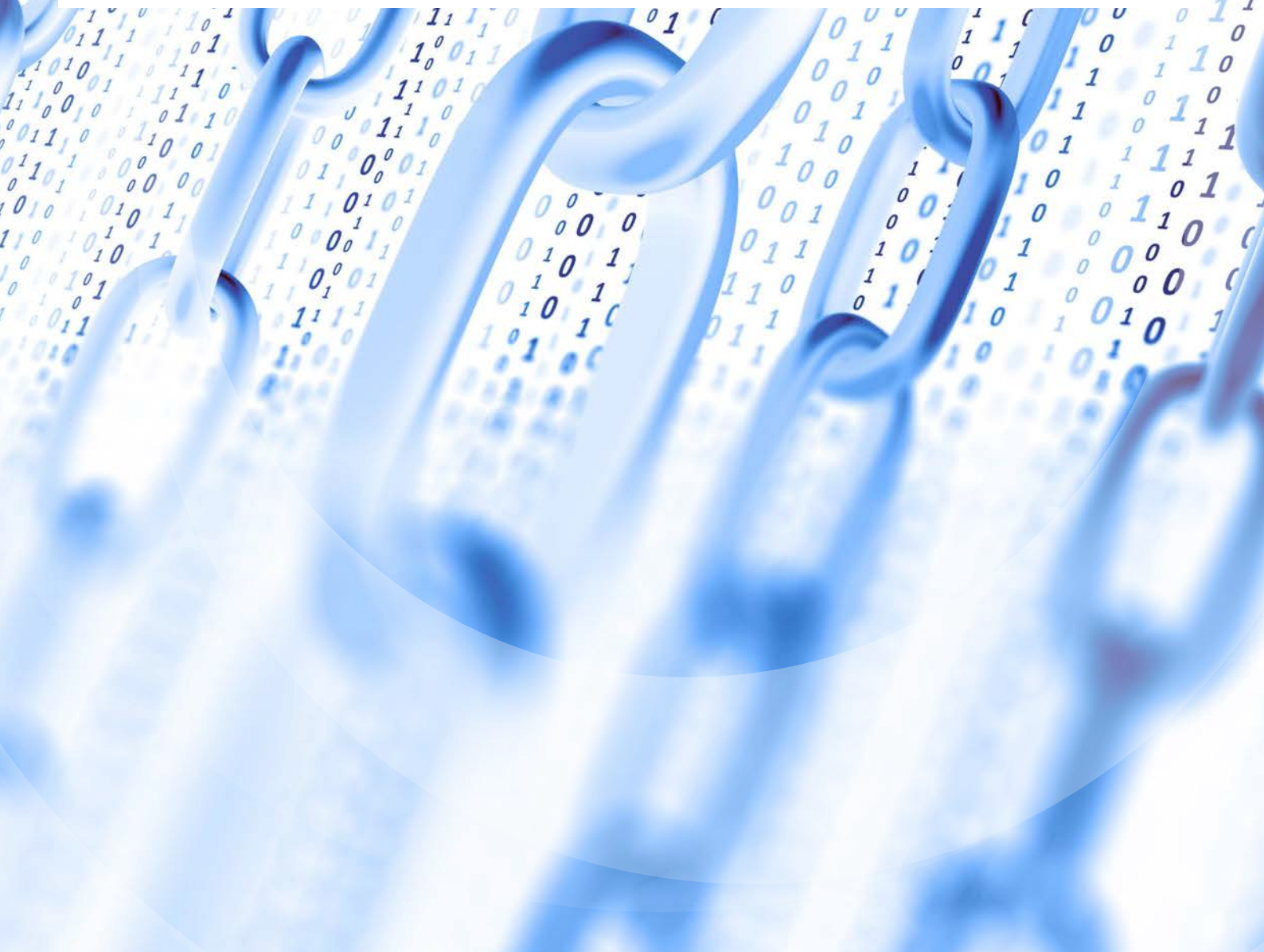


# THE ULTIMATE DISRUPTOR: HOW BLOCKCHAIN IS TRANSFORMING FINANCIAL SERVICES

SPRING 2018









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### ABOUT GOWLING WLG

Gowling WLG is a Global 100 legal practice, with more than 1,400 legal professionals across 18 cities in the UK, Canada, Europe, Asia and the Middle East. Focused on key global sectors including automotive, tech, energy, financial services, infrastructure and real estate, we can provide clients with deep sector expertise. In recent years, Gowling WLG has distinguished itself as a legal market leader in blockchain. It is a co-founding member of the Blockchain Research Institute, was instrumental in the public listing of the very first blockchain company in the world, and its experts are currently authoring *The Law of Blockchain Technology* (scheduled for publication by Thomson Reuters in 2018). In October 2017, Gowling WLG officially launched its Blockchain & Smart Contracts Practice Group, comprising seasoned practitioners from all legal disciplines, including capital markets, financial services, tax, and intellectual property.

From initial coin offerings to consumer protection issues, our team works with clients to overcome the latest blockchain challenges and take advantage of new opportunities.

# INTRODUCTION

**Blockchain is a form of distributed ledger technology (DLT) that offers a transparent, decentralised way of recording lists of transactions, allowing digital information to be distributed rather than copied. It was originally developed for cryptocurrencies like Bitcoin but can be used in any situation where it's important to ensure provenance.**

As opposed to a traditional database which has a central administrator, the distributed ledger of a blockchain has a network of replicated databases, synchronised via the internet and visible to anyone within the network. Blockchain networks can have a restricted, private membership, or be accessible to any person in the world, in the same way as the internet.

The financial services industry has quickly recognised the transformative impact that blockchain can have on their global operations and client interactions. As a result, businesses ranging from small start-ups to large multinationals are investing heavily in the development of blockchain and distributed ledger technology.

In his book "Business @ the Speed of Thought: Succeeding in the Digital Economy" Bill Gates writes: "We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten. Don't let yourself be lulled into inaction."

Our research reveals that the financial services sector is actively following this philosophy. The following pages therefore focus on the blockchain development process currently underway and discuss the associated threats and opportunities.

We discuss both DLT and blockchain in this report and many of our experts use blockchain as an umbrella term for both. We hope you find this report thought-provoking and a useful addition to the current debate.

If you have any comments or ideas that you would like to discuss, then we'd very much like to hear from you.

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# METHODOLOGY AND CONTRIBUTORS

The research was conducted by BizWord Ltd ([www.bizword.co.uk](http://www.bizword.co.uk)), an independent business consultancy. Specific sources have been listed in the report. To compile the report, we undertook:

- A quantitative, online survey, which was sent to FinTech experts in businesses headquartered around the world.
- In-depth interviews with a panel of experts during early 2018.
- Desktop research and analysis of publicly-available information, industry studies and forecasts.

