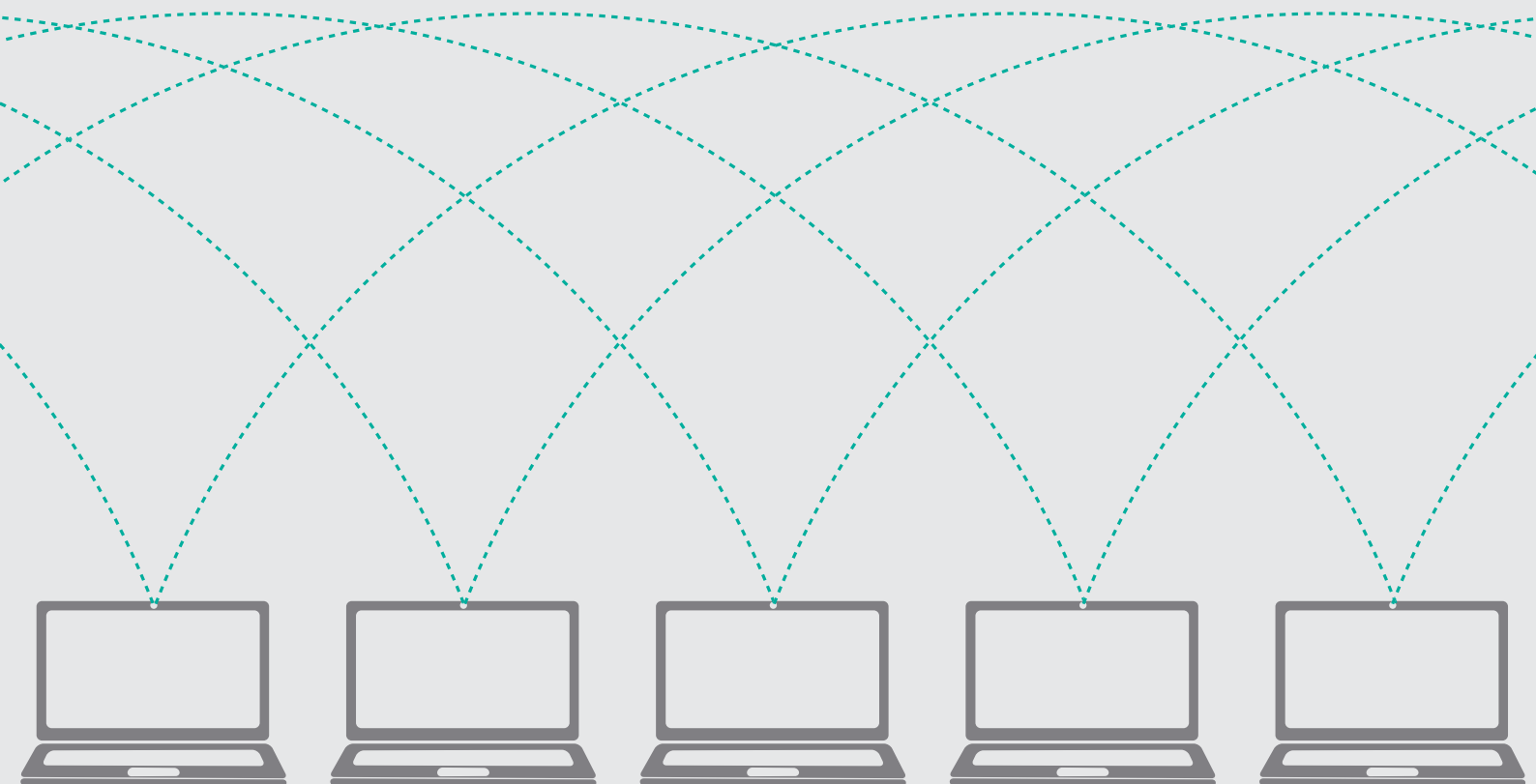


Blockchain:

A Networked Database

Rob Gear, Futurist at PA Consulting Group, explores the rise of blockchain and how businesses can utilise the technology





This year has been an interesting one for Blockchain. I've been following developments with interest since 2009, when it first came to prominence as the underpinning technology of the Bitcoin cryptocurrency.

From my perspective, 2016 is the year in which Blockchain emerged into the consciousness of mainstream businesses, and was given all the associated media coverage. I've lost track of the number of articles I've read that described the technology as being 'as disruptive as the internet' or similar.

Some see such statements as nothing more than hyperbole around a technology at the peak of its hype. Others are turned off by commentators' focus on the technical complexities of the Blockchain structure.

As a futurist, I try to avoid focusing on any technology in isolation. It's far more informative to view technology in the context of how it is used by people and organisations. A perspective on socio-technical systems reveals where societies create and select technologies that in turn shape those cultures and their institutions.

