cost (that of storing and serving that data) that must be balanced out. It also allows for transparency into the behavioral health of the network.

- Tracking read requests is actually a quintessential use of a blockchain: an immutable history of who has participated in a transaction with whom and when.
- This is a two-fold challenge with FABRK: (1) how to keep the data safe and encrypted while many people are accessing it and (2) how to ensure the ledger can keep up with network requests.

- FABRK has several approaches it can take and will phase them in as needed:
  - One-time-use URIs/encryption keys: user nodes can opt to issue one-time-usage keys/URIs and store different encrypted copies of the data for each request. This would likely need to be paired with a Layer 2 scaling solution and very tight pruning of used data.
  - A proxy re-encryption app that enables users to store only one encrypted copy but can manage a system of one-time keys for data requesters.
  - App Developers have access to time-bound multi-use keys and are responsible for recording user data requests on the FABRK ledger.

## Ease of Adoption and True Data Ownership

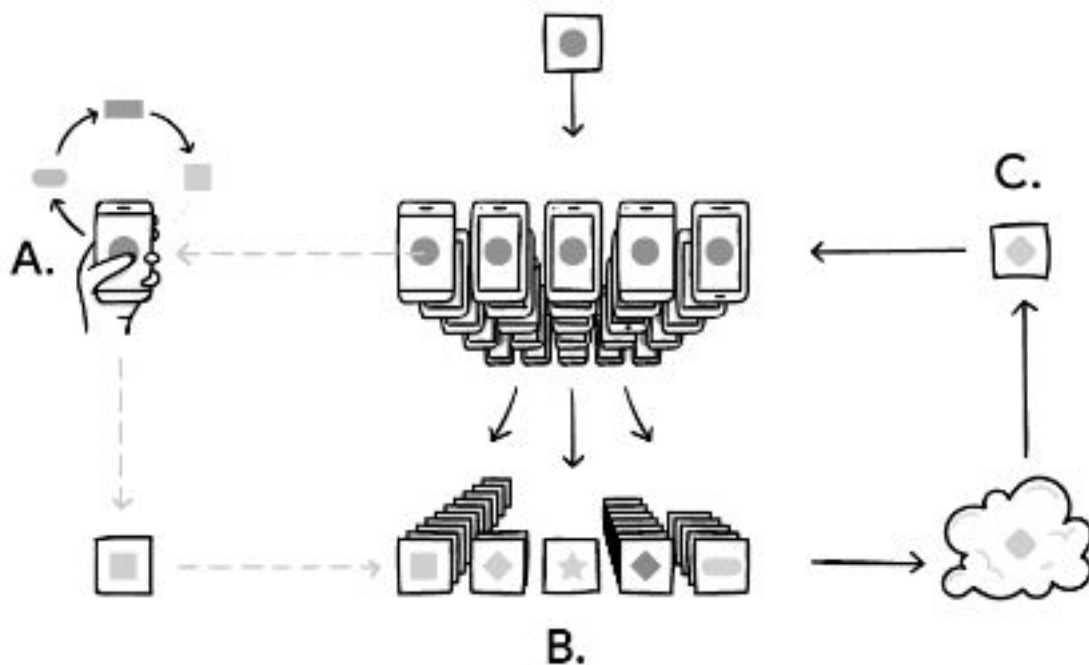


FABRK will aim to smooth setup and onboarding by automating the process of acquiring a cheap, always-on serverless compute instance for lay users that cannot easily maintain a node on their own device. In addition to traditional compute providers like AWS and Digital Ocean, FABRK will work to integrate decentralized storage and compute protocols. Our onboarding will automate the process of getting a node up and running, whether hosted locally or remotely. In the case that a user wishes to host remotely, FABRK will develop partnerships with compute providers, focusing on those that provide secure machine-image marketplaces so that node



setup can be fully automated, along with automated bill payment from users' native wallets. Just as with locally-hosted nodes, a remotely-hosted node is fully-owned and controlled by its user and while third-party key custody may emerge as a service that developers provide to users, FABRK itself will never see or hold user private keys.

