Ripio Credit Network

a global credit network based on cosigned smart contracts
by Ripio International Limited

Abstract

Ripio Credit Network ("**RCN**") is a protocol based on smart contracts and blockchain technology, which brings enhanced transparency and reliability in credit and lending. The protocol enables connections between lenders and borrowers located anywhere in the world, regardless of currency. By reducing the traditional banking brokerage costs and management fees, RCN aims to allow better conditions for both sides, creating a better credit alternative than anything available today. By including an intermediary agent (the "**Cosigner**"), the RCN seeks to neutralize the lender's credit risk and, in case of a default, provide an alternative mechanism for managing the debt collection in the borrower's country of residence.

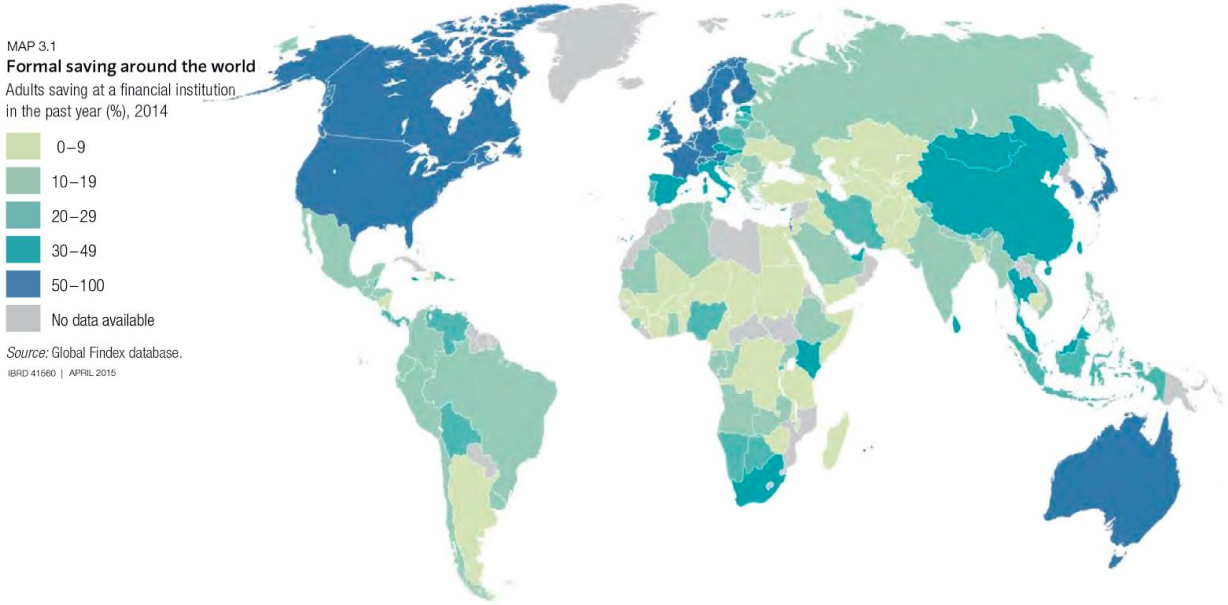
1. Context

1.a. The traditional banking system

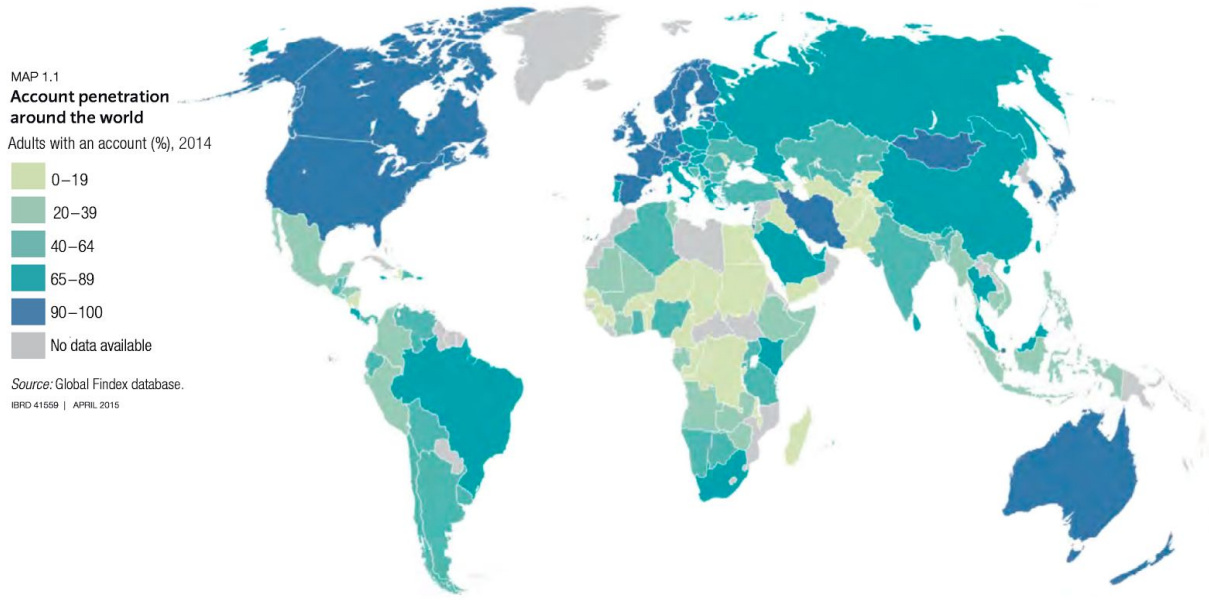
The financial system has been one of the main actors of the global economy for hundreds of years. Credit, one of its essential functions, consists of managing the savings of a population by channeling these savings from agents with surplus funds (lenders) to others with insufficient funds (borrowers). [See Figure 1.]

In a hypothetical scenario in which no bank existed as an intermediary agent, for a credit transaction to take place both borrowers and lenders would need to: (1) become aware of each other's existence, (2) agree on how to value the risk involved in the credit transaction, (3) agree on time-limits, amounts, and related terms, and finally, (4) manage the logistics necessary to actually transfer the money during the lifetime of the loan.

