The Case for CULedger

A Credit Union Industry Owned Distributed Ledger Platform

CULEDGER

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Executive Summary

Blockchain 101 – What and Where is it Happening?

The first step to consider some background in terms of what makes this technology so interesting and so special.

Blockchain technology, which underpins bitcoin, has several interesting attributes.

There are two main types of Blockchain Technology

- Permissionless: think Bitcoin and Ethereum.
- Permissioned (sometimes 'distributed ledgers' or 'replicated shared ledger'). Think CULedger.

Permissionless Blockchains are wide open and operate as a completely decentralized ledger. Every transaction is cryptographically chained (or connected) to the previous transaction. The goal is a permanent, immutable and verifiable "record of truth" that everyone can see. The lack of censorship, complete visibility and total transparency creates a kind of "creative abrasion" amongst the users. The nature of a Permissionless Blockchain network is "censorship resistant". The theory is that no one person or entity can edit chained entries. A statement of truth, for example, a transaction between two people, then becomes unchangeable. As an aside, highly regulated industries like financial services and the credit union industry specifically, appreciate the theory involved but federal regulators nevertheless have a hard time accepting that today, no controls exist anywhere regarding an unpermissioned network. Very scary for that group of professionals.

In contrast, a Permissioned Blockchain platform will more often than not, be far more appealing to an industry like the credit union industry or to a large banking enterprise. Why? For one thing, lets suggest that one of the biggest challenges with banks and credit unions, is the cost of paper. Paper, in the world of a financial institution is a version of truth that we can all agree on.

There have been many different initiatives intended to remove paper from the economy. However, in many cases the new technology has simply recreated old processes in a new way, or has led to solutions which may even require more paper. Paper, as mentioned above, represents a "trusted truth". For example, the process of signing a check has now been digitized by creating a check card, debit cards etc. This model, however, continues to work on the same network and platforms that have been in use for years and years. In other cases, such as rental

agreements or car loans, there is a continuing need for a piece of paper that will hold up in court, the agreed upon truth.

What's possible now is that a Permissioned Blockchain technology could, in contrast, replace certain paper-based processes with automated software processes which are genuinely different, because of the way many of these technologies work.

The trick is in something called "consensus" on the ledger. Just like in a room full of people, computers use algorithms to reach consensus about the truth or in the example above, a rental agreement on paper that will hold up in court.

The very big and costly stark comparison today is that every bank, insurance company, government agency, credit union, or law firm has their own paper copy of truth for every transaction.

From regulatory reporting to derivatives settlement to lending paperwork, the various blockchain technologies could be used to transform key service industry sectors, reducing cost, increasing the speed and transparency for data and reducing reliance on paper.

With that in mind, here's some additional reasoning suggesting pursuit of this technology.

Per a World Economic Forum report published in 2016:

- 24 Countries are investing in Blockchain
- 80% of Banks are beginning Blockchain projects
- Just in the US, over $1.4 Billion in Blockchain investments in the last 3 years
- 90% of the world's Central banks are engaged in Distributed Ledger Blockchain discussions
- >2500 Blockchain patents have been filed the last 3 years

Lastly, new Blockchain consortiums are springing up, it seems, everywhere:

- CULedger
- R3 CEV - Banking
- Hashed Health - Healthcare
- Asia – SBI Holdings
- The Blockchain Alliance – Broad membership
- IBM's Hyperledger
- The Global Sovrin Foundation – global identity
- The Wall Street Blockchain Alliance
- Enterprise Ethereum Group

And it goes on and on!

What's a CULedger and Why Does it Exist?

Just two years ago, a small group of CU professionals came together and began to articulate a vision. It was big and it was audacious then and it remains audacious today. What if a new technology called distributed ledger technology could be utilized by our industry to not only reduce our costs, but what if it could greatly reduce call center fraud and identity theft? What if we could create greater brand awareness for the credit union industry? Would it be possible to create significant growth for the industry, not just for a small number of credit unions, but all of them? What if the credit union industry ***owned and controlled*** a revenue producing technology platform that supported an entire industry? Are those things even possible?

The answer is yes. For the first time, that technology exists and is now in use in the credit union industry. It's called CULedger and it's a prototype "research to action" industry initiative designed to stand up a specific set of use cases to first prove the merits of the platform and second to launch both existing products as well as new and highly competitive products across the entire industry.

