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. 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. Most of the so-called decentralized finance (DeFi) protocols serve advanced users, require over-collateralization, and their adoption is higher in developed markets and by institutional investors. We propose a protocol built on top of the Bitcoin network that addresses these challenges: it helps micro-entrepreneurs build their self-sovereign credit record and connects them to a global marketplace where they can get productive microcredit at a fair price, bringing real-world yield to decentralized finance in the process.

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 the 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 accounts, 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 (DeFi) 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 blockchain technology as a solution to the information asymmetry and credit rationing problem [10]. Lenders have abstained from offering higher prices to riskier borrowers to avoid adverse selection. Instead, they can facilitate self-selection by low-risk micro-enterprises who are ready to signal their credit history on-chain, 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, is relatively more important when evaluating lower-quality borrowers [11].

Decentralized finance offers several benefits such as high efficiency through programmability, open permissionless access and transparency, despite many current shortcomings [12]. Therefore, the availability of on-chain 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—decentralized finance and microfinance—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 lenders, enforcing fair competition for pricing and 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 revenue growth, as well as easier and streamlined agreements with a cooperative instead of with each member individually.
- Lenders in the marketplace benefit from real-world yield generation opportunities on a global scale, and in addition, they get 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 decentralized credit risk assessment and reduction of information asymmetry.
- *Decentralized micro-lending marketplace:* an open and global lending marketplace on top of Bitcoin and its side-chain Rootstock (RSK) [13] that connects borrowers with lenders who publish their targeted offers with predefined conditions and eligibility criteria.
- *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 the 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 an 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 distributor or 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 or a trusted financial data provider.
- *Business activity credential* (hard information). Data about the business activity such as income statement, cash flow, and/or balance sheet.
- *Savings history credential*. 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 by 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 by 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 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 from) 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. Being poor actually becomes very expensive because the financially excluded easily fall prey to loan sharks with usurious conditions.

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 borrowing, 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 course of 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 the 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 the 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 their 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].

Decentralized credit risk management

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 own self-sovereign credit record, lenders 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 the 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.
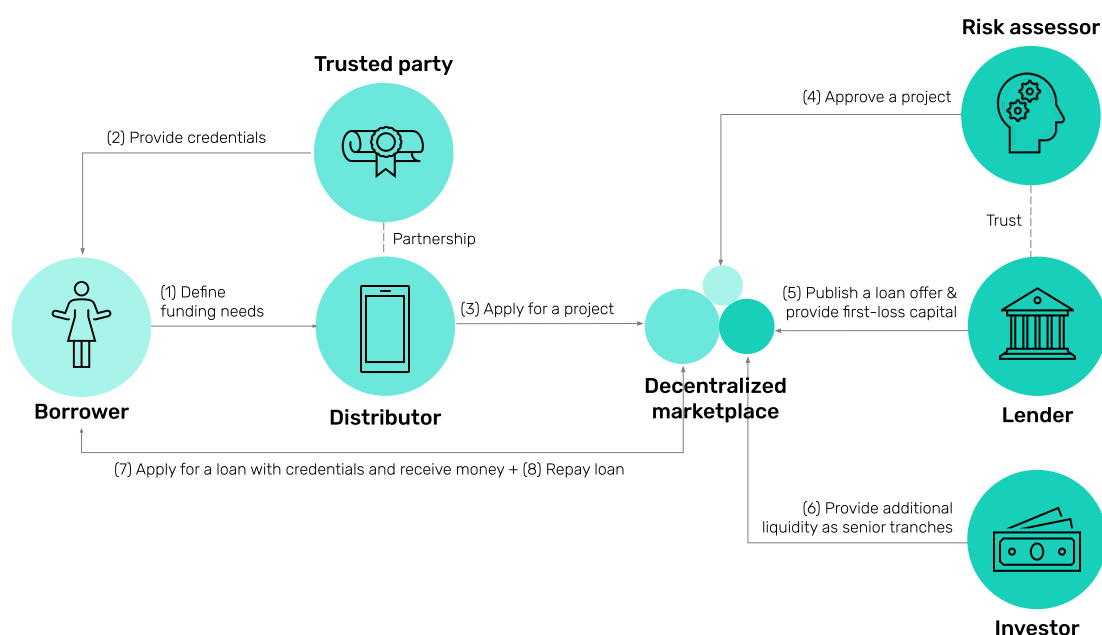
Below is a summary of the protocol mechanics depicted on the diagram:

1. The *borrower* defines their funding needs to or in collaboration with a *distributor*, such as a cooperative, guild, wholesale buyer, digital wallet, or another provider.