Members of the global tech team from Gowling WLG contributed to the report:

**David Brennan**, Partner and Co-Chair of Global Tech Sector.

**Usman Sheikh**, Partner and Head of Gowling WLG's Blockchain & Smart Contract Group.

**Penny Sanders**, Director, UK Financial Services Regulation.

Many thanks to our expert contributors, for giving their time and sharing their expertise. They are:

**Allister Manson** – Partner & Head of Investing & Technology, Cork Gully.

**Andrew Gardiner** – Founder and CEO, Property Moose.

**Barry Childe** – Technical Lead for DLT and Cryptocurrency Technology, HSBC.

**Choon Leng Tan** – Director and Head of Corporate, JurisAsia LLC.

**Dean Elwood** – CEO, Umony.

**Genevieve Leveille** – Founder & CEO, AgriLedger.

**Guy Halford-Thompson** – Director, BTL Group Ltd.

**Haydn Jones** – Founder and Managing Director, Blockchain Hub.

**Patrick Birley** – CEO of NEX Exchange.

**Rodger Oates** – Chair, TechUK Blockchain Working Group.

## DEFINITIONS

**BLOCKCHAIN** – A form of distributed ledger technology enabling a digitised, decentralised, public ledger of all cryptocurrency transactions. Constantly growing as 'completed' blocks (the most recent transactions) are recorded and added in chronological order. It keeps a track of cryptocurrency transactions without central recordkeeping. Each node (a PC connected to the network) gets a copy of the blockchain, which is downloaded automatically. Originally developed to create the peer-to-peer digital cash Bitcoin.

**DISTRIBUTED LEDGER TECHNOLOGY (DLT)** – A digital system for recording the transaction of assets in which the transactions and their details are recorded in multiple places at the same time. All participants within a network can have their own identical copy of the ledger.

Unlike traditional databases, distributed ledgers have no central data store or administration functionality.

**ENTERPRISE SOFTWARE** – An over-arching term for any software used in large organisations. It is an essential part of

a computer-based information system and provides business-oriented tools.

**A HASH** – An alphanumeric string generated according to a file's contents. If the file has been changed in any way, the hash value changes as well.

**INITIAL COIN OFFERING (ICO)** – A means of crowdfunding centred around cryptocurrency whereby funds are raised for a new cryptocurrency venture. In an ICO campaign, a percentage of the cryptocurrency is sold to early backers of the project in the form of 'tokens', in exchange for legal tender or other cryptocurrencies, but usually for Bitcoin.

**SMART CONTRACT** – Computer protocols that facilitate, verify, or enforce the negotiation or performance of a contract, or that remove the need for a contractual clause. Smart contracts usually have a user interface and often follow the logic of contractual clauses.

# SUMMARY OF KEY FINDINGS

**Blockchain and DLT are receiving an increasing amount of industry, media, political, legal and business attention. Their unique selling point is that once a digital record of a transaction has been encrypted, it cannot be tampered with.**

Every time information is run through a blockchain system, a hash is generated. The original information cannot be changed without everyone in the network immediately being aware of an altered hash.

The blockchain therefore provides a verifiable and auditable history of all information stored on that particular dataset. Every record stored in the distributed ledger is time stamped and has its very own cryptographic signature.

For example, if a recorded conversation is run through the blockchain, that recording can never be secretly altered – even if only a millisecond is deleted from the end. A court of law or financial authority can therefore be sure the recording is genuine. This level of certainty is a potentially exciting development for anyone involved in business.

Our research shows that financial services businesses were some of the first to spot the potential to apply DLT to conducting business and that it could disrupt their traditional business models.

But what does this mean for the development of the financial services world and how can it ensure that its innovative promise delivers real benefit?

We have identified several opportunities which are persuading the financial services industry to dedicate material resource and capital, to the use of blockchain technology.



**We will discuss the findings below in more detail over the following chapters.**

Blockchain certifies that facts are true cryptographically, thereby reducing the need for trust in business. DLT can also speed up transactions and simplify the settlement of complex financial instruments.

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The software will work in any organisation. It is a powerful tool because it can take data and pass it almost instantaneously across an entire organisation. Importantly, everyone knows they are looking at the most recent and correct version of that data.

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Investment in blockchain technology is projected to reach US\$9.2 billion by 2021. Our experts and the associated online survey also demonstrate that businesses are investing in large teams of people to guide the development process.

For the financial services industry, enterprise-led versions of blockchain and DLT appear to be the most appropriate solutions.

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It could reduce time and spend on back-office functions but should not be seen as a threat to jobs. Instead it creates new opportunities.

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The association with Bitcoin is having a negative impact on blockchain and DLT.

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It will become a mainstream technology within the next ten years.

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Regulation is needed, but it must be industry-led rather than apply to the technology itself.

# BUILDING A TRUSTED SYSTEM

In general, we are most familiar with blockchain as the software that enables cryptocurrency transactions. In this form algorithms aggregate the transactions in 'blocks' and these are added to a chain of existing blocks using a cryptographic signature. A cryptocurrency ledger is constructed in a distributed and permissionless way, so anyone can add a block of transactions if they can solve a new cryptographic puzzle.

DLT has this basic idea at its root. It is essentially a database that can be shared across a network of multiple sites, geographies or institutions. All participants have their own identical copy of the ledger and changes can be reflected in seconds. The security and accuracy of the assets stored in the ledger are maintained cryptographically using keys that control access.





— Usman Sheikh, Partner and Head of Gowling WLG's Blockchain & Smart Contract Group, comments:

“Blockchain first appeared in 2008 and for several years it was very much a niche technology. Although many had heard the word Bitcoin very few people were using it, while even fewer understood it. But over the last few years the rising price of Bitcoin has propelled both Bitcoin and blockchain onto the international stage.”

## CURRENT PROJECTS

Our experts mentioned several major projects which illustrate the level of investment now going into blockchain development:

- The R3 Consortium which has been working on the development of Corda, a DLT software solution, since 2015.
- The Hyperledger Project is an umbrella project of open source blockchains and related tools, started in December 2015 by the Linux Foundation.
- Project Ubin, run by the Monetary Authority of Singapore (MAS), exploring the use of DLT for clearing and settlement of payments and securities.
- BP, TOTAL and Eni are using blockchain technology for gas trading reconciliations.
- VISA's B2B Connect is the pilot phase of its blockchain-based, business-to-business payments service.

