

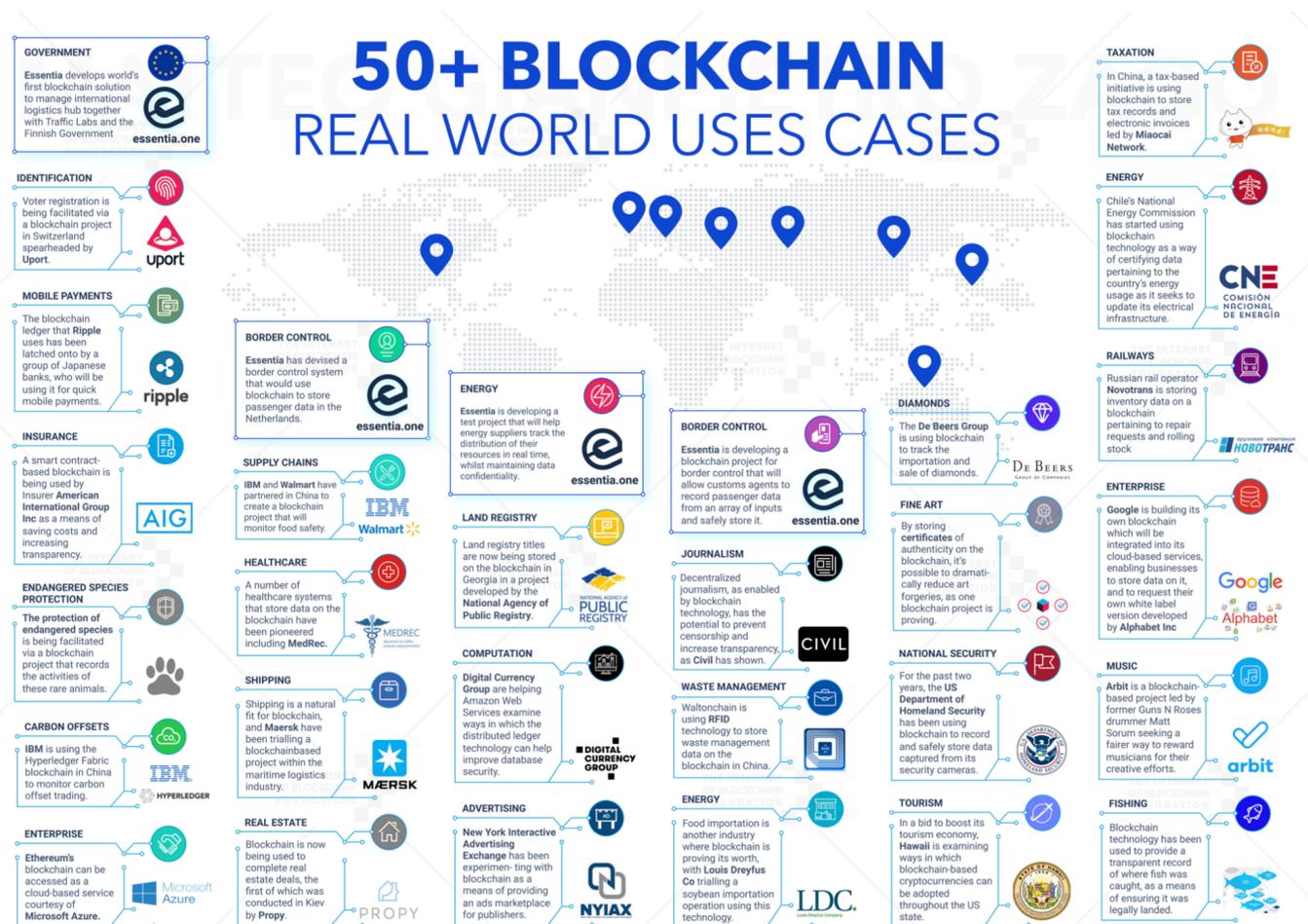
Transaction Management: An Overview of
Digital Tools for Managing Complex Transactions

Module 3: Industry Applications of Digital Tools

Module 3: Industry Applications of Digital Tools (90 minutes)

Digital tools transforming industries

Today we are going to look briefly at a number of industries and companies - mini field trips - that might trigger discussion or idea for blockchain usage.



