



**UNIVERSITY OF
WESTMINSTER**

**INFORMATICS INSTITUTE OF TECHNOLOGY
In Collaboration with
UNIVERSITY OF WESTMINSTER (UOW)**

BEng (Hons) in Software Engineering
Final year Project 2018/2019

Project Initiation Document for

Comparison of possible consensus algorithms
that can be adopted on a blockchain for a data
sharing platform for Microfinance institutions

By Kumaranath Fernando 2014051 w1534103

Supervised by Sudharshana Welihinda

Kumaranath Fernando

Sudharshana Welihinda

Abstract

Sharing loan borrower information between the credit agencies is vital to sustain the growth of the microfinance industry. In the event of a borrower unable to pay off the debts, borrowers with multiple loans from multiple microfinance institutions, borrowers eluding away with finances obtained with malicious reasons or not settling the loans in a timely manner for any other reasons, such people should be barred from obtaining further loans in the best interests of both parties the lender and borrower. At present, the said sensitive information is stored on centralized data stores. This poses several key risks and issues of unauthorized data manipulation and a single point of failure being the strongest of them.

Blockchain is gaining popularity as an immutable distributed technology. As there's no central authority monitoring the actions on the blockchain, in order for blockchain to make decisions the nodes in the network need to come to a consensus using a consensus algorithm/mechanism. This research investigates and critically analyzes popular consensus algorithms available based on various factors as fault tolerance, message delays out of which the best suited algorithm is selected to be used for a proof of concept implementation for sharing blacklist loan borrower information in a permission blockchain environment. This research also aims at reporting the findings of the research to be used potentially for future research.

The permission blockchain chosen here was Hyperledger Fabric and the reviewed algorithms were PBFT (Practical Byzantine Tolerance), HoneyBadgerBFT and Kafka. Based on evaluation HoneyBadgerBFT was chosen as the most appropriate for the data sharing platform.

Keywords:

Blockchain, Consensus mechanisms, Microfinance