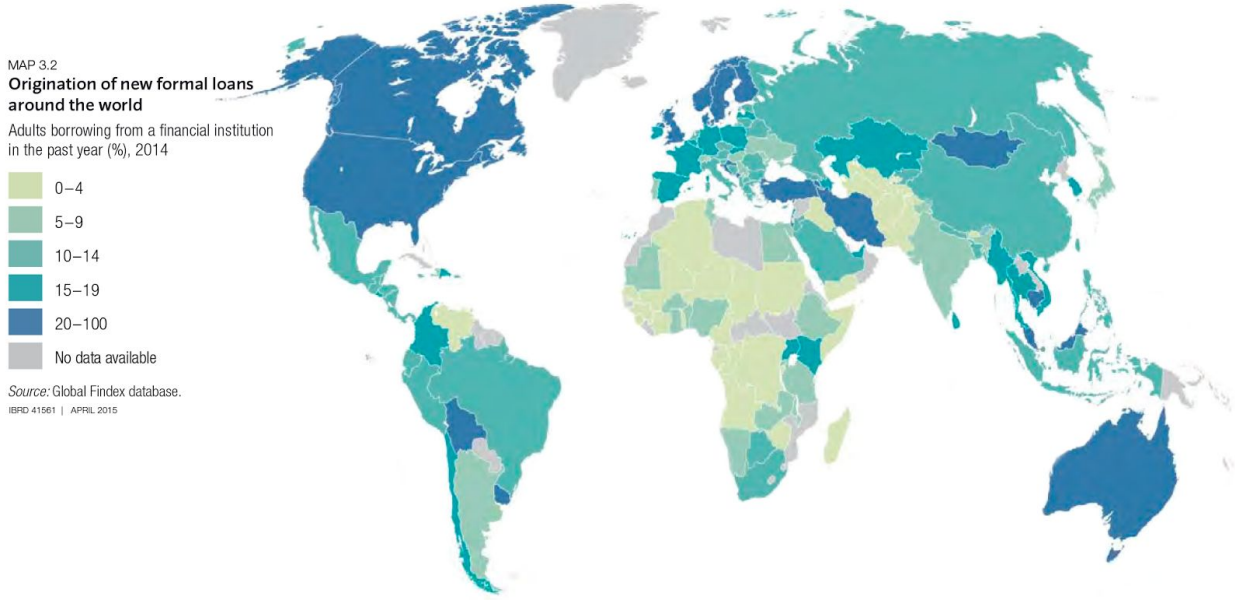
Today, bank intermediation reduces these transaction and information costs, but with certain limitations. Generally, banks focus their operations in determined geographic locations, which makes it difficult for people in different areas to connect for purposes of credit transactions. Additionally, a large amount of the world's population is unbanked or underbanked, and the rest are plainly excluded from the financial system. [See Figure 2.] Banks give loans and credit according to their risk capacities, and as a result, some credit projects are too expensive to undertake relative to the would-be borrower's creditworthiness, and some are simply un-creditable under local banks' risk capacities. As a further limitation to bank intermediation of credit, the standard credit-granting process involves inherent bureaucracy in the collection and dispersion of information, which adds costs and ultimately excludes even larger segments of the population. [See Figure 3.]



[Figure 1: *formal saving around the world*]



[Figure 2: *bank account penetration around the world*]



[Figure 3: *origination of new formal loans around the world*]

* figure 1, figure 2, figure 3 [1]

1.b. Internet and the Rise of P2P Loans

During the last 15 years, the Internet has produced a radical shift in terms of information and communication, setting off an accelerated democratization process on both for the people who have access to it.

The new social technologies of the Internet have also helped to expand the boundaries of the traditional banking system by offering novel credit alternatives, such as peer-to-peer ("**P2P**") loans. These technologies helped the credit system to move forward on some key points: (1) interest in modernizing the whole credit-granting process revved up; (2) the segment of the population covered by the internet-based credit system increased; (3) the localization issue was mitigated, to some extent; (4) the intermediation costs were reduced, and thus the P2P interest rates were less than most traditional bank lending rates; and (5) the shift brought better conditions for both lenders and borrowers in terms of evaluating a project's creditworthiness.

The Internet-driven shift was significant, but there are some structural problems still to solve. First, the credit risk is generally still assumed by the lender, and not by the P2P platform. Second, the credit risk evaluation process, though improved, remains asymmetric. Third, the lender has only a few management tools to manage their assets. Finally, if the company behind the P2P platform defaults or declares bankruptcy, the lender has limited recourse with respect to the borrower.[2]

In this context, the lender is confronted with a binary scenario: its counterpart (the borrower) either meets its obligations or does not. In other words, the risk may be too big and not diversifiable enough for a given lender to participate in the P2P lending platform.

2. Ripio

Ripio (formerly BitPagos) has been described as one of the most promising Bitcoin-Blockchain startups in Latin America.

Ripio means "*gravel*" in Spanish. Just like gravel serves as a foundation for new roadways, Ripio aims to build new roads throughout the digital economy. New roads create new possibilities, and they are the key to widening access towards **financial inclusion** for everyone.

Ripio's main objective is to **democratize the digital economy in Latin America**, offering digital payment alternatives within everyone's reach in a region where 65% remain unbanked.[3]

Due to its efforts toward the democratization of finance, Ripio was recently selected as one of 2017 breakthrough brands by **Interbrand.**[4] Here's what the global consultancy stated on their annual report:

> *Harnessing breakthrough blockchain technology, Ripio is bringing financial freedom to regions of Latin American that lack banking. It sells bitcoins in local currencies to facilitate online transactions and easy peer-to-peer payments, and even extends credit—no cards, accounts, or fees involved. Ripio (which means "gravel" in Spanish) is paving the road to full financial inclusion in a growing digital economy.*

2.a. The Road of Ripio

In 2013, **BitPagos** started as Latin America's first Bitcoin payment platform, offering bitcoin-based financial services for merchants. A year later, the company launched **Ripio**, a digital wallet that enables consumers to send, receive, store, and buy or sell Bitcoin in local currency and to make online payments on thousands of websites. In January 2017, BitPagos rebranded as Ripio.

Ripio has over 100k users in Latin America.

2.b. Ripio Credit

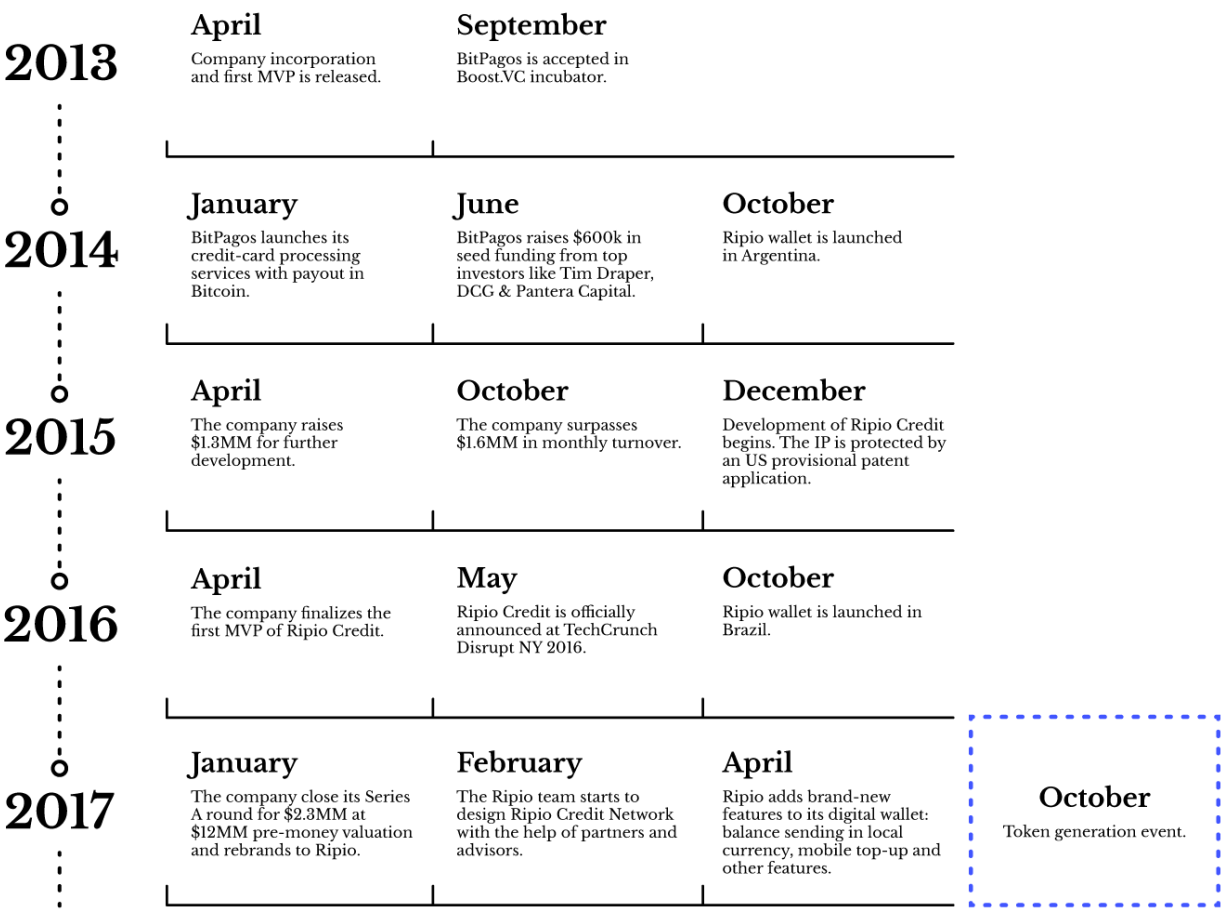
In 2016, Ripio launched a groundbreaking credit service (called **Ripio Credit**), reaching the finals at **TechCrunch Disrupt**,[5] and revealing the innovative service to the world.

