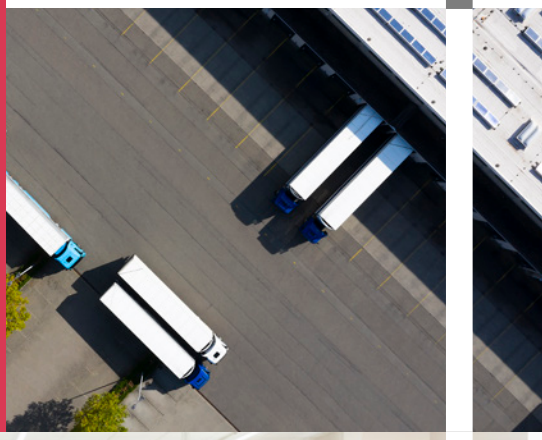
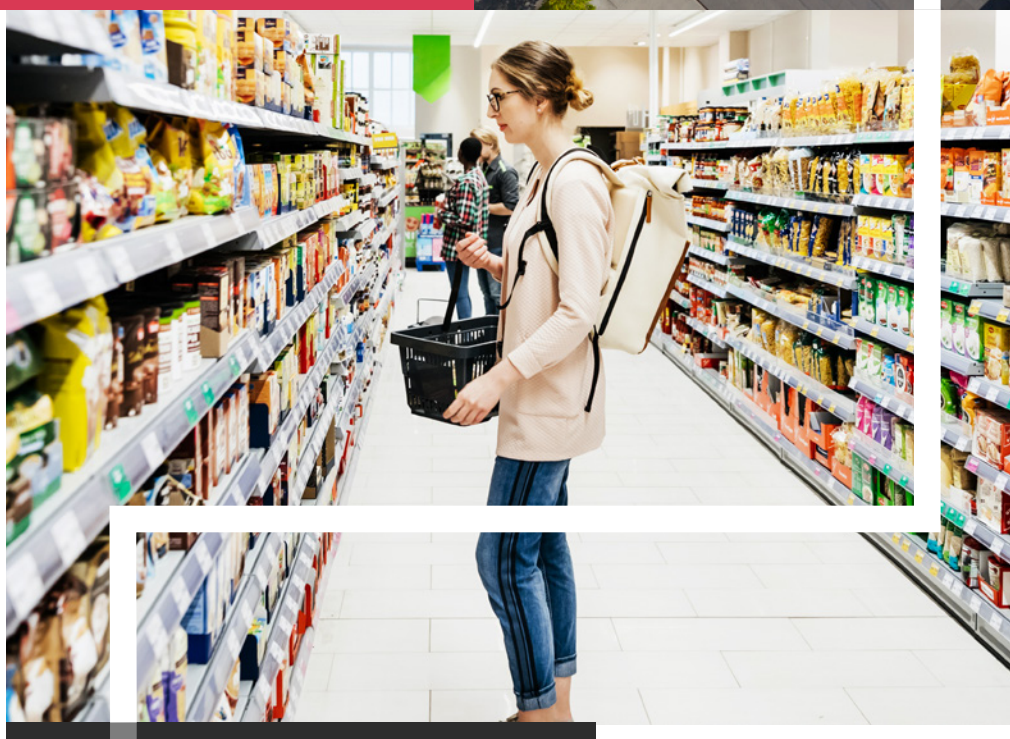
Time for trust

The trillion-dollar reasons to rethink blockchain

October 2020





pwc

“Serious activity around blockchain is cutting through every industry across the globe right now. It’s driven by an acute need to win trust in the digital world. Businesses are rethinking their operations and are discovering not only is blockchain technology key to delivering trust, but it’s an opportunity open to all.”

Steve Davies,
Partner and Blockchain Leader, PwC UK

Time for trust

In this report PwC explores the impact blockchain technology can have on the global economy. We look at how practical, everyday uses are creating an opportunity for organisations to deliver value by building trust and improving efficiency.

Throughout, we present the findings of PwC economists as well as the views and opinions of our global blockchain specialists and industry figures, looking at how organisations can benefit from blockchain technology and what steps they can take to get started today.

Why blockchain is more than Bitcoin

Blockchain technology has long been associated with cryptocurrencies such as Bitcoin, but there is so much more that it has to offer. The technology, as we'll see in this report, creates digital records – such as certificates, public registers or agreements – which are stored, shared and amended online. Transactions are quickly validated, documented and encrypted for security: from amendments made, to who sent or exchanged them. There's no need for a third-party, such as a bank or a regulator, to verify such actions because it's a shared process, secured by cryptography.

This cuts out intermediaries and puts blockchain in an important position for improving trust, transparency and efficiency across organisations.

