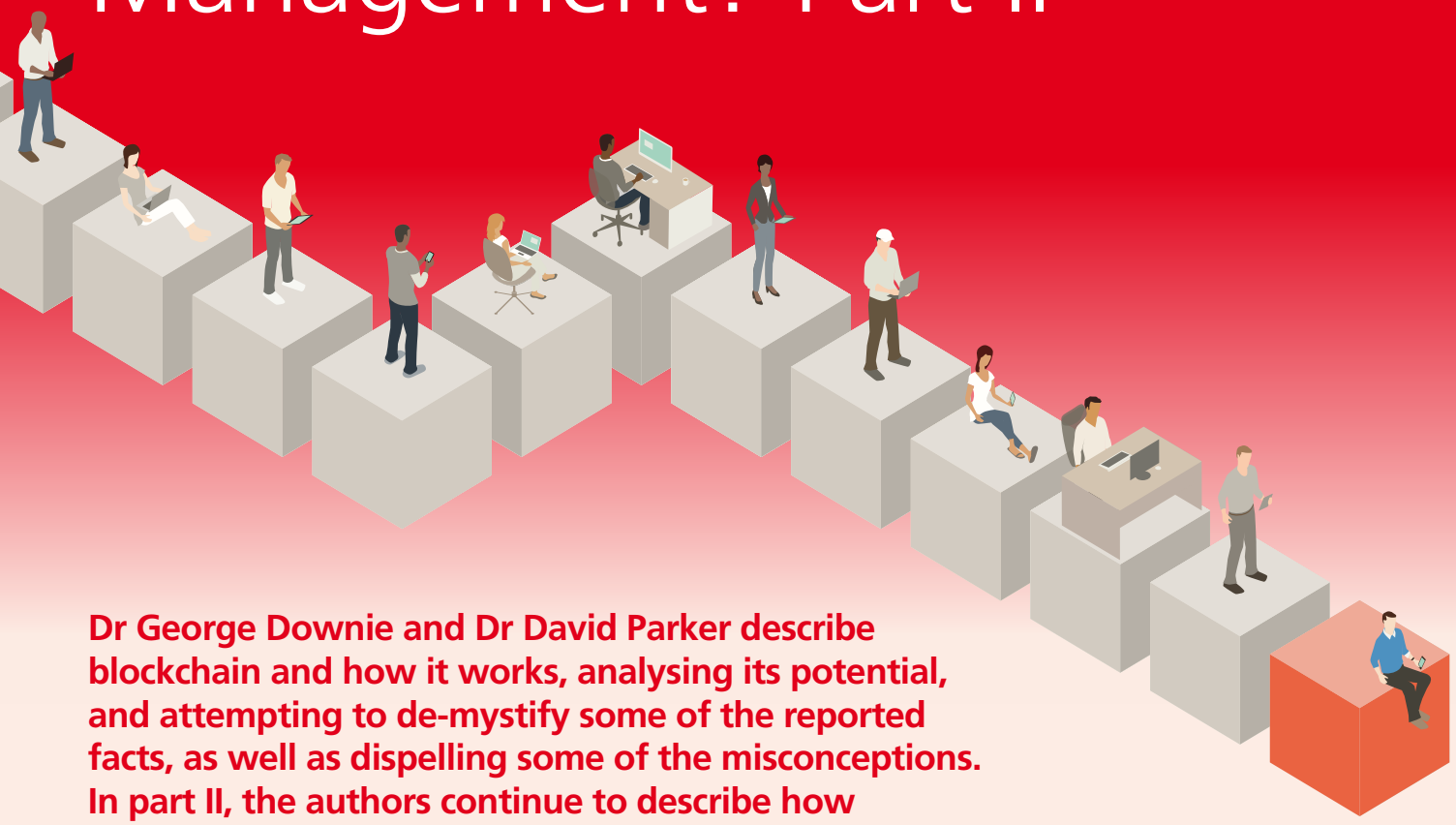
Blockchain Technology: The Missing Link in Services Management? Part II



Dr George Downie and Dr David Parker describe blockchain and how it works, analysing its potential, and attempting to de-mystify some of the reported facts, as well as dispelling some of the misconceptions. In part II, the authors continue to describe how companies are using blockchain and offer some real life examples in the business world.