Ripio Credit currently extends credit to Ripio users, allowing them to finance their online payments in installments, using bitcoin as the transaction vehicle. This alternative credit facility is available to individuals without a credit card or a bank account, and it represents a service that no other Bitcoin wallet company had offered before.

Out of an Argentina-based entity, the company loans its own funds to borrowers in Argentina in order to provide the Ripio Credit service. The company works with local

counsel to ensure compliance with all appropriate lending, data privacy, and financial services laws, and the company currently provides Ripio Credit services only to borrowers in Argentina.

2.c. Milestones



3. Ripio Credit Network

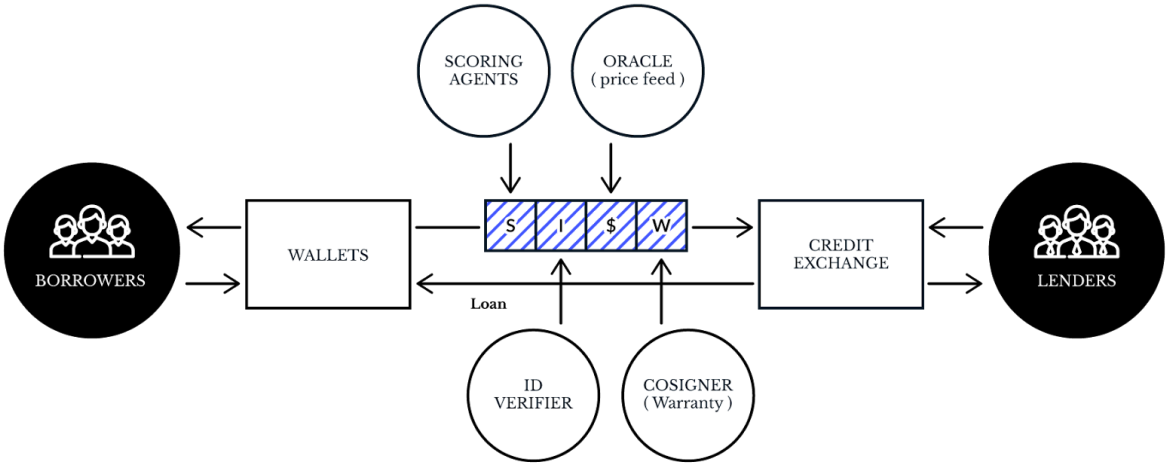
A P2P credit network based on cosigned smart contracts

3.a. The P2P Network

Leveraging the existing Ripio Credit application, the Ripio Credit Network ("**RCN**") leads the road towards credit democratization, offering a solution to traditional banking system alternatives to credit access.

RCN is a protocol based on smart contracts that standardizes credit lending through blockchain technology. The protocol facilitates connections among several agents, each of whom play a role to ultimately offer the lender better tools to manage its capital, reduce the intermediation costs between a lender and borrower, provide increased credit access to borrowers, and, as a result, make more projects viable.

The Ripio Credit Network can connect borrowers, lenders, and other network agents all over the world, allowing each one of them to manage the credit in their local currencies, as long as they have Internet access. First, the RCN connects an agent with information on the borrower's identity to an agent who analyzes the borrower's credit risk impartially. Next, the RCN enables the sharing of this information with a cosigner, who is an agent that provides a guarantee on the loan; the cosigner not only reduces default risk for the lender, but it could also diversify its own credit risk by guaranteeing a number of loans – hence reducing (and in some cases neutralizing) that risk. In addition, in the case of a default, the cosigner may manage the unpaid debts in a traditional way (e.g., through a debt collection process).



[Diagram: *the Ripio Credit Network*]

At the time of the network launch, RCN will consist of the following agents:

- The **Borrower** who makes a credit request from its wallet provider.
- The **Lender** who invests by lending funds via a Credit Exchange.

- The **Wallet Provider** who generates a smart contract to: (i) specify the terms of the loan, (ii) receive funds from the Lenders via Credit Exchanges, and (iii) distribute these funds to Borrowers and other agents, as applicable and as specified by the terms of the smart contract.
- The **Scoring Agent** provides a credit score for each Borrower.
- The **Oracle** sets the price feed of the RCN Token according to the Wallet Provider's local currency, which is used to determine the exchange rate between local currency and RCN Tokens at the time the loan is executed and when subsequent repayments are made.
- The **ID Verifier** verifies the Borrower's identity.
- The **Cosigner** who acts as a guarantor for Borrowers, and who may act as an intermediary agent between the Borrower and the local legal system in the event a Borrower defaults.
- The **Credit Exchange** allows the Lender's offer to extend credit to match with a Borrower's request for credit via a smart contract generated by the Wallet Provider.

3.b. RCN Tokens

Although Borrowers and Lenders will likely prefer to denominate credit transactions in a local currency, RCN Tokens will be required to facilitate transactions among the other agents in the RCN, as further described below. RCN Tokens will be required to access the RCN network given that agents' fees and obligations – plus the corresponding distribution expenses within the network – are driven by the use of these tokens. RCN Tokens also act as an incentive to each one of its participant agents to continue to participate in the network.

3.c. The Smart Contract

The "**smart contract**," generated by the Wallet Provider and executed when matched by the Credit Exchange, contains the relevant credit terms, Borrower obligations, events of default, and signatures or verifications from each of the other agents, as applicable. RCN Tokens will facilitate interaction with the smart contract among agents within the RCN. Each credit flow starts with the **Borrower** who makes a credit request. The Borrower performs the request from its Wallet Provider, which has already integrated to the RCN protocol, and then the Borrower waits for an approval.