Blockchain's trillion dollar opportunity

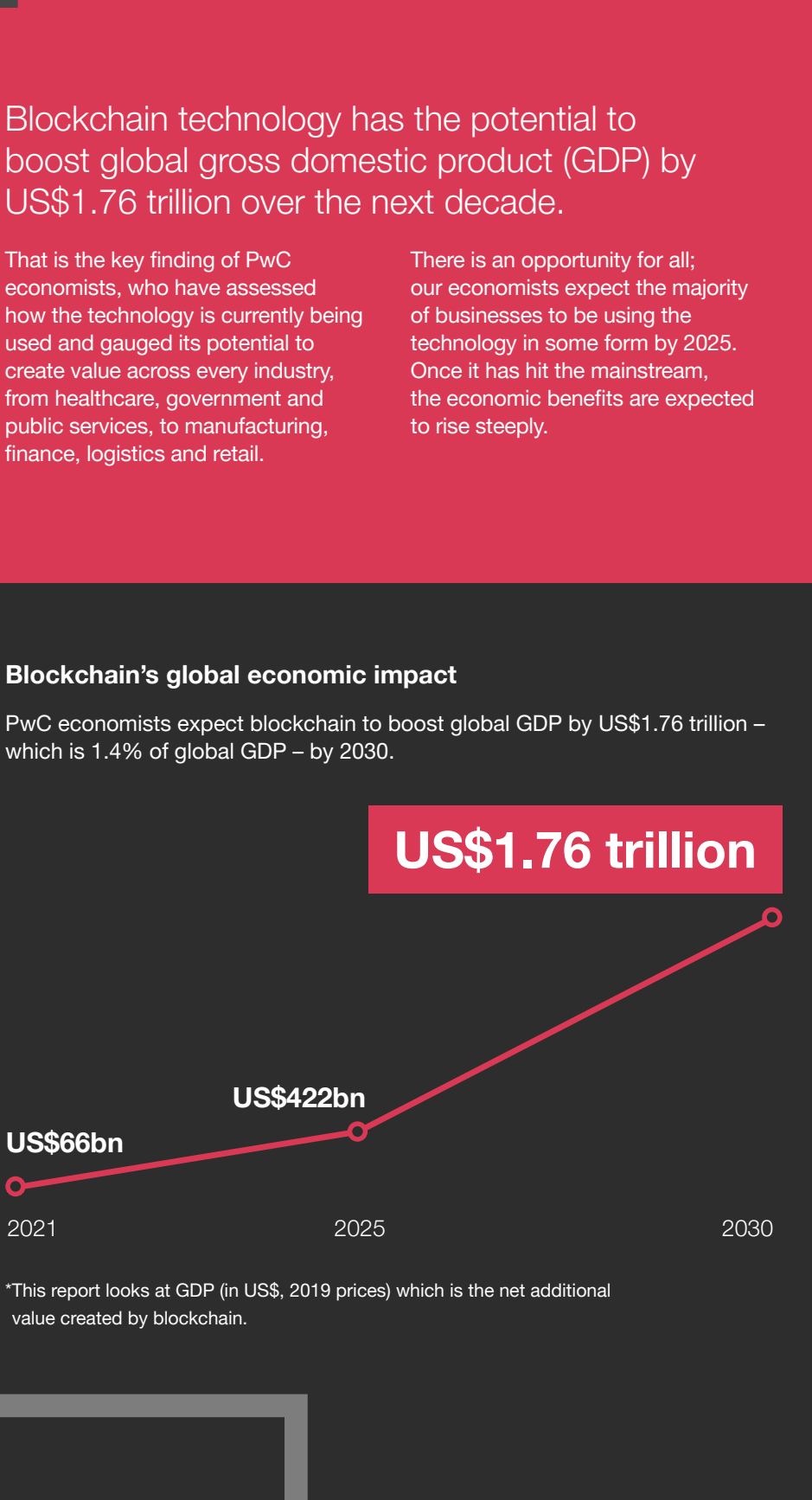
Blockchain technology has the potential to boost global gross domestic product (GDP) by US$1.76 trillion over the next decade.

That is the key finding of PwC economists, who have assessed how the technology is currently being used and gauged its potential to create value across every industry, from healthcare, government and public services, to manufacturing, finance, logistics and retail.

There is an opportunity for all; our economists expect the majority of businesses to be using the technology in some form by 2025. Once it has hit the mainstream, the economic benefits are expected to rise steeply.

Blockchain's global economic impact

PwC economists expect blockchain to boost global GDP by US$1.76 trillion – which is 1.4% of global GDP – by 2030.



*This report looks at GDP (in US$, 2019 prices) which is the net additional value created by blockchain.

Winning trust: Why now?

Organisations are rethinking the way they operate as they grapple with the impacts of COVID-19 and the way the pandemic has accelerated many disruptive trends – such as the shift towards more digital ways of working, communicating and transacting with customers.

Business priorities

Trust is fragile in a digital world. Building trust and transparency by investing in digitisation is a priority that has gathered pace during COVID-19.

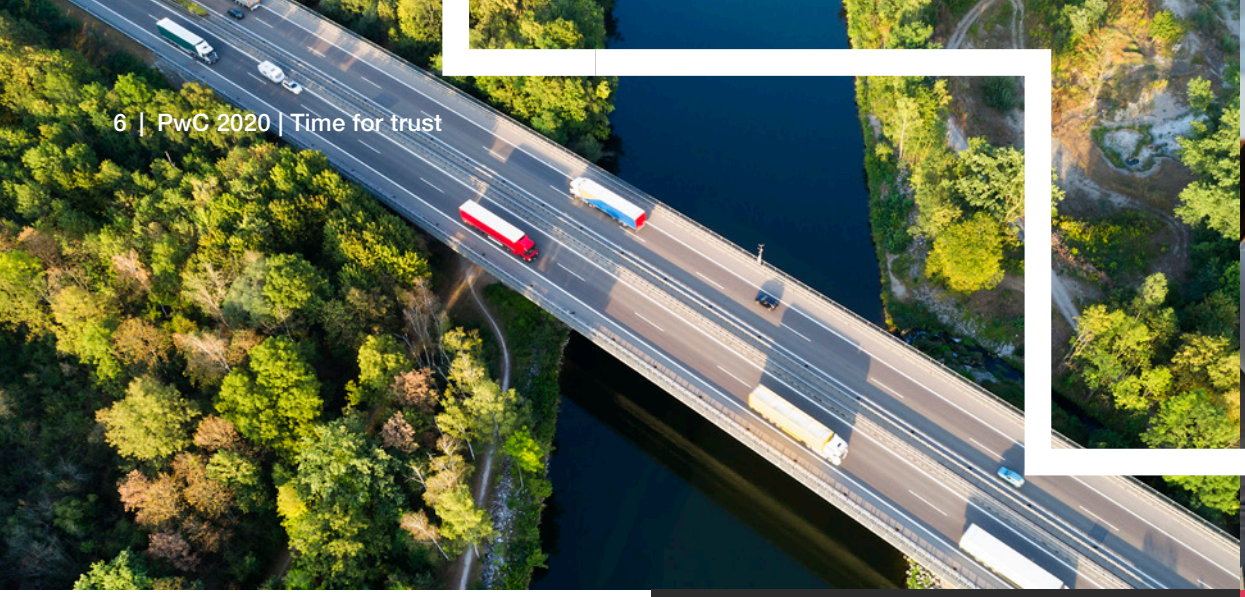
As CEOs across the globe look to reconfigure their operations, some 61% are placing the digital transformation of core business operations and processes among their top three priorities, according to PwC research[1]. Even before the onset of COVID-19, more than half of CEOs believed faltering trust in business was a threat to their organisation[2].

