

Adoption or disruption?

Continuing his explanation of the technology likely to disrupt the transport sector, Dr Nabil Abou-Rahme says that the secure solution is already beginning to be used across a range of sectors, including transport

WORDS BY DR NABIL ABOU-RAHME

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If you start with the idea that the word “blockchain” has become shorthand for several reforming ideas, (not just a nickname for a strand of applied cryptography), then you stand a better chance of understanding what it’s all about. Blockchain expresses the “post truth” mistrust of intermediaries managing ledgers with competence or integrity. Blockchain gives practical expression to a new economic model in which an individual stake in a project or outcome can be reflected immutably through tokens, and value be distributed without delay. Blockchain is about the governance and protocol needed to transcend individual nodes and deliver through the network.

These anonymous, encrypted, distributed networks eventually become resilient to almost anything except a solar flare. For example, the bitcoin blockchain has operated continuously for the last nine years, on the back of an ever-increasing distributed network, with no major outages or service downtime. While it makes no sense to create a whole network like this for an individual project, it does make sense to bring individual projects to such a network.

The academic writer Melanie Swan describes blockchain as “a new organising paradigm for the discovery, valuation, and transfer of all quanta of anything, and potentially for the coordination of all human

activity at a much larger scale than has been possible before”¹. New self-organising networks are emerging at an increasing rate this year because they carry intrinsic value as well as offering others the opportunity to build applications or run services over the top.

Foundations

It’s easy to imagine a patchwork of specialist blockchain solutions growing to cover every aspect of urban life. Identity, democracy, ownership, provenance, entitlements, trade, settlement, transport, you name it and there’s a blockchain service in the making for it. These are not like for like replacements for current business models, but foundations from which to promote entirely new ones. On their own, each service may not seem that remarkable [cue the “why use blockchain for that when we can do it just fine already” counternarrative]. However, the combinatorial power of these building blocks will be what proves the business case, and kicks off the innovation scramble to the next, disruptive, level.

Public blockchain networks with city-scale ambition are making progress by incorporating IoT to the native protocol. One example of this is IOTA, itself a quantum-proof disruption to the blockchain ecosystem, and heavily focused on machine to machine communications. Earlier

this year, the city of Taipei partnered with IOTA to provide new services for residents². The first project is the creation of ID Cards, specific to the blockchain technology that underpins IOTA. The “Tangle ID” offers protection against identity theft and becomes the hub for a range of government sponsored services, while benefiting from the economies of scale that come with an already established blockchain network. With a host of new technology partners on board in the last six months, including Fujitsu, Bosch and VW, the ambition level around use cases, delivered entirely on IOTA, is growing.

Taking a slightly different approach, Smart Dubai is embarked on a full transformation of civic services using blockchain. Having bagged an early success in the form of a blockchain powered land registry, they are now scaling up new services from among 20 pilots, spanning transport, energy, education, and health³. We will start to see a global showcase for “build your own blockchain city”, with best practice shared to fuel the progress.

Forbes suggests that blockchain could become central to every urban transaction, making those transactions secure while also helping to build the data stores more efficiently. Does that lower the cost barrier to accumulating, organising, and interrogating the kind of data needed to drive smart cities forward? If blockchain powered services release “interrelated transactional records from being isolated from one another and needing verification” then rapid progress here could be achieved⁴.

Oracles

In the modern business context, an oracle is a fancy name for external or third-party validation of a specific event through data, that leads to the triggering of a contract clause. How does that relate to blockchain? In a relatively short time period, we have seen the maturing of decentralised ledgers operating on networks that provide true peer-to-peer connectivity, the emergence and rapid maturity of smart contracts executed on the same networks, and oracles now being added to these smart contracts to connect real world events with the blockchain.

If we look at public blockchains, the IOTA Foundation has just announced a complete oracles and smart contracts upgrade⁵, likely to be the catalyst for enabling most of their practical use cases. Microsoft offers “cryptlets” (off-chain code components that are contained and communicated in a secure context). In this case it falls on the organisation running the private blockchain to ensure the security and integrity of the oracle too. Exonum⁶ is implementing corporate oracle services (insurance, digital signatures, land registry), while ChainLink has developed a hybrid for Ethereum and Hyperledger that communicates with Swift Payments⁷.