## Federated AI Provides Intelligence with Privacy



Users can sell their data without giving it up

The FABRK protocol makes use of federated AI, a fast-growing machine learning discipline that allows developers to send a model to a user's node and train it on local user data without ever seeing the data itself. The user node then sends the newly-trained model back to the developer. The developer then securely synthesizes many users' models into a single, well-trained model. On FABRK developers do not need to incur the high costs of mass

private data storage (storage, security, potential loss of trust) . A similar approach can be used to generate a simple signal for the purposes of targeted advertising or requesting brand-engagement. A user can request ads in order to earn tokens, the advertiser may send a response in the form of an algorithm that processes private user data locally and returns a simple score which can be used by the advertiser to create an offering price for the user's attention. This can effectively decentralize the brokerage role that centralized digital platforms play in targeting advertisements. This enables advertisers to target ads effectively while ensuring viewers capture the value that advertisers are willing to pay.

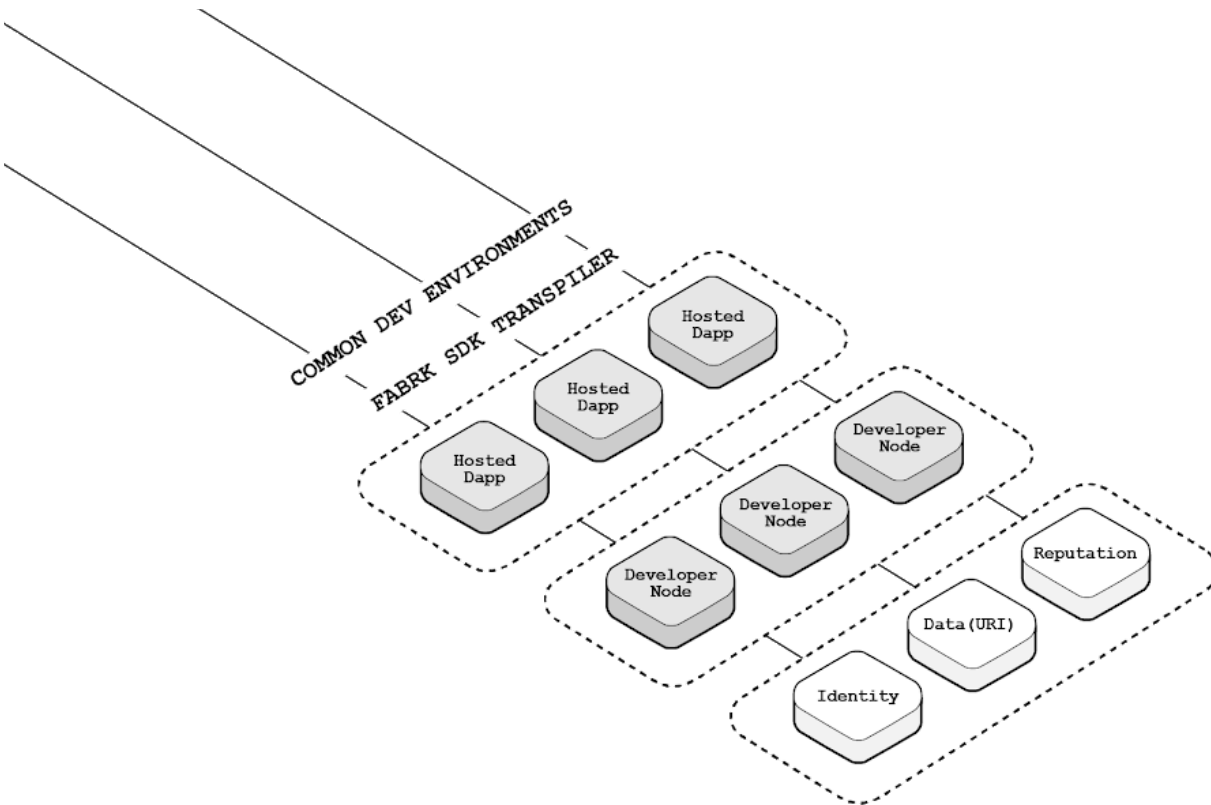
## *Noren*: Anonymous Data Summary and Appraisal Protocol

In order to facilitate a marketplace for high-quality training data, developers must be able to confidently exchange value with users for the opportunity to train on their data. Likewise, users must have confidence that their data remains appropriately private. FABRK's *Noren* protocol establishes an anonymous summary and appraisal process, as well as a secure aggregation protocol for locally-trained models, collectively referred to as *Noren*.

FABRK is augmented by a neural anonymization protocol for distributed ledgers. The *Noren* protocol serves as an interface between node users and ledger services to accelerate secure, anonymized data transactions. Within the *Noren* framework, FABRK users may generate an encrypted, anonymized summary of ledger data as a means to monetize content and engage with advertising opportunities. In this way, a privacy-aware data commons is formed. FABRK developers with data-centric goals are informed by users engaging in broadcastable AI appraisals of their content.