With some recent scandals in the charity sector, blockchain offers some options too. For those making charitable donations, blockchain provides the ability to precisely track where your donations are going, when they arrived, and whose hands they ended up in. From there, blockchain can deliver the accountability and transparency to address the perennial complaints around charitable donations; including the organisational inefficiency, or even financial misconduct, that can prevent money from reaching those it was meant for.

Bitcoin-based charities like the BitGive Foundation use blockchain's secure and transparent distributed ledger to give donors greater visibility into fund receipt and use.

The company has launched a beta version of GiveTrack, a blockchain-based multidimensional donation platform that provides the ability to transfer, track, and provide a permanent record of charitable financial transactions across the globe.

Human resources and general management

Managing the HR function of even a small enterprise is a highly complex endeavour, especially with the seemingly ever-changing litany of rules and regulations. Many believe blockchain has various solutions to offer.

For example, in recruiting or redeploying staff, conducting background checks and verifying employment histories can be time-consuming, highly labour-intensive tasks for HR professionals. If employment and criminal records were stored in a blockchain ledger, and thus free from the danger of falsification, HR professionals could streamline the vetting process and move hiring processes forward more quickly. Similar benefits would accrue to recruitment consultants / head-hunters, whose pool of talent would not only potentially be widened, but would be infinitely easier and more cost effective to streamline and focus.

Australian company Chronobank (www.chronobank.io) is one firm aimed at disrupting the HR/recruitment industry, with

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a specific focus on improving short-term recruitment for on-demand jobs (in cleaning, warehousing, e-commerce, and so on). The start-up aims to use blockchain to make it easier for individuals to find work on the fly and be rewarded for their labour through a decentralised framework and payment via cryptocurrency, without the involvement of traditional financial institutions.

General management and C-Suite applications also abound using blockchain, especially with regard to governance. The benefits of using blockchain for smart contracts and verifiable transactions can also be applied toward making business accounting more transparent. Administrative systems can be included to ensure smart contracts are executed according to rules encoded on the blockchain. Boards can also use such a system for shareholder voting by proxy and collaborative proposal management.

Car leasing

The experience of leasing, buying, or selling a vehicle can be a fragmented process for stakeholders on all sides of a transaction; blockchain may be able to change that. In 2015, Visa partnered with transaction management start-up DocuSign using blockchain technology in the form of a 'smart contract' to streamline car leasing[8]. Smart Contracts are small computer programs that 'live' in the blockchain and are automatically executed once a predetermined set of tasks or protocols have been verified by the blockchain.

They execute automatically and check conditions considered earlier like facilitation, verification or enforcement. In this way the whole process can be streamlined, time is not taken up in verification, eg phoning DVLC to check if a potential driver has any convictions, endorsements or outstanding warrants, as well as credit scores and so on.

Mood music

Some entertainment management companies and entrepreneurs are turning to blockchain to make content sharing fairer for creators, again using smart contracts, whereby the revenue on purchases of creative work can be automatically allocated and paid according to pre-determined licensing agreements.

Companies such as Muzika, a blockchain-based music streaming platform, partnered with Binance, a crypto-exchange network, to try and help independent artists make money from their listeners. Muzika states that it plans to give 90% of revenue to the artists.

Before pivoting into an entertainment think tank, Mycelia was launched with a focus on producing 'intelligent songs' supported by blockchain technology and cryptocurrencies. Ascribe.io, a product of BigchainDB, also works to provide a trackable, verifiable record of ownership between artists and their work.

British blockchain start-up JAAK also has plans to work with music rights holders and other entertainment-industry stakeholders. JAAK, which provides an operating system for content, is developing a platform that allows media owners to convert their repository of media, metadata, and rights into 'smart content' that can self-execute licensing transactions on the Ethereum (a rival cryptocurrency to Bitcoin) blockchain.

Safe as houses

Buying and selling property is often a painful enterprise; indeed a 2016 study by Vivo Property Buyers, confirms previous findings that people find the task of selling their home more stressful than other major life events like having a baby, starting a new job or getting a divorce[9]. Issues including a lack of transparency during and after transactions, copious amounts of paperwork, possible fraud, and errors in public records, are bugbears many of us have experienced.

