Growr: an open, fair and sustainable micro-lending protocol on top of Bitcoin

Abstract. The challenge to provide cost-efficient access to financial services to the unbanked population globally is well-researched. As of 2021, there are still 1.4 billion people worldwide that do not have an account. Most of these unbanked are self-employed, micro-entrepreneurs, and smallholder farmers with financing needs and without much collateral who easily fall prey to moneylenders. Traditionally, microfinance institutions have been serving the poor and unbanked population, especially in developing countries, through unsecured productive microcredit and micro-savings products. However, their over-commercialization has led to opaque practices and questionable success in addressing these challenges. With the invention of Bitcoin, the world has witnessed the emergence of an open monetary network that has enabled an increasing number of financial use cases in a fully digital manner. Bitcoin and its second-layer Lightning network have emerged as a financial inclusion solution for unbanked communities. However, the Bitcoin ecosystem today does not offer unsecured microcredit due to the anonymous nature of its users who cannot assert their creditworthiness and do not possess digital assets to use as collateral. We propose a protocol that addresses these challenges: it helps micro-entrepreneurs build their self-sovereign credit record and connects them over Bitcoin and its layers to a global financial infrastructure, where they can access productive capital at a fair price, bringing real-world yield to the capital providers.

Protocol overview

Problem

Today, a quarter of the world's adult population does not have an account [1]. In some countries in the developing world, financial exclusion is as high as 90%. Most of the unbanked population does not have a typical "job"—they are smallholder farmers, micro-entrepreneurs or self-employed [2]. They are all facing a staggering financing gap of over US$5 trillion per year [3]. In addition, only a third of adults worldwide are financially literate, and as a result can easily fall prey to moneylenders and loan sharks [1].

Traditional financial services actors are not economically incentivized to solve those problems. The distribution costs of banks to deliver their services to remote areas and informal populations have led to low adoption of their services in the developing world. Moreover, one of the main reasons for the high global financing gap is credit rationing due to information asymmetry [4]. Microfinance has emerged as a solution to the financial inclusion problem, providing the necessary financing to poor entrepreneurs in the form of microcredit. Originally operating mostly in the form of NGOs, the sector has progressively commercialized and its image as an agent of poverty alleviation has been tarnished through research [5] and public scandals due to the lack of transparency and other bad practices [6].

Bitcoin, its second-layer Lightning network and other projects are focused on democratizing access to savings, payments and remittances through the use of open-source protocols and software. They have emerged as a viable financial inclusion solution for unbanked communities [7]. At the same time, the typical decentralized finance protocols—including the ones that are part of the Bitcoin ecosystem such as Tropykus [8] or Sovryn Zero [9]—require over-collateralization, which is out of the reach of the unbanked. Due to the pseudonymous nature of the users of Bitcoin, there is currently no widely available solution to provide unsecured credit on the network or its upper layers.

Solution

Previous research exists on the promise of using distributed ledger technology as a solution to the information asymmetry and credit rationing problem [10]. Lenders have abstained from offering higher prices to riskier borrowers in order to avoid adverse selection. Instead, they can facilitate self-selection by low-risk micro-enterprises who are ready to signal their credit history transparently, while high-risk ones will not be able to do so and will remain served by traditional microfinance. A similar approach exists in online peer-to-peer lending where screening through soft information such as the number of friend endorsements and the loan purpose, has been shown to be relatively more important when evaluating lower-quality borrowers [11].

Bitcoin and decentralized finance offer a number of benefits such as high efficiency through programmability, open permissionless access and transparency, despite many current shortcomings [12]. Therefore, the availability of cryptographically secure and transparent information signaling from borrowers can be an excellent source of risk assessment by decentralized lending protocols.

By using this approach, the *Growr protocol* aims to be a bridge between two worlds—the decentralized capital infrastructure that is emerging on top of Bitcoin, and the local communities that have been excluded from the traditional system—while addressing each one's challenges. The protocol enables micro-entrepreneurs to receive instant productive loans based on their self-sovereign credit record without the need for over-collateralization. In contrast to traditional microfinance, the protocol creates an open and global lending marketplace that connects borrowers to both traditional and decentralized capital providers, enforcing fair competition for pricing and a fully transparent deployment of capital down to each micro-loan.