Energy & Mining

BHP

The mining giant is using blockchain to digitize multiple operations, including tracking ESG (environmental, social and corporate governance) attributes and verifying suppliers' identities. BHP completed its first iron ore blockchain trade with China Baowu Steel in June 2020. The risk of our reliance on physical copies of shipping documents for bulk commodity transactions was highlighted with the onset of the COVID-19 crisis, when buyers, seller, shipping agents and banks were operating with reduced workforces or closed offices, making it difficult to ensure documentation reached customers and their banks. This trial is a step towards a completely digital end-to-end post-trade process that increases security, transparency and efficiency across the BHP value chain.

- <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/bhp-china-baowu-complete-1st-trial-for-blockchain-iron-ore-trade-59229525>

Saudi Aramco

In 2019, Aramco invested \$6 million in building a blockchain platform that aims to integrate thousands of sensors at oilfields and refineries, the better to verify asset performance and reconcile smart contracts with Aramco's vendors. Last year, Saudi Aramco Energy Ventures invested \$5 million in Vakt, a blockchain platform for trading cargoes of oil and petroleum products.

- <https://www.arabnews.com/node/1825376/business-economy>

Vakt

Vakt is currently live in the North Sea BFOET crude oil market. Intertek will initially test the platform ahead of full integration and VAKT's expansion into new markets and commodities. Platform participants access to timely, accurate data and better oversight of their positions, volumes and risk to improve invoicing. Intertek's inspectors will benefit from a streamlined workflow and clearer, more standardized nominations

- <https://www.vakt.com/press/vakt-ecosystem-expands-commodities-inspection-services-with-intertek>

Mitsubishi Electric & Tokyo Tech

Mitsubishi Electric & Tokyo Tech Develop Blockchain Technology have developed blockchain technology that can optimize peer-to-peer (P2P) energy trading. The technology is expected to contribute to more effective use of surplus electricity from renewable energy by creating trading environments that flexibly respond to shared trading needs, particularly to maximize the amount of surplus electricity available in the market at any given time.

- https://energycentral.com/news/mitsubishi-electric-tokyo-tech-develop-blockchain-technology?utm_medium=eNL&utm_campaign=DAILY_NEWS&utm_content=454171&utm_source=2021_01_19

Energy Web Foundation

Energy Web Foundation (EWF) has assembled over 100 energy and blockchain Affiliates, including several of the biggest energy players in the world and many of the most successful innovators in the energy blockchain space. It is deliberately diverse geographically—global in scope—and includes utilities, grid operators, renewable energy and cleantech companies, blockchain developers, startups, and others. Their aim is to use blockchain technology to “accelerate the global transition to a decentralized, democratized, decarbonized, and digitalized energy system.”

- <https://energyweb.org/wp-content/uploads/2019/05/EWF-Paper-TheEnergyWebChain-v2-201907-FINAL.pdf>

GuildOne

GuildOne and R3 Successfully executing a royalty transaction requires a lot of general and administrative (G&A) costs for the parties involved. Royalty owners who are entitled to a part of the total production. To calculate and check oil and gas royalty transaction payments, stakeholders must agree to contract terms upfront. Those terms may be interpreted differently depending on the systems each stakeholder uses, the human resources available to confirm accuracy, and the data available. Successfully executing a royalty transaction requires a lot of general and administrative (G&A) costs for the parties involved—and they are often disputed. The Western Canadian oil and gas industry is employing advanced database solutions, business intelligence and blockchain's distributed ledger technology to simplify, automate, and reduce complexities in royalty contract transactions.