A node's internal and general containers are cryptographically secure without access to external services by default. By opting into *Noren*, containers acquire the capability to 1) generate an anonymized statistical summary of the container state for data transactions, and 2) approximate and repute container utility towards various commercial goals. FABRK encourages third-party developers to produce alternative tools toward achieving these capabilities and alternative data protocols. In the [FABRK Technical Memorandum V1](#) we detail the procedures underlying *Noren* Summary and *Noren* Appraisal.

## Web 2.0 Developers Can Start Building Now



Developers can access any form of user data, provided they possess appropriate permission from the user who owns said data. However, the system will be initialized with certain default parameters that are meant to protect the naïve user from potential bad actors. Additionally, users and other developers will have tools (particularly an immutable transaction history) to do their own due diligence on any given developer. Incentives will be offered to developers to produce social apps, algorithm and interface alternatives, opportunities marketplaces, interoperability portals and wrappers, social games, and data clearinghouses via grants.

The SDK will allow access to data such as images, videos, messages, user activities (data reads, clicks, downstream purchases, and other data), the activities of other developers, and financial flow (where are users making money, losing money, etc.), given the appropriate permission from users.

FABRK's SDK makes a concerted effort to be open to all of the world's 25 million developers, as opposed to the world's mere 80 thousand blockchain devs. For this, FABRK will offer

Software Development Kits (SDKs) written in JavaScript, Python, and Ruby (Q4 2019) that will abstract away a significant portion of the initial learning curve.

The FABRK SDK helps to manage privacy and verification so that developers can focus on helping users discover the content, people and opportunities they are looking for. Our approach gives users and apps a standard protocol for monetizing and voluntarily exchanging data and attention, while giving users and product developers (rather than social platform owners) direct control over user experience.

## **First Marketplace of Social Products by separating data from interfaces**

In current social platforms and products, user data and the interface they use to view that data are vertically-integrated; meaning that they are both owned and designed by a centralized platform. This arrangement tends to be quite beneficial for the centralized platform and quite detrimental for the users. Feeds, search and suggestion algorithms are our windows to our social relationships and to the shared body of human knowledge. When our windows to the world are designed to optimize for interests that aren't ours, we suffer. Presently, a developer wishing to provide an app that sends messages to a user's friends must first sign up the majority of that user's friends in order to have a truly useful product. That is to say, social apps must acquire a majority of the population in order to be viable. It's easy to understand how this barrier to entry would suppress competition and strongly constrain the market for social products. FABRK breaks this centralized, vertical-integration by enabling developers to help users access the public ledger from the users' point of view. This means that if a user has permission from a friend to message them, they can do so via any app on FABRK. Thus, FABRK allows developers to compete to help users leverage their own connections and data, as well as their own content and the content produced by the wider community.

*When a developer makes a product on FABRK, all FABRK users are “their” users and all products can face competition to deliver the greatest user value based on all of the data that user owns, and all of the network that the user has permission to see.*

When Steve Jobs created a common hardware platform via the iPhone and associated competitive marketplace (iOS App Store), he ushered in a renaissance of innovation and ubiquitous data consumption, generating billions of dollars in value for investors and participants. Similarly, by creating a common social graph and creating competitive opportunities for applications that have immediate access to the entire ledger (subject to users' own privacy settings), FABRK creates long overdue marketplaces for products that are essential to the future of human networks and woefully uncompetitive today. FABRK

ensures that these marketplaces are attractive to new products by creating an exceptionally low barrier to entry for developers, both from other blockchain ecosystems and from traditional web applications. Since product developers don't need to each acquire a billion-person user base to build truly social products on FABRK, we can expect competition and innovation to be intense. Of course, this means that FABRK must target a critical mass of users interested in this expanded vision for social media - a major focus for our team, covered in the User Acquisition section of this paper.

# **03 TOKEN UTILITY**

## Token Utility

FAB is the native network token in the FABRK ecosystem and will be required for essential functions. We intend for FAB to be used for many purposes, which may include the following:

- FAB will serve as a means of payment for access to user data or content, enabling the sharing of content or social data value. Each transaction serves as an immutable record that a piece of data was accessed by an individual at a certain point in time.
- FAB is designed to be used as a means of exchange to offset processing and serving costs related to content consumption.
- FAB will provide a staking mechanism to influence the election of Delegate Nodes (block producers) through the Delegated Proof of Value consensus mechanism. Compensation for block production will be provided.
- FAB may be wrapped in a smart contract that allows developers to create their own FAB-based tokens. This gives product developers many of the benefits of having their own currency, while still enjoying all of the advantages of FABRK's network and SDKs.

