Beyond Blocks

Biannual blockchain in
healthcare report
Volume 1

July 2019

WELCOME

For the past 25 Sundays I've sent out a free blockchain and healthcare with top stories and ideas. I'm proud that leaders from some of the world's top healthcare and life sciences organizations receive and read my newsletter every week.

Now twice a year I'm going to be putting out a report on the state of blockchain and healthcare summarizing 6 months worth of news. Whereas my newsletter contains week to week updates, this report will take a more high level look at industry trends and contain more long form commentary. As always, I'll be experimenting to find the best way to add value, and am open to ideas. This inaugural edition will be free, but future editions will likely not be.

2019 has been an exciting year. As I reviewed the stories I had curated for my readers I noticed three trends that stood out:

1.   Major new business networks are being formed

2.   Acquisitions and venture capital investment are at an all time high

3.   Supply chain applications of blockchain are seeing the most activity in healthcare

I highlight each of these trends in this report, unpacking the stories, giving context and sharing commentary. Further, there are a number of stories which are notable, but which didn't fit neatly into a trend that I've included at the end.

There is deeply important work being carried out today that has the potential to be the foundation for healthcare tomorrow. I hope this report serves as a useful guide to that work and can play some role in ushering in tomorrow's better healthcare system.
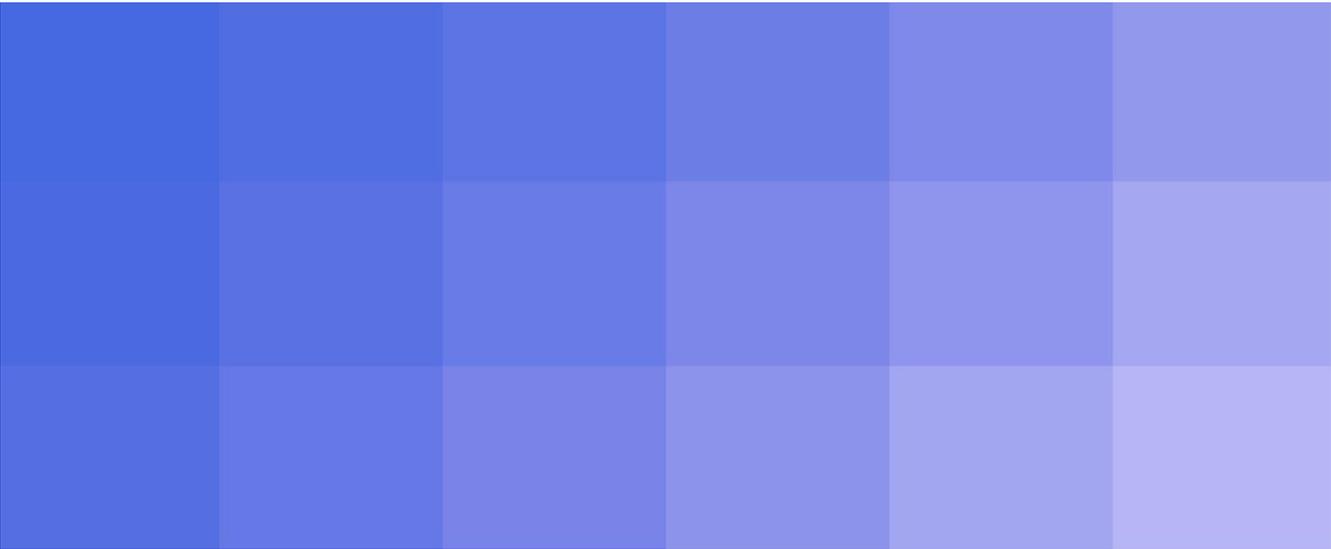
TREND 1

Major new business
networks are being formed

MELLODDY

Description

The MachinE Learning Ledger Orchestration for Drug Discovery project uses federated learning and a blockchain to allow businesses that would otherwise be competitors to collaboratively train a machine learning model used for drug discovery.

By breaking down barriers to sharing data MELLODDY hopes to create what is effectively the world's largest data set of small molecules and generate more predictive models to increase efficiencies in drug discovery.

The tech

Federated learning lets a network of computers train a single AI/ML model, but with each participating computer keeping their data on their device instead of sending it to a centralized center. A blockchain is used to orchestrate this process, keeping track of what data has been accessed, executing learning, and passing models between parties. By using a blockchain for this no single party controls the learning process, and each participant has transparency into what actions have taken place.