- <https://aws.amazon.com/partners/success/guildone/>

Trading & Settlement

NASDAQ

NASDAQ partnered with R3 to help their clients move from traditional ways of issuing, trading and settling financial instruments to new blockchain enabled mechanisms. Surging demand from the traditional capital markets and from participants outside of the financial sector are causing traditional exchanges to look at digitizing their assets and making them more accessible through DLT-solutions. NASDAQ is building technology solutions that enable member firms to build their own digital assets marketplaces,

- <https://www.forbes.com/sites/benjessel/2020/05/22/why-nasdaqs-partnership-with-r3-is-great-for-digital-asset-adoption/?sh=1bc53cbc630f>

SERES

SERES is a company that specializes in solutions for the secure exchange of electronic documents. Integrated blockchain technologies into its services portfolio, leveraging Oracle Blockchain Platform as the foundation for innovative electronic invoicing services.

- <https://www.oracle.com/customers/seres-1-blockchain-platform/>

Results: 100 million annual documents, reduce delays, risk and high fees

IBM

IBM Blockchain for invoice reconciliation and dispute resolution. Participants send process data to the blockchain directly from their systems of record, granting visibility to selected participants (and to no one else, preserving privacy in an environment where multiple parties are participating). This approach also avoids errors that come from manual data entry processes. Business logic identifies discrepancies between data elements and documents to determine the root cause of any dispute. For example, in the supply chain, is the discrepancy due to a unit of measure error, or a delivery location error, or the quantity delivered? For roaming charge settlements in the telecom space, everyone needs to agree on data, text and voice consumed and rates to be charged. All comparisons are performed on a near real-time basis as new data becomes available. As a result, disputes are identified and acted upon as they occur, dramatically reducing dispute resolution cycle time. Automated dispute resolution rules synthesize the discrepancy data to reach consensus. This decision, along with the applied rules, is made visible to all required participants. Final consensus decisions are then sent back to the system of record. All data, discrepancies and resulting decisions

are stored within the blockchain distributed ledger to create a comprehensive, immutable audit history.

- <https://www.ibm.com/blogs/blockchain/2020/11/blockchain-for-invoice-reconciliation-and-dispute-resolution/>

Logistics

TradeLens

TradeLens example we talked about in week 1 as Maersk and IBM collaboration. This global solution has been working for a few years now and the results continue to improve for all partners.

- <https://www.ibm.com/blockchain/solutions/container-logistics> (3:30 video)

Boeing

Its HorizonX venture arm has contributed funds to the development of SkyGrid, a blockchain-enabled air traffic control system to track and communicate with drones. Already approved by the FAA to provide drone pilots with low-altitude authorization and available as a free iPad app, Skygrid creates a permanent record of data—important for package delivery, industrial inspections and especially (someday) autonomous flying taxis.

- <http://www.boeing.com/company/key-orgs/horizon-x/>

Supply Chain

Cargill

The ag giant first dipped into blockchain in 2017 when it used Intel's Hyperledger Sawtooth to track turkeys through its pre-Thanksgiving supply chain. Last year it became one of six partners (with the likes of ADM and Louis Dreyfus) in the Covantis platform—which uses the Ethereum-based Quorum blockchain to create an immutable record of every step in the process of moving grain and oilseed cargoes around the world. Cargill now offers its blockchain-basked turkey traceability program to cover metro areas in 30 states after receiving "overwhelming interest" from farmers and consumers. The program launched in a small pilot offering consumers only in Texas more information about the farms 60,000 Honeysuckle White-branded turkeys came from, via text or the Honeysuckle White website. Now the program covers 200,000 turkeys from 70 farms, representing one-third of the turkeys sold under the Honeysuckle White brand. Consumers may learn about the farm at which their turkey was raised.

- <https://www.supplychaindive.com/news/cargill-expands-blockchain-for-turkeys/541744/>

Honeywell

The industrial conglomerate has transferred more than 2 million aviation quality documents to a blockchain ledger, making them fully accessible to its customer base. It also operates blockchain-based marketplace GoDirect Trade, which lists \$4 billion in used aviation parts and has attracted more than 10,000 users.

Each user that Honeywell allows has a copy of the database and knows its contents in real time. Instead of storing only PDF documents or a reference to the digital aircraft record, Honeywell now stores the actual form data "on chain." This data is used to re-construct aircraft records, including records that prove the U.S. Federal Aviation Administration has certified that aircraft parts are safe to fly. These records can be accessed by customers, and in the case where paperwork is missing, customers can simply input the part number and serial number and the user interface will retrieve the data from the blockchain and "rebuild" the missing document.