It is key for much of the ongoing development work that these projects are not being undertaken by one company, but through cross-industry collaboration.

R3, for example, is an enterprise software firm working with more than 100 banks, financial institutions, regulators, trade associations, professional services firms and technology companies to develop Corda – a DLT designed specifically for financial services.

The aim of the consortium is to make the business of banking simpler and cheaper. It wants to use DLT to replace the existing array of financial technology platforms that communicate poorly with each other, thereby improving efficiency and minimising costs.

Barry Childe, Technical Lead for DLT and cryptocurrency technology at HSBC, tells us:

“Distributed ledger technology is mostly not about what one firm does, its strength is as a collective or collaborative thing. It's important we get it right as it's transformative for the financial services industry. It's about people being able to transact and do business easily and safely.”

The Hyperledger Project is a similarly collaborative undertaking. It is all about developing an open source solution that, in their words,

“brings blockchain technologies forward to mainstream commercial adoption”.

Project Ubin aims to help MAS and the financial services industry in Singapore better understand DLT technology and the potential benefits it may bring, through practical experimentation. Its eventual goal is to develop simpler, more efficient alternatives to today's systems which are based on digital central bank issued tokens. A key part of Ubin is its partnership with R3 on a proof-of-concept (POC) project to conduct inter-bank payments using blockchain and DLT.

Choon Leng Tan, Director and Head of Corporate at JurisAsia LLC, stresses the importance of a collaborative approach:

“The Singapore government has made a deliberate decision to put its muscle behind such big collaborative projects such as Project Ubin. I think it absolutely requires this sort of investment at the highest level to drive the changes we need and to fulfil the potential that blockchain promises.”

All our experts stressed that DLT will work in any organisation. What makes it so powerful is the way that it takes data and passes it across an entire organisation at the same time, with everybody knowing that they are looking at the most recent and correct version of that data.

## INVESTMENT LEVELS

Perhaps one of the clearest signs that blockchain and DLT software have the potential to change the way we transact business globally is the amount of money going into its development.

A recent report by the International Data Corporation (IDC)<sup>1</sup>, estimates that US\$945 million was spent on blockchain solutions in 2017. This amount is expected to more than double to US\$2.1 billion during 2018 and, by 2021, levels are expected to reach US\$9.2 billion.

<sup>1</sup> Worldwide Semiannual Blockchain Spending Guide, IDC, 2018.



Our experts are tracking this rise in their daily business life. Patrick Birley, CEO of NEX Exchange, comments:

“We are the other stock exchange in London, and we've been encouraging blockchain companies to list on NEX. Obviously as a stock exchange we're interested in new areas, particularly ones where we think there is potential for large growth. There is undeniably a great deal of interest around blockchain.”

One of the companies at the forefront of this development is BTL Group Ltd. In fact, it was the first blockchain company to list in 2015, a move that validated BTL's assumptions in relation to blockchain technologies and firmly positioned the company as a leader in the space.

BTL co-founder and Director, Guy Halford-Thompson says:

“We saw a lot of people interested in Bitcoin, but we thought there was potential to use the software behind it as an enterprise solution. And it quickly became obvious that blockchain could have a lot of applications. To me, Bitcoin is just a use-case on blockchain. If blockchain is the internet, then Bitcoin is email. But of course, the internet does a lot more than enable email. We tell people to forget cryptocurrencies and use blockchain technology to reduce the cost of your IT infrastructure.”

Dean Elwood, CEO at Umony, has a similarly entrepreneurial approach:

“Blockchain was taking off and I realised that it could help with compliance around communications. I founded Umony about a year ago to build the next generation of compliance recording systems for the banking sector.”

Allister Manson, Partner & Head of Investing & Technology, at Cork Gully backs this up:

“I'm not a technologist but I've seen blockchain technology used in real life in a wide number of cases. I also advise numerous technology companies on their restructurings and mentor some younger companies. I see early stage tech companies incorporating blockchain in their offerings all the time.”

For the financial services industry, it appears to be the development of blockchain-based enterprise solutions that are gaining most traction. Barry Childe, continues:

“We're expecting the first DLT-based live transactions to take place in the next few months, although building this at scale will take longer.”

Genevieve Leveille, Founder & CEO at AgriLedger agrees that financial services businesses understand the impact of the technology but believes that some of their eagerness to invest in it is to protect their current positions:

“The banks realise that if they don't create and harness this technology, they run the risk of being displaced by clever tech or service providers. For example, there is a company called AID:Tech who deal with micropayments for refugees. They issue an ID card which is like a credit card and work with the UN to deliver benefits using this method. This does, in effect, remove the need for the banks.”

## EXPERTISE

For blockchain and DLT to achieve their promise of being transformational technologies, they require expertise and understanding.

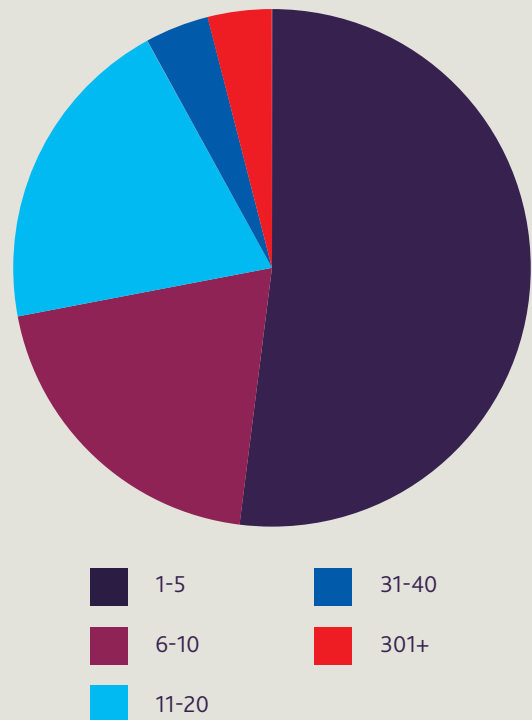
Dean Elwood remarks:

“The financial services industry is really getting its head around the technology. Many of the banks are investing in it and, as tends to happen with these big companies, they buy in the intelligence and talent to run it. I think that everyone in the financial world has realised that it is the future.”

From a regional point of view, our experts agreed that the UK, Canada and the US are leading the technology development. But Singapore and Tel Aviv were also mentioned as hot-spots of expertise.

Responses to our online survey confirm there is investment going into the development of in-house knowledge. The data shows that many internal teams focused on the development of blockchain are currently small, but some already have more than 300 people in them.