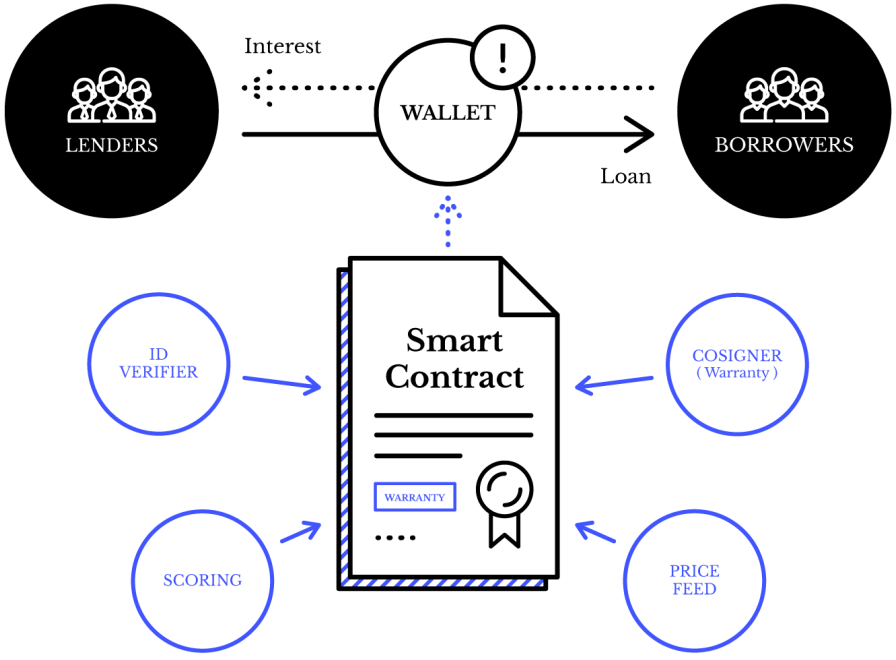
The **Wallet Provider** (*i.e.*, any entity that wants to offer credit services to its users via the RCN) adds information about the Borrower and its credit request, generates a smart contract, and then broadcasts it to the network. Borrowers will only connect with the RCN through a Wallet Provider. As a condition to using any software or services provided by Ripio to the RCN, each Wallet Provider must warrant its compliance with all applicable regulatory frameworks for the jurisdiction(s) in which the Wallet Provider offers its services, including any applicable lending laws.

The **Oracle** provides the service of informing the exchange rate between any given currency used by a Wallet Provider, Credit Exchange, Borrower, or Lender, and RCN Tokens, at any time it is consulted. The Oracle will most frequently be consulted at the time a loan is originated, and during the credit life time in order to determine its installments.

An **ID Verifier** identifies each Borrower and verifies that he / she is who he / she claims to be; this will prevent most fraud or scam attempts and provide the Borrower's identification information in case of a default.

A **Scoring Agent** then analyzes available information to statistically evaluate the probabilities of a default linked to a certain ID. This same Scoring Agent could eventually gather the transactional information from the RCN blockchain (which is open to anyone on day one) to build a credit ledger and track a Borrower's instances of default or non-default over time.

The **Cosigner** uses information provided by the ID Verifier and the Scoring Agent to establish the terms under which it will operate on a loan. The default terms, under which the cosigner takes responsibility for the Borrower's debt, will be clearly specified in the same smart contract. The Cosigner terms will be added to the smart contract, along with the terms provided by the ID Verifier and Scoring Agent, and the smart contract will be then generated and broadcasted by the Wallet Provider. In the event of a default, the Cosigner acts on behalf of the Borrower by taking responsibility for the debt amount as specified in the smart contract. The smart contract also determines if the Cosigner is obliged to make a unique payment to the Lender or if it will continue to bear the expense of the periodic installments under the original conditions.



[Diagram: *the Cosigned smart contract*]

The cosigned smart contract is then listed by a **Credit Exchange**, including the information gathered up to this point. That is: amount, currency, Borrower ID, Borrower credit score, co-signature insurance options, and any other agent or Borrower input permitted. As a condition to using any software or services provided by Ripio to the RCN, each Credit Exchange must warrant its compliance with all applicable regulatory frameworks for the jurisdiction(s) in which the Credit Exchange offers its services, including any applicable lending laws.

Through the Credit Exchange, a Lender that holds RCN Tokens can create a trading order. When these orders match the conditions on the cosigned smart contract, the loan will take place and the smart contract will execute accordingly. The RCN Tokens involved will be transferred to the corresponding Wallet Provider, who will, in turn, grant credit to the Borrower, upon turning the RCN Tokens into local currency.

3.d. Credit Lifetime

Once the cosigned smart contract is generated, the Borrower is bound to the Lender under a payment obligation. The Borrower has committed to return the funds borrowed, plus interest, in periodic installments or in a single installment. The Wallet Provider is also obliged to inform the due dates and installment amounts to the Borrower.

The total amount of RCN used in each payment will depend on the exchange rate(s) set by the Oracle, which will oversee the market conditions and inform the smart contract of exchange rates at each particular moment of payment. The repayment of funds will flow as follows: (i) the Borrower will pay in local currency terms the amount due to the Wallet Provider; (ii) Wallet Provider will trade the Borrower's payment amount for RCN Tokens at the rate set by the Oracle; (iii) the Wallet Provider will then send the RCN Tokens to the Lender; and finally, (iv) the Lender can decide whether to hold the RCN Tokens or trade them for another currency.

3.e. RCN Launch

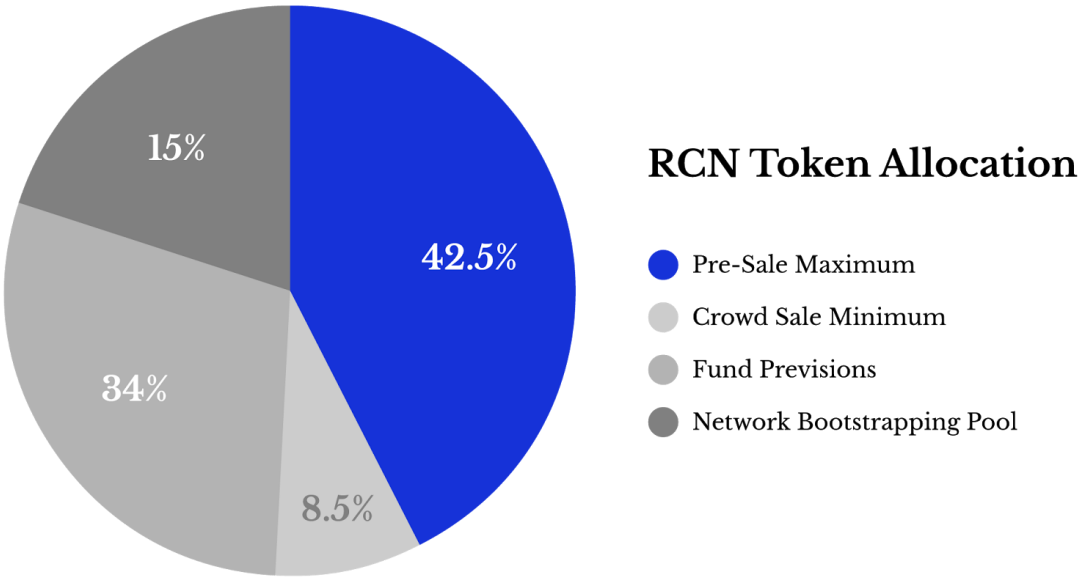
At the time of the RCN launch, an Oracle will be live and capable of providing its services to anyone who accesses the network. Additionally, the Argentinian entity that currently provides Ripio Credit services will begin using the smart contract functionality described above to provide simple, single-installment loans. Initially, this entity will act as several agents in the RCN: the Wallet Provider, the ID Verifier, the Scoring Agent, the Cosigner, and the Credit Exchange, using RCN Tokens to interact with the Oracle on the RCN network. The entity will continue to comply with all applicable lending laws in Argentina, where Ripio Credit services are available.

