



Perspectives on Blockchain

A NOTE ON INNOVATION

The pursuit of innovation is necessary for the health and long-term viability of an organization. This is especially true in highly competitive business environments where technology, legislation or other external forces are constantly changing—at an ever-increasing speed. Innovation is key for market leaders seeking new business opportunities, commodity-driven organizations seeking efficiencies or cost improvements and every type of organization in between. At NASCO, we are committed to the identification, research and testing of innovative technologies, methodologies and business models to maximize value for our shareholders. We categorize the concept of innovation as either evolutionary or disruptive. Each are critical to the organization, but in different ways.

EVOLUTIONARY INNOVATION

Evolutionary innovation, also known as operational innovation, primarily occurs internally within an organization. It typically will not change the core business model of an organization or change the role of an organization within its ecosystem. These innovations start from the current state and improve it. They are more common, typically have a higher adoption rate and are easier for an organization to employ.

DISRUPTIVE INNOVATION

An innovation is disruptive if its implementation fundamentally changes how an organization operates or shifts the role of the organization within its ecosystem. Frequently, disruptive innovation occurs external to an organization, either through some new transcendent technology or through a novel approach to interacting with partners, customers or shareholders. Disruptive innovation may first surface in an entirely different industry. The emergence of Blockchain is a perfect example of a disruptive innovation that may have a profound impact across a number of industries, including healthcare.

Blockchain represents a fundamental shift in business practices from centralized control to distributed consensus. Transactional inefficiencies in the healthcare industry make it vulnerable to disruption.

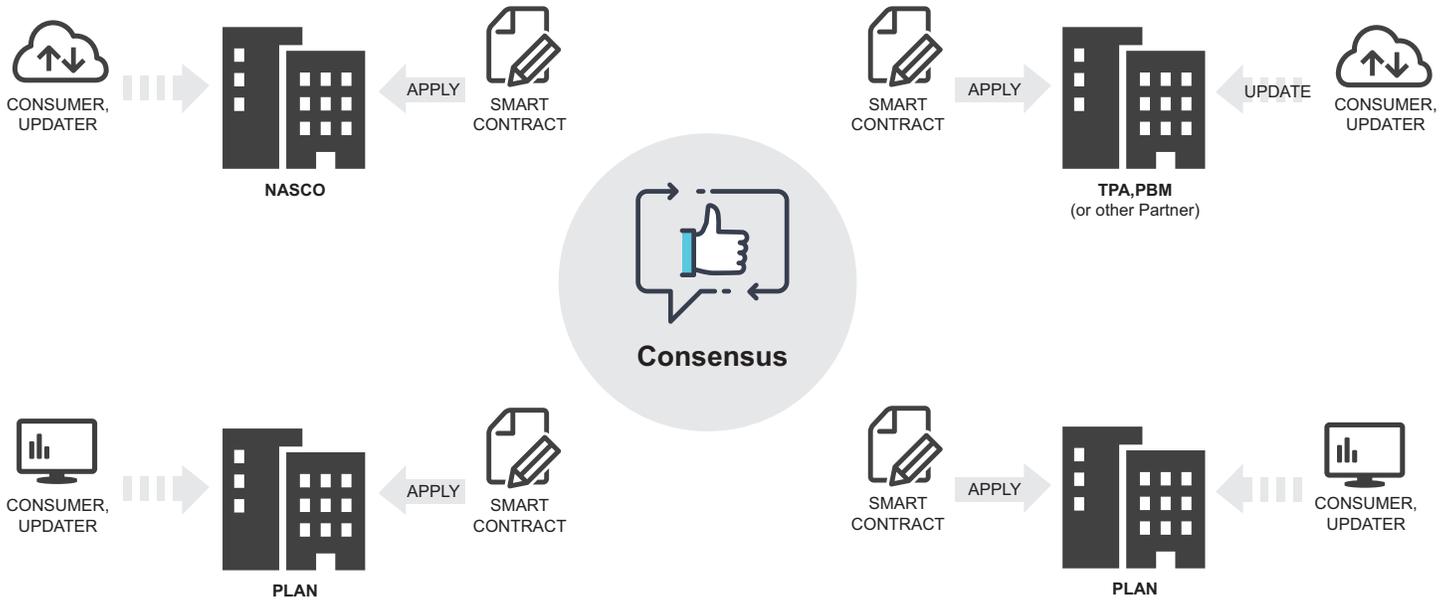
WHAT IS BLOCKCHAIN?

Blockchain is a distributed ledger used for the benefit of a network of participants who have agreed to an operating model and security model that eliminates transactional friction and enables trust between the parties.

Unlike most transactional environments today, in a Blockchain solution, no one party owns centralized control of the data; therefore, participants must agree on formats and protocols to participate. This has the potential to be a transformational concept for healthcare. Each participant maintains its copy of the information on the Blockchain, which is encrypted and permissioned. Each participant plays a role in evaluating the validity of any new transaction from any of the participants in a consensus model and employs a governed set of rules to append new data via smart contracts. The network of participants, consensus model and smart contracts are core to the integrity of the Blockchain solution. Additionally, as a ledger, records on the Blockchain are immutable. New transactions are append-only. Existing records cannot be modified once accepted by the participants.

The characteristics that make Blockchain such a compelling concept include:

- **Distributed algorithmic consensus** using cryptography to ensure transactional integrity
- **Transactional immutability** to ensure trust, auditability and traceability
- **Permissioned visibility** to specific information that can vary by participant
- **The network effect** on transactional integrity and overall security



BLOCKCHAIN TECHNOLOGY

While there are a number of current frameworks to implement a Blockchain solution — including Ethereum and Hyperledger — they are all somewhat immature, and our perspective is that they will evolve quite significantly over the next 18 to 24 months. At this time, while many organizations across industries — including NASCO — are engaged in proofs of concept with various Blockchain frameworks, it is too early to predict the framework that is most appropriate for healthcare or enterprises in general. What is important at this early stage is to learn as much as possible about how an existing ecosystem can employ a Blockchain solution to fundamentally reduce transactional friction and its associated costs, or to imagine entirely new business opportunities within the healthcare industry while potentially blurring the lines between healthcare and other industries.

NEW BUSINESS MODELS

A successful Blockchain implementation will change the business dynamic for the information and processes it encompasses, and will flip the traditional business model on its head. With a Blockchain solution, a governed consortium of willing Blockchain network participants share responsibility for the integrity and accuracy of distributed information, instead of a central authority controlling the security and integrity of the information and extracting revenue from others in the ecosystem. Centralized control of information invariably results in customizations of content, format, protocol and timing that lead to higher costs for all parties using the information as they deal with security, reconciliation and trust issues that are inherent in the consumption of external information. These are all examples of transactional friction that are common in the healthcare market.

APPLICABILITY TO THE U.S. HEALTHCARE INDUSTRY

Organizations typically begin the evaluation of Blockchain solutions with consideration for applicable use cases. To be clear, Blockchain is not appropriate for every business problem. Typically, it is most appropriate for scenarios with high transaction costs that cross enterprise boundaries where security, data integrity or interorganizational trust are concerns. High friction information flowing in and out of an enterprise comes with a cost for validation and reconciliation.

We believe that the U.S. healthcare industry and all of its constituents and participants can benefit from any number of thoughtful, well-organized implementations of Blockchain within the ecosystem. Claims processing, lifetime health record management, member and contract management, provider management and various financial and payment management domains are all potential opportunities for healthcare constituents to come together to eliminate much of the friction at the core of the healthcare cost debate.