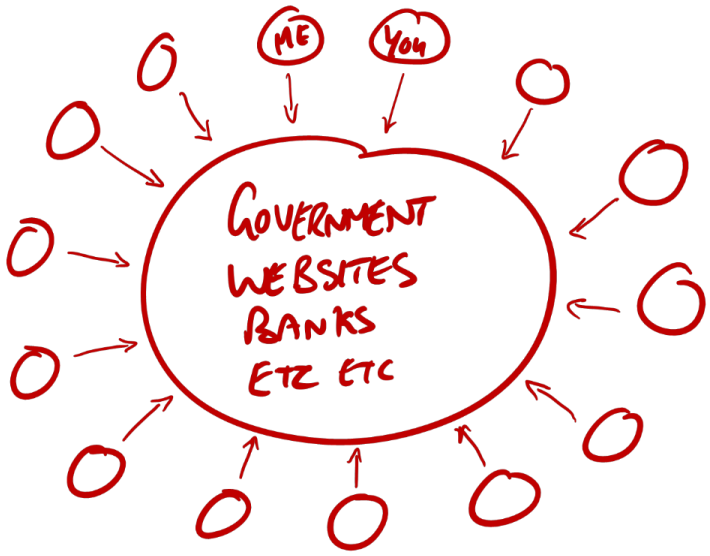
What are the Problems That Need Solving?

A solution only works if you are solving problems. When it comes to Distributed Ledger Technology (DLT), the possible use cases are endless….in fact, the only limits involved are the imaginations of the leaders in the brave new financial services world…. welcome to the credit union industry of the future.

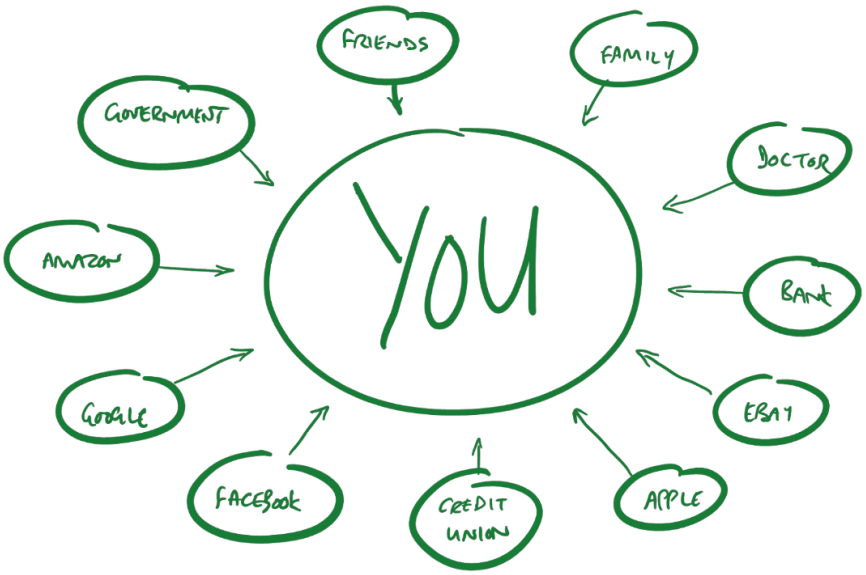
Following are just a couple of the possible applications currently under pursuit by the CULedger team but first, let's tackle the concept of Identity.

The concept of a person's identity is the most sacred part of who they are. Today, without identity, sometimes you can't shop at a brick and mortar store or go shopping online, you can't drive a car (legally), buy insurance, buy a home, join the military, travel internationally, vote (in some cases), immigrate, get a library card, pick up your child from school, bank, do your taxes, go to the movies, pay your bills, work online, pickup your mail, take out a loan, or pay a loan. Your identity is the most fundamental part of a person and it really should be yours meaning it should be self-sovereign. Today, it's not. Yes, we freely allow companies that make burgers or sell flowers or do welding, all fantastic professions by the way, the ability to manage our personal identity, but worse, we then allow them to sell our identity to the highest bidder. That's one of the things we will change with the CULedger initiative.

So, what does Identity look like today? In the diagram, following, you and I must ask permission to ***give*** our personal data to companies that we want to do business with. They ask us to check a box and read a big document if we want to do business with that organization. We always agree (even though most of us lie and say we read it) and then, our personal information is almost always eventually sold. If that sounds backwards, it's because it is.



One of CULedger's missions is to work at shifting that paradigm to self-sovereign identity with the help of our technology partners. That looks like the diagram just below.