Once the RCN shows early signs of a favorable outcome (by increased usage), we expect new agents will be drawn to the network. Eventually, RCN participants could evolve their businesses to build new products on the RCN protocol or take on additional agent roles within the network. These new products would bring new users and participants to the network, and new ways for RCN Tokens to be used. Ultimately, as the RCN grows, P2P lending can take place via an increasingly more efficient, borderless network of agents offering services ancillary to lending that can programmatically execute via RCN smart contracts.

3.e.i. RCN Token Sale

The RCN Tokens will be the backbone of the Ripio Credit Network. Around the launch of the RCN, and in order to undertake future and further development of the network protocol, the company will conduct a Token Generation Event ("**TGE**") and crowd sale of RCN Tokens, where 51% of the RCN Tokens will be made available for sale. The

company intends to start the TGE on October 17th, 2017, and it will allocate a total RCN Token supply of 1 billion as follows:



- The 51% of RCN Tokens made available for sale in connection with the TGE will be allocated as follows:
    - Up to 42.5% / 425,000,000 RCN Tokens may be sold to purchasers before the TGE. Any remaining unsold Tokens will be reallocated and made available to the public via crowd sale at the time of the TGE.
    - A minimum of 8.5% / 85,000,000 RCN Tokens will be made available to the general public via crowd sale, beginning at the TGE on October 17th, 2017 and lasting until the earlier of either the date 510,000,000 RCN tokens have been sold, or November 5th, 2017.
- 15% / 150,000,000 RCN Tokens will be kept as a pool to incentivize the participation of agents and for otherwise bootstrapping the network.
- 34% / 340,000,000 RCN Tokens will be held as a provision for partnerships, marketing, and future RCN expenses.

4. Anticipated RCN Network Development

Following the RCN network launch and token sale, the company will continue to use RCN smart contracts to facilitate lending transactions in Argentina. In the future, the company anticipates the network will grow, and an increasing number of agents will begin providing various RCN agent services in jurisdictions throughout the world.

4.a. **Importance of the Cosigner**

As the RCN network develops, the Ripio International team views the existence and inclusion of the Cosigner agent as a significant and meaningful benefit to the network's utility. The "**Cosigner"** will act as a guarantor for Borrowers, and may act as an intermediary agent between the Borrower and the local legal system in the event a Borrower defaults.

The **Cosigner** uses information from the Identity Verifier and Scoring Agent and credit ledger to determine the terms by which the Cosigner is willing to cosign on a loan. A Cosigner may group the smart-contract-based loans (generated by the Wallet Providers) in homogeneous risk portfolios in order to diversify them. This way, the Cosigner will be able to estimate and predict an expected loss for a portfolio of similar credit rates and use this information to assign its fee to cosign the smart-contract-based loan and/or add credit information to the smart contract under various conditions. The default terms, under which the cosigner takes responsibility for the Borrower's, will be clearly specified in the same smart contract. These terms from the Cosigner will be added to the smart contract, along with the terms provided by the ID Verifier and Scoring Agent, and the smart contract will be generated and broadcast by the Wallet Provider. In the case of a default, the Cosigner acts on behalf of the Borrower by taking responsibility for the debt amount, according to the insurance conditions noted on the smart contract. The smart contract also determines if the Cosigner is obliged to make a unique payment to the Lender or if it will continue to bear the expense of the periodic installments under the original conditions.

The Cosigner is intended to be one of the key agents of the Ripio Credit Network. It is intended to act as a reinsurer that distributes and reduces the Lender's risk and, perhaps most importantly, to also help improve the contract conditions on the Borrower side by retaining access to the Borrower's local legal system.

4.a.i. Regular P2P Loans: an Unbalanced Loss

In the case of a regular P2P loan, the lender doesn't know whether the borrower will have enough payment capacity in the future to pay off the loan or not. If the lender gets a certain number of borrowers sharing the same characteristics, he will learn that eventually some of them pay off the debt and some of them don't. In other words, in a regular P2P loan, the lender faces a random phenomenon, statistically speaking; by taking the exact same action in apparently similar conditions, he gets different results.

In the following table, we have 10 borrowers that – according to a trusted credit score assumption – each bear a 10% chance of default. The lenders are listed in rows, the crosses represent the default events, and the columns represent different scenarios and / or successive loans of the same lender.

	loans / scenarios										
	1	2	3	4	5	6	7	8	9	10	Σ
lender 1	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	9
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
3	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	9
4	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	9
5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
6	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	9
7	✓	✓	✓	✓	✓	✗	✓	✓	✓	✗	8
8	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	9
9	✓	✓	✓	✗	✓	✓	✗	✓	✗	✓	7
10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Σ	9	9	9	9	9	9	9	9	9	9	

[Table 1: *loans scenarios*]

As Table #1 shows, every column has 9 successful payments and 1 case of default, which means that the 10% default assumption is correct in each of the 10 scenarios. However, the entire loss is borne by just one lender, who loses potentially all of the funds invested.

In the last column (Σ), some lenders haven't lost funds in any of the 10 scenarios (lenders 2, 5, and 10) and some lost their funds in more than one opportunity (lenders 7 and 9).

This example simply reveals the main problem of most P2P loans: **the single lender cannot diversify the credit risk**. By following the trajectory of a single lender on many scenarios (i.e. a single row on infinite columns), we would notice that the default rate would stay at 10%, but there would still be no guarantee for the lender that the loss would be as expected.

On an individual level, there's very little utility in talking about the difference between a borrower's expected chance of default and the lender's expected position. What the credit system needs is an agent with enough credit volume to use the statistics to diversify exposure and thereby neutralize the default risk.

In order to neutralize default risks by credit diversification, the lender's risk on each loan should be:

- **Finite**: the parameters of the event of default must be clearly defined.
- **Accidental by nature**: the lender should not have control of the event of default in order to avoid manipulation and anti-selection.
- **Measureable**: the economic value of the loss should be determinable. There must be enough data available in order to evaluate the risk with a high degree of confidence.

- **Independent**: exposure units should be spatially and temporally separate from each other (i.e. if one lender has a claim, this should not affect another lender's claim).