### Size of in-house blockchain development teams

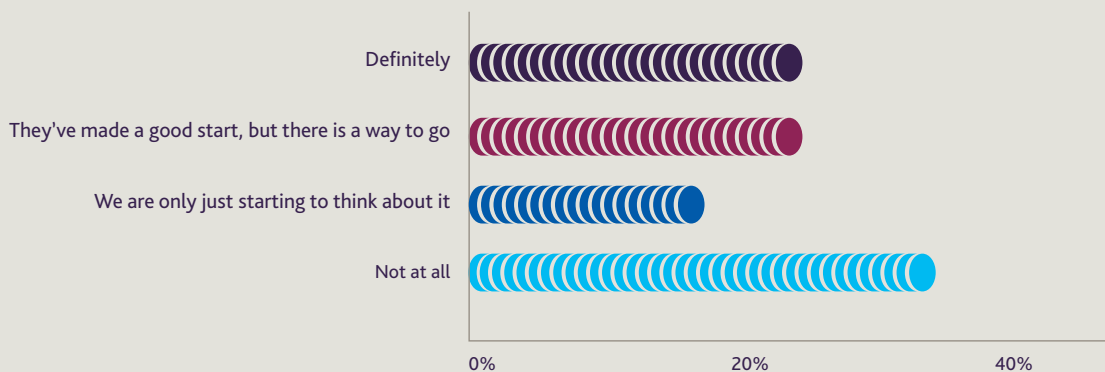


However, there is a consensus among our panel of experts that more developers who really understand the technology and how to build it are needed. Usman Sheikh agrees:

“There are people who understand it in general but I think there are very few who really understand the complexities of the technology.”

Our survey below also shows a wide divergence of opinion on whether the respondent's company is on top of blockchain and DLT advancements.

### Is your company on top of the developments blockchain can bring?





Allister Manson from Cork Gully comments:

"As far as the financial services sector is concerned, I think it is generally true that people further down the businesses, who are actually working on these projects, really understand the tech. But the people at the top of the organisations don't really have a grasp of what it can do."

— David Brennan at Gowling WLG comments:

"The business community has been quick to grasp the numerous opportunities blockchain solutions afford, but the key challenge will be communicating its significance to both the public and policymakers. Collaboration between governments and the private sector is key in order to facilitate widespread acceptance and adoption of the technology."

## OPPORTUNITIES AND THREATS

In early January 1985, Sir Clive Sinclair unveiled his one-person, battery electric vehicle at a glitzy launch event. His C5 was billed as "the next big thing" and he hoped to repeat the success of his PC range in the electric vehicle market.

But it received a less than enthusiastic reception and became known as one of the great marketing disasters of post-war British industry.

DLT software is designed to increase transparency, with evangelists telling us it will shift control over daily interactions with technology away from central control and redistribute it among users. This will make systems more transparent and, the argument goes, increasingly democratic.

However, there is still significant development needed and some of our experts questioned whether complete transparency was desirable. Personal information, for example, must be protected at all times.

The problem with technological innovation is that there is always a chance it will go wrong. So how can blockchain and DLT avoid being another C5?

This is the point at which many of our experts start to differentiate between blockchain and DLT. Blockchain is open to all, while DLT gives more control over access.

The opportunities highlighted by our experts divide themselves into two main categories. They believe the software will:



Streamline back office processes, making business faster, more efficient and less costly.



Enhance trust and interoperability.

## STREAMLINING

There are huge numbers of back-office applications associated with keeping track of processes and information. Many of these applications are a result of evolution, rather than specific design. If technologists were starting with a blank piece of paper today, many existing processes would be categorised as red tape and consigned to the bin.

Barry Childe at HSBC provides an example:

"Going forward, transaction agreement can be simplified using DLT. When Mr A and Mrs B agree on a business transaction, what they need is a system that records their agreement. In an ideal world, they should be able to each push a button and say, 'we're done, we've agreed' and watch the value transfer happen. This is what blockchain and DLT can do."

So, if this software can automate simple processes, in theory it means employees will be able to work more efficiently and reduce the amount of time spent on repetitive tasks. It also frees up people to work on more interesting upstream or downstream areas and provides new opportunities.

To many of our experts, the similarities between blockchain and the internet are obvious. Guy Halford-Thompson comments:

"Everyone was worried that the internet was going to replace people's jobs. However, the amount of jobs and opportunities it created vastly outweighed the numbers lost. Just like the internet, blockchain will allow companies to offer services they previously wouldn't have been able to."

As far as the financial services industry is concerned, it is widely believed that DLT can save banks a lot of money.

Barry Childe again:

"The actual cost of operating a bank is very high. If DLT software can make operating the bank faster, cheaper, and simpler, this will inevitably benefit banks and their customers."

For example, DLT could keep track of every clause in every contract ever agreed by a bank. It would know what it says and make sure it is never breached. This would happen automatically without the need for detailed searches or intensive input from a human being. In summary, it would enforce every important piece of paper automatically. So suddenly a bank has more control and can run more smoothly.

Another significant outlay for financial services businesses is accessing financial data systems. Blockchain and DLT could help in this area too.

David Brennan points out:

“Each time a bank buys access to Thomson Reuters or Bloomberg for example, they have to physically build infrastructure to use it. And then they need a market data team to take care of it. Blockchain-based software can do this for you at a fraction of the cost and at a much bigger and better scale.”

Blockchain has been criticised for using large amounts of computing power and electricity. The traditional model of blockchain, when it is used as a currency software tool, is to have “miners” who are given mathematical or cryptographical problems to crack, to receive coins. But solving these problems results in immense energy consumption and potential climate impact.

Dean Elwood at Umony explains that this doesn't apply to all DLT software being used by banks.

“We are not using blockchain as a currency. We are applying the same technology in a different way - we have a DLT chain which represents an audit trail which is cryptographically secure and can prove that auditable elements have not been tampered with.”

He continues:

“The software has become a commodity and is now low cost to manage. For non-currency/mining use cases, computing power required isn't a problem.”

Andrew Gardiner, founder and CEO of Property Moose, sees speed and transparency as blockchain's main advantages and believes that property transactions will benefit.

— Andrew said:

“The perfect match for using this sort of software is dealing with conveyancing. As anyone who has bought a property knows, dealing with the conveyance can take anything from three to 12 months. Blockchain should reduce this significantly and make it both easier and cheaper.”

## INTEROPERABILITY AND ENHANCING TRUST

Many of our experts use the word “transformational” to describe DLT technology.