- <https://www.prnewswire.com/news-releases/honeywell-uses-blockchain-to-digitize-aircraft-records-parts-pedigree-data-301106495.html>

Walmart

Its Food Traceability Initiative, which helps Walmart detect contamination and other food safety issues, now tracks nearly 500 items like fresh leafy greens, coffee, seafood and meat. Last year, it assisted the FDA with six investigations into food safety and was able to provide detailed information on the original source of potential contamination within an hour. This year, Walmart will conduct a pilot with U.S. Customs and Border Protection to track imported foods.

- <https://techcrunch.com/2018/09/24/walmart-is-betting-on-the-blockchain-to-improve-food-safety/>

AURA

AURA is a supply chain management consortium employing blockchain technology pioneered by the LVMH Group to track and trace luxury goods – from raw materials to the point of sale, to second-hand markets – in order to assure consumers of product history and proof of authenticity.

During production, each product is recorded on the shared ledger, irreproducible and containing unique information. At the time of purchase, a consumer can use the brand's application to receive the AURA certificate containing all product information. Decentralized and immutable, blockchain technology provides transparency and a single source of truth for the consumer: it ensures the authenticity of the product, (Louis Vuitton, Christian Dior and other luxury brands) provides details on product origin and components (including ethical and environmental information), instructions for product care, and the after-sales and warranty services available

- https://cdn.consensys.net/uploads/AURA_ConsenSys_Press-Release_May-16-2019-1.pdf

Bext 360

Bext 360's blockchain tracks production, establishes environmental goals and facilitates payments for coffee producers in Kenya. Kahawa 1893 is a direct trade coffee company, which utilizes the services of Bext 360, to ensure economic equality for women in its production chain. Kenyan coffee is considered to be some of the best in the world, but its business practices are lagging. Through blockchain, Kahawa 1893 is opening the industry for women in the region. Bext 360's blockchain tracks production, establishes environmental goals and facilitates payments for women coffee producers in Kenya.

- [Blockchain for Logistics by Kahawa 1893 and Bext 360](#) (2:30 min video)

Bellucci Premium Extra Virgin Olive Oil (EVOO)

Certified Origins Italia Transforms Supply Chain with Oracle Blockchain - To meet consumer demand for certified, high-quality food products, Certified Origins Italia is utilizing the Oracle Blockchain Platform to track and trace the Bellucci brand EVOO from their Italian bottling facility to the port of arrival in the US. This implementation of blockchain technology is a continuation of Certified Origins' commitment to providing greater food supply chain transparency.

- <https://www.oracle.com/it/customers/certified-origins-1-blockchain-story.html>

Results: Reduced operational costs and human errors by automating each step of traceability from the bottling facility in Italy to the US ports—increasing mutual trust, willingness to share information, and collaboration towards meeting common goals

IBM Food Trust

- https://www.ibm.com/blockchain/solutions/food-trust?lnk=hpmps_bubc&lnk2=learn
(Raw Seafood: 3 min video)

Banking

Consensus

Consensus is building Central Bank Digital Currency (CBDCs) as a digital form of central bank money, which is legal tender created and backed by a central bank that represents a claim against the central bank and not against a commercial bank or a Payment Service Provider (PSP). 80% of countries are looking at CBDC's.

- <https://consensus.net/solutions/payments-and-money/cbdc/> (3:35 min video)

IntellectEU

IntellectEU has been using blockchain technology to build Catalyst, its proprietary integration platform, which easily connects traditional financial services infrastructures with any enterprise distributed ledger technology (DLT) network.

- <https://www.oracle.com/customers/intellecteu-1-blockchain-platform/>

Lygon

Bank Guarantees Lygon - Australia bank moved paper-based guarantee online

- <https://www.ibm.com/blockchain/solutions/letter-of-guarantee> (3:30 min video)

Finastra

Finastra is harnessing R3's Corda Enterprise blockchain to open up a new business line and transform transparency and efficiency in the syndicated loan market.