The protocol aims to contribute to addressing the global financial inclusion problem by providing open access to basic financial services:

- Borrowers, represented by self-employed, micro-businesses, smallholder farmers and the communities of which they are members, are provided with access to fair productive micro-loans to grow their businesses. In addition, they receive help and promotion of financial health and good business practices.
- Suppliers and buyers that support the development of sustainable local economies have a revenue growth, as well as easier and streamlined agreements with a cooperative instead of with each member individually.
- Originators and capital providers in the marketplace benefit from real-world yield generation opportunities on a global scale, and in addition they get a complete transparency of the impact of each unit of capital they invest.

The key elements of the protocol are:

- *Self-sovereign credit record (SSCR):* a global digital self-sovereign identity, owned and managed by the user. The SSCR stores protocol-specific verifiable credentials based on the user's financial health metrics, on-chain activity, and trusted off-chain data, and enables credit risk assessment and reduction of information asymmetry.
- *Decentralized micro-lending marketplace*: an open and global lending marketplace that connects borrowers with global capital providers through originators who publish their targeted offers with predefined conditions and eligibility criteria. It is built using a peer-to-peer architecture to ensure transparency while preserving privacy.
- *Financial health incentivization:* the protocol promotes the usage of tools and education that help borrowers develop financial health habits and rewards the roles that issue and consider such credentials.

More details about the protocol mechanics are provided in the following sections.

Key concepts

Decentralized identity

Decentralized identifiers and verifiable credentials

The protocol implements the W3C's standards (recommendations) for *Decentralized Identifiers* (DIDs) [14] and the *Verifiable Credentials Data Model* (VCs) [15].

The DID is a new type of identifier that enables verifiable, decentralized digital identity. DIDs are URIs that associate a DID subject (e.g., a person, organization, thing, data model, abstract entity, etc.) with a DID document allowing trustable interactions associated with that subject. DIDs have been designed so that they may be decoupled from centralized registries, identity providers, and certificate authorities. Specifically, while other parties might be used to help enable the discovery of information related to a DID, the design enables only the controller of a DID to prove control over it without requiring permission from any other party.

The VCs are global uniformed provable claims associated with the subject of the DID. They are cryptographically secure, privacy-respecting, tamper-evident and machine verifiable. They can be used to build universally verifiable presentations, which can also be cryptographically verified.

Verifiable credentials are provided by *credential issuers*—i.e., centralized or decentralized third parties—asserting certain facts about the DID owner. Verifiable credentials are consumed by *verifiers* using the concepts and data models for *presentation exchange*. Verifiers ensure that the credential presentation is signed with the subject's DID, it is signed by a trusted Issuer, it is not expired and it is not revoked.

Self-sovereign credit record

The Growr protocol relies on a new type of decentralized identity built using DIDs and VCs that we call the *self-sovereign credit record (SSCR)*. The SSCR is intended to represent a borrower's unique global identity and financial record, storing various general-purpose and protocol-specific verifiable credentials based on borrower's on-chain activity, trusted off-chain data, peer vouching, financial health metrics, and others.

The SSCR contains both hard information (facts such as credit score and history, debt-to-income ratio, bank account verification, and business financial indicators) and soft information (such as endorsement, community membership, and self-declared business plans) that are used in the credit risk assessment.

Verifiable credentials in a SSCR can be (but are not limited to):

- *KYC credential* (hard information). This credential proves, possibly in a zero-knowledge manner, a successfully passed KYC process (including AML/CFT risk check) and can be issued by any user platform integrated with the protocol or by a traditional third-party identity verification service. While not necessarily contributing

to the risk assessment, the presence of such credentials may be a prerequisite for certain regulated lenders to provide funding.

