IN ITS THIRD ANNUAL BLOCKCHAIN SUMMIT, EY CALLS THIS 'YEAR 0' FOR BLOCKCHAIN

Author: Geoff Woollacott
(geoff.woollacott@tbri.com), Senior Strategy
Consultant and Principal Analyst;
Patrick Heffernan (patrick.heffernan@tbri.com),
Principal Analyst

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❯ SUCCESS IN THE DIGITAL ECONOMY MEANS IT IS HIGH NOON FOR SHADOW IT

Blockchain, as this recent blog attests, radically transforms economic activity, the likes of which society has not experienced since double-entry accounting was invented in Italy in the late 1400s. Blockchain was described throughout the summit as:

- Internet 2.0, with the same architectural building block progressions that, once hardened and embraced, will enable rapid scaling of capabilities on a public blockchain network

- A multi-enterprise ERP system with the fundamental enhancement of being able to track physical entities throughout the system as tokenized digital assets

EY GLOBAL BLOCKCHAIN SUMMIT

The third annual EY Global Blockchain Summit gave an indication of the rapid acceleration in adoption that had EY describing this as "Year 0." With hockey stick charts for the number of proof of concepts (POCs) and live applications, blockchain appears poised to deliver on its anticipated promises to transform business interactions and greatly reduce operating expenses while creating new business services networks. The event was held at 32 Old Slip in the heart of New York's financial district with several hundred attendees and 28 breakout sessions organized in four tracks consisting of blockchain business applications (where TBR spent most of its time); blockchain assurance, tax & compliance implications; financial services and the token economy (where TBR attended a session on decentralized finance); and blockchain technology.

At many other emerging technology presentations around blockchain filled with breathless predictions and optimization proof points, data management regularly comes to the fore. Often the recommendation to avoid early adoption comes as half warning and half plea to enterprises: Get your global business rules locked down. Absent business rules consensus or standardization, smart contracts will struggle to yield the error-free tracking and transmission of goods and services at the heart of distributed ledger technology.

The tech industry, for the most part, has locked down the standards for the transmissions of the zeros and ones that automate the digital economy. We have a set collection of runtimes. We have very compatible architectural stacks emerging as de facto standards. We have the tracks laid down for utility computing and are laying down new tracks in the form of compilers, programming languages and developer tool kits to plug into next-generation quantum architectures

when the algorithms humans apply against the ever-expanding data sets require bursting to this new compute platform.

Technology in and of itself is no longer the business challenge. The business challenge is ending shadow IT, for with shadow IT comes shadow costs. Blockchain removes the need for reconciliations and dispute resolutions. It can enable auditing 100% of the transactions rather than relying on an audit that selects only a sample to review. But blockchain-enabled technology can only achieve these outcomes if humans adhere to consistent business rules. In an ideal word, from TBR's perspective this would start with global businesses collapsing down to a single ERP instance with standard nomenclature across their geographies (and acquired companies) to enable the automation of the nonvalue-added commercial activities of tracking transactions. Tracking transactions adds no value to the customer or to the business; indeed, it can annoy customers if they must track, trace and correct what they requested from their supplier. Noncompliance with business rules adds costs other competitors will not have, enabling those competitors to make the great leap forward to distributed ledger or digital business rules. Shadow IT has to end to avoid shadow sanctions that will put noncompliant business operations and multi-enterprise business networks at perilous competitive disadvantage. As EY Blockchain Lead Paul Brody summed up blockchains: There are "no overlord robots to get used to; we're just getting rid of paper."

Enterprises will be hard pressed to achieve this frictionless digital economy backbone without collaborating with the public sector. Multiple parties have to come together to rethink the established trust institution's ways of working and to think more thoughtfully about the policy regulations and inconsistencies of those regulations across geographies and across the multiple economic segments converging as data amassed in the course of one operation can deliver value and insight to adjacent operations. Data sharing underpins the network effect of the digital economy, but the inconsistent business rules (policy) and inconsistent application of those rules (e.g., daily worker activity and interaction with the distributed networks underpinning blockchain) will be sand in the gears of the network effect.