With these emerging technologies businesses gain the benefits of sharing their data *but without compromising their privacy*. It is the first of what I suspect to be many pairings of privacy preserving technologies with blockchains.

MELLODDY

Innovative Medicines Initative

The project is being ran under the auspices of the Innovative Medicines Initiative ("IMI"), a public private partnership between an office of the European Commission and the European Federation of Pharmaceutical Industries and Associations. In total MELLODDY has €18.4 million of funding, will last for three years, and findings will be open sourced.

A note on the participants and who is missing

An impressive roster of 10 pharma companies are participating, and will be joined by several technology partners. Projects under IMI are socialized to all relevant parties to see who is interested in participating, and it's interesting to note the big pharma companies which presumably declined to join.

While MELLODDY preserves the privacy of participants' data, *if a company has larger or higher quality data sets than its peers, they may gain less than their competitors do by collaborating.* In order to gain industry wide adoption there needs to be some kind of incentive system for rewarding outsized contributions to the network.

Pharma partners

Health Utility Network

Building off of their success in Food Trust, IBM has led the creation of a new consortia: the Health Utility Network, which is crafting a blockchain ecosystem for healthcare. The initial announced network included Aetna, Anthem, Health Care Service Corporation, and PNC Bank, but quickly expanded to add Cigna and Sentara Healthcare.

There are sparse details on what *exactly* the Health Utility Network is doing. Press releases have had boilerplate descriptions of what leaders hope to achieve, and multiple, often tangential, use cases are mentioned. Indeed, there has been much speculation at conferences about what use case would be tackled by this formidable group of enterprises. However, it's becoming clear that the lack of clarity around a use case is a feature, not a bug. The Health Utility Network isn't focused on one use case, but instead provides a platform for multiple use cases. There are definite trade offs with this approach. On one hand, you have a shared infrastructure with a diverse set of stakeholders and multiple potentially force multiplying use cases. But on the other hand, it becomes much more difficult to reach consensus between members on a governance structure without a clear vision for what the consortia will do and the value it will provide.

What use cases might they eventually take up? Participants seem to be still figuring that out, speculating they'll have use cases advancing in early 2020. Given the constitution of the network my guess is that early use cases will focus on paying for healthcare, and bundled payments as well as claims processing are two leading candidates.

Coalesce Health Alliance

The Coalesce Health Alliance is made up of NASCO, a health technology company owned by and exclusively serving Blue Cross and Blue Shield health plans, Blue Cross Blue Shield Massachusetts, Blue Cross Blue Shield Michigan, Express Scripts, and Horizon Healthcare Services.

As patients pay for healthcare and move between different parties they incur costs and these costs aren't always synchronized across the relevant parties. For example: a patient could hit their out of pocket maximum by paying their coinsurance to a provider for a procedure. They could then go to the pharmacy, where they are *overcharged* for a prescription because the pharmacy did not have up to date accumulation data.

This is the problem that the Coalesce Health Alliance is seeking to solve. They hope to use a blockchain to improve the accuracy and efficiency of patient healthcare claim accumulations across different entities within the Blues ecosystem. Moreover, the Coalesce Health Alliance makes it clear that they are interested in other use cases down the road as well. Separate to that the Blue Cross Blue Shield Association is orchestrating a blockchain coalition among their member health insurance organizations and companies. It's not clear how, or if, these initiatives will interact with each other.

TREND 2

Acquisitions and venture
capital investment are at
an all time high

Venture capital

Date	Name	Raise	Category	URL
5/8/2019	LunaDNA	$4,600,000	Genomics & Genetics	Link
4/4/2019	Veratrak	$1,300,000	Supply Chain	Link
4/1/2019	Genomes.io	$100,000	Genomics & Genetics	Link
2/20/2019	Embleema	$3,700,000	Health Records	Link
1/15/2019	Chronicled	$16,000,000	Supply Chain	Link

In the first half of 2019 we saw 5 publicly announced venture capital ("VC") investments into blockchain in healthcare startups. Overall just under $26m was invested, with Chronicled, who created the MediLedger project, taking an outsized chunk of that. Previously $25m was invested by VCs into 5 startups in 2018, and 3 startups garnered $10m in 2017. That means that investment into the blockchain and healthcare space is on pace to *double* in 2019. Not included here are some companies, like HealthVerity ($25m raise), which did not begin as blockchain companies, but have added significant blockchain offerings and gone on to raise significant amounts of money.