- *Financial data credential* (hard information). This credential contains various financial data of a borrower, such as products and transaction history, and can be issued by any account servicing financial institution, by a trusted financial data provider or based on on-chain bitcoin or side-chain activity.
- *Business activity credential* (hard information). Data about the business activity such as income statement, cash flow, and/or balance sheet.
- *Savings history credential* (hard information). This credential proves that the user is making regular micro-payments to his/her saving account. It could be issued by any trusted financial institution or savings account provider.
- *Credit history credential* (hard information). History of the borrower's past loans from the protocol or any external trusted sources.
- *Credit score credential* (hard information). This is a credential that summarizes other atomic credentials, and represents the overall credit score of the borrower.
- *Community membership credential* (soft information). This credential is issued by a local organization (cooperative, union, chamber) or an employer, asserting the membership of the borrower in the organization.
- *Social vouching credential* (soft information). This credential is received through endorsement from other protocol users, who have a certain reputation level and/or are trusted by the protocol.
- *Financial health credential* (soft information). This is a special credential issued by the protocol itself for successfully passing "financial health treatment" through education and/or mentoring, as well as earned through regular on-time repayments of past loans received through the protocol.

Lending and borrowing

A brief history of debt

The concept of lending and borrowing is probably as old as the Sumer civilization around 3500 BC [5]. However, this often brought social tension—a significant part of the farmers would become over-indebted and be forced to sell their kids into debt slavery. Due to this fact, jubilees (cancellations of all debts) were often initiated by the rulers.

After the advent of coinage, banking and lending money against interest had emerged as a business activity. This however often led to usury, or lending money at unreasonably high rates of interest out of the formal institutions, which was naturally considered sinful by most religions and outlawed by many states throughout history. Still, this practice continues today around the world, especially in communities with high informality and without access to financial services [16].

In the Middle Ages, the notion of *interesse* (from which "interest" originally comes) began to be accepted as a non-usurious compensation for the profit a merchant would have made, had they placed it in some profitable investment.

Modern banking and financial inclusion

In modern banking, a loan is given to a borrower against interest and fees, which highly depend on the local context. Today, most countries have regulations on maximum interest rates. In Islamic banking where interest (riba) is forbidden, productive financing is provided through risk-sharing instruments.

However, even with regulated interest rates, the price of banking services is high, especially for almost a billion people around the world who live under the international poverty line of around $2/day. This is mostly due to the cost of distribution, as banks traditionally rely on physical infrastructure, as well as due to information asymmetry, which limits the appetite of banks to lend to informal micro-enterprises and leads to credit rationing.

To assess borrower risk, banks use the services of credit bureaus—private companies or government agencies that collect data about borrowers from various sources. But people without prior credit history may find themselves trapped in a loophole as banks may not be willing to serve them at all. In the end, being poor becomes very expensive because the financially excluded easily fall prey to loan sharks with usurious conditions.

Informal financial groups

Informal or semi-formal community financial groups (such as rotating savings and credit associations, village savings and loan associations, savings and credit cooperative societies and many other varieties) have existed for hundreds and even possibly thousands of years. They remain the primary way to save and borrow for the population in the Global South that does not have access to formal financial institutions. However, these groups remain disconnected from the global financial system and suffer from bad practices and physical cash security.

Microfinance

Microfinance has emerged as an alternative to banking, as a large-scale, businesslike provision of financial services to the poor. Microfinance institutions (MFIs) usually lend money to large groups of people in dense regions, in a minimally subsidized way. To monitor and manage multiple borrowers, MFIs rely on a combination of reputation, knowledge of the client, collateral, cosigners, and enforceable contracts.

Although it has its roots in the Middle Ages, microfinance was reinvented in a scalable model in the late 1970s. Witnessing extreme poverty and a deadly famine in his country Bangladesh, Professor Muhammad Yunus came up with the noble vision to provide microcredit—and later more financial services—to poor communities, in a fair and sustainable manner, and help them out of poverty [17].

However, over the last decades, there has been a significant deviation from this original purpose, with many MFIs changing their focus from social impact to profit and replicating the narrative but not the good practices. In some well publicized cases, MFIs have contributed to increasing poverty rather than decreasing it.

Decentralized lending protocols

Since 2020, an increasing number of decentralized borrowing and lending protocols have been emerging fast in the decentralized finance (DeFi) space. They aim to fundamentally reinvent the financial infrastructure, enabling people to transact with each other globally, securely and in a permissionless manner.