⟩ EY LAYS OUT ITS DIGITAL BLUEPRINT AS 'NOW, NEXT AND BEYOND' WITH BLOCKCHAIN USE CASES EASILY FITTING INTO THE CONSTRUCT

This fundamental playbook repeated in many of the use cases discussed in the breakout sessions:

- Early efforts focus on cross-collaborative business entities establishing business rules.

- The rules become the digital contracts.

- The first use case is either low-dollar-value or intracompany; the sponsoring enterprise working with EY becomes "customer zero."

- Once fully operationalized, EY and the client partner look for ways to enroll additional participants to:

    ◊ Broaden the use case into an industry utility

    ◊ Extend the underpinning business logic into adjacent industries for the repeatable capability to build out industry utilities

Gaming: The editors for the EY-Microsoft playbook

Much of the content shared at the 2018 event revolved around EY's ongoing collaboration with Microsoft to deliver a blockchain royalty payment system to track developer community activities in the gaming space. This year, EY and Microsoft touted the collaboration on many different levels that easily fit into the "now, next and beyond" construct.

Now	• Available to the Xbox gaming developer community and software distributors
	• Documented evidence of 99% reductions in the time it takes to track royalty payment accruals and a 60% reduction in the cost to deliver those real-time royalties
Next	• Enroll "fierce competitors" within the gaming space to create a gaming utility platform from which all participants benefit by automating out labor not associated with value creation or endpoint service delivery. (In short, create the network effect now that the technology and the business rules are hardened.)
	• Extend the system further for the ability to pivot Xbox gaming to an Azure streaming service providing two different network effects (gaming and the tracking of the payments associated with gaming consumption) to spin the Azure as a Service consumption meter.
Beyond	• Take the underlining business logic encapsulated in the blockchain code and build out comparable multibusiness networks for:
	◊ Music and Entertainment
	◊ Oil and Gas

EY Tesseract: A clear view not to be confused with a short distance

The Tesseract-like aspirational objective is autonomous vehicles; period. To achieve the objective requires prototyping the IoT sensoring and business rules ahead of when specific technologies and revised public policy regulations have been hardened. Interim steps revolve around building out the ecosystem participants required to allow autonomous vehicles to be serviced absent human accompaniment as the vehicles course through the physical world based on their digital instructions.

Now	• Proven software and IoT sensor mechanisms demonstrated at the event with Lego-like depictions of vehicles, distribution warehouses, businesses and homes
	• Reaching out to additional businesses to enroll them in the future to deliver their services (such as vehicle maintenance, fractional ownership, insurance) to the platform
Next	• Establishing a network of vehicle maintenance and repair services billed as a way to optimize repair shop labor and equipment while providing the human drivers and owners of the vehicles convenient ways to book service repairs
Beyond	• Autonomous vehicles able to move freely throughout the physical world due to the software available now, the ecosystem participants being recruited, and the anticipated infrastructure advancements necessary for the vision to become reality
	• Public policy changes based on the reality of autonomous vehicles inserting new moral hazards into our daily lives

Intercompany blockchain networks remove shadow sanctions and provide the 'customer zero' use case

According to EY, many businesses have more intercompany transfers than transactions with suppliers and customers. The challenge, EY asserts, is "not always about trust; it is about information imbalance." The information imbalance locks cash in intercompany transfers or in cash moving between entities where there are regulatory differences. According to EY, 10% of procure-to-pay (P2P) transactions have reconciliation issues in intracompany activity, and intercompany transactions have a considerably higher error rate.

ERP systems do not excel at applying data to finished goods. ERP works as a material master, yet it loses the details of what happens to the individual items. Similarly, apportioning margin along the value creation process does not happen, which can trigger information imbalances across the organization.