VCs review thousands of startups every month and it is quite literally their job to pick winners out of this crowd. They bring a level of rigor to the space that is notably lacking from Initial Coin Offerings, and can help companies accelerate development and scale their products. Moreover, beyond just cash, VCs bring huge value in coaching entrepreneurs, opening doors, requiring talent, and providing oversight. Their increasing interest is a sign of a maturing industry.

Acquisitions

Date	Name	Acquirer	Category	Value	URL
4/30/2019	BetterPath	Hu-manity	Health Records	N/A	Link
2/9/2019	Lumedic	Providence St. Joseph	Financials & Insurance	N/A	Link
12/18/2018	PokitDok	Change Healthcare	Financials & Insurance	N/A	Link
11/2/2018	DoveTail	EMIS	Health Records	£2.5m	Link

Lumedic, a revenue cycle management startup, was acquired by Providence St. Joseph Health and BetterPath, a startup with a suite of health data products, was acquired by Hu-manity.co. In the last two months of 2018 there were two other note worthy acquisitions: DoveTail, a startup focused on health records and consent, by EMIS for £2.5m and PokitDok, a platform focused on insurance, by Change Healthcare.

I've decided to include PokitDok in this list because of the focus on blockchain in Change Healthcare's press release. PokitDok's blockchain product, DokChain, was only introduced in 2016, which is after they had already raised $38m ($4m series A, $34m series B) in 2015. They went on to raise $17m more, but it's difficult to separate how much of that was driven by DokChain vs their other products. It's not clear how much of their business was driven by DokChain vs their other products.

Biotech meets fintech

Agenus, a publicly traded biotech company (NASDAQ: AGEN), made waves when it announced it was launching the first security token offering (STO) to fund drug development. Each token would represent a portion of potential future US sales of AGEN2034, Agenus' anti-PD-1 antibody currently in clinical trials, and Agenus was seeking to raise up to *$100,000,000* to put towards the development of AGEN2034.

These tokens gave investors the ability to invest in *a single product*. Previously the only way for investors to get exposure to AGEN2034 was to buy AGEN stock, which at a high level, is valued as a basket of products in market and in pipeline. Conceptually this is similar to the difference between buying a single stock versus buying an index fund containing that stock. The index fund represents a much more diversified product, but all of its parts may not appeal to you. On the other hand, the single stock may have a much higher risk/reward profile. Similarly, investing in this STO has a higher risk/reward profile as it is only tied to a single product in comparison to the more "diversified" AGEN stock.

There's nothing new about the *underlying asset of this STO per se,* but how this asset is packaged is new. Proponents of security tokens tout how they can automate compliance, better manage cap tables, fractionalize ownership, and increase liquidity. The key test, in my eyes at least, is whether these new capabilities are successful in attracting *new types* of buyers for Agenus' STO. There are well established avenues of funding that Agenus could have tapped instead of doing a STO, and perhaps they are still interested in this offering. But can a STO bring new buyers to Agenus? Is there demand for more risky, concentrated assets that traditional investors didn't have appetite for? Does fractionalization enable newer and smaller investors to participate? Will earlier liquidity lift valuations and entice new money to enter the market? Time will tell.

Health ICOs struggle

Name	Raised	Listing Price	Price 6/22/2019	Return
modum	$ 13,400,000.00	$ 0.49	$ -	-100%
shivom	$ 35,000,000.00	$ 0.05	$ 0.001	-99%
aidoc	$ 23,000,000.00	$ 0.23	$ 0.005	-98%
patientory	$ 7,000,000.00	$ 0.65	$ 0.016	-98%
medical-chain	$ 24,000,000.00	$ 0.32	$ 0.009	-97%
timicoin	?	$ 0.06	$ 0.002	-96%
curecoin	$ 6,800,000.00	$ 0.80	$ 0.071	-91%
nam-coin	?	$ 0.00	$ 0.0001	-91%
medibloc	$ 6,000,000.00	$ 0.02	$ 0.003	-86%
dentacoin	$ 3,000,000.00	$ 0.00	$ 0.00005	-84%
ambrosus	$ 32,000,000.00	$ 0.20	$ 0.043	-78%
farmatrust	$ 20,000,000.00	$ 0.01	$ 0.002	-71%
medishares	?	$ 0.03	$ 0.013	-59%
encrypgen	$ 1,000,000.00	$ 0.05	$ 0.028	-42%
lympo	$ 14,000,000.00	$ 0.02	$ 0.011	-36%
docademic	$ 1,100,000.00	$ 0.01	$ 0.009	-9%
Solve.Care	$ 20,000,000.00	$ 0.14	$ 0.324	127%

Healthcare ICOs continue to struggle with several tokens producing *deeply negative returns*, companies abandoning their token all together, the SEC getting involved, and a handful seemingly pivoting away from their token. One ICO, Modum, had no volume at all, making it effectively dead. Several others are on life support.