- <https://www.r3.com/case-studies/finastra/> (4:40 min video)

AJIB

Arab Jordan Investment Bank (AJIB) provides retail, corporate, and investment banking services in Jordan, Cyprus, and Qatar. Delivered nearly instant cross-border payments—down from two to three business days—with lower costs, higher security, and more reliability, responding to customer demand for convenience, speed, and simplicity of money transfers

- <https://www.oracle.com/jo/customers/ajib-1-blockchain-cl.html>

Manufacturing

Daimler

The maker of luxury Mercedes-Benz vehicles is using blockchain to streamline everything from production to a recent fundraising.

- <https://www.daimler.com/sustainability/resources/blockchain-pilot-project-supply-chain.html>
- <https://blog.mcaconnect.com/use-of-blockchain-in-the-manufacturing-industry>
- <https://101blockchains.com/blockchain-in-manufacturing/>
- <https://www.bcg.com/publications/2019/blockchain-factory-future>
- <https://www.forbes.com/sites/andrewarnold/2018/09/29/5-use-cases-proving-blockchain-can-have-a-massive-impact-on-the-manufacturing-industry/?sh=7d5c395b5d8c>

Lots of articles on how blockchain is perfect for manufacturing ... not many case studies yet.

Insurance

State Farm and USAA

For insurers resolving claims, the process of subrogation—that is, determining which policy and insurer is ultimately responsible for paying which claim—can take months. State Farm and insurer USAA used to mail each other an average of more than 200 checks a day. But since they began using the Subrogation Net Settlement blockchain last year, the number of checks exchanged has been reduced by 80%. Carrier-to-carrier claims payment will be almost automated saving time and money.

- <https://newsroom.statefarm.com/blockchain-solution-solves-state-farm-usaa-subrogation-challenge/>

IBM

IBM industry solution - automate underwriting, claims settlement and reduce fraud

- <https://www.ibm.com/blockchain/industries/insurance> (4 min video)

B3i

B3i Re-Managing Catastrophe Excess of Loss on Distributed Ledger Technology. Electronic placement and administration of Property Catastrophe Excess of Loss (Cat XoL) treaties, from structuring the submission to negotiating, binding, endorsing and technical accounting. Claims Management being introduced in 2021