Blockchain offers a way to reduce the need for paper-based record keeping, enhance transparency and verification and speed up transactions. This helps stakeholders improve efficiency and reduce transaction costs on all sides of the transaction. Real estate blockchain applications can help record, track, and transfer land titles, property deeds, liens and more, and can help ensure that all documents are accurate and verifiable.

For example, Californian based Propy bills itself as 'a global real estate marketplace with decentralised title registry'. The company allows buyers, sellers, brokers, and escrow/title agents/notaries to come together through the utilisation of a suite of smart contracts on blockchain to facilitate and speedily execute transactions. Documents are signed and securely stored online, while deeds and other contracts are recorded using blockchain technology as well as on paper.

Many small firms are, understandably, reluctant to invest in 'bleeding edge' technology. Delaware Tech start-up Ubitquity offers a Software-as-a-Service (SaaS) blockchain platform, similar in concept (at a basic level) to say, Microsoft 365.

Similar to Propy, it securely records, tracks, and transfers deeds on a blockchain platform. This helps financial institutions, title, and mortgage companies benefit from a reduced title search time, increased confidence, and transparency.

Construction is a highly regulated industry which employs a wide variety of services and tradespeople for often complex projects. Validating their identities, their quality of work, and their dependability can be difficult and time consuming. A blockchain-based ecosystem could help solve this challenge by making it simpler to verify identities and track progress across multiple teams.

Blockchain technology could also help ensure professionals such as architects, quantity surveyors, etc. are qualified, registered and fully compliant with industry requirements. Checks can be made on construction materials ensuring they are sourced from the right places and are of the appropriate quality, while smart contracts may make it simpler to automatically issue timely payments linked to project milestones.

Keep on trucking: logistics on the move

As previously discussed, one of the most universally attractive aspects of blockchain is that it enables more secure, transparent monitoring of transactions. Supply chain management and logistics are therefore prime candidates for adoption and development.

Applying blockchain, as products change hands across a supply chain from manufacture to sale, the transactions can be documented in a permanent decentralised record, reducing time delays, added costs, and human errors.

Several blockchain start-ups are innovating into this sector: a number of firms are building traceability systems for materials and products, enabling businesses to engage consumers at the point of sale with information gathered collaboratively from suppliers all along the supply chain, thus substantiating product claims with trustworthy, real-time data.

The assets that can be tracked and recorded using blockchain aren't just digital transactions they also include physical items, like trucks themselves, as well as produce. Many of the other industries discussed involve public records and private blockchain networks offer their own possibilities.

The Blockchain in Transit Alliance (BiTA) has already been formed to develop industry standards and educate its network of members. It's the largest commercial blockchain alliance in existence, and its members are developing the frameworks that will change the trucking and transport industries.

Blockchain can improve transactions, shipment tracking, and fleet management, as well as protect assets and increase fleet efficiency. It can help track contamination in food, for example, by tracking a truck that carries ingredients and noting if safe storage conditions were maintained during any delays. Additionally, it can help optimise routes by matching truckers and items to be delivered with trucks in a given region or territory.

For a decentralised ledger to work in this industry, there needs to be buy-in from every side: small and large businesses, last-mile shippers, and mega trucking companies. Without total buy in, the system will not optimise fully.

On a slightly more controversial note, The cannabis growing and distribution industries have been investigating blockchain. Since the legalisation of marijuana in Canada, and growing support for legalisation across the US, the cannabis industry is