Organisations have clearly recognised the role of their reputation in building trust with their people, customers and business partners – and have begun to pay far greater attention to the risks that undermine trust online, from issues such as fraud and other forms of cyber crime to data loss or misuse.

Now an increasing number of organisations are recognising that blockchain technology provides an opportunity to change for the better. Using blockchain, organisations can build greater trust and transparency in areas such as certification, recruitment, commercial transactions and the way they secure, share and use data.

Blockchain also helps companies from heavy industries, such as mining, through to fashion labels, demonstrate their credentials in areas such as sustainability and ethical sourcing – to satisfy the rise in public and investor scrutiny around these issues.

[1]PwC CEO Panel Survey, August 2020
[2]PwC 23rd Annual CEO Survey, January 2020



61%

of CEOs put digital transformation in their top three priorities

Business benefits

As organisations start to reimagine their futures, they have the opportunity to explore ways blockchain technology can drive growth.

One of the major benefits of blockchain is its potential to create, store and share sensitive information online. Contracts, identity documents, certificates, official records and agreements can all be verified in a safe and secure way.

For example, personal records such as birth certificates or driving licences can be generated and viewed on mobile apps for instant, reliable proof of identity. Universities and other awarding bodies can create degree and qualification certificates that can be shared by graduates with prospective employers at the touch of a button. They can be instantly verified, with no need to run a credentials check with a third party. This saves time and money, improves efficiencies which can be a deterrent to fraud.

Technology today allows you to trace the origins and follow the journey of just about anything, but blockchain enables far greater confidence and trust than other technologies. For example, used in supply chains it can prove the provenance of goods ranging from fresh produce to raw materials, or even diamonds. As these goods change hands, records can be added, inspections and deliveries can be logged, and payments can be released automatically, all in a secure, verifiable and trusted manner.

Food retailers have created ‘source to shelf’ solutions using blockchain which track the journey of produce as it moves through a supply chain. It helps them provide proof of origin and of environmental and manufacturing credentials, as well as allowing them to spot fake goods, or contaminants, with speed and accuracy. The technology can also be used to trigger warnings around quality issues, or automatically issue proceedings in the event of a dispute.

Blockchain streamlines processes by consolidating records, automatically, online. This spells an end to inefficient paper trails, reducing the related risk of manual error and oversight, and the reputational damage that can follow.

Set for success: The top five uses driving blockchain adoption

PwC economists have identified the top five uses of blockchain, ranked by their potential to generate economic value.

1. Provenance (potential boost to global GDP by 2030: US$962bn)

Blockchain has enormous potential to help organisations verify the sources of their goods and track their movement at every step, strengthening transparency in any supply chain. Fraud, contaminations or counterfeits can be pinpointed immediately, ensuring customer safety and enhancing efforts to be socially and ethically responsible.

“Earlier in my career I took the mystique out of barcodes and I feel reinvigorated as I face similar challenges getting businesses excited by, and educated on, the opportunities blockchain presents them and partners in their supply chain. There’s a competitive advantage to be gained in adopting blockchain technology early because it’s going to change the world like barcodes did in the 70s and 80s – creating even greater trust in all of your business transactions.”

Brian Marcel, Chairman, IBCS Group

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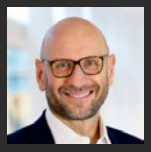
Blockchain can be a real differentiator, a new technology with the potential to be a force for good.

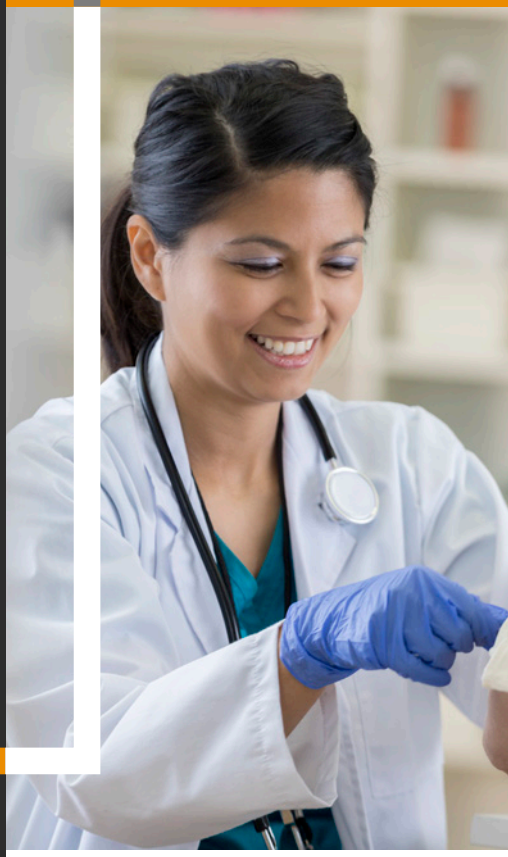
Take retailers – they can track the provenance of products, enabling them to build customer loyalty and trust through transparency. If they want to demonstrate that a product is environmentally friendly, or that everyone involved in its production was paid and treated fairly, they can. Counterfeit, stolen or contaminated goods can be flagged within seconds. The technology provides a safe and transparent journey for goods, allowing organisations to prove they live up to their values.