While most of activity in the space is outside of the Bitcoin ecosystem, projects such as Tropykus and Sovryn built on Bitcoin's side-chain Rootstock (RSK) are promising to bring decentralized lending to Bitcoin.

Decentralized finance protocols still target mostly advanced users and let them lend or borrow digital assets without going to a centralized intermediary. Users deposit digital assets into liquidity pools, which become funds that the protocol can lend out to other users. Decentralized finance protocols aim to automate lending and would not be willing to assess individual borrowers. That is why they require collateral. This means that on-chain assets of the borrower are used to secure a loan. The borrower provides the asset to secure the loan, and if the borrower defaults on the loan, the lender can take possession of the asset and sell it to cover the loss. Moreover, they often require over-collateralization, i.e. the value of locked assets as collateral must significantly exceed the loan amount. Currently, decentralized finance usage is higher in developed markets and by institutional investors [18].

Open and transparent credit data

The Growr protocol approaches lending differently. The protocol aims at providing instant unsecured loans based on risk assessment and verifiable credentials, instead of requiring on-chain collateral. It provides an open credit record model, which also preserves the privacy of the borrowers through a self-sovereign identity, instead of relying on risk data locked within proprietary databases.

A large percentage of the global population remains with limited access to credit due to immigration, lack of credit history or due to negative reporting to credit bureaus in case of late bills—even when the invoice was never received by the debtor [19]. In contrast to the traditional credit bureaus, the protocol puts the users in control of their data by storing their credit record in "their own pocket" without dependence on any central authority or intermediary. This way, the protocol aims at enabling borrowers to build a credit record based on alternative and relevant data sources, such as trusted organizations, financial health metrics, and peer vouching.

Borrowers collect credentials into their self-sovereign credit record, originators use these credentials to better assess creditworthiness, and trusted parties are incentivized by the protocol to provide the credentials.

Financial health

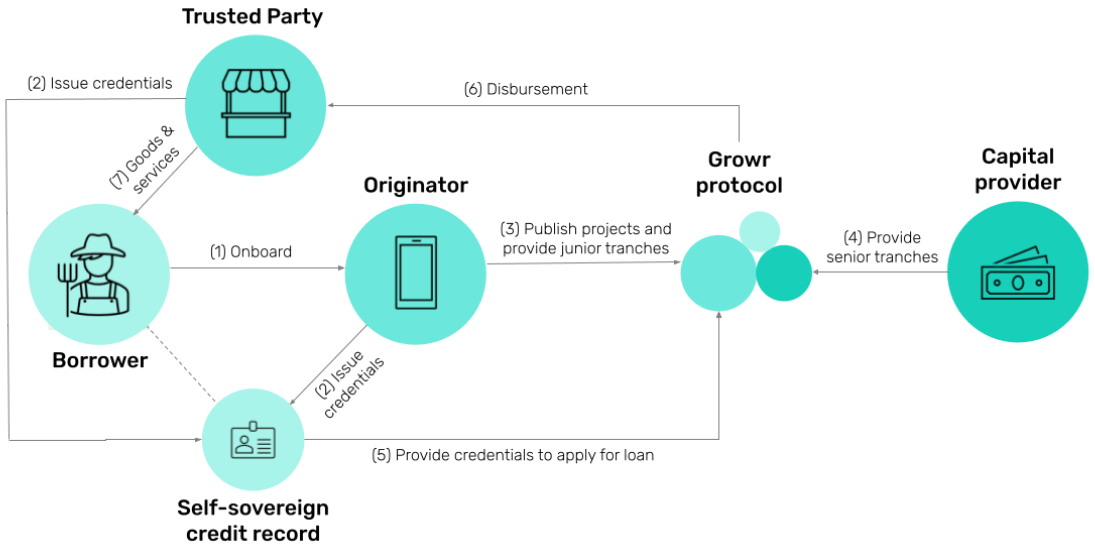
Dealing with money, especially borrowed from others, requires knowledge and high responsibility. Unfortunately, only 33% of people are financially literate [20] and more than half of the global population is living without any savings [1].

That is why the Growr protocol aims to incentivize providers who help borrowers to improve their financial health through education and tools promoting good behavior. Borrowers' financial health credentials can be used in the risk assessment to improve loan conditions and providers get rewarded based on the actual benefit provided to the borrowers.