Typically ICOs have been tethered to the movements of Bitcoin, but as Bitcoin surged nearly 400% off of a bottom and regained the majority of its losses, healthcare ICOs decoupled almost entirely from Bitcoin. This is a significant departure from historical market activity and one that lays barren the truth about these coins: no one wants them or is using them.

Nonetheless, after a long winter and several healthcare projects failing outright to even raise money, a new guard of healthcare ICOs has emerged and has been successful at raising some cash. The newest healthcare ICOs have engaged in Initial Exchange Offerings ("IEOs"), which is the latest funding raising model to emerge from the crypto space, but practically has little functional difference from ICOs. These new health cryptocurrencies have not iterated on their predecessor's economic designs in any significant way, and so I don't have high hopes for them either.

Health ICOs struggle

Several non-market developments are critical in understanding healthcare ICOs. The first of which was a prominent healthcare ICO, SimplyVital Health, revealed they had been contacted by the SEC in May 2018 and were returning funds to investors in haste. For a short period in February there was a notice up and a series of legal documents up on their website, but since then those documents and any mentions of tokens have been scrubbed, though there are mentions of that notice still live on their [Twitter](). Without knowing the details it is hard to say what happened here, but it marks an incredible development for a company that reportedly had raised $30m and has been a staple of the community.

Other prominent companies have also sought to disassociate themselves from their token sales. doc.ai is another market leader who raised $10m, and though their token sale information is [still available](), any mentions of that page have been removed and you need to know the URL to reach it. To be clear, I don't know why they made this choice, and perhaps there is a totally innocuous reason for it, but it certainly speaks to the changing priorities they have and how they want to manage their public perception.

There exists one fundamental and inescapable problem for ICOs: no one knows how to create sustainable value. Cryptocurrencies are bleeding edge kinds of economic activity and the truth is we have no idea how to make sense of it all. We can't value cryptocurrencies in the same way that can value, for example, a share in a company. And as such, we don't understand the levers to pull on to create value in cryptocurrencies the way that we understand how to create value with traditional assets. Some day someone will figure it out, and that will unlock incredible value and completely new business models. But until then we need to be level headed about ICOs, recognize them as experiments, and be clear about the risks associated with them.
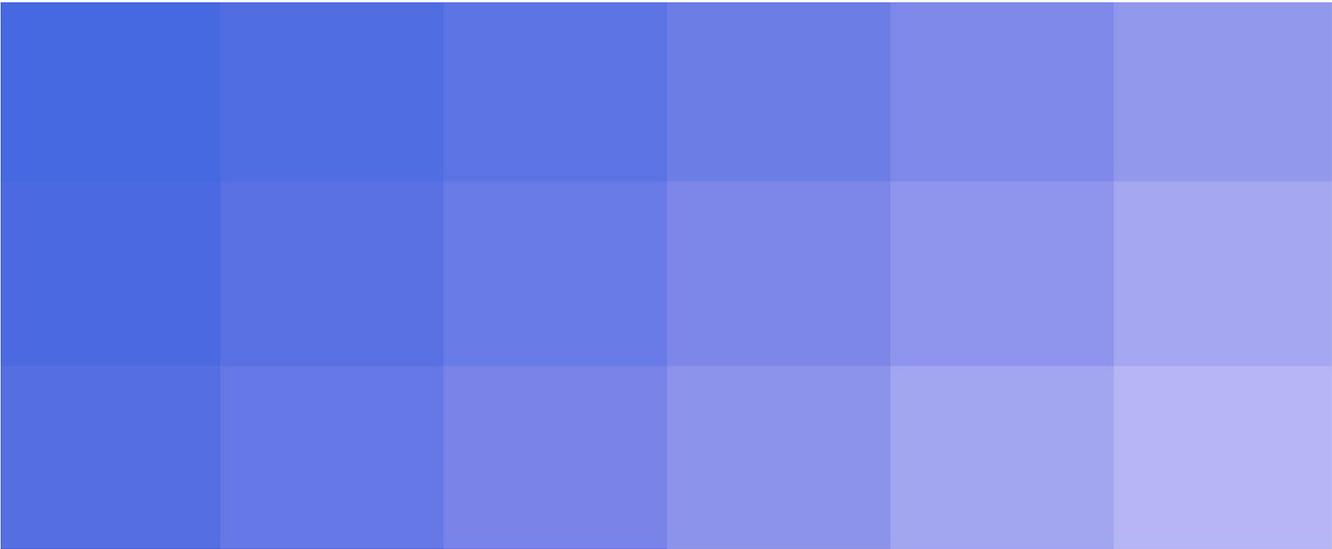
TREND 3