- <https://b3i.tech/what-we-do.html>

Healthcare

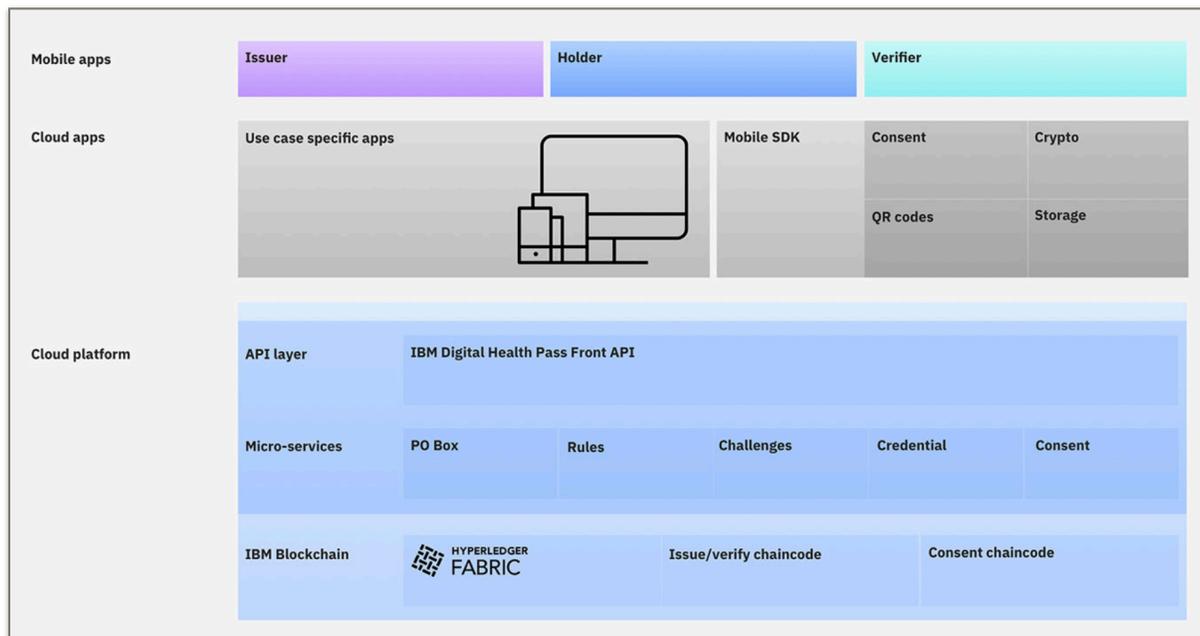
HealthSync Platform

A healthcare network as a service (HNaaS) which empowers healthcare organizations to share processes and data securely and on a need-to-know basis.

- <https://www.oracle.com/customers/healthsync-1-blockchain/> (1 min video)

IBM Digital Healthpass

- <https://www.ibm.com/watson/health/resources/digital-health-pass-blockchain-explained/>



IBM and CDC Electronic Health Records

- <https://www.ibm.com/blockchain/use-cases/>

Medrec

Medrec Electronic Health Records (EHRs)

supported by a grant from the Robert Wood Johnson Foundation, with additional support from the MIT Media Lab.

- <https://medrec.media.mit.edu/>

Government

Dubai

Blockchain for Smart Cities. Smart Dubai is an initiative spearheaded by His Highness Sheikh Mohammad bin Rashid Al Maktoum, seeking to make Dubai the happiest city on earth by leveraging blockchain, AI and IoT technology.

- <https://consensys.net/blockchain-use-cases/government-and-the-public-sector/smart-dubai/>

Zug

Zug Digital ID: Blockchain Case Study for Government Issued Identity. Zug, aka Crypto Valley, set out to explore blockchain-based digital identities to improve access to digital government services while increasing efficiency, data security, and voting accessibility.

- <https://consensys.net/blockchain-use-cases/government-and-the-public-sector/zug/>

Blockchain Council

Blockchain Council recommendations for adoption in government and public sector describes a few case studies: Digital Identity Management, Fair Voting Mechanisms, Maintaining Registries

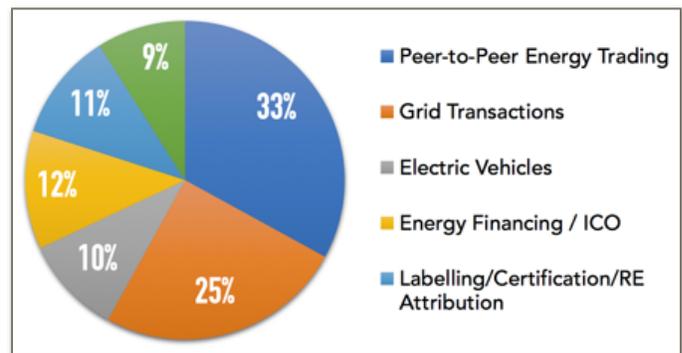
- <https://www.blockchain-council.org/blockchain/blockchain-adoption-in-government-and-public-sector/>