Protocol mechanics

How it works

The following diagram provides a high-level overview of the Growr protocol.



Below is a summary of the protocol mechanics depicted on the diagram:

1. The *borrower* is onboarded on a platform, provided by an *originator* (such as a cooperative, guild, wholesale buyer, digital wallet, or another provider), where the borrower defines their funding needs.
2. One or more *trusted parties* provide credentials to the *borrower* to start building their self-sovereign credit record.
3. The *originator* creates a loan offer in the form of a project with details about the local activities and the financing needs of the borrowers, with the aim to receive a credit line from the *decentralized marketplace*.
4. A *capital provider* reviews the projects with their predefined eligibility criteria, assesses the risk and approves the credit line if it fulfills the risk policy. *The capital provider* deploys additional funding to the project as a senior tranche via the *decentralized marketplace*, fully delegating the actual lending activity to the *originator* and the protocol.
5. *Borrowers* go through a simple application process to receive a loan from the *decentralized marketplace* after asserting their eligibility with their verifiable credentials.
6. The disbursed amount is received by the *borrowers* in the borrowing application or directly paid to a *trusted party*, such as a merchant or a supplier, who provides the necessary goods and services to the borrower to achieve their goals.

The Growr protocol aims at standardization of the protocol mechanics. However, depending on the protocol participants and the tools and services they use, implementation details might vary. In general, we can distinguish the following use case specifics.

- *Origination*: access to the protocol is provided in a custodial model by an independent originator, or in a non-custodial model directly using a decentralized borrowing application.
- *Risk assessment*: performed by the originator with internal risk assessment function, or by an independent trusted risk assessor.
- *Loan payments*: they are processed on-chain as part of the protocol mechanics or off-chain.

Protocol participants

Borrowers

Borrowers, represented by self-employed, micro-businesses, smallholder farmers, apply for productive loans from the marketplace, most often with the help of a local originator, and then repay the loan plus its price.

Originators

Originators facilitate the access to the protocol by grouping a number of borrowers with similar needs. They publish offers to the loan marketplace by creating *projects* on behalf of the borrowers. The originators provide junior (first-loss) capital to finance the whole project or part of it. They can be:

- *Local cooperatives, guilds or other community organizations* that are formed by borrowers to gain better access to loans and to standardize their relationship with the rest of the participants in the ecosystem.
- *Federated Chaumian mints* [21], enabling access to micro-financing to their users.
- *Telcos, retailers and gig-economy platforms* that onboard and vet the users into their services and then facilitate their access to the protocol as an embedded financial service.
- *Digital wallets and fintech providers* that already offer financial services and that can expand to unsecured decentralized lending.

Trusted parties

Thrusted parties assert facts about the borrowers in the form of verifiable credentials. They can be:

- The *originator*, issuing credentials for its members or users.
- *Merchants, buyers, unions, chambers or other local organizations* that serve the community or have knowledge of their members.
- *Independent third-party data providers* that can issue credentials related to the activity of the borrower and relevant to the risk assessment process, such as KYC/AML, account data, and on-chain activity.
- *Financial health providers* that publish educational materials and tools to help borrowers develop good financial habits and issue credentials that assert knowledge, skills, and accomplishments.

Capital Providers

Capital Providers can be decentralized finance protocols or large institutional or individual investors who allocate senior capital to the loan marketplace and delegate the actual lending activity to the originators in the form of senior tranches for the financed projects.

Decentralized marketplace

The *global decentralized micro-lending marketplace* is provided by Growr through a set of open-source services. They enable originators to publish loan offers with predefined conditions and eligibility criteria, and borrowers to apply and get financing using credentials from their self-sovereign credit record.

Participant incentives

Role	Tangible incentives	Intangible incentives
Borrower	Access to productive capital at a fair price. Optional “cash back”-like rewards paid by the originator for positive behavior (e.g., on-time repayment).	Build their self-sovereign credit record with the ability to use it for future financing needs.
Trusted party	One-time fee paid by the borrower upon VC issuing (optional). Financial health rewards paid by the originator after on-time loan repayment (optional).	Success and growth of the community.
Originator	Origination fee upon each loan disbursement. Interest margin (yield) from the borrowers.	Success and growth of the community. Revenue growth for service providers. Access to more customers in the marketplace.
Capital provider	Real-world yield on the invested capital.	End-to-end transparency for the investments without intermediary counterparty risk.
Marketplace	Protocol fee collected for the open-source project development.	