2. One or more *trusted parties* provide credentials to the *borrower* to start building their self-sovereign credit record.

3. The *distributor* applies for a project with details about the local activities and the financing needs of the borrowers, to receive a credit line from the *decentralized marketplace*.

4. A *risk assessor*, working for a *lender*, or a third party trusted by them, reviews each application, to assess the risk and determine the loan price and conditions.

5. A *lender* (a bank, non-banking lender, or a fintech) approves the credit line if it fulfills the risk policy. Upon approval, the *lender* creates and creates a loan offer in the form of a project on the *decentralized marketplace* with predefined eligibility criteria.

6. *Investors* can provide additional funding to the project as a senior tranche via the *decentralized marketplace*, fully delegating the actual lending activity to the lender and the protocol, according to their risk appetite.

7. *Borrowers* go through a simple application process to receive a loan from the *decentralized marketplace* after asserting their eligibility with their verifiable credentials. The disbursed amount is received by the *borrowers* in the borrowing application, where they can make a direct payment to a merchant or use it in another way 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.

- *Distribution*: access to the protocol is provided in a custodial model by an independent distributor, or in a non-custodial model directly using a decentralized borrowing application.
- *Risk assessment*: performed by a lender with an internal risk assessment function, or by an independent trusted risk assessor.
- *Funding*: provided partially by a lender with additional capital from global investors, or fully by the lender.
- *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, and smallholder farmers, apply for productive loans from the marketplace, most often with the help of a local distributor, and then repay the loan plus its price.

Distributors

Distributors facilitate the access to the protocol by grouping several borrowers with similar needs and presenting project applications to the marketplace on their behalf. 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 mints* [21], enabling access to micro-lending 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 embedded financial service.
- *Digital wallets and fintech providers* that already offer financial services and can expand to unsecured decentralized lending.

Trusted parties

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

- The *distributor*, 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.

Lenders

Lenders publish offers to the loan marketplace by creating and funding *projects*. The lenders provide first-loss capital to finance the whole project or part of it.

Risk Assessors

Risk assessors review project applications, assess the risk and determine the loan price and parameters. In most cases, this role is internally covered by the lender.

Investors

Investors can be decentralized finance protocols or large institutional or individual liquidity providers who allocate capital to the loan marketplace through liquidity pools and delegate the actual lending activity to the lenders in the form of senior tranches for the financed projects.

Decentralized marketplace

The *global decentralized micro-lending marketplace* is the open-source smart contract infrastructure and the tools for decentralized lending.

Participant incentives

Role	Tangible incentives	Intangible incentives
Borrower	Access to productive capital at a fair price. Optional "cash back"-like rewards paid by the lender 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 lender after on-time loan repayment (optional).	Success and growth of the community.
Distributor	Distribution fee upon each loan disbursement.	Success and growth of the community. Revenue growth for service providers.
Lender	Interest margin (yield) from the borrowers.	Access to more customers on the marketplace. Reduced information asymmetry through the combination of self-sovereign credit record and on-chain history.
Risk assessor	If there's an independent risk assessor, a reward is paid by the lender after on-time loan repayment.	
Investor	Real-world yield on the invested capital.	End-to-end transparency for the investments without intermediary counterparty risk.

