This document presents the main requirements for the solution **BCMLOAN (Blockchain Microloans)**

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## Goal

The client requires an application supported on Blockchain technology to execute microfinance loans creating trusted credit histories. This application is addressed towards under-banked individuals without a credit score or history and seeks to support the growing number of small businesses and expand financial inclusion. Considering the security for our client, the application will guarantee that sensitive data will be recorded in a safe way and the information of the transactions will be recorded in the blockchain ledger to have the credit history of each borrower.

## Measurements

Some of the metrics that can support the achievement of the goal are:

- Calculate the number of loans per month
- Calculate the number of lenders per month
- Calculate the number of transactions in the ledger
- Validate and calculate a complete track of the transactions for a borrower

## Problem statement

Microfinance has the ability to provide loans to impoverished communities both in developing countries and here in Canada. The problem is the cost of the existing auditing methods outweighs the benefit of tracking the small amounts that have been loaned out, resulting in much of the world's population not having access to loans and here in Canada many are forced to pay high interest rates (often over 300% annualized) in order to cover the cost of loans that have defaulted. Creating an ERC721 non-fungible token (NFT) would allow loans to be traceable in an affordable way which would pave the way for both financial institutions and decentralized projects to enter the microfinance loan market.

## Stakeholders

Who is involved?

- Lender
- Borrower

What are the roles that they play?

- **Borrower:** A borrower requests a loan for a particular amount of money from the EOA address. Once the loan is approved by the lender, the borrower will receive an NFT token that can be exchanged for the loan amount.
- **Lender:** A lender creates an NFT with an amount of money to be lent to a borrower, the interest rate, and due date. The lender will pay some gas to commit the transaction.
- **Borrower:** A borrower pays the loan + interest in back to the lender.
- **Lender:** A lender receives the payment of the loan with interest.

What are their restrictions?

- Immutable data (no changes).
- No central owner (distributed computers).
- The borrower cannot lend the loan to another user.
- The borrower can have only one loan at a time.
- Only an individual with an admin role can have access to the sensitive data of the borrower or lender.

## State data (store data)

- Data with the personal information of the borrower will be stored in an external database.

- Data related to a request for a loan will be stored in the ledger (address of borrower, address of the lender, amount of the loan, date of the transaction, NFT ID, interest rate, due date, amount owed to payback).
- Data related to the payment of a loan will be stored in the ledger (address borrower, address of the lender, payment amount and due date).
- Oracle. The application has an oracle that tracks the current interest rate. These rates will be updated by a web service and consulted by the main contract before a loan is approved.

### Assumptions

Considerations for the solution that are not implemented considering the limited time.

- Digital identity is one of the main problems in microfinance loans. This problem is associated with the limitations to confirm the identity of the lenders and borrowers, which can increase the risks in the payments of the loans as well as the sources of the money to be borrowed. In this application, the validation of the ID of a borrower will be off-chain. We assume that an external authority validates the identification (passport, driver license, KYC, etc.) of the borrower previously. This application will receive a notification with a value (false or true) if the ID is valid or not. Considering this value, the transactions in the ledger will be executed.
- The validation of the interest rate by the borrower and lender is an off-chain activity. In this application, it is assumed that both borrower and lender have agreed with the interest rate before executing the loan.
- The exchange of the NFT for any coin is the responsibility of the borrower.

### Restrictions

- Are there restrictions by roles/users?

  Only the borrower can check his personal information (ID, name, address, phone number, etc.)
  Regulators require the permission of the borrower to check the credit history.

- Are there date/time restrictions?

  Restriction to execute the payment
  Restrictions to send a loan

- Are there technology restrictions?

  Considering the amount transactions, the application could have some limitations in the interoperability and scalability.

### Exceptions

- Can any of the rules be broken under certain circumstances?

  The credit history could be checked in case of government investigation (drug cartels, money laundry).