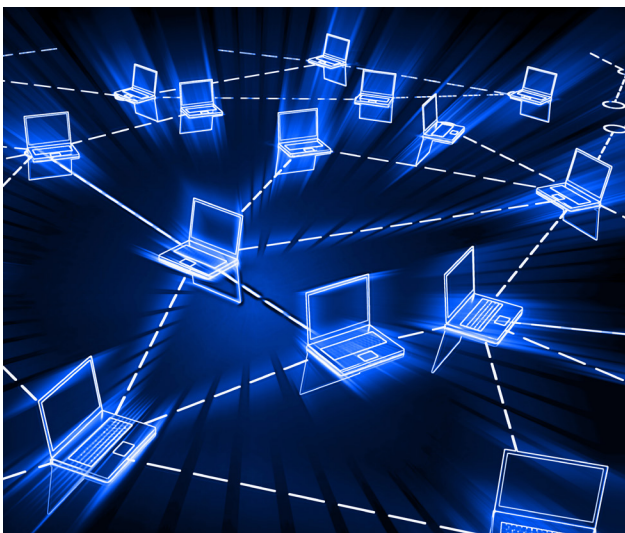
According to our experts, the two things that blockchain does extremely well is keeping track of data and making sure it is accurate. At the same time, it shows everybody who has been involved in the data processing. Increasingly, financial services businesses are being forced to share their core data, so this “audit trail” becomes very important.

“In the past, banks weren't really pushed to connect with other banks,” comments Guy Halford-Thompson. “Increasingly however, they must share their data with their peers, and many of their app services are being built on the assumption of this sharing. The banks really need to be sure about what they're sharing and how they're sharing it. This is a difficult challenge using traditional technology, but it is very, very easy using blockchain.”

Interoperability is a key goal for the members of R3 consortium in their development of Corda.

“All the work we're doing is really about building superior business networks so that we can all work and transact together,” says Barry Childe. “In the future we wish to see interoperable applications on these business networks, where businesses and customers can transact seamlessly regardless of the underlying DLT technology.”

An important part of sharing information is being able to trust the validity of the information in the first place. Many of our experts comment on the importance of ensuring blockchain technologies are well-built, can spot all human error and be tamper-proof.



— Dean Elwood at Umony, adds:

“Often when we talk about something being ‘immutable’, people think about stopping bad guys from tampering with records. With financial services this isn’t always the case – human error is a bigger problem than fraud. We look at it as enabling the good guys to cover their backs from an auditing point of view and give them the ammunition to say: ‘you don’t have to even trust me, here is the evidence’.”

This is one of the reasons why the financial services industry is at the forefront of its development. It is often referred to as “trustless”, because you can cryptographically prove everything that has taken place.

Blockchain and DLT could also fundamentally change the role of business intermediaries, namely lawyers and accountants.

In the legal world the array of use cases have been well documented, from simplifying the due diligence process on a corporate transaction to coding IP royalties from streaming into the blockchain to ensure artists receive immediate payment.

For accountants, it means companies can be audited more easily, because it gives you a live audit trail. If, for example, you are a large multinational spending £millions per year being audited, blockchain will give you the tools to go to your regulator and show them that the bottom line figure is completely accurate.

Patrick Birley, at NEX Exchange, comments:

“To a certain extent, it seems pointless developing this technology unless there is going to be some level of disintermediation. The need for multiple layers of due diligence on transactions should disappear, for example. But I don’t think this is going to be a revolution. It will be an evolution that will take several years. And in that time law and accountancy firms will have plenty of time to adapt.”

Dean Elwood believes:

“It will do away with a lot of very complex litigation because it immediately proves that something has or hasn’t happened. So as an evidence gathering system it is extremely powerful.”

There are, however, issues to be resolved in relation to smart contracts, particularly how they apply in different jurisdictions and how this affects any underlying legislation.

Usman Sheikh, at Gowling WLG, comments:

“Lawyers and accountants are intermediaries and we are not immune from the transformative nature of this sort of technology. I

think, for example, that smart contracts will demand that we change our business model.”

Our experts also pointed out that blockchain would mean the law firms would need to change their business models.

Genevieve Leveille adds:

“I don’t think this software removes the need for the middlemen, I believe it rehabilitates them and gives them purpose.”

David Brennan comments:

“So in some ways we’re back to heeding Bill Gates’ advice. However, given how technology is transforming how we do business, the speed of change is such that law firms do need to think about what they’re going to look like in two years’ rather than ten years’ time. The business model will have to change, but this will create new and exciting opportunities for us all.”

Usman Sheikh adds:

“Gowling WLG’s recent strategic alliance with Decentral Inc., one of Canada’s leading blockchain companies, demonstrates the importance we place on innovation in this space and our commitment to optimising the many commercial and legal applications of blockchain technology.

The relationship with Decentral will allow our respective businesses to fuse expertise on a number of significant initiatives – from engineering practical smart contract technology and drafting foundational legal precedents documents, to helping regulators establish frameworks that encourage the responsible growth of a thriving blockchain sector.”









## THE BITCOIN FACTOR

Discussions concerning pitfalls for the development of the blockchain family were dominated by a single point – its association with Bitcoin.

Dean Elwood comments:

“Bitcoin is creating so much noise, much of it negative, that the genuinely useful and practical side of blockchain is getting buried. I think there is a real pressure on the industry and people like me, to make sure that everyone really understands the difference between blockchain and cryptocurrencies like Bitcoin. There is nothing wrong with the technology, it is cryptocurrencies in unregulated markets that are the problem. To maximise blockchain's potential we must make it clear that cryptocurrencies simply use this technology.”

Andrew Gardiner agrees:

“Its main flaw is that blockchain is automatically associated with cryptocurrencies and that's not right. I don't think there is enough focus on what blockchain actually is. Fundamentally, it is a solution for business that solves problems, but at the moment we're simply not talking about it loudly enough in this context.”

Many of the major banks are seeking to distance themselves from unregulated cryptocurrencies.

Barry Childe confirms that HSBC does not trade cryptocurrencies nor process payments denominated in virtual cryptocurrencies.

Rodger Oates, Chair of the TechUK Blockchain Working Group, adds:

“When you're talking about this sort of software still the conversation goes to blockchain, rather than DLT solutions. People need to understand that we are talking about enterprise grade

software that complies with the necessary rules and regulations, rather than anything associated with cryptocurrencies.”

Patrick Birley fully understands why the banks are shying away from cryptocurrency involvement:

“As a financial services company, you have to be extraordinarily careful if you are involved in the crypto world. But if you're involved with blockchain then this is merely a facilitating technology. It isn't particularly magical, but it does have the potential to change the way we do certain tasks, particularly anything that involves processing.”