As such, the current process and blockchain for intercompany transactions can help as follows:

- Siloed and duplicate data can be resolved through tokenization

- Manual processes then move to smart contracts between operating units

- Lack of transparency gives way to reporting accuracy

- Imperfect communication gives way to immutability

- Reporting delays move to transparency on par with the gaming royalty improvements of the Xbox network

- Compliance costs theoretically disappear based on business rules digitized as intercompany smart contracts

Now	• A suite of modules ◊ Ops chain intercompany ◊ SAP and Oracle integration ◊ Multicurrency ◊ Contract management workflows and audit trails ◊ Tokenization and transaction management
Next	• Given clients often lack a single general ledger across the firm and ERP systems cannot tokenize assets, the new modules in development are: ◊ Tokenized fiat currency ◊ Zero Knowledge Proofs (ZKP) ◊ Indirect tax and transfer pricing
Beyond	• Work with the anchor enterprises in traditional hub/spoke fashion to enroll additional ecosystem participants to move beyond intercompany into true distributed ledger record keeping.

Healthcare networks have many cats to herd before becoming a reality

EY, like many vendors seeking to modernize healthcare delivery vehicles, finds itself ensnared in overlapping and seemingly inconsistent public policy regulations. Patient privacy, for example, has overlapping policy regulations. Similarly, EY and others expect a slew of state-mandated data privacy regulations to be brought forth like those the General Data Protection Regulation (GDPR) imposed on European Union activities and what California's legislature has proposed for its

state. Federal law versus state law comes into play in that the more restrictive policy rules out over the less restrictive policy. In short, it is highly unlikely the U.S. will have a single, omnibus data privacy law for the foreseeable future.

That, of course, clouds the business rules necessary to avoid shadow sanctions from inconsistent human compliance with enterprise business rules.

The other side of the equation is hardening the automated trust systems through IoT sensing and blockchain contractual reporting across the multiple enterprises that compose any healthcare service delivered to humans. Considering this, EY has opted to harden the technology systems through veterinary applications. Rather than testing new medicines on animals, however, these processes test new service delivery methods and business models on veterinary practices prior to scaling them to human healthcare.

	Humana (Permission Privacy)	Merck (Supply Chain Optimization)
Now	• Prototyping consent management and date exchange • Addressing consent management and data exchange from the patient side of consent management to hopefully streamline, through public advocacy, the number of overlapping regulations applying to healthcare medical records	• Prototyping of the intercompany distribution network and tracking • Beta deployment of one medical serum for pigs
Next	• Extend patient consent to the vast number of varied data pools useful to medical care, medical research and clinical trials of new medicines • Address the overlapping silos among those medical entities through advocacy of revised medical rules around patient data coupled with prototype blockchain systems	• Scaling the deployment across the broader Merck Veterinary product line • Broader enrollment of ecosystem participants for shipping/receiving, tracking, and token burning once the medicines have been administered
Beyond	• Join the networks between identity access management, medical treatments, medical research and medical billing • Shape modified public policy rules to collapse the agency silos regulating medical activity for seamless data interoperability	

∑ EY ASSERTS THE EFFICACY OF PUBLIC BLOCKCHAINS TO REVOLUTIONIZE BUSINESS BY DRAWING PARALLELS TO THE INTERNET EVOLUTION THAT REVOLUTIONIZED SOCIAL INTERACTION

Underpinning the business value rapidly dawning on global commerce rests a set of protocols and capabilities slowly coming to light. A breakout session titled "Decentralized finance – the scaffolding for a new financial system" outlined very compelling parallels between the evolution of what we know today as the internet and the changing standards materializing for blockchain networks.

The takeaway from the presentation was not that public chains work only for financial services. Core attributes of any business interaction are financing and moving assets between entities across all industries. Therefore, the first areas to harden are financial services and shipping, into which other cross-industry networks can integrate. The financial services

activities are the most evolved of the public chain networks, and the added services have been built on top of the base protocols in much the same way as early internet service providers (e.g., AOL, CompuServe) built their messaging platforms on top of the base internet protocols. In time, other industry participants' cross-industry e-commerce platforms moved further along as the internet became an innovation platform built on these open, or public standards.

This analogy underpins the now, next and beyond bets EY places on public chains as the preferred methodology for implementing blockchain networks. It represents the core of the Ops Chain integration layer that EY believes sits between the historical general ledger accounting systems and protocols and the emerging multibusiness networks that distributed ledger technology enables.

In partnering with Microsoft, EY has an established company with the technological competencies to translate the domain expertise at the core of EY's company DNA as an audit and tax partner into the increasingly automated and ubiquitous compute backbone at the core of social and business interactions.