Adopting a macro cultural view has helped me think about why Blockchain is disruptive and how it might evolve to reshape our organisations. Let's start by thinking about how today's organisations and institutions have evolved to use technology to storing knowledge.

SQL – A Story of Centralisation

If we cast our minds back several computing generations to the 1970s, we witnessed the arrival of another

disruptive technology – the SQL database. This technology was wildly popular and remains so today.

Most major businesses and institutions have a large centralised database at their heart that holds the 'organisational truth' and institutional knowledge of the company.

SQL was revolutionary in that it helped companies build and manage a much greater degree of trust in their data, and the relationships between them, than with previous technologies.

Groups and individuals could be given permission to create and consume data at a controlled level. For example, as a project manager I might be trusted to see a list of my team members' addresses, but not their salaries, the latter of which would only be seen by the HR team and divisional manager.

In most organisations, a great deal of information is held in ad hoc knowledge repositories, spreadsheets and smaller databases. Yet if it's not in the central database, effectively it doesn't exist. In an era when the dominant organisational structure was centralised, hierarchical and organised around command-and-control, such SQL databases were a highly complementary fit.

Grit in the Machine

A big database at the heart of your organisation is a source of wisdom and competitive advantage, so you will be reluctant to let anyone else access it.

Collaboration is indirect – an organisation transmits knowledge from its database to another organisation, which does

something to it before storing it in its own database. When information is shared, often intermediaries are required to establish consensus between parties who don't inherently know or trust each other; think of land registries, clearing houses.

Good collaboration is based upon trust, transparency and efficient sharing of information, but when it's predicated on centralised and closely guarded private databases, the result is indirect, bureaucratic and inefficient. >

WHAT IS BLOCKCHAIN?

It's a type of distributed database that stores a permanent and tamper-proof ledger of transaction data. Most commonly it's associated with cryptocurrency; Bitcoin in particular. The technology is viewed as having the potential to transform multiple industries as an enabling technology for digital trust and transparency.

The digital records are put together into 'blocks' and then bound together cryptographically and chronologically into a 'chain' using complex mathematical algorithms.

This encryption process, known as 'hashing' is carried out by lots of different computers. If they all settle on the same answer, each block then obtains a unique digital signature. It is through this digital consensus that the integrity of the blockchain is assured.



Enter the Network

The greatest technological disruption to occur since the SQL database was the arrival of the internet, which undermined command and control structures, overturning and flattening hierarchies.

Power and influence have migrated to the network edges and information is more fluid than ever, but – and it is a big issue – our institutions, governments, corporations and regulatory regimes are still struggling to adapt to this enormous change.

We are still living and working in a society that is dominated by huge, centralised database-backed institutions that often communicate with each other through very inefficient and indirect means.

This can lead to the creation of silos and monolithic bureaucracies that struggle to co-operate well and can be difficult to interact with due to a lack of mutual trust and transparency.

At least some of this is down to the technical limitations of the SQL database. Trust in SQL was designed to work in a traditional hierarchical organisation of individuals, in groups that were considered as rigid and responsible for a defined set of functions. This has become unmanageable when scaled up and used in a fluid constellation of organisations and relationships.

What if?

What if we were to design a database technology optimised for co-operation between organisations and constant rapid change? I suspect it wouldn't look like SQL.

“ We are still living and working in a society that is dominated by huge, centralised database-backed institutions ”

Moreover, had we designed such a technology several decades ago, we might see a completely different macro-socioeconomic structure today – because it would be easier for people, businesses and governments to co-operate, share and efficiently respond to optimise for change.

A Database for a Networked World

Perhaps if we were to design a technology for our modern networked world to support trust, transparency and data sharing, it might look a lot like Blockchain.

If we start to think about the technology as an invention at the same level of abstraction as the SQL database, we can begin to understand its potential to transform.

I propose that a good place to start is to view Blockchain as a new kind of database and web infrastructure, which compliments rather than replaces existing web technologies.

But it also allows us to radically redesign our organisations and institutions for a networked, rather than a centralised, age.

By acknowledging there is currently tension between two generations of technology – the old, which is characterised by centralised SQL databases, and the new, which is characterised by Blockchain and the Internet of Things (IoT) – we can begin to think about redesigning organisations to support a decentralised, rapidly changing, fluid and highly networked society. ■

This blog was originally published on PA Consulting Group's website. Find out more [here](#)



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Rob is PA's Futurist and conducts ongoing horizon scanning of social, technological, economic, environmental and political trends looking for signals of change. He uses strategic foresight tools and techniques to explore uncertainty, challenge assumptions, and to develop alternative future scenarios to support strategic planning and innovation.

Rob also leads PA's Innovation Lab, a small team developing prototypes with existing and emerging technologies to highlight new opportunities and business value.

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