It's a complete inversion that puts identity in the hands of the real owner, the consumer. Believe it or not, large on line service providers should not control your online identity. The consumer should be the "keeper of identity", not a fast food joint, or a butcher, baker or candlestick maker. CULedger's prediction is that sooner or later you will.

CULedger Proof of Concept – Call Center Authentication

The CULedger teams have developed a proof of concept that uses identity as a primary consideration. In August 2016, our CULedger technology partner, Best Innovation Group (BIG) led by John Best, and our identity partner, Evernym, jointly reviewed a series of common use cases that could apply to all Credit Unions, independent of their details or core configurations. Since that time, BIG and Evernym have worked with various stakeholders inside CULedger to reach the conclusion that *out-of-band authentication for members calling the call center* is the most compelling first use case for a Proof of Concept to demonstrate these technologies, and conducted research into the design and implementation. This next phase is focused on delivering a demo which shows the technical feasibility of using the Sovrin Identity Network developed by Evernym to provide a stronger and lower friction authentication experience for members when interacting with call center agents.

This Proof of Concept will be demonstrated live in early May, 2017 at the upcoming National CEO Roundtable in Tucson.

When it comes to self-sovereign identity, please don't take my word for it… As a suggestion, you might consider some of the below research.

http://www.coindesk.com/path-self-sovereign-identity/

https://www.uport.me/

https://www.evernym.com/

https://www.sovrin.org/

http://www.objecttechgroup.com/

http://www.windley.com/archives/2016/04/self-sovereign_identity_and_legal_identity.shtml

Next, the brave new world of smart contracts is here.

Smart contracts will do several very important things for the credit union industry but there is one very big thing it will do. Smart contracts will save credit unions lots and lots of money.

"Smart contract" is a term used to describe computer program code that is capable of facilitating, executing, and enforcing the negotiation or performance of an agreement (i.e. contract) using Blockchain technology. The entire process is automated, can act as a

complement, or substitute, for legal contracts, where the terms of the smart contract are recorded in a computer language as a set of instructions.

Smart contracts software is the code that becomes an agreement, the terms which can be installed with the ability to self-execute and self-enforce. The agreement/software allows two unknown parties to complete a fair exchange of value.

Imagine as a retailer, you sign a smart contract including several key clauses that could automatically execute. The purchase was 500 televisions currently in a shipping container off a port located in Seattle. If we assume some Blockchain technology of choice is helping keep records in sync between multiple parties (e.g. which shipping container contains the televisions), then Smart Contracts are the logic layer on top that allow for "if this, then do that" conditions to be directly tied to the smart contract.

Taking our television example further. What if the buyer/retailer had agreed they would buy 100% of the televisions from the seller but only as long as the market price for televisions stayed above a certain retail price? A smart contract would record this "clause" in the same way a paper contract would. The difference however is if the price of a television fell below the agreed to price, the smart contract could change the purchaser of the televisions back to the seller.

The list of smart contract use cases is essentially endless and they cover every industry imaginable, in fact, wherever trade, transactions, and business occur will, at some point, use smart contract technology.

Related to the credit union industry, below is a short list of possible use cases that CULedger will consider as the CULedger network matures:

- Real estate titles
- Automobile titles
- Lending including signature and personal, student and auto.
- Credit union membership
- Mortgages
- Insurance of all kinds including auto and home
- Card Issue
- Supply Chain
- Securities
- Human Resources
- Remittances, both domestic and international

- Third party agreements between vendor suppliers

CULedger Proof of Concept -Loan Participations and Money Transactions

In consideration of the above use cases, CULedger leadership has identified another use case called Loan Participations and Money Transactions. The goal of this POC is to begin to show the value of Distributed Ledger Technologies for Identity management and point to point credit union financial transactions. One of the features of this POC will utilize Distributed Ledger Technologies to execute contracts in seconds, not days. Loan participations, for example, can allow the CULedger network to create the development of a bidding platform where CU's can bid on loans from other credit unions. A normalized lending participation network would also allow for increased throughput for higher risk applications like Student Loans.

The above represents just a couple of the early possibilities regarding the CULedger initiative. By this summer, CULedger will consist of an entity and ownership opportunities for credit unions and other investors from across the entire industry. CULedger will provide an opportunity to re-launch the bedrock services and solutions that we have always provided our membership but it will also provide a Launchpad for new innovations that can provide true growth for a truly great industry.

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