Likewise, Microsoft can assemble the basic Lego blocks sitting atop the decentralized financing (DeFi) scaffolding to quickly enable the launch and interconnections of new business entrants into blockchain ecosystems. Microsoft's Azure Blockchain Workbench helps facilitate the fundamental core at the heart of any digitization effort: the thoughtful, cross-organization efforts creating global business rules.

Though ironically more and more business jargon talks about collaboration and empowerment, the only way for these company efforts to succeed is for there to be zero defect compliance with how the business wants information digitized and tracked.

In a breakout session, Microsoft described the workbench as a place where businesses could go to minimize the learning curve around global business rules by providing a
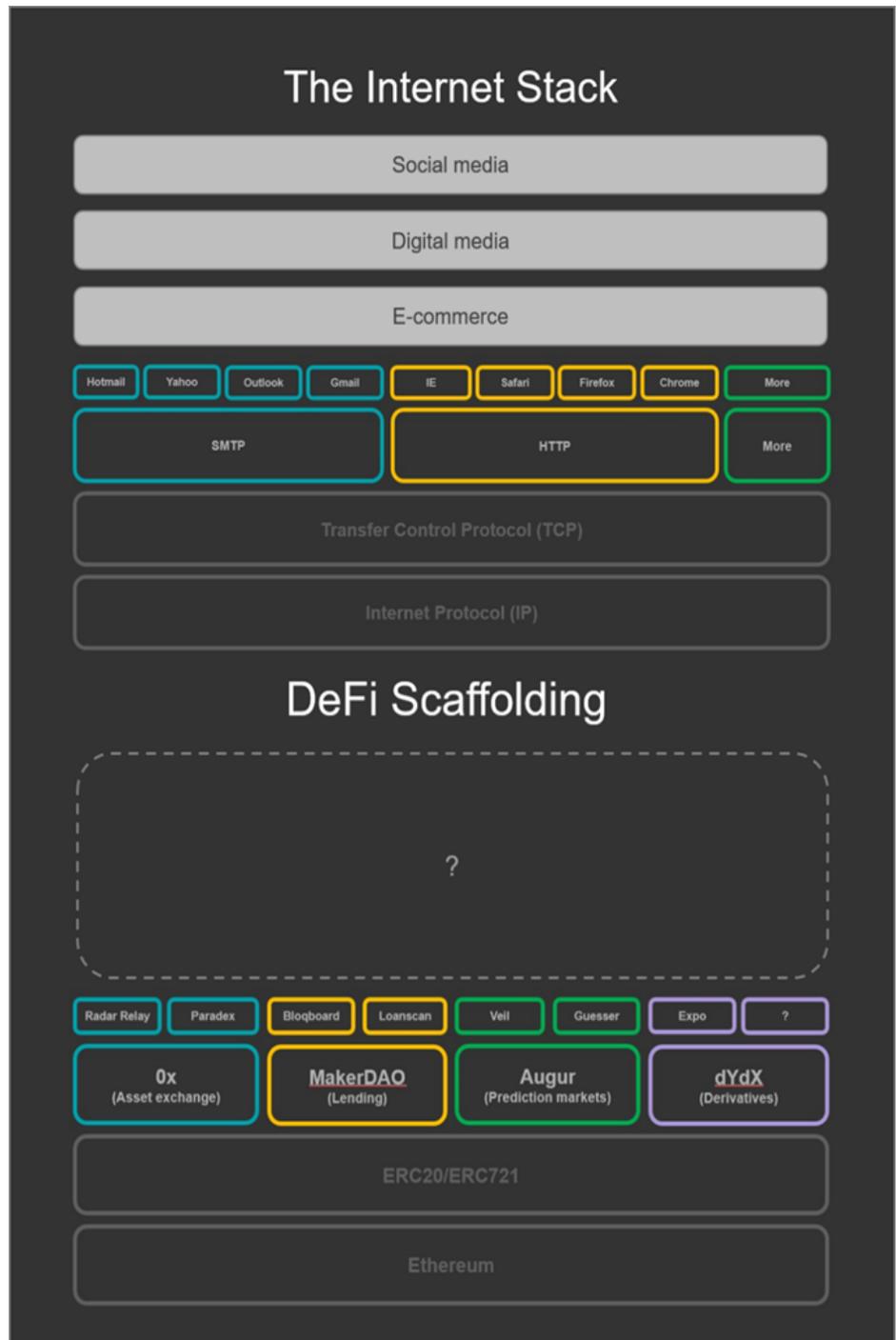
place where parties can rapidly iterate on multiparty workflows. The service is not designed for the development of live applications, but rather for proofs of concept only. Microsoft estimated most users of the workbench will create 75 to 90 workflow iterations over the course of a two- to three-week period as the collection of cross-organizational stakeholders think through the implications to their specific domain areas.