4.a.ii. RCN: Enter the Cosigner

RCN seeks to solve the risk neutralization problem by adding the figure of the Cosigner. In order to explain the role of this agent, let's review scenario #2 on the previous graphic and add the cosigner:

loan = mu 180
pd = 10%
pp = mu 18

#	loan	pure premium	paid by borrower	paid by cosigner	received by lender
1	180	-18	180	0	162
2	180	-18	180	0	162
3	180	-18	180	0	162
4	180	-18	180	0	162
5	180	-18	180	0	162
6	180	-18	0	180	162
7	180	-18	180	0	162
8	180	-18	180	0	162
9	180	-18	180	0	162
10	180	-18	180	0	162
Σ	1800	-180	1620	180	1620

where

mu= monetariy units

pd = probability of default

$$pp = pure\ premium = \sum_{lender} \frac{expected\ loss}{amount\ exposed}$$

[Table 2: *risk neutralization by the Cosigner*]

As Table #2 reveals, a default occurs regardless of the Cosigner's intervention, but the risk has been neutralized. The Lenders have traded higher but uncertain profit for lower but more certain profit. The risk and the surplus are transferred to the Cosigner, who collects a predefined premium to guarantee the loan.

Let's review a second example, where the Cosigner undertakes a smaller part of the obligation. In this case, the Cosigner stands for the 60%:

loan = mu 180
pd = 10%
pp = mu 7,2
% sig/cosig = 60%/40%

#	loan	pure premium	paid by borrower	paid by cosigner	received by lender
1	180	-7,2	180	0	172,8
2	180	-7,2	180	0	172,8
3	180	-7,2	180	0	172,8
4	180	-7,2	180	0	172,8
5	180	-7,2	180	0	172,8
6	180	-7,2	0	72	64,8
7	180	-7,2	180	0	172,8
8	180	-7,2	180	0	172,8
9	180	-7,2	180	0	172,8
10	180	-7,2	180	0	172,8
Σ	1800	-72	1620	72	1620

[Table 3*: risk neutralization by the Cosigner (with lower premium)*]

As we can see on Table #3, the Lender will lose a larger amount of his investment in the case of a default, but his profit will be higher if there's no default event. In other words, the risk transferred to the Cosigner is smaller, but the cost (pure premium) is lower on the Lender side.

In fact, there can (and will) be more complex scenarios. The Cosigner will evaluate his participation on the loss and ponder that participation when iterating and estimating his pure premium when he undertakes his next responsibility.

$$PP = Frequency * Severity * (1\text{-}LER)$$

$$LER = \frac{amount\ of\ losses\ eliminated}{total\ amount\ of\ losses}$$

[Formula 1: *pure premium (p.p.) estimation by the Cosigner*]

The previous examples are simplified to explain the role of the Cosigner agent in basic terms. In practice, the loan amount ("*amount exposed"*) will be quite different, and, in the case of a default, the Borrower may have already paid a few installments, so the debt for which the Cosigner is responsible would be just a proportion of the initial amount (*referred to as "EAD," or exposure at default*).

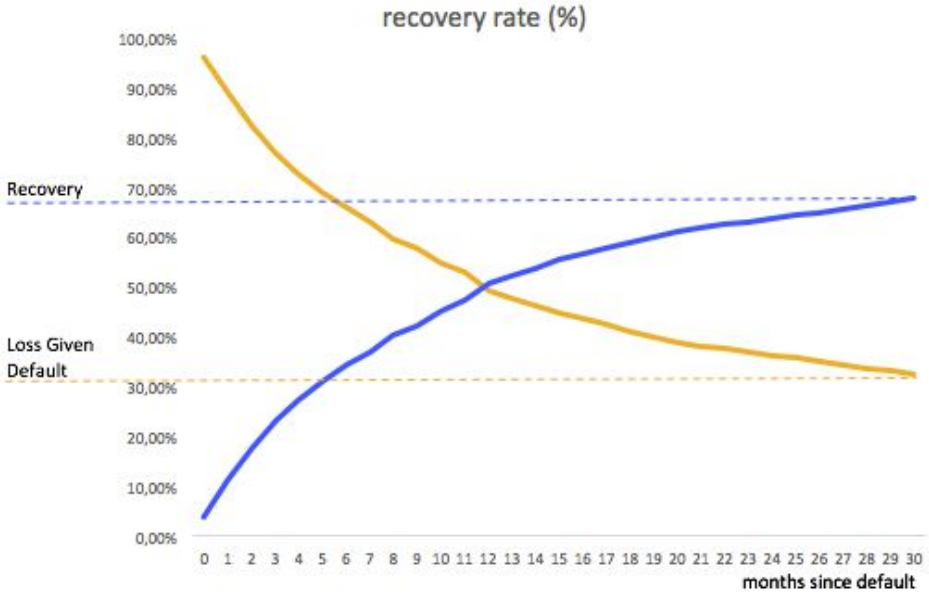
In the RCN, we intend for the Cosigner to be able to manage the debt as a local agent in the Borrower's country of residence, which enables robust opportunities for collection that may consist of:

1. **Contacting the Borrower** via email, sms, phone, social media, or any other means, to inform the Borrower of the default amount now due.
2. **Offering a repayment reschedule plan**. The Cosigner might incentivize the Borrower to make repayments (*i.e.*, by agreeing to not report the Borrower's

default to a credit bureau) if a new payment schedule is accepted and the repayments are made on time.

3. **Reporting the debt to the local credit bureau** (such as Equifax/Veraz in Argentina and Peru, CIFIN in Colombia, etc). This report enables local collection agencies to intervene.
4. **Taking legal action**. If the Borrower ignores alternate means of contact, the Cosigner could send a demand letter, noting an intention to proceed with legal action. If this demand letter meets no response, legal action or a collection process can be initiated.

Collection strategies, as described above, usually result in recovery curves such as the following:



[Chart 1: *loss given default vs. recovery rate*]

The inclusion of a Cosigner can substantially reduce the loss in the whole network – not just the loss attributed to the Cosigner himself (*referred to as loss given default, or "LGD"* [6]) – but also the loss sustained by the Lender.

Consequently, the Cosigner should then be able to estimate a pure premium, just like the traditional banking system does to predict a loss (*"EL," or expected loss*):

$$PP = EL$$

$$EL = PD * (EAD * LGD * Amount\ Exposed)$$

[Formula 2: *expected loss*]

Furthermore, the Cosigner likely has more capacity than the Lender to undertake any estimation deviation. The Cosigner can use his know-how to estimate the score that will be included in the smart contract and assesses an estimated loss beforehand (that may or may not be exactly the same in the future). This is why the Cosigner adds a statistic safety margin (*risk charge*) in order to cover unfavorable / unexpected scenarios; the more homogenous the risk, the lower the margin.