How does Bitcoin enable this in a fundamentally better way?

First, Bitcoin provides a sound monetary foundation. It is the perfect store of value for long-term capital accumulation, which cannot be inflated or seized by governments or adversaries. It’s fully open and censorship-resistant in nature, which allows anyone to participate directly without the need to rely on intermediaries, creating a platform for building financial services outside of the traditional system.

Second, the Lightning network enables low-cost instant and global transfer of value—in bitcoin or fiat-pegged digital assets. This way, capital from anywhere in the world can reach even the most distant community directly, avoiding unnecessary costs.

Third, solutions such as federated Chaumian mints enable the creation of local circular economies based on bitcoin, based on community custody of self-sovereign digital identities, bitcoin and other digital assets. Bitcoin mints connected to the Lightning network make it possible for informal financial groups to become digital micro-banks and empower their members with a full set of financial services.

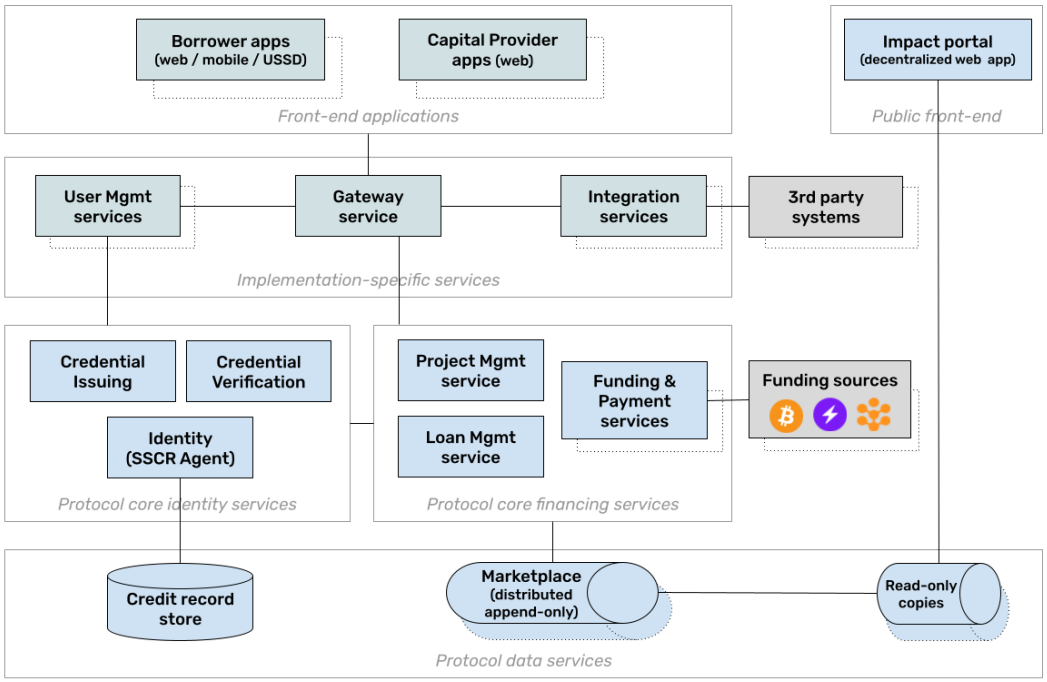
Fourth, smart contracts on Bitcoin side-chains such as Rootstock [13] and Liquid enable global digital capital infrastructure and automated pooling of funds by capital providers, matching their investment criteria to community projects.

With the Growr protocol, community members can also build their self-sovereign identities and credit records, enabling them to apply for financing from capital providers connected to the global digital capital infrastructure.

Protocol architecture

Overview

The following diagram provides a high-level overview of functional architecture with the open-source protocol components and the necessary apps and services for a working case example.



