

The Blockchain Vending Machine proposal

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This idea was inspired by my observations of the auditing efforts for a large pharmaceutical company that I was associated with recently. The company has audit problems associated with “risky” behaviors and auditing is helping to build tools to detect those. That’s where I think blockchain would really help since currently it is an ad hoc process to get people to follow and record compliance agreements and policies. Getting signed agreements in a blockchain would likely help a lot.

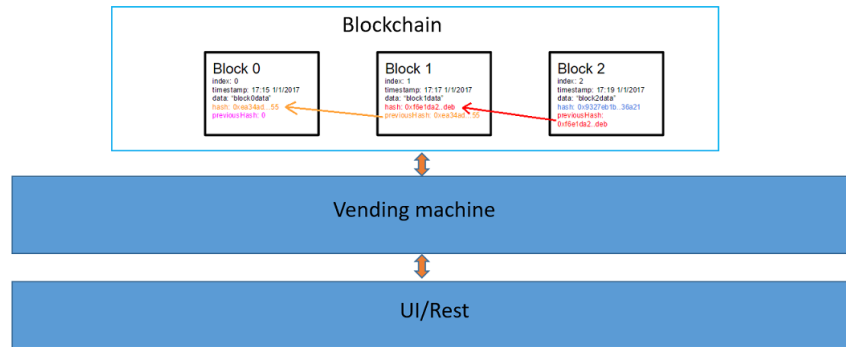
Further conversations at the Future Technologies Conference in Vancouver last November, where I presented a cryptocurrency design and pitched a whiteboard-in-the-cloud metaphor for blockchain, and takeaways from another blockchain project for involving royalty remittances recently have solidified the following idea.

If you start talking about blockchain hashing and cryptography concepts with non-technical users they will zone out pretty fast. See the Dilbert cartoon below. And how to get started? Confusing! (Ethereum, Quorum, Corda, etc. etc.) We need deep (rare and expensive) technical help! So the idea is just to focus on what blockchain can do for a client in a simple-to-use way. The metaphor would be something like blockchain is a whiteboard in the cloud that you write contracts/agreements/transactions to that are global yet private to stakeholders, immutable, signed by all stakeholders, and chained into a history. If you could just self-serve something like that out a vending machine and get people up and running quickly I think this is a use of blockchain that many clients can more easily get going with. Behind the curtain there is an openly available, permanently running blockchain system that hammers out the immutable transaction chain in a redundant network.

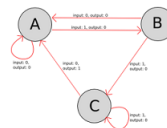


The Proof of Concept (POC)

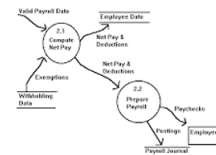
The initial system will consist of a Blockchain, dapp (decentralized app) Vending Machine, and a User Interface, as shown below. The Vending Machine will likely be an Ethereum Smart Contract. Interactions will be done via a browser interface or REST interface for automated/batch processing.



Signed document



State machine



Data flow

The Blockchain Vending Machine

The Vending Machine will dispense three types of dapps (decentralized apps):

- Document
- State Machine
- Data Flow

The *Document* dapp is a uniquely identified entity that is shared among a set of stakeholders, each of which is transparently issued certificates for encrypting/decrypting the document and signing the Document. Transactions on the Document consist of creating, signing, and updating the Document. Updating the Document creates a new version chained on the previous version. The document is a general purpose dapp with myriad free-form uses. For example, it could be used to record an acknowledgement of an audit policy. It will also contain tags for search enhancement.

The *State Machine* is a common useful dapp for processing a progression of status changes. For example, the sale of a barcoded bottle of wine might progress from “produced by winery” to “for sale at retailer” to “sold to customer”. Once sold, any further sales with that barcode will be detectable as fake. Each state change will be signed by the appropriate party.

A *Data Flow* dapp captures the familiar notion of data input, process, and output. For example, a sales event might trigger the calculation and issuance of a royalty. The code in the process nodes is public to each stakeholder and signed by them as well for validation purposes. One or more popular coding languages could be supported. Alternatively, a pipeline of graphical processing steps à la [Knime](#) might be used. The data is recorded in the blockchain ledger for later retrieval and inspection.

More advanced features

Additional capabilities could consist of:

- Key-value pairs.

- First order logic.
 - Complex smart contracts coded in full-blown programming languages are prone to bugs. First order logic is much more amenable to provability.
- Trees, graphs, etc.

Value

Being able to offer a fast, easy and flexible blockchain solutions will improve profitability.

References

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