There is also potential for healthcare organisations. For healthcare organisations, blockchain can ensure patient safety is at the heart of the pharmaceutical supply chain. It has the potential to give patients confidence in the authenticity and origin of drugs, medical products and provides transparency around medical supplies and therapies. It’s early days but the need is there.

Blockchain’s ability to offer such transparency around life changing treatments can build confidence and propel the industry forward.”



Anthony Bruce, Partner and Pharmaceutical and Life Sciences Leader, PwC UK



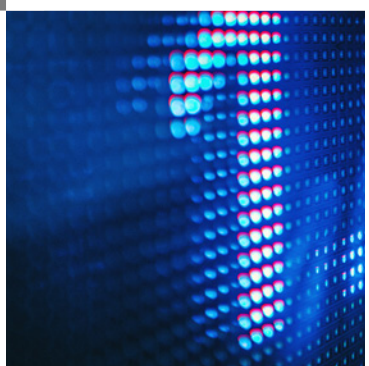
2. Payments and Financial Instruments (US$433bn)

Central Banks around the world have been exploring how blockchain can improve their nation's payments infrastructure through central bank-issued digital currencies (CBDCs).

Wholesale CBDCs can facilitate more efficient clearing operations between central banks and their member banks, while retail CBDCs would effectively be the equivalent of a bank note, in digital form, for public use.

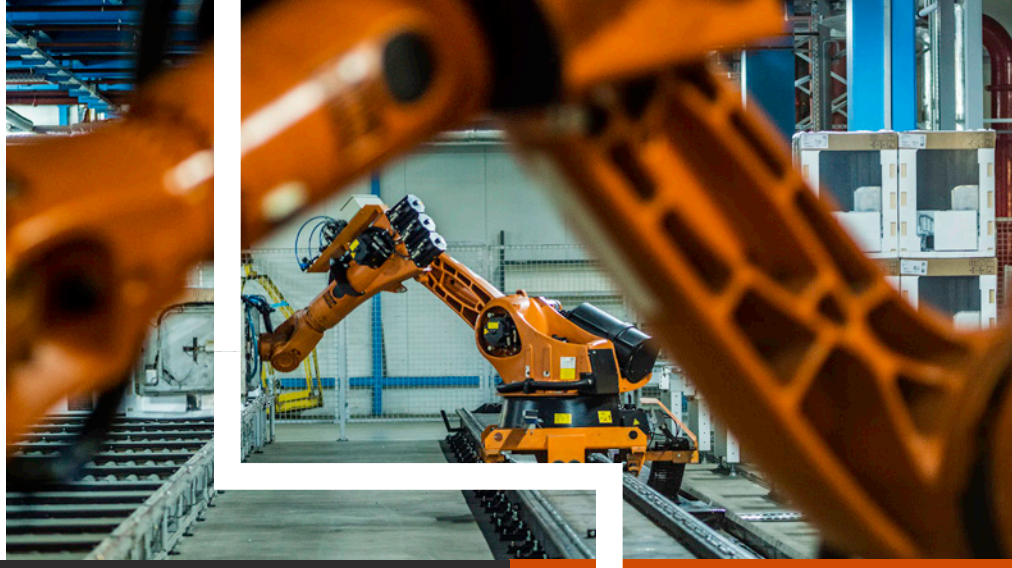
Financial institutions have also been experimenting, for example by using 'stable coins' as new digital instruments to transform cross border payments by lowering remittance fees and enabling near instantaneous transactions. Stable coins are tokens that are typically backed by fiat money (which is a government-issued currency), or other real-world assets and can operate on a blockchain.

By comparison, cryptocurrencies such as Bitcoin are not backed by fiat money, nor do they represent fiat money in a digital format, but they can be used for payments. However, unlike CBDCs (which are legal tender) and regulated stable coins, cryptocurrencies are not a regulated means of payment in many jurisdictions and their use is even illegal in certain countries.



"Blockchain is transforming the investment and asset management market and is improving transactional security and transparency. It's increasingly protecting the market from illicit activity, fraud and money laundering because we can quickly identify behavioural changes, trace reported illicit funds, get alerted to potential associated risk and get deeper insights into the risk patterns of all transaction parties."

Pawel Kuskowski, CEO & Co-founder, Coinfirm



Blockchain first appeared as the technology underpinning Bitcoin in 2009 and that remains the best known example of how the technology works. However, the crypto space has evolved and matured significantly. Particularly over the last few years, the crypto industry has become increasingly institutionalised. As the regulatory landscape becomes better defined, regulated financial institutions are more confidently exploring how they can adopt blockchain and crypto assets.

Yet most people won't even realise they are using blockchain. It's back-end technology that allows the financial services industry to create and manage assets more efficiently.