## Block Production, Incentives & Inflation

FABRK is a people protocol for the general population as well as crypto-savvy users and developers. Participants in the FABRK ecosystem will benefit from network size; as outlined in Metcalfe's Law where the value of a network is proportional to the square of the number of users of the system ( $n^2$ ). The long-term sustainability of the network size not only depends on user acquisition, but will also depend on the level of existing user participation and network utility developed through novel product features in data privacy and control, as well as newly developed features such as discovery rewards, payments, and others.

In the short-term, FABRK will implement an ongoing development fund allocated to delegates, influencers, content creators, developers, and affiliate/affinity marketers across the network.

Ongoing, long-term user acquisition efforts and delegate compensation are also necessary to ensure the sustained growth of the ecosystem well beyond the early adoption phase.

For these long-term ecosystem considerations, FAB will institute an annual inflation, which is anticipated to be 1% or less.

Inflation is expected to have a minimal impact on overall token economics, as the initial set-point will be at a lower standard than seen in projects like EOS.

The inflation-driven fund can be tied to incentive-driven activities like user acquisition, for example, automatically through smart contracts. In this case users, independent marketers, influencers, and developers would share the reward simply by continuing to do what they do best.

The fund could be used to provide additional incentives for Delegate Nodes, a network-wide subsidy on hosting costs, developer grants, or similar infrastructure-level initiatives, should any of these areas require a boost in order to foster uninterrupted ecosystem growth.

## **Block Production**

FABRK block producers receive rewards in the form of newly-minted tokens and are elected by users according to users' voting weight.

We propose a Delegated Proof of Value (DPOV) approach, where the weight of a stakeholder's vote is proportional to the value they generate on the FABRK social networking platform.

The Delegated Proof of Value algorithm is similar to the Delegated Proof of Stake (DPOS) approach taken by EOS or Delegated Proof of Contribution on Icon.

DPOV has a number of implicit advantages for a platform like FABRK, including scalability and greater decentralization in practice than certain other models.

FAB minting for block-producer compensation will happen through annual FAB inflation described above.

## **Ecosystem Growth**

In the short-term FABRK will implement an ongoing development fund that is allocated to influencers, content creators, developers, and affiliate/affinity marketers across the network. These participants will be rewarded based on their ability to reach key user acquisition, interface and protocol extension, interoperability, and other community-driven goals.

While funds will be allocated by the FABRK Foundation based on budgets for ecosystem development and developer incentives, a portion of the overall incentive value will also be driven into the longer term by the set annual inflation.



Long-term user acquisition activities will be funded through ecosystem growth budgets and protocol-level FAB awards. User acquisition activities include developer grants, influencer partnerships, contests, evangelist incentives, and other programs.

The protocol will distribute recurring FAB awards for this purpose, from the overall inflation calculation described above. FABRK will determine the distribution of inflation between block producers and other ecosystem activities during the test net period as the ecosystem health requires.

## **Content: Storing, Serving, and Optional Charges**

FABRK's Protocol handles automatic microtransactions to ensure that users are paid for the cost of storing data and serving it to others. Delegate Nodes determine baseline costs based on public information. This ensures that users who create viral content (or content of any arbitrary popularity) do not have to pay a cost for serving that content. On one hand, we expect the individual cost for loading each piece of content to be so low that this aspect will not modify normal browsing behavior. On the other hand, introducing a tiny cost here does help socialize the overall habit of micro-spending for content, which ultimately promotes higher value network participation, including paid App, pay-per-click, and subscription engagement.

Content creators and developers have the option to levy their own fees. As discussed above, content creators will already be receiving the costs of hosting and serving the content from the viewers. In addition, content creators can charge a modest pay-per-click fee for all or a part of their posts, or institute subscription or pay-per-click fee on VIP content, all possible through user-friendly smart contracts.

**THANK YOU**

# ADDENDA

## Other Considerations

### Scalability for Social

Many large distributed app ecosystems are focused on scale and on providing value to industry/enterprise applications. By focusing on the problem of large (>100M user) decentralized social networks we are carving out a very small subset of the issues faced by some of the distributed app ecosystems getting attention today.