The protocol works as a *distributed micro-lending marketplace*. It enables originators, using a Lending portal (Capital Provider app) or protocol's API, to publish their loan offers with predefined conditions and eligibility criteria. The borrowers then apply to get financing based on the automatic matching of these criteria with the credentials in their self-sovereign credit record. The architecture presents the minimum set of services and applications to make the marketplace fully operational.

Implementation-specific apps and services

At the top of the diagram are the front-facing applications and on the next layer are the supporting services. These apps and services are on top of FOSS protocol and services. They can be developed by Growr or other integrators per deployment. The protocol can be extended with other services and apps fitting the purpose.

- *Borrower apps:* Set of applications that are used by the borrower to operate their self-sovereign credit record and to apply for funding from different projects. Depending on the local environment and user base, those might be web, mobile or USSD applications.

- *Capital Provider apps:* Applications used by originators and investors to create and fund projects, and to monitor their performance.
- *Impact portal:* An open-source standalone web application that can use aggregated data from the protocol to display a dashboard presenting the global impact of the marketplace.

The front-facing applications are connected to a project-specific service layer, which depends on each implementation. The services in this layer are responsible for the integrations with the third-party systems, for the authentication and authorisation of the users, as well as for the communication with the core services of the protocol.

Protocol core components

The core of the Growr protocol contains four groups of FOSS components. These will be maintained as open-source software under an open license and can be extended by following the community and product guidelines:

- Protocol core identity services
- Protocol core financing services
- Protocol core data services
- Protocol credit record store

All the services in these groups are deployed with proof that the running service has a well-known identity or a public key, and its code is identical to the source code in the Growr repositories.

Identity services

The Growr protocol's core identity services are:

- *Credential issuing service:* Issues verifiable credentials based on data received or verified for given borrowers.
- *Credential verification service:* Verifies presentations of credentials in order to access funding
- *SSCR agent service:* A custodial service that operates with the self-sovereign credit record of the user with his permissions.

To be trusted by all participants, the Credential issuing and the Credential verification services will have well-known DIDs and deployment addresses.

Financing services

The Growr protocol's core financing services are:

- *Project management service:* Provides an API to create and manage lending projects in the marketplace. It reads and writes data to the *Project book*.
- *Loan management service:* Controls the creation, utilization and repayment of loans from the marketplace. It reads and writes data to the *Loan book*.

- *Funding and payment services:* A set of services with payment management functions. They provide integration with supported funding sources such as Lightning Network channels and on-chain multi-sign accounts.

Data services

The Growr protocol's core data services are:

- *Project book*: Enables the creation of new projects with strictly defined eligibility criteria and a funding source.
- *Loan book*: Enables the creation of loans after an eligibility check of the borrower against a given project.
- *Payment registry:* Contains history of loan utilization, repayment and other related events. It supports the issuing of proof of positive credit history.
- *Read-only copies:* Contains aggregated data plus audit logs of the above services, sanitized from any personal-revealing data. It is publicly exposed to ensure transparency in the marketplace and to monitor its global impact.

To implement the operational data stores, the Growr protocol leverages Holepunch's Hyperbee, an append-only B-tree based on Hypercore. The read-only copies are implemented as a Hyperswarm with published well-known Public Key and Topic.

Protocol credit record store

The *credit record store* provides decentralized storage of the self-sovereign credit record (SSCR) of the users. Each record represents a unique global decentralized identity and contains general-purpose and protocol-specific verifiable credentials. The credentials data is encrypted and accessible only by the identity owner.

Use cases

Microfinance

The global microfinance market amounted to $124B in 2018 [23]. 139.9 million borrowers benefited from the services of microfinance institutions, compared to only 98 million in 2009. Of these 139.9 million borrowers, 80% are women and 65% are rural borrowers. The main regions of microfinance are Latin America with $48.3B, South Asia with $36.8B, East Asia and Pacific with $21.5B, Africa with $10.3B. In the developing and emerging markets, a large segment of the population is still unbanked and more than 50% of the economy is informal. The majority of micro-businesses don't have a bank account or access to traditional financial services. They mostly rely on support from their friends and family or they go to loan sharks charging as high as 15-20% per month. Connecting this market to the Growr protocol providing a global decentralized micro-lending marketplace will bring efficiency in capital allocation, fair conditions, and transparency of the impact. Using the protocol, unbanked micro-entrepreneurs can apply for productive unsecured micro-loans with their self-sovereign credit record.