Supply chain applications of blockchain are seeing the most activity in healthcare

The FDA's DSCSA Pilot

Project Leads	Pilot Project Title
IBM/KPMG/Merck/Walmart	DSCSA Blockchain interoperability Pilot
IDLogiq	IDLogiq Next Generation Advanced REAL FIPS-Compliant Cryptographic ID Authentication with Transaction Ledger Powered by Blockchain/Distributed Ledger Technology for Decentralized Heterogeneous Global Network Computing Environment
MediLedger	MediLedger DSCSA Pilot
Rymedi	DSCSA Implementation in Intra and Inter Healthcare System Medicine Transfers
TraceLink	DSCSA Traceability with Distributed Ledgers and Digital Recalls Project Proposal
UCLA Health	UCLA-LedgerDomain: DSCSA Solution Through Blockchain Technology

The Food and Drug Administration ("FDA") has signaled an interest in blockchain in multiple avenues. In two different press releases they call blockchain out, no doubt in part due to the influence of recent hire Frank Yiannis, who previously was VP of food safety for Walmart and played a big part in Walmart and IBM's blockchain pilot FoodTrust. Most significantly they launched a pilot program for complying with the Drug Supply Chain Security Act ("DSCSA"), and though it's description doesn't mention blockchain directly, the pilot was clearly designed with blockchain in mind. When the list of pilot participants was released a few weeks later at least 6 out of 20 projects were using blockchain.

The FDA's DSCSA Pilot

Some of these participants were familiar faces, and some of them are new. IBM has been beating the blockchain drum for some time now, touting their success with Walmart in the [FoodTrust](#) project as a model for other industries. KPMG has a blockchain advisory practice, and Merck has [signaled their interest](#) before. Perhaps if their pilot is successful then this will form the core of a new consortium.

[MediLedger](#) doesn't come as a surprise, after all, it was founded to tackle DSCSA compliance. Similarly, Rymedi makes sense after their [track and trace work elsewhere](#). However, the other three projects, IDLogiq, TraceLink, and UCLA Health, are all industry incumbents, but newbies to the blockchain space. It'll be interesting to see how different organizations are approaching and applying blockchain technology.

One interesting thing to note: Walmart will be participating in *two* DSCSA pilots. They're a project lead along with IBM/KPMG/Merck as well as in the MediLedger DSCSA pilot. They are the only project which was publicly stated their involvement in multiple projects.

Incumbents edge in

Tracelink

TraceLink, [launched a blockchain product called TraceHistory](). It was subsequently [accepted to the FDA's DSCSA pilot](). This is significant because they are the world's largest track and trace network, have deep expertise, and are signaling their seriousness by participating in the FDA's pilot.

Moreover, they reference a diverse set of industry stakeholders as participants in their pilot. advantage; other track and trace solutions have been held back by an inability to get buy in from all the necessary stakeholders. But, given that TraceLink's pilot is split into to work streams, an "interoperable blockchain network solution" and a digital recalls solution, it is unclear which stakeholders are actually engaged with their blockchain solution. Regardless, it is definitely a project to watch in the future.

SAP

Another technology giant, [SAP, launched their own blockchain track and trace solution.]() Similar to MediLedger, they are helping customers comply with the near term DSCSA requirement of verifying serialized product identifiers for any saleable products that have been returned to them before they are resold. This product was codeveloped along with several other pharma companies, but notably they are not leading a DSCSA pilot like MediLedger or TradeLink.

Walmart shows up

The world's largest retailer and a pharmacy giant extended their blockchain enabled supply chain activities into the world of prescription drug tracking. Walmart joined the MediLedger project, which is building blockchain solutions for the pharmaceutical industry, and emerged as a leader along with IBM, KPMG, and Merck in a DSCSA pilot. Previously Walmart's involvement with blockchain had been primarily through the IBM led Food Trust platform, a system for tracking fresh produce through a supply chain built on Hyperledger Fabric.

Strategically this is important for a few reasons. First, Walmart has made a significant move into healthcare, opening up a wide range of possibility for the self-insured employer and pharmacy giant. Walmart employs ~1.4 million people and spends ~$4.5bn annually to cover those employees and their dependents. They have shown a willingness to innovate to drive down costs, such as its centers of excellence program that steers plan members towards designated providers for select procedures because of the high value care they provide. Walmart has ample opportunity to use blockchain to control costs and provide value for its employees, and I would be surprised if their scope was limited to only supply chain applications.

