

Beyond BitCoin: Blockchain for the Federal Market

An Intuitive Perspective

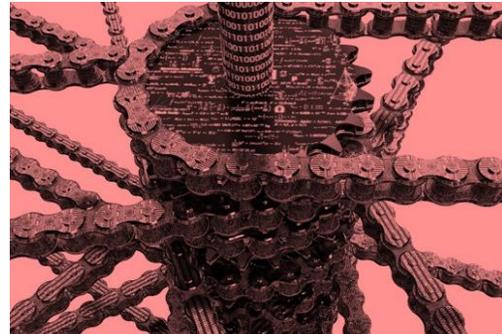
Background

As Federal Agencies increasingly understand the value of their digital assets and the number of cyber-security breaches that make the news climbs, Federal agencies are eager to better evaluate and adopt distributed ledger technologies (like blockchain) that use encryption and coding to improve transparency, efficiency and trust in information sharing. However, most initiatives are still in the earliest stages without well-defined use cases and the uncertainty created by recent stories about the volatility of bitcoin have created concerns about the security and viability of the technology. Agencies need to clearly understand their intended use and business case for this technology, even as it shifts from the Peak of Inflated Expectations into the Trough of Disillusionment (per the Gartner Hype Cycle for Emerging Technology, 2017).

Understanding Blockchain

Despite these concerns, Gartner believes that long-term this technology will lead to a reformation of whole industries, including Government. From mostly being a digital currency infrastructure, blockchain is evolving into a platform for digital transformation, an objective of Federal IT Modernization efforts that appear to be on the cusp of becoming reality with the passage of the Modernizing Government IT Act, which is bundled into the National Defense Authorization Act for 2018. GSA reports receiving use cases for: Financial

management; Procurement; IT asset and supply chain management; Smart contracts; Patents, Trademarks Copyrights, Royalties; Government-issued credentials; and Federal assistance and foreign aid delivery.



Like all emerging technologies there is a certain amount of hype, but more importantly Agencies need to understand practical considerations, such as: transaction costs, integration, technology readiness, business-model creation and efficiency.

Our solutions to date have been focused around using Blockchain as more than just a database to protect against illegitimate transactions, inconsistency and downtime (as more nodes are established).

Federal Uses and Lessons Learned

Blockchain has the potential to revolutionize how value is exchanged and transactions are conducted, whether that be in bitcoin or in the exchange of information. There is an explosion of formative blockchain initiatives and it seems more are announced every day. History tells us that many are destined to fail. Not necessarily because of the technology,

but the choices made early in the design phase of the project. Among our Lessons Learned on Federal and commercial blockchain efforts:

- **Embrace Decentralization.** One of the key business drivers behind Blockchain is building trust through consensus. Partners need to trust the overall system in order for it to be successful. One of the major benefits of Blockchain is the decentralized nature it provides to actors who may tend to shy away from yet another siloed solution or Federal regulatory database. Blockchain provides that distributed ledger that allows actors across the ecosystem to fully trust and engage in transparent manner.
- Distributed apps (Dapps) are an ideal format to interface with partners. With a Dapp, not only will the partners be able to standup a copy of the blockchain node, but they will be able to run the user interface to the blockchain from their local desktops. While nodes may run locally, the overall chain and all its nodes will hold a record of every transaction for which the Agency and its partners want to develop contracts.
- **Architecture Matters.** We believe that to increase your chance of success that you must architect for a purpose. There are several emerging taxonomies to help describe and categorize blockchain to enable understanding. The most recent is the Blockchain Project Ecosystem by Josh Nussbaum of Compound Venture Capital for grouping like efforts for analysis. Applying this taxonomy to an Agency's conceptual architecture has many components that cross blockchain functions and activities that will reveal the complexity of relationships and the value of an architecture to understand them. There is often a level of complexity that the Agencies and their

partners will need to navigate. A well thought out architecture will enable a better understanding of trade-offs and support informed decision making.

- **Standards are your Friend.** Longevity may be an oxymoron when talking about technology, however standards do tend to endure. We have found that incorporating standards is just as challenging and rewarding as work arounds that ignore them and introduce unnecessary risk to projects. They also tend to be cost effective and easier to communicate and document in the long run.
- **Thresholds Throttle Response Time.** Agency implementations will often be a closed ecosystem similar to a peer-to-peer network with member IT infrastructure hosting and mining their respective nodes. As a governance decision, once the architecture has been defined there are significant impacts on performance and response times to validate blocks. Any near real-time requirement an Agency may have will be impacted depending the governance decision made with respect to the:
 - Number of Transactions or amount of passed time to create a block
 - # of Blocks found for initial validation (e.g., greater than 50% of total nodes)
 - # of Blocks found for continuing validation (e.g., first 3 nodes confirming).

Conclusion

Finally, a lesson learned through our work, both in the Federal and commercial marketplaces, is that identifying and bringing aboard upstream and downstream partners is critical to the success of viable blockchain initiatives.

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