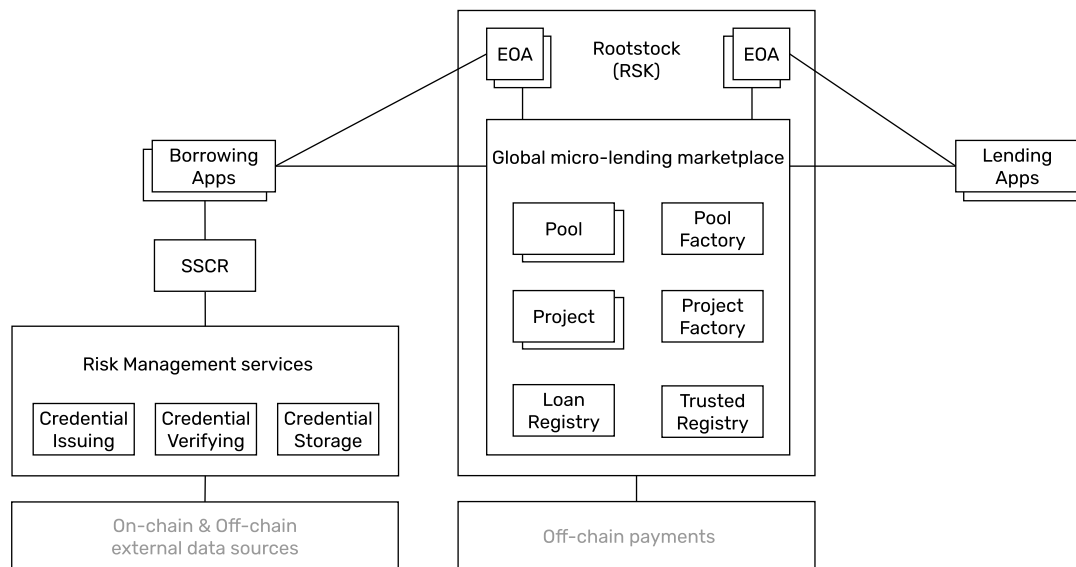| Marketplace	Protocol fee collected for the open-source project development.	

Protocol architecture

Overview

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

Decentralized micro-lending marketplace

The decentralized micro-lending marketplace is where lenders publish their loan offers with predefined conditions and eligibility criteria, and borrowers apply to get financing based on the automatic matching of these criteria with the credentials in their self-sovereign credit record. It is implemented as a smart contract system on top of Rootstock (RSK) mainnet, a side-chain secured by approximately 66% of Bitcoin's miners as of August 2022 [22].

The Growr protocol consists of a set of smart contracts:

- *Pool factory*: enables the creation of new liquidity pools for senior tranche funding.
- *Pool*: supports deposit & withdrawal operations from its owner and enables projects to apply for credit lines.
- *Project factory*: enables the creation of new projects with credit line parameters and eligibility criteria.
- *Project*: supports deposit & withdrawal operations from its owner, provides loan offers and enables users to apply for micro-loans within the approved credit limit and eligibility criteria.
- *Trusted service registry*: supports verification of risk assessment results.
- *Loan registry*: registers privacy-preserving history of loan repayment commitments and supports issuing of on-chain verifiable credentials.

Self-sovereign credit record storage

The *self-sovereign credit record (SSCR)* is a unique global decentralized identity containing general-purpose and protocol-specific verifiable credentials. The SSCR is owned and managed by the user, and the credential data is encrypted and kept in decentralized storage.

Protocol apps

Protocol apps are custodial or non-custodial web and mobile applications, integrated with the protocol, including:

- *Borrowing (distribution) apps.* End-user web or mobile applications for the Borrowers to onboard, collect credentials and apply for loans to the protocol. Such applications can be provided either by an independent financial service provider in a regulated custodial scenario, by local communities, or as a completely decentralized app providing the necessary access to the protocol.
- *Lending apps.* Decentralized applications for lending pool and project management. Those applications include the creation of pools and projects, depositing and withdrawing of funds, and monitoring utilization and profitability performance.

Protocol services

The Growr core protocol and applications are integrated with various internal or third-party services, covering mainly risk management functions.

- *Credential issuing services.* Issue verifiable credentials asserting certain facts about the borrower.
- *Credential verification services.* Verify that the presented credentials are trusted and valid and owned by the subject.
- *Credential storage services.* Securely store the credentials and the declarative details, part of the borrower's SSCR.
- *Payment services.* Cover various on-ramp, off-ramp services, and fiat settlement services. To implement the above services, the protocol utilizes various building blocks from RSK Infrastructure Framework (RIF).

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, and 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 and access 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 that provides 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 prime beneficiaries 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 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 transition to the blockchain is a matter of time, as the example of Kickstarter shows [24].

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 have 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 a 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 Bitcoin and RSK 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 custodial solutions.

Final notes

Work in progress

This Growr protocol's documentation is a 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 0.5 from August 2022.

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 many aspects are yet to consider. We welcome your input on how to improve the protocol and support its development.

To provide your feedback, please submit an issue or a pull request in the Growr documentation repo on GitHub.

Additional information

- Growr repos in GitHub
- Growr official website
- Growr on Twitter

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