Second, they are signaling their willingness to move away from the Hyperledger Fabric stack. Previously Walmart's only blockchain initiative was their collaboration with IBM in Foodtrust built on Fabric. In contrast MediLedger uses a private deployment of Ethereum, and that opens up scope for Walmart potentially building on new platforms with new business counterparties.

Lastly, Walmart's inclusion in these business networks (MediLedger and IBM/KPMG/Merck DSCSA pilots) makes them more attractive. Walmart carries a lot of weight, particularly in rural America where it has unique infrastructure, and that added value could compel wavering parties on the sideline to join these networks.

MediLedger expands

MediLedger built on their initial, verifiable saleable returns use case by adding a "working group" on contracting and chargebacks. Though it is just a working group, a impressive roster of members have joined, including Pfizer, McKesson, AmerisourceBergne, MediLedger's first group purchasing organization ("GPO") Premier.
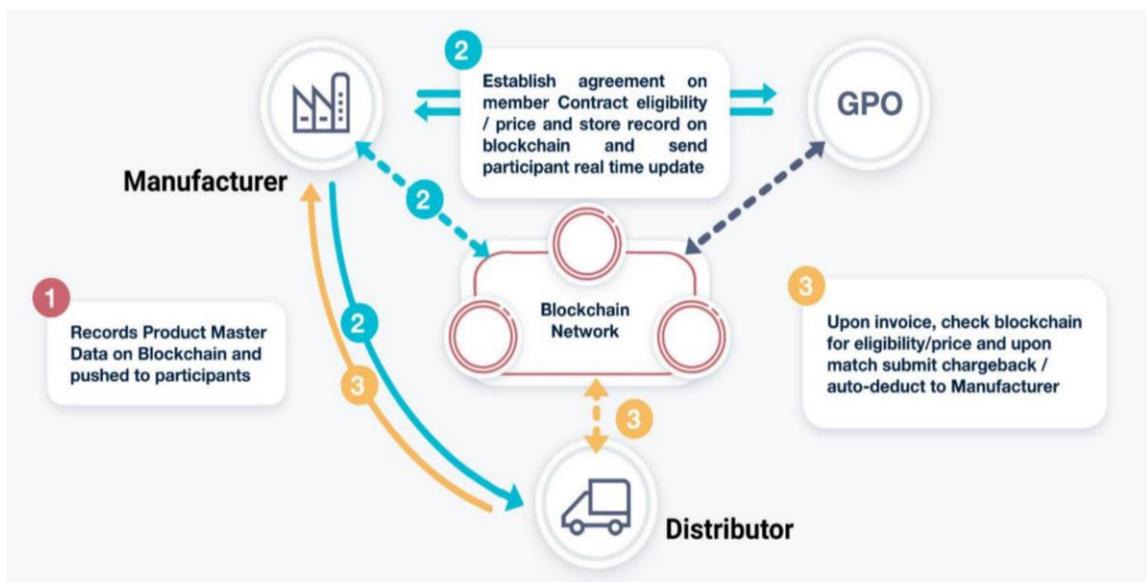

Image taken from the MediLedger 2018 Progress Report

Pharma supply chains are made up of a plethora of stakeholders, a web of contracts, a general lack of transparency, and complicated pricing structures. Often times this means that parties will need to chargeback others to be made whole on a transaction when they are paid less for goods than what they bought them for. MediLedger will be facilitating this process for chargebacks by wholesalers, who sit in the middle of manufacturers and GPOs, and will likely move to chargebacks by other parties after this. A high level description of the use case is above, taken from MediLedger's little advertised 2018 progress report. In this use case, a blockchain is essentially used as a single source of truth for contract and product master data between multiple parties.

MediLedger expands

Strategically this is an important development for MediLedger as it expands their scope beyond just compliance with the Drug Supply Chain Security Act ("DSCSA"), which has been their remit to date. The addition of a working group on "contracting and chargebacks" comes at the same time that the [federal government is loudly proposing reforms](#) that will radically alter how drugs are paid for in federal programs, with the expectation that these changes will make their way to commercial markets. A discussion of these coming changes and their merits is beyond the scope of this document, but if realized they will require new business arrangements and technology infrastructure. Blockchains could provide a lot of value, and the MediLedger team is well positioned to expand in this arena with their interest in contracting and multiparty workflows in pharma supply chains.