Blockchain has the potential to cut costs, speed up transactions and promote greater financial inclusion by streamlining cross-border and remittance payments. These powerful innovations will transform payments infrastructure for people, businesses and governments."

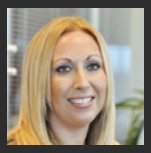
Lucy Gazmararian,
Crypto and FinTech Advisory, PwC Hong Kong

3. Identity (US$224bn)

Blockchain can safeguard valuable personal credentials online, from personal identification, such as driving licences, to professional credentials and certificates, bringing vast cost efficiencies and helping to curb fraud and identity theft.

“Individuals want to be able to access and share their professional qualifications anywhere, anytime, and organisations want to know they can trust those qualifications. As the education sector accelerates its move into digital learning, particularly in light of COVID-19, it is embracing new technology with greater urgency and freeing us all from time-consuming, inefficient, paper-based credentials systems, which are so easily violated.

At PwC, we have partnered with, among others, the Institute of Chartered Accountants and a major European university to develop our Smart Credentials blockchain solution. It shares the credentials of chartered accountants and technology graduates in a ‘digital wallet’, saving time and money in the verification processes, while combating fraud. Students can also add any number of documents to it, from their birth certificates to a sporting qualification, which they can control and share.”



Caitroina McCusker,
Partner and Education Consulting Leader, PwC UK

4. Contracts and Dispute Resolution (US$73bn)

Blockchain holds great promise in the realm of contracts and dispute resolution. The technology can bring together ledgers, contracts and payments, improving the flow of commercial agreements and flagging any disputes.

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The world has changed. Disputes can no longer easily be resolved face to face. Business continuity requires issues to be determined using remotely accessed enterprise-grade technology and human expertise. Blockchain is fantastic in resolving disputes because it has its own evidential audit trail, embedded at its core.”

Dean Armstrong, CEO, Proof of Trust

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Blockchain is causing major disruption to some really complex systems in the agreements and contracts space. The types of terms and conditions usually seen in a legal contract can be added to blockchain payments. Known as smart contracts, they can synchronise the release of payments with the delivery of goods, services, or even financial instruments.

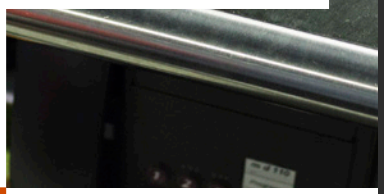
The biggest advantages are in the signing and filing: the contracts don’t need to be signed in person, and the technology automatically creates an audit trail. This saves time, lowers costs and removes friction to improve the flow of any commercial agreement, within and across borders. As an early adopter of this technology, we are among the world’s leading providers of smart contract assurance.

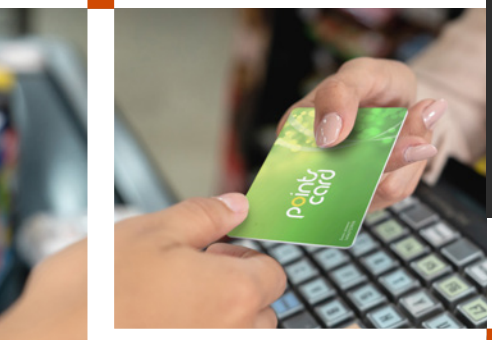
If a dispute occurs, blockchain can help by automatically blocking payments and triggering alerts that automate dispute processes. With its tracking abilities, the technology can help quickly unwind disputes and exposures in a trusted way.”

Guenther Dobrauz, Partner and Global Financial Services Leader, PwC Switzerland

5. Customer Engagement (US$54bn)

Blockchain can breathe new life into traditional, card-based loyalty and reward programmes. The technology can boost engagement through integration with customer relationship management (CRM) platforms such as Salesforce[3], HubSpot CRM and Microsoft Dynamics 365 Sales and generate more value by making them more user-friendly for smartphone users.





“Blockchain could prevent loyalty programmes from falling out of use. Loyalty and reward programmes were created in the 1980s when we bought things with cash. The idea is still sound, but redemption rates are low. Consumers just aren’t motivated to use them as much as they could. The younger generation is likely to be carrying around nothing more than a smartphone as a means of payment. They don’t want a wallet full of plastic cards. They want to redeem, share and swap their points, whether air miles or supermarket rewards, on their smartphone.

That’s not unreasonable, but integrating all that information is fraught with complexities. This is where blockchain can help, allowing consumers to store, check, consolidate and spend points online. It can also be used in a similar way for gift cards and vouchers. With digital payments now the norm, consolidation of these programmes is inevitable, and blockchain is key in unlocking value, in a fair way, for all involved.”

Haydn Jones, Senior Blockchain Market Specialist, PwC UK, and author of ‘The Executive Guide to Blockchain’

[3]https://www.salesforce.com/products/platform/products/blockchain/

Global leaders: The countries leading the blockchain revolution

PwC economists expect China and the United States to benefit the most from blockchain technology over the next decade.