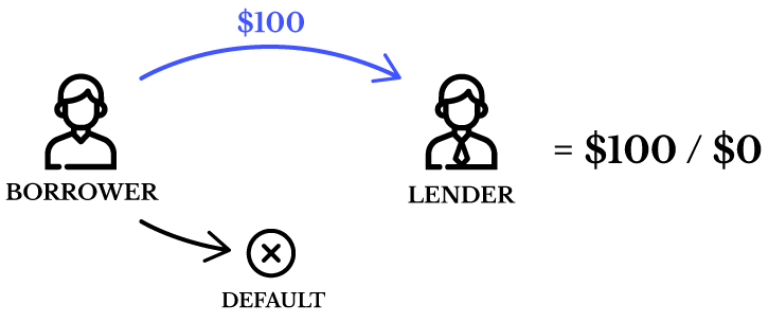
Finally, the Cosigner should be able to add an amount over the pure premium to cover his expenses and a desired profit. As such, we can rethink the Cosigner premium this way:

$$premium = pure\ premium + risk\ charge + expense\ of\ doing\ bussines + profit$$

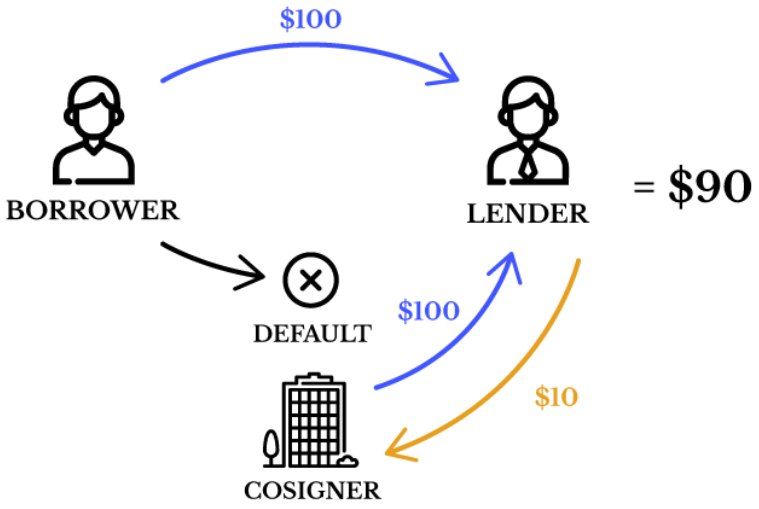
[Formula 3: *Cosigner full premium components*]

This formula explains how the Cosigner collects his premium and reveals the components that factor into the premium. The same formula also works to reveal how the Cosigner might (i) deal with future default events in unexpected or worse scenarios, (ii) undertake the expenses of his work, and (iii) leave a profit margin to participate in the Ripio Credit Network.

Summing up graphically:

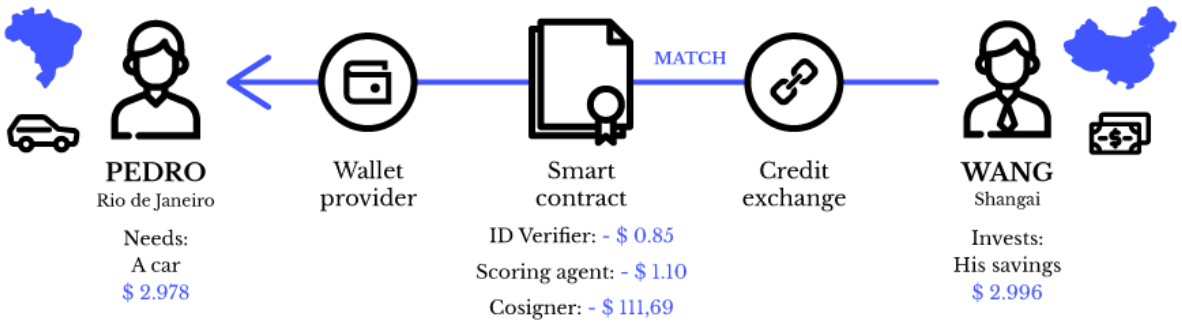


[Diagram 1: *a regular P2P loan*]



[Diagram 2: a P2P loan with Cosigner]

4.b. The Vision of an RCN Use Case



[Diagram 3: *RCN use case*]

Pedro, a student from Rio de Janeiro, wants to buy a car so he can more easily go from his workplace in Leblon to the Federal University of Rio de Janeiro in Maracaña, where he studies. Pedro requests a loan from his Wallet Provider for BRL 9,799 (USD $2,978). The Wallet Provider generates, fills, and signs a smart contract with an amount request in RCN equivalent to BRL 9,799 and broadcasts it to the network, including terms such as the interest rate and the number of installment payments Pedro will make. The smart contract is then completed with data from the ID Verifier, Scoring Agent, and Cosigner.

Wang, a Juneyao Airlines employee from Shanghai, has CNY 20,000 (USD $2,996) in savings, and he is not planning to spend these funds for awhile. He decides to invest that money in a P2P loan, so he makes an order with a few requirements (interest rate, due date, etc.) via a Credit Exchange.

The smart contract is then settled in RCN, however, the value of settlement is represented in US dollars ("USD") in accordance with the data supplied by the Oracle. The equivalent to USD $0.85 in RCN goes to the ID Verifier, USD $1.10 in RCN goes to the Scoring Agent, USD $111.69 in RCN goes to the Cosigner, and USD $2,978 in RCN are transferred to Pedro's Wallet Provider. Then, the Wallet Provider trades those RCN for the amount in BRL that Pedro requested as a loan to buy his car.

Pedro is now committed to return a debt of USD $2,979.95 in 24 monthly installments of USD $136.14. Thus, Pedro agrees to return an amount that includes the commissions of the ID-Verifier and the Score Provider and Wang pays the Cosigner fee. The internal rate of return for Wang is slightly lower than 9% and the interest rate paid by Pedro is slightly higher than 9%.

Summing Up

__ID Verifiers__ get RCN Tokens in exchange for verifying the Borrower's identity. __Scoring Agents__ receive RCN Tokens in exchange for providing data related to, and rating, the Borrower's creditworthiness. __Cosigners__ collect a premium in RCN Tokens in exchange for cosigning the smart contract along with the Borrowers. When a Lender agrees to the smart contract listed on the Credit Exchange, RCN Tokens that have, per the Oracle, a corresponding funds value in a specified currency in the amount of the loan, are sent from the Credit Exchange to the Wallet Provider through the smart contract. Finally, the Wallet Provider trades RCN Tokens for the Borrower's local currency and provides the Borrower with the funds accordingly.

4.c. Ripio Credit Network Development Roadmap

Milestone: Testnet
ETA: August 2017

Description:
RCN Tokens and initial network agents are deployed via a testnet environment to perform simple loans without installments and corresponding tests prior to the TGE and network launch. An Oracle (which returns fixed prices and exchange rates) is deployed to perform simple loans based on smart contracts: i.e. loans without installments (zero coupon bond). A credit exchange interface is built into the RCN test-net so as to allow testing of interactions among lenders, wallet provider, and network.

Time-estimate: 1 month

Milestone: TGE & Network Release
ETA: October 2017

Goals:
- Oracle MainNet deployment.
- RCN Token crowd sale begins.
- RCN development team growth.
- Linking of the current Ripio Credit product to the network.

Description:
The Oracle now functions within the RCN network and is also linked to the existing Ripio Credit product. Acting as the network's first user, as a Wallet Provider on the Borrower side, the Ripio Wallet builds simple smart contract-driven loans and broadcasts them to the network tested on the previous stage. RCN holders (contributors who bought RCN tokens during the crowdsale) are now able to interact with Credit Exchanges connected to the network and use their RCN tokens as capital for these loans requests.

Further development of the RCN protocol is documented and specifications are mapped out (agents, contracts, interfaces, technologies, etc). This stage includes the addition of new members that will build up the development team.

Resources:
Technical architects, software engineers, blockchain experts, web designers, content managers, and UX designers.

Expected Deliverables:
- RCN protocol documentation (diagrams, written records, etc).
- Initial network agents deployment (results report).

Time-estimate: 2 months

Milestone: Full scale completion

ETA: December 2017

Goals:
- Implement of advanced smart contracts, RCN agent interfaces, and SDKs.