Hyperledger takes on the a new type of project

Hyperledger made a significant move when it approved a first of its kind project to officially join the Hyperledger family. The Hyperledger Grid project is a framework for supply chain solutions build on top of Hyperledger Sawtooth. Arguably it is Hyperleger's first project that is inhabits the application layer, though the consortium eschews that label. Until this project Hyperledger had largely stayed at the lower levels of blockchain infrastructure, and left everything else to others to implement.

This departure for the open source consortium reflects a growing interest in blockchains from supply chain stakeholders as well as a growing maturity of the technology. A multitude of Hyperledger members have supply chain use cases, there has been a supply chain special interest group for some time, and there are several networks built on Hyperledger tech that are live today. As a result of these things it doesn't come as a surprise that a supply chain project was the first "app" to officially join the Hyperledger family of technologies.

What will be interesting to watch is what other "apps" are ushered into Hyperledger. There is a sizable healthcare community within Hyperledger and there are a number of repeatable design constructs that would benefit from becoming modular pieces of open source technology. That being said, it will take time for particular the ecosystem around particular "apps" to develop, and we will need a sponsor to donate the code of a specific project, as Intel did to Grid.

Medical data pioneers

In the US and Europe progress on using a blockchain to manage patient data has slowed down after a plethora of announcements in 2017 and 2018. There are notably exceptions but on the whole the locus of activity has shifted away. In contrast South Korea has had a flurry of announcements this year by both enterprises and startups aiming to manage patient data, often in collaboration with a top medical center or the government.

In some ways this isn't surprising. South Korea has an almost unbelievable level of interest in blockchain and cryptocurrency. One study found that a third of salaried Koreans had bought crypto and the average investor owned more than $5,000 in crypto! Combine that with leading health information technology, a high degree of investment in innovation, and you get a vibrant blockchain and healthcare sector.

Blockchain and health data related stories from South Korea this year
Mar 19th - Seoul Medical Center collaborates with the South Korean Science and IT Ministry for a blockchain based medical information platform

Apr 22nd - Blockchain EHR startup MediBloc to be implemented in a dental healthcare center

April 24th - Gil Medical Center partners with medical data marketplace Longenesis and biotech company Insilico Medicine to create a blockchain based health data management solution

May 2nd – KT Group, one of South Korea's two leading telecoms companies, announced plans to launch a blockchain platform for managing medical data for hospitals and clinic

May 16th - South Korean Government invests $1m into medical consortia with blockchain data platform through their MyData project

Jun 17th - Blockchain EHR startup MediBloc signs an MOU with one of Korea's biggest hospitals
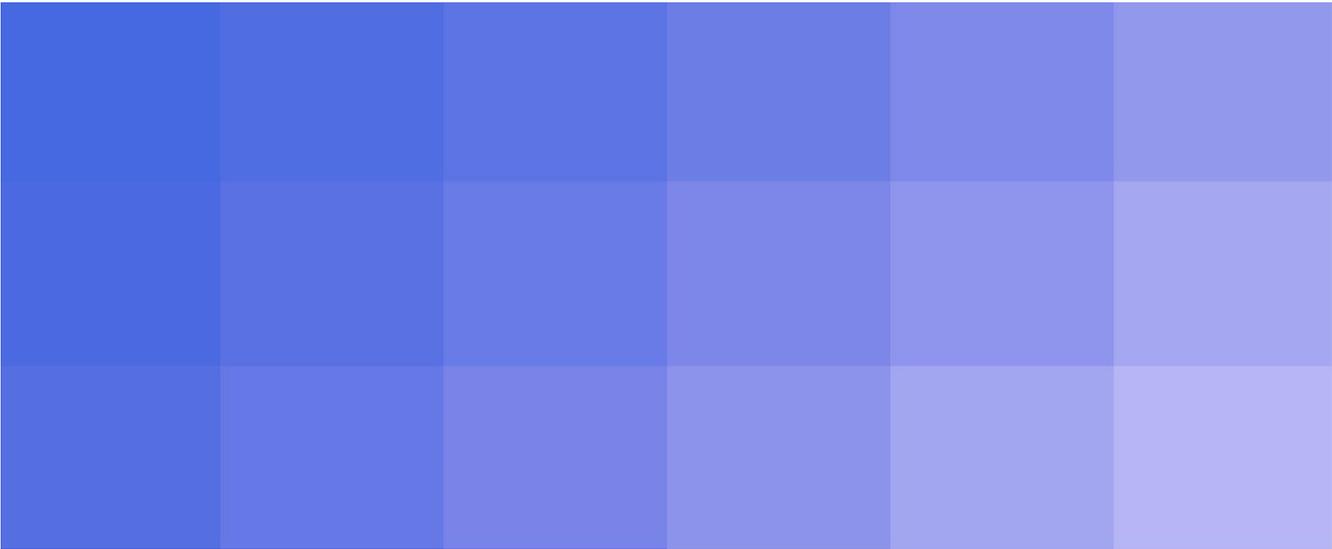
Important stories