Agriculture finance

Currently, smallholder farmers have difficulties accessing financing for their activities due to high informality and distance to servicing providers (banks, MFIs). The financing gap is higher in rural areas with agriculture remaining largely underserved. The farmers suffer from loan sharks charging high interest rates, thus not having much left after each season for their long term farm development. Smallholder farmers can access the Growr protocol and apply for unsecured micro-loans by forming cooperatives and receiving credentials from regional merchants that source inputs and wholesale buyers that deliver their production.

Lending to vulnerable social groups

Vulnerable populations such as victims of violence, natural and man-made disasters, as well as micro-merchants from poor communities, are a prime beneficiary of the protocol. Such populations can rely on memberships within local associations, who can become both credential providers and funding donors. In addition to lending, donations can also benefit from a global and open protocol such as Growr, giving the donors a complete transparency of the impact of each dollar they give.

Crowdfunding

The crowdfunding business model continues to grow fast globally. In addition to the established platforms for investment in startups and product R&D, impact finance providers such as Kiva are helping micro-businesses with loans for as little as $25. Crowdfunding's transition to distributed ledgers and Bitcoin is a matter of time, as the examples of Kickstarter [24] and Geyser Fund shows.

Islamic finance

Islamic finance forbids interest (riba) and therefore traditional interest-based lending is not applicable. The protocol may provide Sharia-compliant instruments instead, allowing borrowers to apply for funding based on risk-sharing.

Bitcoin-native unsecured lending

Bitcoin and its ecosystem has already demonstrated its great potential as a financial inclusion tool. The Growr protocol can be a complementary solution to Bitcoin-based circular economies and community custody solutions such as federated mints, by enabling groups of people to jointly apply and use credit from the decentralized marketplace. This will create a stronger incentive for more communities to join the Bitcoin inclusion movement.

Challenges

Regulatory compliance

Lending services are regulated everywhere in the world. DeFi protocols providing lending services have succeeded in achieving regulatory arbitrage. The Growr protocol will aim to strike a balance between covering regulation at the “last mile” of consumer financing depending on the jurisdiction and the locally residing stakeholders through which the protocol services are delivered, and the supranational decentralized space outside of the reach of traditional regulators.

Credit risk assessment

While we plan to leverage verifiable credentials from traditional credit bureaus, we envision a future with more decentralized credit risk assessment based on alternative data sources. This is mostly uncharted territory and may lead to lower yield for investors or even losses due to incorrect calculation of the cost of risk.

Fraud

We expect that such a protocol will be a high-interest target of fraudsters. We will work on developing the right anti-fraud measures including permanent blacklisting of users from accessing the protocol services.

Technology maturity

Some of the technologies described in this whitepaper are new and unproven at such scale. We aim to leverage as much as possible the experience of other projects and to test different aspects of the technology stack via demo applications and pilots.

User experience

Setting up non-custodial Bitcoin, Lightning and self-sovereign identity wallets is still complicated for technically unsophisticated users. As part of the work on the Growr protocol, we will seek the most user-friendly implementations for accessing the protocol and interacting with its smart contracts, including facilitating access through solutions such as self-sovereign identity agents and community custody.

Final notes

Work in progress

This Growr protocol's documentation is work in progress, intended to present the high-level design of the protocol for public feedback. It should not be considered complete or final. Future revisions will address incomplete elements and currently unforeseen aspects and issues.

The present Growr documentation version is 0.6 from January 2023.

Feedback and contribution

We are developing the Growr protocol as an open-source project. Lending, and especially *decentralized micro-lending*, is a very complex topic and there are many aspects that are yet to consider. We welcome your input on how to improve the protocol, and support in its development.

To provide your feedback, please submit an issue or a pull request in the Growr documentation repo in GitHub, or send an email to info@growr.xyz

Additional information

- Growr repos in GitHub
- Growr official web site
- Growr on Twitter

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