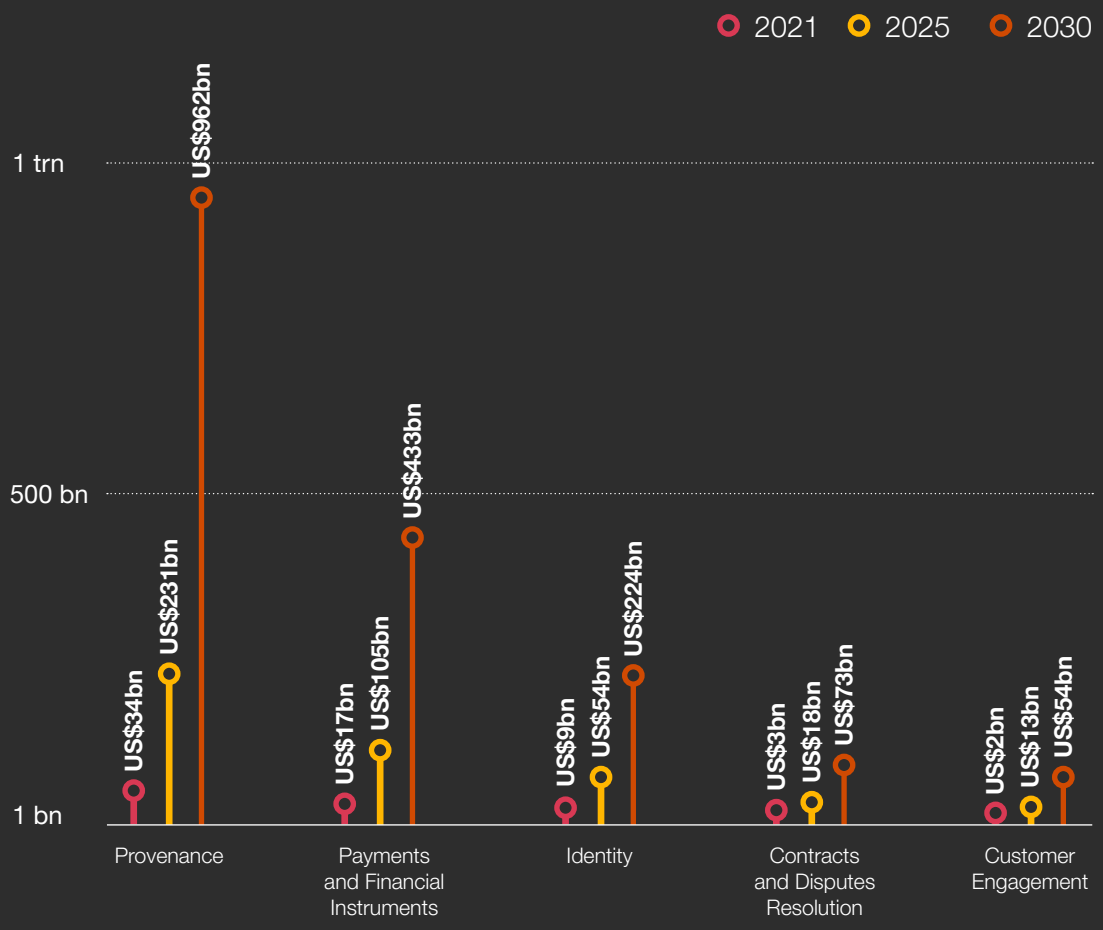
Blockchain's success requires a friendly policy environment, a business ecosystem that is ready to exploit the new opportunities that technology opens, and a suitable industry mix. China is embracing innovation and pushing ahead with its own central bank issued digital currency, DCEP (Digital Currency Electronic Payment). This will help it reap a US$440bn reward over the next decade, representing a potential 1.7% boost to GDP. Not far behind is the US, where the expected US$407bn prize is driven mainly by the opportunity around its vast supply chains, as well as the social and ethical demands of consumers.

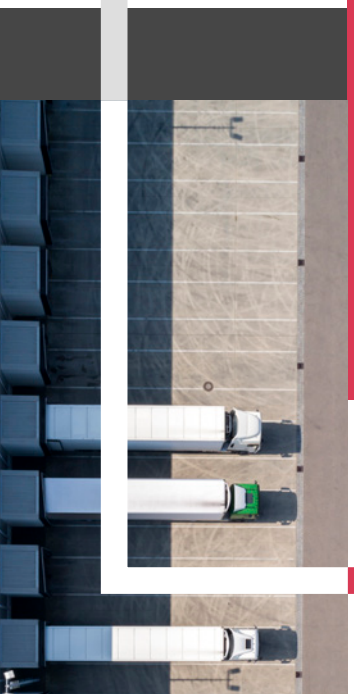
Elsewhere, our economists expect northern and western Europe to benefit the most in percentage terms – thanks to existing technology infrastructure and well-equipped workforces. Sweden could enjoy a 3% boost to GDP from blockchain by 2030, followed by Luxembourg (2.6%) and Germany (2.4%). The UK, in fourth place (2.3%), has an opportunity to pursue its own agenda for blockchain following its departure from the EU.

2.3%

potential contribution to UK GDP by 2030

Blockchain's comparative economic contributions





"Countries have to believe in each other in order to work together, which is difficult when each government believes their own system is right and might regard others with distrust. Blockchain technology can provide a platform for sharing data around global issues, such as climate change, that transcends borders and facilitates trust between countries."