### General Feature-set

We are marrying microtransactions, social app marketplace (and open developer access), a user-centric privacy interface, and a flexible approach to social feed algorithms and user interface - a combination that is completely novel. A number of other features and UI/UX elements also remain under consideration for inclusion in our roadmap.

### User Acquisition

We are an ecosystem and a people protocol. Our goal is not just to build the platform, but to engage in continuous user acquisition up through the magic 10M user number and beyond. We also have a time-tested influencer engagement model related to user acquisition and ecosystem growth. Nearly half of our anticipated user growth will be through this program of celebrity and influencer engagement, incentivizing content creators to join FABRK and to bring their audiences along.

### The “Web 3.0” People Protocol

As the people protocol for the blockchain revolution, we are inviting other developers to "ride" our social graph and access users who wish to be reached. Just like Amazon AWS provides infrastructure as a service to other e-commerce sites and is active in e-commerce itself, we are the people protocol on which other future social networks are going to be built; this is the opposite tact taken by incumbent social networks today. Practically, this means

that whether users are seeking to find new social network offerings or simply wish to change the FABRK interface or feed algorithm, lock down privacy, or explore new opportunities, they will be able to turn to the FABRK ecosystem. Users will access a large marketplace of social apps and opportunities, filtering developers and information by issue, social proximity, geographic proximity, reputation, and other factors.

## **Team**

FABRK team members have created networking, financial, and consumer products generating value in the billions for global brands.

Our team has founded both social networks and direct messaging platforms with hundreds of thousands of Monthly Active Users.

Our founding team holds several patents in social networking and social content processing.

Team members have founded, grown, and sold bleeding edge tech business to major brands.

## **NADEEM MAZEN, CHIEF EXECUTIVE OFFICER**



Award Winning Serial Entrepreneur With Over A Decade Of Experience



Nadeem Mazen is an award-winning serial entrepreneur with over a decade of experience in viral marketing and interactive software. His work has been featured domestically and globally by BBC, NPR, Boston Globe, New York Times, Washington Post, Gizmodo, CNN, CBS, NBC, and many other news and television outlets.

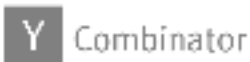
Mazen holds his B.Sc. from MIT, where his thesis developed novel interactive software for user education and where he focused on large scale user engagement; he later became a research assistant at MIT Media Lab, developing large-scale interfaces and viral media. In 2013, Mazen was elected to Cambridge City Council for two terms, winning full-time elected office in the home of MIT and Harvard. In this role, Mazen oversaw \$3B in public funds, stepping down in 2018 to assemble the FABRK team.

A Y Combinator-backed entrepreneur, Mazen founded danger!awesome, a 3d printing rapid fabrication startup funded by TechStars in 2016, that was later acquired in 2017. Mazen's longest running venture, Nimblebot, is an award-winning software development, video production, and viral dissemination agency, serving clients like Samsung, Revlon, IBM, McGraw-Hill, Mozilla, Fight for The Future, Reddit, Consumer Technology Association, and other global brands. Mazen's viral marketing reach has surpassed over 100,000,000 engagements. He has won top AdFest honors for his directorial and viral dissemination work as well as prestigious awards in the fields of interactive video, product design, and education.

## **JAMES MOFFET III, CHIEF TECHNOLOGY OFFICER**



Data privacy expert and Y Combinator-backed entrepreneur



James David Moffet III is an accomplished engineer, designer, and data privacy expert. Moffet has been engaged as a global expert in privacy and user-centric design, lecturing worldwide on the future of online communities. Moffet is a prestigious Fulbright Fellow and a Y Combinator-backed entrepreneur. His master's degree studies were conducted at the Harvard Graduate School of Design, the Harvard Graduate School of Engineering, The where his research was at the intersection of machine learning, data privacy, and user experience design. He has built and launched viral, interactive websites, decentralized systems, and social collaboration software for the likes of the MIT Viral Communications Lab and MIT Community Innovators Lab. James architected and built a member and financial platform at SEIU, serving an organization with 1.9M members. Most recently, his Y-Combinator backed direct-messaging platform reached 180,000 Monthly Average Users (MAUs) in under 6 months.