He continues, however, with a warning that blockchain companies need to be clear about where their shareholder value lies.

“It is important to realise that the blockchain investment companies which are around now do all dabble in cryptocurrencies. So, when cryptocurrencies are worth a lot of money their share prices go up and similarly when the value of cryptocurrencies drop, so does their shareholder value. As yet, it is unclear whether shareholders see value in blockchain itself, or whether they are only looking at cryptocurrencies.”

Some of our other experts are slightly less worried about the long-term impact of Bitcoin on blockchain's reputation.

Haydn Jones, Founder and Managing Director at Blockchain Hub, believes:

“We need to move beyond this and see the bigger picture. Bitcoin is a brilliant innovation built on government originated cryptography. To really understand the value of blockchain, one must also understand Bitcoin. The biggest opportunities emerge when we focus on the blockchain software and its use with cryptocurrencies.”





Guy Halford-Thompson says:

“I think for the broader audience, the negative PR being given to Bitcoin is having an adverse impact on blockchain. But this isn't affecting the specialist audience. For example, I know there are unscrupulous websites out there but that doesn't mean I don't use the internet for my business. New technology is always about how you use it, rather than the technology itself.”

Choon Leng Tan thinks the “noise” about Bitcoin will dissipate.

“In reality most people are outside looking in – only a very small number are actually trading in cryptocurrencies. There is a lot of curiosity about Bitcoin, combined with amazement surrounding its outlandish rise in value. I do think that those people who are part of the industry i.e. trading in Bitcoin or building blockchain software are more than aware of the difference. I am therefore very hopeful that the negative PR won't make any difference.”

Again, similarities can be found with the development of the internet. Usman Sheikh recalls the association between the web and criminal activity:

“Despite being associated with a certain amount of criminal activity at the start, we now use the internet for everything and it is a ubiquitous technology. I think the same thing will occur with Bitcoin and blockchain.”

## IS THERE A BUSINESS THREAT?

Our experts think not. In fact, nobody who responded to our online survey thought it posed a risk. All our experts could, however, see where there might be a perceived threat, namely:



It could replace people's jobs.



A lack of understanding.

Dean Elwood comments:

“The word processor replaced the typewriter, but we still need people who can type! And some companies are simply afraid of what they don't understand. There is, therefore, a risk of some organisations falling behind because they fail to keep up with the times. It is key that financial services companies make sure they put their hands around blockchain and understand the strategic importance to their business and its development.”



# FROM INNOVATION TO EVERYDAY

**So how can blockchain become mainstream? Today's market demands that new products and services enter the market at a more advantageous stage and cheaper from the start. This means technologists cannot rely on the old model of selling their new product at a high price to a select band of early adopters, whose endorsement then funds further development.**

In fact, many of our experts think that blockchain has already arrived. Guy Halford-Thompson comments:

“In 2017, people were just about aware of it enough to pencil in some budget for blockchain innovation in 2018. So, in early 2017 we were going to the banks and educating them in blockchain. Now they have entire teams devoted to it. They're still getting up to speed, but the fact is that they have now made the investment. This is going to be mainstream very quickly. It's very clear that this is a foundational piece of technology.”

Rodger Oates also believes it will form the backbone of technology solutions but adds a note of caution:

“There is no doubt that blockchain technology can simplify internal business processes. However, in cases like this where we are talking about disruption, multiple parties need to work together to ensure it works. We need to agree common processes and governance as a framework for innovation.”

But what will the mainstream version of blockchain look like? Our experts agree that it will probably not be the “open to all” version of the software that was designed for Bitcoin.

Andrew Gardiner sums it up:

“I do think that blockchain technology will be mainstream shortly. However, I don't think it will be in the same form as it is now. For example, I don't think it will be a 100% open ledger. Mostly because I just don't know how you will achieve the speed and consistency of transactions. The actual business of having a decentralised ledger will definitely be around. But I'm pretty sure it won't be on ordinary peer-to-peer computers.”

Patrick Birley at NEX Exchange believes that blockchain will become part of everyday technology solutions.

“I think within five years blockchain will be one of the standard technologies available. I would be very surprised if it wasn't and I would also be surprised if almost every application wasn't being built with some element of blockchain included.”

## GOVERNANCE AND REGULATION

Many of our experts discussed regulation as a key part of blockchain and DLT's move into the mainstream. And they all agree that regulators need to be aware of the context. Rodger Oates explains:

“You don't regulate technology, you regulate to protect the consumer. The technology needs to sit within the regulatory environment of its sector and then regulation exists around the outcomes the technology delivers.”

I am working with a lot of clients who have already produced proof of concept for the software. Some of these concepts are not appropriate and blockchain is not the answer to everything. But part of the problem with getting my clients from proof of concept stage to actual production is that the regulatory environment is not clear, so they don't know what they can and can't do.”

The financial services sector is already working towards regulation, under the umbrella of the R3 consortium.

Barry Childe says:

“Through the R3 consortium we are engaging with regulators to ensure that DLT in financial services is done properly. For it to succeed I believe it must be performant, robust, reliable, tamper proof and trustworthy.”

And again, most experts agree that the technology suffers because of its association with Bitcoin.

Barry continues:

“Trust is so important to getting Enterprise DLT accepted within the marketplace. If Bitcoin is viewed negatively, this can have a knock on impact to adoption of Enterprise DLT solutions. Being able to educate about the differences will be important”

Again therefore, developers need to ensure the distinction between Bitcoin and the software that was designed to support it, is clear.

Andrew Gardiner adds:

“Cryptocurrencies need regulating, absolutely, 100%. But you can't regulate blockchain itself. It's just a piece of tech. For example, do you regulate Microsoft Word or Google for emails? They all have to be ISO compliant, so you'll have industry standards, but these are not regulation.”

While there is agreement that some regulation is desirable, there is no consensus on the level necessary. And some of our experts believe the shared nature of the technology already gives a level of control. Dean Elwood clarifies this argument:

“Blockchain technologies are open-source and this effectively means it is self-regulated by a community. So, Bitcoin is to a certain extent regulated by the community using it. Cryptocurrencies and ICOs will become regulated, but from the technology point of view it already kind of is, because it is open-source.”

Choon Leng Tan in Singapore says:

“I think cryptocurrencies will absolutely need some regulating, but the level really depends on their adoption. Past civilizations tried to use coral shells as currency, and you can be sure that if this had caught-on then sea shells would be regulated by now. My view is that until you can walk into a Starbucks and buy a latte with a cryptocurrency, then regulation is not necessary.”