Tomohiro Maruyama, Senior Manager, PwC Japan

Industry leaders: The sectors that will reap the greatest rewards

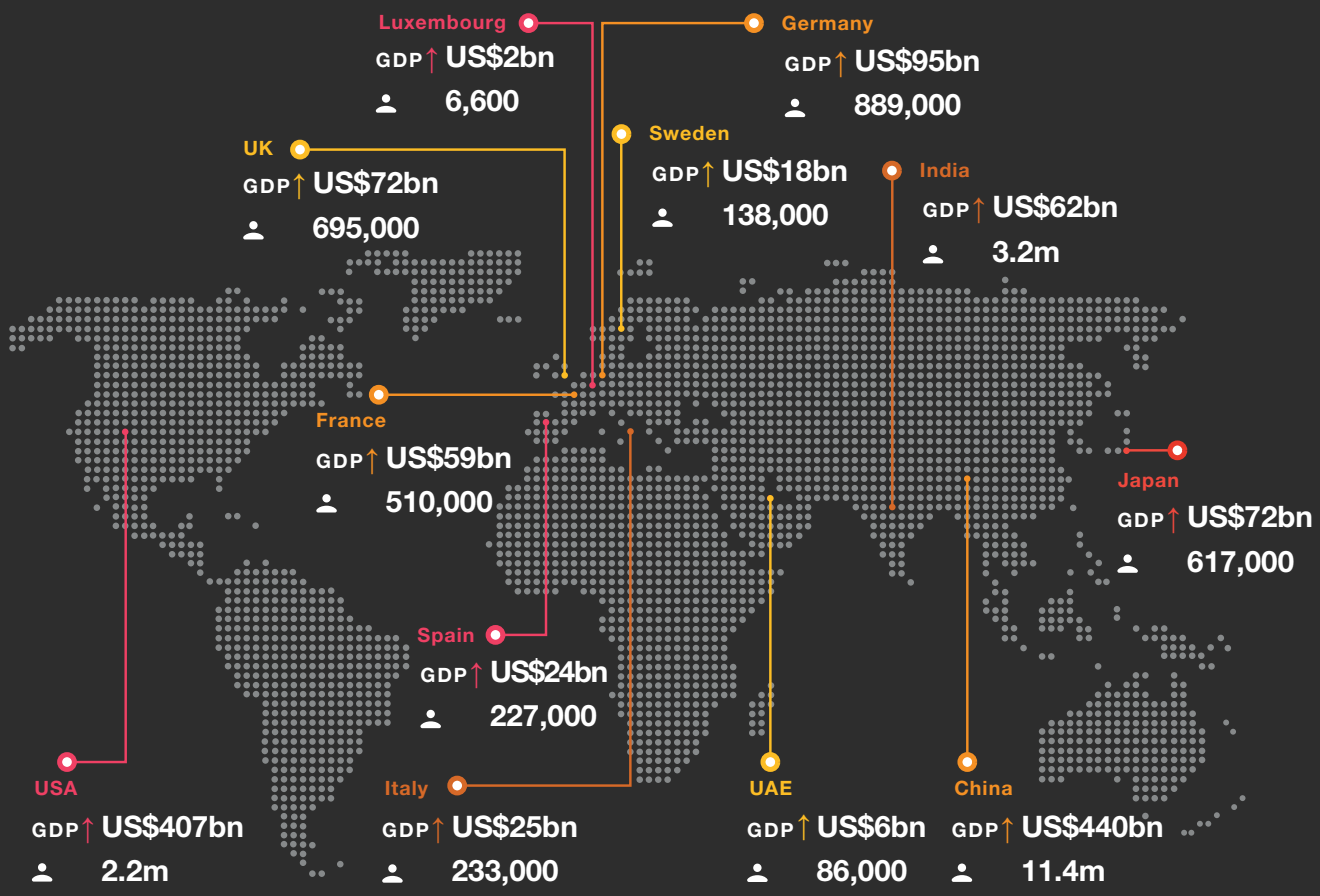
Our economists expect blockchain technology to bring benefits across a wide range of industry sectors. Much of the value will be realised behind the scenes. We expect between 10% and 15% of worldwide infrastructure to be using blockchain within a decade.

The biggest beneficiaries look set to be the public administration, education and healthcare sectors. PwC economists expect these sectors to benefit to the tune of $574bn by 2030, by capitalising on the efficiencies blockchain will bring to the world of identity and credentials.

Meanwhile, there will be broader benefits for business services, communications and media, while wholesalers, retailers, manufacturers and construction services will benefit from using blockchain to engage consumers and meet demand for provenance and traceability.

> “Blockchain is a team sport. It works best when companies come together even with industry competitors and lay the groundwork for blockchain in terms of processes, sharing data and required automation via smart contracts. Once they understand the value that comes out of it, blockchain will become an integral part of business technology.”
>
> **Husen Kapasi, Blockchain Leader, PwC Europe**

The global impact of blockchain GDP boost and jobs enhanced by 2030



Rest of the world

GDP↑ US$473bn 21m

Unlocking value: Getting started with blockchain

Though every industry stands to benefit from blockchain, there are some misconceptions around the technology that may deter organisations from getting started.

These issues must be addressed in order to drive understanding and overcome inertia.

Look beyond Bitcoin

Raising awareness of blockchain's broad uses may be the most important step in driving transformational change. Many people do not understand blockchain technology and find it hard to see the immediate benefits. Others cannot see beyond its association with Bitcoin and cryptocurrencies.

The first time blockchain was seen in action was when it exploded onto the scene as the technology behind Bitcoin.

The two have been linked ever since, and as a result blockchain has taken off a lot more quickly in the financial services space. It has taken longer to reach other industries, but in the last few years there have been big leaps in the technology and the uses for blockchain have broadened.

Now is the time for every organisation to look at how it will transform their industry.

"Blockchain will be at the core of digital trade finance, delivering benefits of automation efficiency, transparency, provenance, immutable records and ultimately trust. With the ability to reduce fraud, lower costs and improve the network, blockchain will enable credibility and support continued, growing international trade. This will also help businesses to achieve their ESG ambitions."

Dr. Ruth Wandhöfer, Partner Gauss Ventures, Co-Founder and Partner Sinonyx, I-NED, Advisor

Be energy aware

One of the main advances in thinking since we published our 2018 Global Blockchain Survey has been the way blockchain solutions use energy, to the extent that it is now very different to that of Bitcoin.