## **ACE MOGHIMI, CHIEF OPERATIONS OFFICER**



Globally-recognized leader in innovation and entrepreneurship



Ace Moghimi is a globally recognized leader in innovation and entrepreneurship. He holds an MBA from the F.W. Olin School of Business at Babson College, the #1 ranked entrepreneurship MBA program in the world, with a focus on corporate innovation and finance, and an Executive Certificate from MIT in strategy and innovation. He is the former Global Head of Innovation and Strategy at Manulife/John Hancock, where Moghimi founded the Labs of Forward Thinking (LOFTs) in 2014. Moghimi scaled this business unit to 100 employees globally and developed business cases leading to over \$1B in value. Moghimi's internal programs have touched more than 15K employees, fostering his life-long interest in organizational design, culture, and people analytics.

During his tenure at Manulife/John Hancock, he developed the strategy for the firm's strategic venture fund and led the CIO's organizational transformation strategy for 7,000 employees globally. For his visionary work, Moghimi was awarded the Corporate Star of Excellence as well as Best Innovation Program Prize at Market Gravity in 2015. Moghimi is a Venture Partner at Nextgen VC and a cryptocurrency angel investor.

## **YASIN OZCAN, PH.D, CHIEF STRATEGY OFFICER**



Research Fellow at MIT Sloan and global innovation ecosystems expert



Yasin Ozcan is a Ph.D. strategist with several years of research and industry experience, advising C-Suite technology executives at companies such as Leap Wireless (now AT&T), MC Ventures, Columbia Capital, and Counciltree Telecom, among others, in deals worth over \$2B. He is a former Research Fellow at MIT Sloan School of Management, and holds his B.Sc. in Economics and Mathematics from MIT and Ph.D. in Strategy from Northwestern's Kellogg School of Management. His research focus is technology strategy and entrepreneurship, with a concentration on decentralized innovation and competitive strategy. Ozcan has authored several distinguished papers on startup innovation ecosystems and growth, startup acquisition trends, and startup exit and acquisition strategy.

Dr. Ozcan's work in academia and business has been recognized with awards from the Alfred P. Sloan Foundation, National Bureau of Economic Research, General Motor Research Center for Strategy in Management, and the National Institute of Health. Ozcan has headlined several conferences on technology strategy, innovation, and entrepreneurship, including American Association for the Advancement of Science, Searle Center, Duke Strategy, and Foundations of Business Strategy.



## **ILIR CAPUNI, Ph.D., TECHNOLOGY**



Head of the Advanced Computation Research Center at UNY in Tirana



Ilir Capuni is the head of the Advanced Computation Research Center at the University of New York in Tirana. He holds a Ph.D. in computer science from Boston University. His research and entrepreneurship work is focused on reliable computational systems in adversarial environments and self-organizing computation on unsynchronized dynamic peer-to-peer networks. In 2011, he led the programmers behind Trufflehead (now MobileSkillet), which was acquired in 2014. Capuni also launched DamBox - a digital asset management system for multi-platform live streaming with novel in-stream DRM, acquired in 2017 by Sony Europe.

Capuni's Excellence Labs devised a complete ERP for broadcasting companies, a self-organizing cluster of video-streaming engines that are compatible with any CDN. Through his work at Excellence Labs, Capuni also developed a novel way to embed inaudible real-time cryptographic watermarks into video streams. Capuni has received numerous education excellence awards, including the Teaching Excellence Award (BU) and the Research and Service Excellence Award (Tirana). Capuni and his steering committee colleagues deploy €35M in innovation funding per annum.

## **GAUTUM SAMPATHKUMAR, VP, ENGINEERING**



### **Silicon Valley Veteran with 15+ Years Experience in Engineering**

Gautam Sampathkumar is a Silicon Valley Veteran with 15+ years of experience building some of the most scalable systems used today for companies like Bloomberg, Paypal, and Cisco. Sampathkumar holds an MS in Information Systems Management from Carnegie Mellon University where his focus was on Grid Computing and Distributed systems. He is a serial entrepreneur who has built technology products and high-quality teams from scratch in various Engineering Leadership positions.

Sampathkumar is a true believer in the promise of cryptocurrency and blockchain technologies broadly, having been involved as a developer since 2013. Sampathkumar has extensive experience recruiting top-tier talent into promising startups and “walks the walk,” as a full stack blockchain developer. He is skilled in every layer of cryptocurrency and blockchain development, having overseen GPU/ASIC mining operations in various geographies, run Masternodes and other services to enable the growth of various high profile chains, and run algorithmic trading systems for liquidity and efficiency in various markets. He advises various high profile crypto startups and developed a stable coin and decentralized exchange for the Indian market.

**\_FABRK**