And there was by no means universal doom and gloom from our experts when it came to discussions about cryptocurrencies. Patrick Birley tell us:

“I believe that cryptocurrencies will be part of the future. I am a believer and I think they're a positive thing because it's making people think about what currency is all about. Many of the arguments used against cryptocurrencies can also be levelled at the Sterling and the US\$. I think the first national crypto that comes out will be very, very exciting.”

Allister Manson is also keen to put forward a realistic view:

“I think it is important to get some balance in the cryptocurrency debate. Some people view ICOs simply as a way of raising huge amounts of money, and there are inevitably individuals at the fringes who will take advantage of that. But I think it is important to realise that many of the ICOs that have already happened, in the US for example, have been fully compliant with SEC regulations. They have followed the regulations that apply to IPOs, because the people doing the ICO don't want to be caught out by their regulators. What needs to happen now, is for ICO regulation to catch up!”

Usman Sheikh provides some background:

“Governments and regulators have started to focus a lot more on this technology in recent years. We have also seen several enforcement actions which, while not necessarily enjoyable for those involved in them, have helped to define the parameters of the law. We all agree that cryptocurrencies should not be a vehicle for criminal activity, for example, and there needs to be some level of regulation to ensure that important policy objectives like this are met. And separately the technology needs to be regulated within whichever industry it is being used. We must be careful that regulation never stifles innovation, but still protects investors. This is currently a very active discussion in the capital markets area.”

— Penny Sanders, Director at Gowling WLG, adds:

“As our contributors have rightly highlighted, which regulator, if any, and which regulations, if any, might apply will depend on the use to which the technology is put and who is the intended end user. There are legal frameworks, which are to a great extent technology neutral, already in place in the UK to protect consumers entering into contracts, investors in securities and users of fiat currencies. The focus must be on whether the technologies are fit for purpose and have utility. Serious players in the market will be comfortable moving into a regulated environment as innovators in the past have demonstrated.”

## WHO WILL IT IMPACT?

It seems that blockchain and DLT have enormous potential and that their impact is by no means limited to the financial services area. All our experts mentioned other sectors where they could be useful, and the results of our online survey on the following page show a striking level of enthusiasm.

Genevieve Leveille believes blockchain has cross-sector appeal:

“We often think that money is the most valuable thing. But I think data is our most valuable asset and certainty around that data is key. Blockchain gives us this and this makes it applicable to any industry.”

Dean Elwood talks about a use-case for the healthcare sector:

“If we look at a doctor/ patient relationship; during a phone call the patient is wearing equipment that can measure his vital signs at home. The call is recorded, and a cryptographic audit trail is produced. The doctor can then take this to his medical council if he is being blamed for anything that happens to the patient. He can prove that the vital signs were normal, and that the information he is providing is tamper-free.”

Allister Manson mentions a number of sectors where the technology can be used:

“The insurance industry is a fertile area for blockchain. Mainly because insurance is one of the industries where companies tend to share information.

Various people have also mentioned diamonds to me, because there is a benefit in tracking every single diamond that comes out of the ground. And just to show the breadth of its appeal, I've also seen companies who distribute music looking to use blockchain to deal with rights.”

Haydn Jones at Blockchain Hub, agrees:

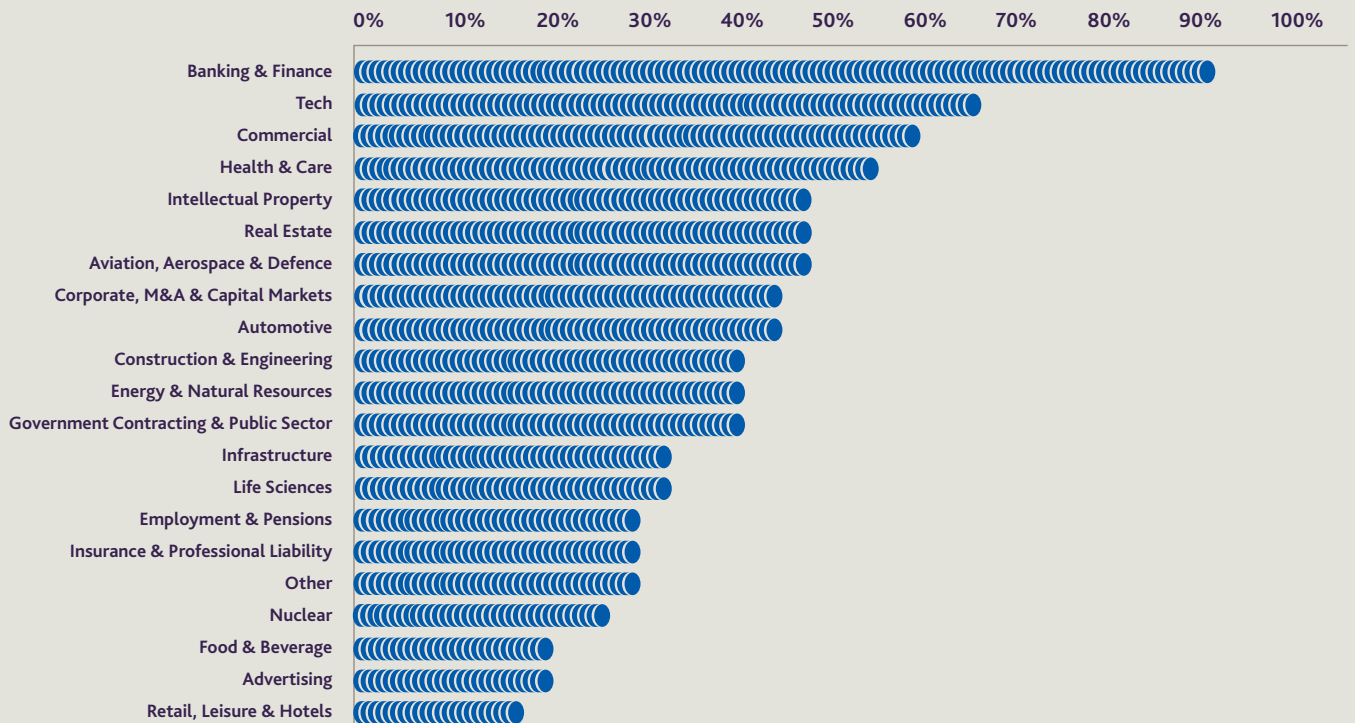
“Any kind of commercial transaction can be encoded into a smart contract and published onto a blockchain for perfect instantaneous settlement. Aligned to this is the inherent cryptography associated with the secure capture and distribution of data, content or information. This could be used in film, music, healthcare records, and many others.”

