

Key challenges

“There have been a few different start-ups trying to create basically their own blockchains with specific use-cases. In our view we feel that kind of defeats the purpose of having a network itself because it just recreates silos.”³¹

Tim Swanson, head of research at R3CEV

As the blockchain ecosystem evolves and different use-cases emerge, organisations in all industry sectors will face a complex and potentially controversial array of issues, as well as new dependencies.

Awareness and understanding

The principal challenge associated with blockchain is a lack of awareness of the technology, especially in sectors other than banking, and a widespread lack of understanding of how it works. This is hampering investment and the exploration of ideas. As George Howard, contributor to Forbes Media and Entertainment, says about the music business, *“Artists – visual, musical, or otherwise – really must educate themselves about these emerging technologies, or suffer the fate of being exploited by those who do”*.³² This is a message that applies to organisations, also.

Key questions every leader should ask:

- Who is a thought leader in my industry in blockchain technology?
- To whom do I turn to in my organisation to explain blockchains?
- How do we increase our level of understanding – at all levels?
- Is a blockchain right for my organisation? And, if so, how are we thinking about applying it and what would this mean organisationally and culturally?
- With whom do I interact within my organisation to collaborate and deliver?
- What are my competitors and peers saying about blockchain?

Organisation

The blockchain creates most value for organisations when they work together on areas of shared pain or shared opportunity – especially problems particular to each industry sector. The problem with many current approaches, though, is that they remain stove-piped: organisations are developing their own blockchains and applications to run on top of them. In any one industry sector, many different chains are therefore being developed by many different organisations to many different standards. This defeats the purpose of distributed ledgers, fails to harness network effects and can be less efficient than current approaches.

Key questions every leader should ask:

- What problems or opportunities does my organisation share with others in the sector?
- Will a blockchain approach still leave a marketplace in which we can compete?
- What are the bottlenecks that might prevent us from working together?
- How can we take a lead in bringing the community together?
- How many organisations would be needed to create a critical mass?
- What are the common standards we require?

Culture

A blockchain represents a total shift away from the traditional ways of doing things – even for industries that have already seen significant transformation from digital technologies. It places trust and authority in a decentralised network rather than in a powerful central institution. And for most, this loss of control can be deeply unsettling.

It has been estimated that a blockchain is about 80 per cent business process change and 20 per cent technology implementation.³³ This means that a more imaginative approach is needed to understand opportunities and also how things will change.

Key questions every leader should ask:

- Where can we pilot new blockchain approaches on the edges of our business?
- Who will be most affected by blockchain implementations and are they supportive?
- Which areas of our business are likely to be most disrupted?
- Have we thought about impacts on our strategy, organisational structure, business processes, governance, talent and legacy systems?

Cost and efficiency

The speed and effectiveness with which blockchain networks can execute peer-to-peer transactions comes at a high aggregate cost, which is greater for some types of blockchain than others. This inefficiency arises because each node performs the same tasks as every other node on its own copy of the data in an attempt to be the first to find a solution. For the Bitcoin network, for example, which uses a proof-of-work approach in lieu of trusting participants in the network, the total running costs associated with validating and sharing transactions on the public ledger are estimated to be as much as \$600 million a year and rising.³⁴ This total does not include the capital costs associated with acquiring specialist mining hardware.

Blockchains are something of a productivity paradox, therefore. At the scale of the entire network the process is significantly productivity enhancing, but requires a certain ‘critical mass’ of nodes. Yet, even so, individual nodes can work extremely hard and may not contribute very much to the network overall.

Therefore, decisions about implementing blockchain applications need to be carefully thought through. The returns to individual processing nodes – either individuals in a public blockchain or organisations in a sector-wide blockchain – may diminish as the network grows in size. This means that blockchain applications must harness network effects to deliver value to consumers or to sectors at large.

Key questions every leader should ask:

- What is the business case for implementing a blockchain? How do we make it pay?
- What are the bottlenecks in the processes we are replacing with the blockchain?
- What are the main drivers of cost in our implementation of the blockchain?
- How can the cost and processing load be shared among participating organisations?

Regulation and governance

Regulations have always struggled to keep up with advances in technology. Indeed, some technologies like the Bitcoin blockchain bypass regulation completely to tackle inefficiencies in conventional intermediated payment networks. One of the other challenges of the blockchain approach, which was also one of its original motivations, is that it reduces oversight.

Centralised systems, particularly in financial services, also “act as shock absorbers in times of crisis” despite their challenges and bottlenecks.³⁵ Decentralised networks can be much less resilient to shocks, which can impact participants directly, unless careful thought is given to their design.

There is thus a strong argument for blockchain applications to work within existing regulatory structures not outside of them, but this means that regulators in all industries have to understand the technology and its impact on the businesses and consumers in their sector.

Key questions every leader should ask:

- How do current regulations impact our application of blockchain?
- Where are current regulations lacking?
- What will a regulator want to know about our application?
- How do we work with the regulator to bring our application to market?
- What else might we have to do alongside the existing rules to keep regulators happy?

Security and privacy

While cryptocurrencies like Bitcoin offer pseudonymity (Bitcoin transactions are tied to ‘wallets’ rather than to individuals), many potential applications of the blockchain require smart transactions and contracts to be indisputably linked to known identities, and thus raise important questions about privacy and the security of the data stored and accessible on the shared ledger.

Some argue that while no technology is completely secure, no one has yet managed to break the encryption and decentralised architecture of a blockchain.³⁶ Identities created within a blockchain would be unique and offer a higher level of assurance that the party was who they claim to be. But these claims do not take away from the need for every organisation adopting the technology to consider how privacy and security can inform the design. In particular, driving public acceptance of blockchain applications will likely mean proactively framing the discussion of privacy around concepts of value, security and trust.

Key questions every leader should ask:

- How are we applying security to our application and is privacy a priority?
- Who has access to the ledger and how is access controlled?
- How are updates to the software or application agreed and made?
- Have we thought about what our customers think about our application beforehand?
- How are we engaging with our customers?