The main difference between private, permissioned, and public blockchains may soon become irrelevant, in that most practical solutions will need modality across all three. A possible tipping point could come from the advent of next generation chipsets that offer advantage to one or more of these approaches.

Community

Blockchain ecosystems continue to re-organise for greater collaboration and interoperability. In the mobility sector, there has been a positive move to explore standardisation. The formation of the Mobility Open Blockchain Initiative (MOBI)⁸ brings together partners from a recent wave of pilots into a bigger community. Blockchain native organisations like IOTA, VeChain, DOVU, FOAM, and Xain, are working together with

innovative developers and adopters like IBM, Accenture, BMW, Ford, and GM. The themes to be tackled include digital identity, machine payments, mobility commerce, driving data, and usage based insurance and taxes. What we will see is simple applications and services underpinned by complex solutions. What we will not see easily is the market shift in favour of such ecosystems, to the detriment of those who continue to go it alone.

What about the professional services sector? What if, instead of multiple small impact adoptions of individual solutions, we see a coming together of those elements into a more fundamental disruption? What if the very organisations that deliver services to market now start to appear as dispensable intermediaries when it comes to application of these individual solutions? What if you could externalise, decentralise, and redistribute the work done by large organisations, so that the concept of a company as a means for obtaining trusted professional services became redundant?

One project looking to build this out from the oracle model is ‘CoEngineers’, a partnership between the IEBC and Blockhaus Investments. The project will: “create a shared ledger of integrated engineering knowledge embodied in a global network of engineers from the infrastructure, energy, transportation, and construction industries. Use cases include the secure dispatch of credentials, transaction records, digital modelling, and the “verification of physical state” in support of, among others, novel financial and insurance products, IoT, AI, AV and applicable smart contracts. Use cases also include adjudicating contracts, analytics, as well as mitigating insurance and financial risk”⁹.

The engineering fraternity decentralised beyond organisational boundaries and connected more directly to tokenised projects, in which all affected parties have a clearly defined stake.

Similar models are starting to spring up in other STEM Sectors. For example, the “CFD Token” creates a decentralised supercomputer to open-up the market for computation fluid dynamics simulations¹⁰, tokenising this for efficiency and scale. The main net is likely to be released this year but the prototypes already have strong backing from Tesla, Daikin, and Lockheed Martin. Now imagine starting a business that provided services leveraged by these networks? Or imagine, as a client, interrogating these networks directly?

Governance

If you allow this kind of thought experiment to run, you might find yourself questioning the need for anything hierarchical that could be distributed instead. What if the end game from all these self-organising networks is in fact a reduction of the city or state governance, perhaps even to the level of a series of publicly scrutinised smart contracts. If people can become stakeholders directly in the projects that affect their lives, and protocols can govern the distribution, then do we end up voting on decentralised protocols rather than on centralised institutions?

This article has posed more questions than answers because I believe we need to think very differently about blockchain in our profession. Will the blockchain movement continue to protest the status quo or start moving forward to update and replace it? Will “blockchain native” start-ups manage to scale for delivery and execution, shifting the balance of power in their favour? Or will established service providers partner quickly enough and with sufficient impact and scale to lead the way? I hope the result will be a combination of the two but it is still too early to tell.

Footnotes

¹ Melanie Swan, Blockchain: Blueprint for a New Economy

² <https://cointeltegraph.com/news/taipei-partners-with-iota-to-become-a-blockchain-powered-smart-city>

³ <https://www.thenational.ae/business/smart-dubai-close-to-rolling-out-20-blockchain-based-services-1.695280>

⁴ <http://meetingoftheminds.org/will-blockchain-secret-sauce-smart-cities-25072>

⁵ <https://qubic.iota.org/>

⁶ <https://exonum.com/>

⁷ <https://create.smartcontract.com/sibos17>

⁸ <https://www.dlt.mobi/>

⁹ <https://medium.com/@ingenesisist/first-blockchain-developed-by-engineers-for-engineers-629a2a51010d>

¹⁰ <https://cfdtoken.com/>

DR NABIL ABOU-RAHME is Global Practice Leader, Data Science at Mott MacDonald
nabil.abou-rahme@mottmac.com
 MottMac.com