Barry Childe at HSBC is very enthusiastic about its future and the level of its impact:

“I think this software is going to become mainstream very quickly, but we could be looking as far out as 2025 before it is being used at huge scale. I believe that distributed ledger technology has the potential to transform the financial services industry to the benefit of its clients and participant firms alike. I envision a future where financial agreements are recorded and automatically managed without error, where anybody can transact seamlessly for any contractual purpose without friction. I believe markets will move towards models where parties to financial agreements record them once and collaborate to maintain accurate, shared records of these agreements.”



## Sectors that will particularly benefit from blockchain



— Usman Sheikh agrees:

“Blockchain is a paradigm shift and it could reshape the underlying fabric of many industries not just the financial services sector. It is industry agnostic.”

— David Brennan adds:

“The tech mindset has permeated every sector and touches every part of the economy. Every company is arguably a tech company and there is a requirement for businesses to understand and stay ahead of software developments in order to not only grow, but to survive. Blockchain and the DLT that underpins it are here to stay and use cases will undoubtedly emerge that do not today appear obvious”.

# CONCLUSION AND RECOMMENDATIONS

Many technologies have been given the “disruptor” tag, but few of them result in real change. However, according to our experts and other commentators, blockchain could be a truly disruptive and positive influence on business.

To go some way to achieving this, this report makes the following observations:

Technologists, blockchain entrepreneurs, regulators and influential business people need to make sure everyone understands the difference between Bitcoin and blockchain. Its business impact could be reduced, or significantly delayed, if the negative PR currently associated with cryptocurrencies is permitted to leech into opinions about the software.

Blockchain and DLT are all about sharing information, not only internally within firms, but also with customers and, in many cases, with competitors. The development of the technology will happen much faster if competitors collaborate and regulators are involved in the development process.

Regulators could also find the technology directly makes their role easier. The level of transparency delivered by blockchain and DLT makes fraud and human error much easier to spot.

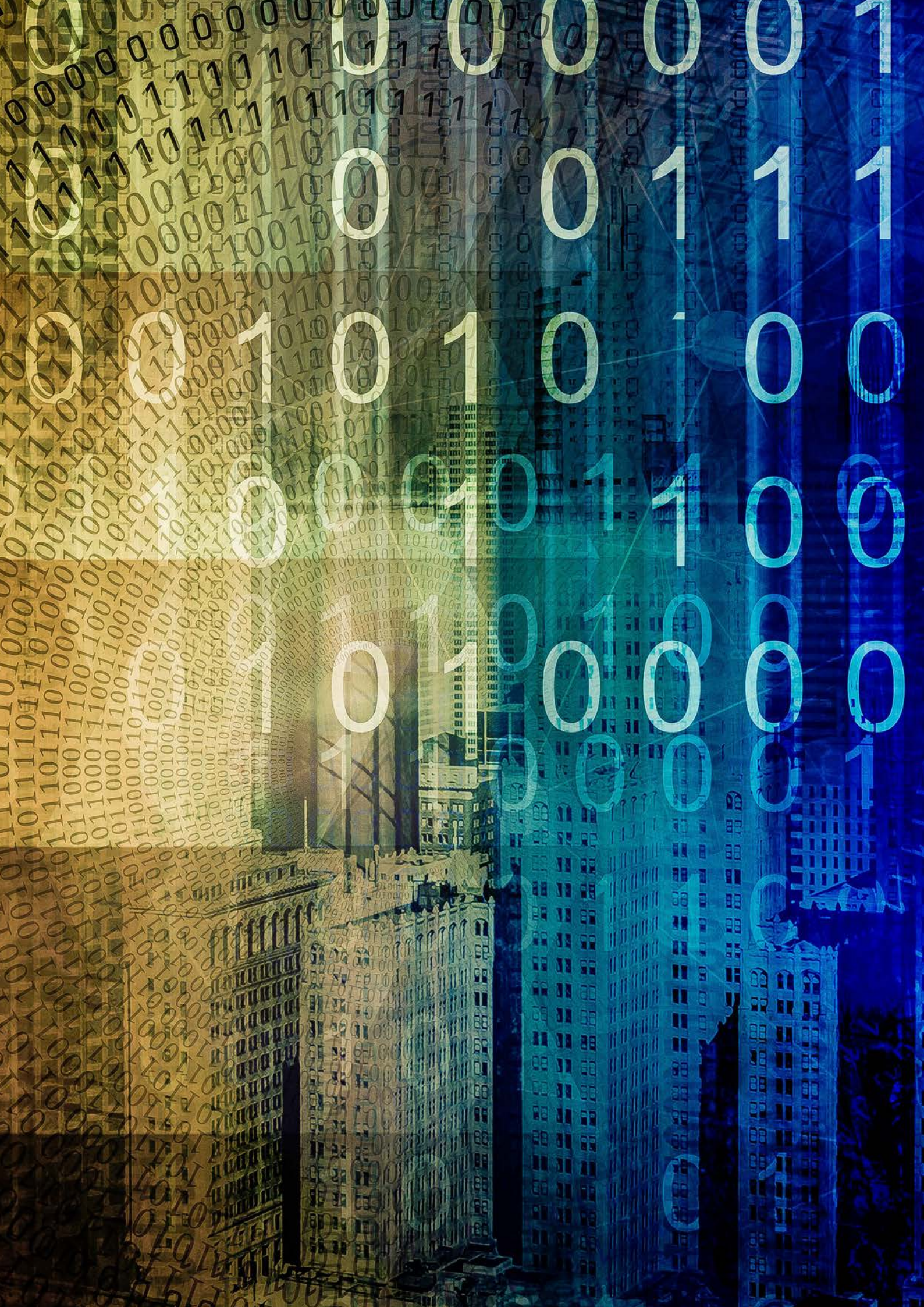
There needs to be continued investment into the development of blockchain and DLT. The setting up of consortia seems to be a preferred approach of our experts. These also encourage sharing across businesses within a sector.

Businesses need to make sure their employees understand the impact of blockchain and that it is not about reducing internal costs by cutting jobs. They need to look for other opportunities for their staff, which build on the efficiencies delivered by blockchain. It is an opportunity to expand capabilities, rather than make people redundant.

Intermediaries, such as lawyers and accountants, need to be prepared to change their business models to maximise the potential of blockchain and DLT.

Regulators need to catch up with technological developments in this area, but the technology itself does not require regulation.







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