Digital tools employed in the Energy Industry

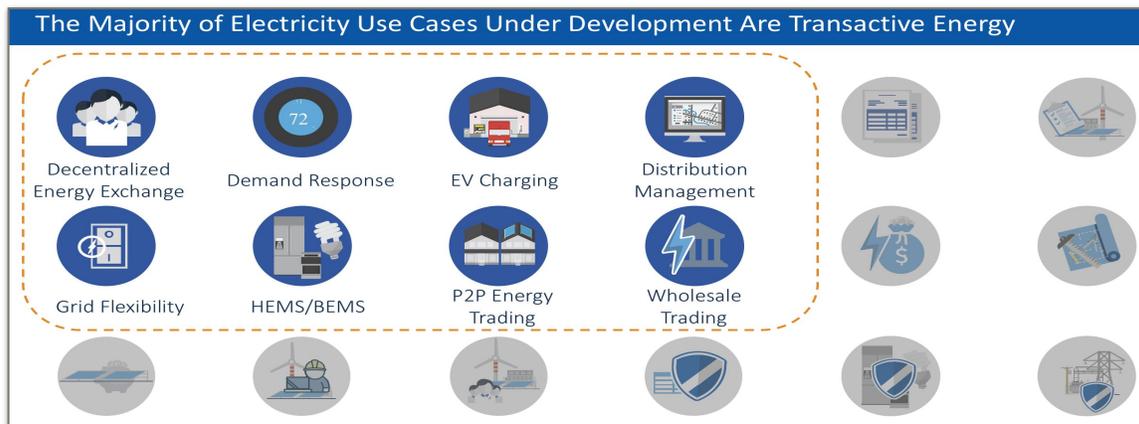
IEEE 2019 study

As we were addressing the competitive market for EnergyXchain, we got some very interesting insight from our partner Umit Cali PhD and the Vice Chairman of the IEEE Energy Blockchain working group. IEEE did a deep dive of 214 global energy blockchain initiatives at the time.

- Most focus on grid edge power applications
- Insufficient transactions to commercialize
- Few focused on transmission/distribution
- Most successes outside U.S.
- No consistent U.S. national rules



These examples help shape our strategy to focus on midstream - where there are enough transactions for commercialization.



Power and Utilities

Electron

Since establishment in 2015, Electron has engaged in eight network optimization projects in four countries, involving partnerships with 20 major energy industry players including National Grid ESO, EDF Energy, Shell and London Hydro. Based on these successful projects, the ElectronConnect platform has been selected to support marketplaces for Scottish and Southern Electricity Networks, National Grid ESO in the UK and London Hydro in Canada.



- <https://electron.net/>

LO3

We work with utilities and retailers to deliver configurable digital tools that meet the demands of modern energy customers. Our technology platform, Pando, offers a simple way to account for local distributed energy resources and enable new incentives for customers.



Their recent Series B round included worldwide investments from Shell Ventures and Shikoku Electric Power, Braemar Energy Ventures, Sumitomo Corporation and Centrica.

- <https://lo3energy.com/>

Power Ledger

Power Ledger is the operating system for new energy markets enabling tracking and trading of energy, flexibility services and environmental commodities.



We are developing systems that bring resilience and flexibility to electricity grids. Our technology is helping clients like TDED in Thailand, CUB in Australia and ekWateur in France bring new ideas and forms of energy to powering their clients and workplaces.

- <https://www.powerledger.io/>

Energy Web Foundation

The Energy Web Decentralized Operating System (EW-DOS) is an open-source stack of decentralized software and standards—including the Energy Web Chain, middleware services, and software development toolkits (SDKs). EW-DOS is the grid's new digital DNA, a shared technology running on a decentralized network maintained by some of the world's most-respected energy companies. Renewal Energy Markets, Demand Flexibility and Electric Vehicles products



- <https://www.energyweb.org/>

Xage Security

We are Security and IoT experts who created security products and industrial automation solutions used by global 1,000 companies. Using our experience enabling high growth markets, we deliver the only truly decentralized platform for protecting the Industrial Internet of Things.



Xage simplifies security in the Edge, enabling machine-to-machine and human-machine authentication, secure data sharing, device life cycle management, device access-control enforcement, and autonomous operation. Industrial and commercial IoT security

- <https://xage.com/>

Discussion - Q&A Day 3

Useful blockchain use case links:

- <https://www.amazon.com/Blockchain-Success-Stories-Studies-Business-ebook/dp/B08LF2R144>
- <https://www.powermag.com/blockchain-and-energy-innovation-marches-on/>
- <https://www.ibm.com/blockchain/use-cases/success-stories/>
- <https://www.oracle.com/blockchain/customer-successes.html>
- <https://consensus.net/blockchain-use-cases/case-studies/>
- <https://www.pwc.com/gx/en/industries/technology/blockchain/blockchain-in-business.html>