Description:
This phase will see the implementation of advanced smart contracts and SDKs. These additions allow third-parties to join the network as RCN agents. The RCN smart contracts now have the capacity to generate advanced credit requests, manage due dates, and allow payments in installments, among other actions. The ID Verifier interface is now defined and implemented, as well as the Cosigner and Scoring Agent interfaces and their roles within the network. In addition, the Credit Exchange is implemented in order to support smart contract trading and represent peer-to-peer loans.

Resources:
Blockchain experts, developers, project managers, DevOps, web designers, and UX designers.

Expected Deliverables:
- Documentation of advanced smart contract functionality, along with SDKs for RCN agent roles.
- The smart contracts' solidity source code will be published on Github and/or other repositories, including the release of SDKs and related agent integration tools.

Time-estimate: 4 months

Milestone: Network development

ETA: March 2018

Goals:
- Build the RCN business development team.
- Drive business development efforts to bring new network players as participant agents.

- Participation in events within the Ethereum community.
- PR & Marketing activities to increase network awareness.
- RCN performance analysis (KPIs, cost, metrics, stats, etc.).

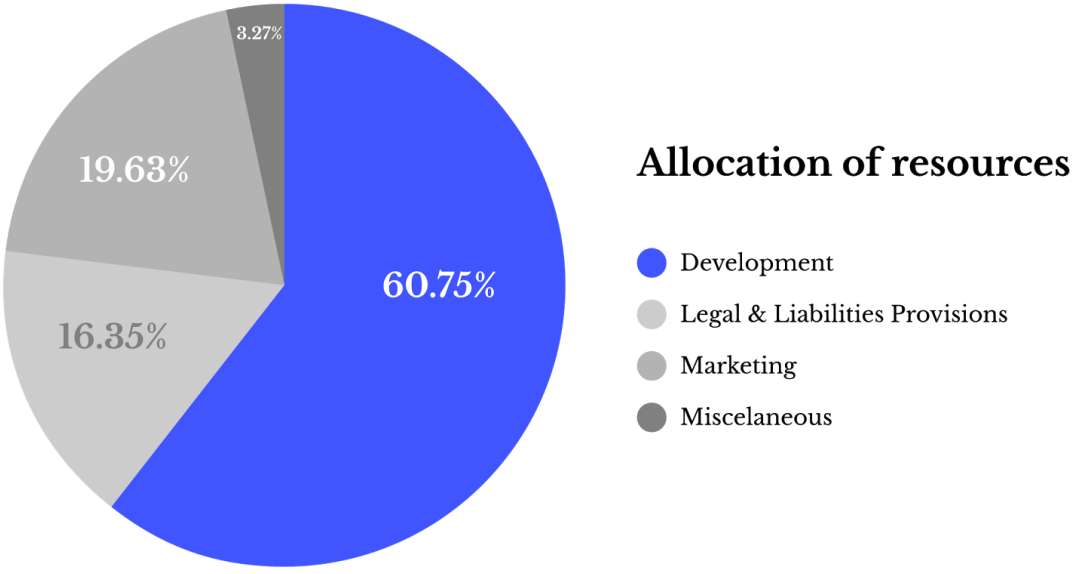
Description:
The RCN project has significantly matured and is ready to grow exponentially by adding new participating agents. In order to achieve this, Ripio builds a business development team that works with several strategies (PR, marketing, event participations, sponsorships, etc.) focusing on the network development.

Resources:
Business developers, marketers, growth hackers and business managers.

Time-estimate: Ongoing

4.d. Allocation of Resources

To reach the development milestone goals described above, the funds provided by sale of Tokens following the TGE and RCN Token crowd sale are expected to be allocated as follow:



- 60.75% of the resources will be allocated to the development of the Ripio Credit Network, which includes hiring and growing a development team, implementing RCN business strategies, and others related expenses.
- 16.35% of the resources will be used for the legal, tax, and related corporate structure fees, and for potential liabilities of the RCN.
- 19.63% of the resources will be part of the marketing budget to promote the Ripio Credit Network.
- 3.27% of the resources will be kept for miscellaneous and other unforeseen expenses.

-

5. The Team Behind RCN

Ripio operates behind an accomplished team of developers and marketing and finance experts, offering several digital payment solutions for various segments of the Latin American population.

The Ripio team

Sebastian Serrano

Founder & CEO
Former DevsAr CEO

David Garcia

SVP & Board Member
Former PayU Country Manager

Luciana Gruszeczka

Compliance Officer
Former DevsAr co-founder

Andres Fleischer

Head of Operations & Admin
Former IBM Admin Analyst

Eugenio Cocimano

Actuary & Data Scientist
Former Risk Data Analytics at Banco Galicia

Melody Bohn

Controller
Former Fin Director at Schweber Securities

Juan Mendez

Head of Growth & Content
Former Yum Yum Videos content manager

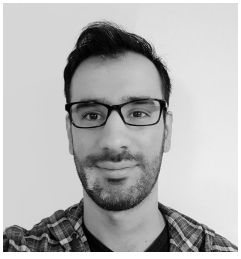
Bruno Acorsi

Head of Support & CX
Former Head of Support at Accenture

RCN Core Developers

Antonio Ceraso

CTO & Lead Blockchain developer
Former Lead Dev at devsAr and Security Consultant at Patagonia Bank



Facundo Rodriguez

Blockchain developer
Former Full stack Dev at Gobierno de Neuquen (Arg)

Pablo Lefort

Full stack developer
Former Full stack Dev at Gobierno de Buenos Aires (Arg)

Agustin Aguilar

Mobile developer
Former Full stack Dev at Garcia Corado S.A. & Outland Logistics

Significant Ripio Investors

Tim Draper

DCG

Funders Club

Boost.VC

Pantera Capital

Fenbushi Capital

Huiyin Blockchain Ventures

Medici Ventures

RCN Advisors

Sergio Demian Lerner
Co-founder & Chief Scientific at RSK

Juan Llanos
Fintech & Regtech Lead at Consensys

Jeff Stewart
Co-founder & Chairman at Lenddo

6. Conclusion

The importance of the credit system as one of society's most accomplished collaborative efforts is unquestionable. Most great ideas would have never seen the light without sharing funds from different people.

In this line, the longstanding contribution of traditional banks in the worldwide economy must be acknowledged. However, due to traditional banks' credit selectiveness, renowned bureaucracy, and high-brokerage costs, the question now presented is whether this system can be improved.

In recent years, new credit and lending alternatives have emerged based on the Internet and P2P technologies. These alternative solutions improve most traditional banking services by covering a larger segment of the population and offering new project viabilities. Still, they present a structural problem in that it remains difficult for a lender to have a diversified portfolio in order to mitigate default risks.

RCN aims to strengthen the solution provided by most P2P platforms and magnify its potential. Based on the Ethereum blockchain's ERC20 protocol, Ripio will launch a **credit network operating on cosigned smart contracts**, and connecting borrowers, lenders, and cosigning agents. The cosigning agent undertakes insuring a sufficient volume of credit transactions to predict its own return on investment, to manage the debt, and to collect the funds in case of borrower default.

Ripio Credit Network sets the stage for a decentralized, trustworthy, predictable, and more efficient P2P global credit network that can make it possible for many ideas and projects all over the world come to fruition.

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