The energy quotient of Bitcoin brought all of the wrong kind of headlines for blockchain, largely triggered by the link to Bitcoin 'mining', the home to large numbers of computers solving complex mathematical algorithms. However, with more than a decade since the launch of Bitcoin in 2009, much has changed in how the underlying cryptography is applied to blockchain solutions, and the energy overhead this creates.

Nonetheless, it must be remembered that all technology uses energy in the form of data centres, computing, storage and networking. So combining platforms that support for example, payment and ledger, offers a two-for-one opportunity, especially when shared across multiple companies. That's where some real opportunities for consolidation, and, in actual fact, energy reduction, really kick in. Blockchain has reduced, and can continue to reduce, reliance on traditional data centres, which can actually help organisations bring down their energy consumption.

Focus on collaborations

There's little value in an organisation building a blockchain solution for internal use. For blockchain to reach its full potential, organisations must collaborate.

The beauty of blockchain is it facilitates trust between organisations, allowing peer-to-peer exchanges that cut out the intermediary. Organisations should come together to create an industry approach. The key is to get clear on what you stand for as an organisation, or industry, and look for areas where you might be struggling to prove it with verifying data. Look to turn conversations into partnership investments that incentivise and engage end-to-end organisations.

It should be relatively easy to collaborate, but it's harder to establish a common approach when organisations compete. Careful consideration needs to be given to a number of practicalities, such as choosing which blockchain enterprise to align with – there is a spectrum of platforms and frameworks to choose from, such as Ethereum, R3, Hedera, Ripple, MultiChain and Hyperledger – and how to integrate new technology with existing technology. There is work to be done, and it needs to be done in collaboration to succeed.

Take it seriously

One of the biggest mistakes organisations can make with blockchain is to consider it a hobby, and leave it in the realm of the enthusiast in the team. It needs C-Suite support to work and to facilitate the right level of collaboration within an industry. It is complicated, and takes time to develop a blockchain solution. But organisations should accept that and start by establishing a proof of concept which, if successful, can be extended as a satellite project.

By starting with a satellite project, when the time comes to move it to the inside – as a core product – you'll be ready. And the opportunities to extract value, while building trust and transparency for your organisation will be there.

Can blockchain deliver for your organisation?

Our research shows that there are clear reasons to rethink blockchain: the economic benefits of the technology are real and are set to grow. As organisations look to reconfigure and embrace new technology, they should seize the opportunity to explore blockchain solutions.

PwC has a simple process to determine whether blockchain can create value for your organisation.

Do any of the below apply to your organisation?

1. Multiple parties share and view common data
2. Multiple parties update and record data
3. Verification of records is needed
4. Intermediaries add costs and complexities
5. Interactions are time sensitive
6. Transactions depend on two or more parties

If your answer is 'yes' for four or more of these, blockchain could deliver for you and we can work with you on a plan to make it happen. We'll help you implement the plan and turn it into a reality. And finally, we'll be there after project delivery to support business change.

To find out how blockchain can deliver for your organisation, get in touch:

Steve Davies

Partner and Blockchain Leader, PwC UK

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For any questions related to our economic modelling get in touch:

Jonathan Gillham

Director of Econometrics and Economic Modelling, PwC UK

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"Blockchain is going to become an infrastructure technology – like the internet. No one really cares how the internet works, but it has become integral to our daily lives. The same will be true of blockchain. We haven't reached that tipping point yet because there are no dominant players. At some point soon, this will change."

Guenther Dobrauz, Global Leader, Financial Services, PwC Switzerland

Research methodology

Our report looks at the GDP impact of blockchain, which is the net additional value of goods and services within an economy as a result of blockchain technology. There have been previous reports, issued by others in the industry, which have predicted a higher contribution from blockchain. These may refer to total business revenues.

This study provides a scenario of the impact blockchain technology could have on the global economy by 2030 if uptake and the quality of products and services available develop as expected.

PwC conducted interviews with specialists in blockchain technology at PwC, and third party sources in emerging technologies, to form a comprehensive list of potential use cases for blockchain that these specialists believe could realistically be implemented by 2030.

Our analysis also includes economic impacts that, while not currently considered transformative use cases, will have significant productivity effects, such as impacts on global supply chains and compliance adherence across industries.

For each use case identified as likely to have a significant impact on the global economy, a range of sources and techniques to estimate their productivity impact were used. Existing research on their adoption and associated productivity increases, forecasts from ABI Research, and PwC economic analysis were drawn on to estimate productivity change that could occur with each use case.

Multi-factor productivity figures were incorporated into PwC's dynamic Computable General Equilibrium (CGE) model to estimate the aggregate effects of blockchain adoption on global GDP up to 2030.

The CGE model captures economic interactions in the global economy including: trade and spending between firms on one another's goods and inputs; spending by consumers on goods; investment decisions, and dynamics in the market such as demand for factors like capital and labour, trade, employment and wage effects.

In this report, we did not model the impacts of COVID-19 separately. However, given how COVID-19 has encouraged remote working and technological solutions across sectors, we consider that we have taken a prudent approach in estimating blockchain's economic impact.

More from PwC

Our teams of emerging technologies and economic specialists have produced a series of reports exploring how to balance business understanding and human insight with technology innovation. The series includes the following reports:

Seeing is believing: How VR and AR will transform business and the economy
www.pwc.com/seeingisbelieving

Sizing the prize: What's the real value of AI for your business and how can you capitalise?
www.pwc.com/ai-study

The impact of drones on the UK economy
www.pwc.co.uk/dronesreport

www.pwc.com/timefortrust

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