Other developments to note

Notable developments

ProCredEx expands
Hashed Health's physician credentialing product, the Professional Credentials Exchange ("ProCredEx") was endorsed by the Texas Hospital Association as an exclusive partner to speed up the process of credentialing healthcare practitioners. The Texas Hospital Association is the largest state hospital association in the country, and it a strong partner for the burgeoning business network.

Tencent backed insurance startup seeks cash and blockchain solutions
The three-year old Waterdrop is raising funds at a valuation of more than $1 billion as it seeks to entrench itself in a highly competitive market. Among the stated uses for their raise is to develop blockchain technology with Tencent.

Blockchain Health Insurance Startup Decent launches in Texas and pays their first claims
After launching a pilot on April 1st, the startup paid their first claims the following month. Decent helps self-employed people come together to achieve cost savings on their insurance. It's great to see blockchain startups shipping products and impacting people's lives.

HHS appoints Jose Arrieta as CIO
Jose Arrieta spearheaded the HSS Accelerate program, which used a blockchain to streamline contracting, and was the first blockchain product to receive authority to operate in the federal government. It also landed him a Federal 100 award. Don't expect the HHS to be putting everything on a blockchain anytime soon, but also don't underestimate the impact of having a leader like Jose advocating for blockchain at a high level.

Embleema partners with WHISE and the Government of Armenia
This story is two fold: first Embleema partnered with WHISE to form a new consortia around health data. Then that new consortia partnered with the Government of Armenia to accelerate R&D for innovative medical treatments by leveraging health data.

Notable developments

[Nonprofit Pharmacy, University Establish Blockchain Consortium To Reclaim Medicines And Track Prescription Waste](#)
The RemediChain Consortium is seeking to fix the environmental and financial disaster that is prescription waste and woefully inadequate medication access. It uses a distributed ledger to share prescription waste data among members, and university partners study this data to help design ways to reduce prescription waste.

[Nebula Genomics enters into anonymized data sharing agreement with Merck's EMD Serono](#)
Nebula is the blockchain and genomics startup cofounded by George Church which raised [$4.3m last year](#). Under the new agreement with Merck's North American biopharmaceutical business, EMD Serono, lung cancer patients can receive free high-coverage germline and tumor whole-genome sequencing in exchange for access to their data. After that patients get to choose what to do with their data.

[JP Morgan acquires healthcare payments company Instamed](#)
Instamed isn't a blockchain company, but they had announced their blockchain POC. The CEO and cofounder of Instamed referenced the alignment over blockchain in the above news article. With JPM's issuance of a digital currency and their continued movement into the healthcare payments space I wouldn't be surprised if they release a blockchain payments product for healthcare.

[Pfizer Exec: Technology is "basically good enough" to ramp up production blockchains](#)
An executive at the world's largest pharmaceutical company made the comment that it wasn't the technology that was holding back adoption. Instead it was the hard task of sharing infrastructure and governance. I would add to that the problem of finding a business model that works for all parties as well.

About me

I'm an entrepreneur focused on next generation technologies in healthcare with a mission of making a better, more equitable, and more open healthcare system. I work towards this with the best and brightest of the industry at ConsenSys Health, where I'm a Senior Consultant. In previous jobs I've been a founder and CEO, as well as a quant at a hedge fund.

I advise the amazing team at Remedichain where we work to get donated chemos meds to those in need (get in contact if you want to help!). I also sit on a number of industry organizations and working groups including Blockchain in Healthcare Global, the HIMSS Blockchain Taskforce, PhUSE's blockchain working group, and the IEEE Blockchain in Healthcare Standards Development Working group.

I am an active writer exploring themes of blockchain, bioethics, data, healthcare, and privacy preserving technologies. You can find my writing on SSRN and my blog. In addition, I curate a free weekly newsletter highlighting important ideas and updates in the blockchain and healthcare space. Sign up for that here.

Lastly, if you found this report valuable and wish to support me then the best way for you to do that is by sharing my content. I deeply appreciate it.

Until next week,

Robert Miller

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