Assuming organizations come out of the workbench process with a minimum viable product architecture, then Microsoft can facilitate the connections into the existing legacy business application layers with Azure Logic Apps. At 200 and counting, logic apps connect different systems together. Many focus on SAP instances as one of the de facto legacy ERP standards. Where once integration would have required a six-figure application development engagement, logic apps enable the rapid integration and tie-in to SAP instances for the purposes of accelerating blockchain adoption and thus increasing the RPMs of the Azure consumption meter.

Templates are one architectural deployment on par with the out-of-the-box chart of accounts small business can select for accounting software. Eighty percent of all blockchain smart contracts are estimated to flow from 50 standard contract templates, for example. If there is multiparty agreement on the smart contracts 80% of the time, then that takes the total number of potential transactions in need of human intervention and cuts it to one-fifth of the prior labor workload. It removes a lot of paper, to paraphrase Brody.

This concept of standard frameworks rests at the heart of cloud scale and DevOps transformation efforts within large enterprises. Flowing from this concept is also the notion of "industry utilities," as Microsoft calls them, where the nondifferentiable transaction activity can be standardized to dramatically reduce noncustomer labor-facing activity in reconciliation, tracking and auditing commerce for all competitors. This benefit only happens, however, if all competitors are willing to agree on basic transactional business rules or a single global standard.

⟫ NEAR-TERM MARKET IMPLICATIONS: WHAT IS NEXT, RATHER THAN BEYOND

Forecast as the envisioned end point in the beyond, labor activity that is not at the point of creation or at the point of consumption will become automated. Public policy will have to transform alongside businesses for this to occur, but that end point is technologically achievable.

Interim steps toward that end point will be varied, but EY, SAP, Microsoft and fearless businesses willing to explore these emerging technologies will continue developing repeatable frameworks, first as technology protypes, then as small-scale deployments where other businesses will be enrolled in the activities and lastly as the full-blown industry utilities.

The creation of these industry utility models will result in businesses with seemingly disparate value propositions coming together at the human service intersection point based on the user experience the platform provider delivers. It is the consumerization of IT morphing into the consumerization of business commerce as we undergo this profound economic rebirth many firms call Industry 4.0 and TBR calls the Business of One. Out of this comes entirely new business models and economic assets: fractional ownership of vehicles, new forms of insurance, automated toll collecting, driverless vehicle drive-up gas pumps or electric charging stations. All of these new commercial activities will fuse at the point of consumption with business model characteristics more in line with the FAANGs (Facebook, Amazon, Apple, Netflix and Google) that have sunk their teeth into our social lives and our business-to-consumer purchase preferences. Companies that can capture the imagination of the user based on the experience they can deliver will have first-mover advantage when seeking to enroll more businesses in their ecosystem. In short, the early blockchain adopters, rather than push the consumerization of IT, will accelerate economic disruption pushing the "FAANG-ification" of business. Blockchain-enabled businesses will certainly take a bite out of lagging competitors' market shares, if only from the cost savings that stem from removing the paper and nondifferentiable labor via blockchain smart contracts, which can be made possible with human agreement on global business rules.

EY has wisely deployed low-risk use cases to build the frameworks and harden the technology layers. It will be interesting to see what comes next based on what fearless and creative business leaders can promise for the market beyond the near-term horizon. New FAANGs are coming, to be sure.