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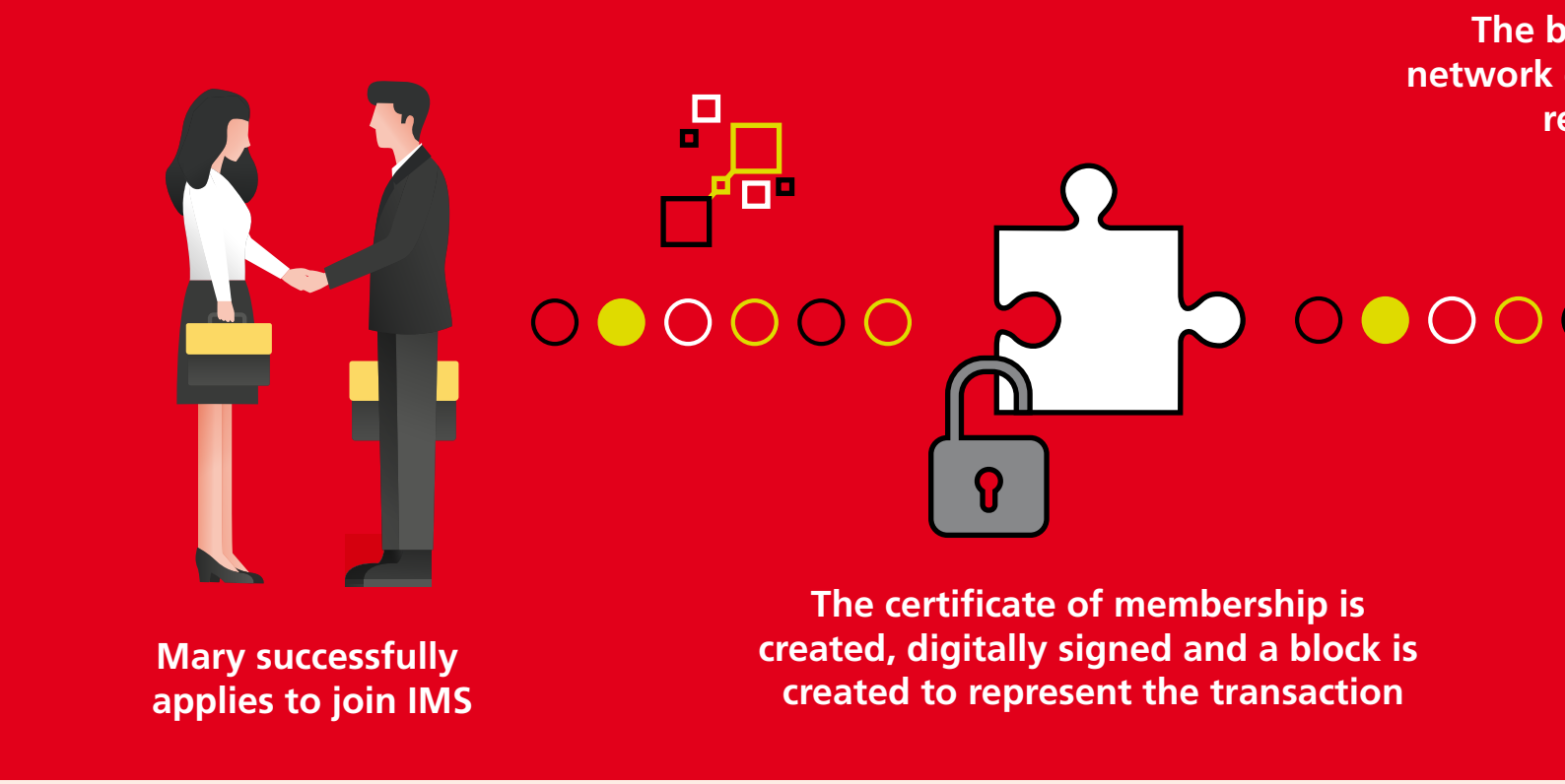
Figure 6: The application of blockchain in a professional body



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supporting big investments in tech and research.

The legalised cannabis industry is tightly regulated and could benefit from a transparent and secure system for tracking production and distribution. Blockchain technology could provide a record of product movement from farm to dispensary to user; helping to boost safety and regulatory compliance.

Mile High Labs, a producer and supplier of CBD products, partnered with Chain.io to create a blockchain-tracked supply chain for the cannabis industry. Beyond supply chains, Mile High Labs is also interested in using the ledger technology for regulation and compliance.

IBM has also proposed blockchain technology as a way for governments to control the source and sale of cannabis.

Facilities and operations management

Many of our clients operate in, and hence their research is often in, the facilities/operations management arenas. Service operations has changed significantly in the past decade: mobile platforms, the internet of things (IoT), real time data (RTA) availability and client interfacing has had a major impact on the industry.

Three areas where we find clients are particularly exploring opportunities in using blockchain are:

Smart contracts

Projects can be incredibly complex with multiple, often contemporaneously deliverable elements, and many stakeholders. This results in multiple contracts, some multi-faceted and multi-stage.

Stage payment and service level agreement (SLA) fulfilment can be difficult to track and manage, sometimes resulting in costly disputes and project delays.

Smart contracts, securely stored and monitored in the blockchain allow both facility owners and contractors to ensure payments are made when the contract terms are fulfilled.

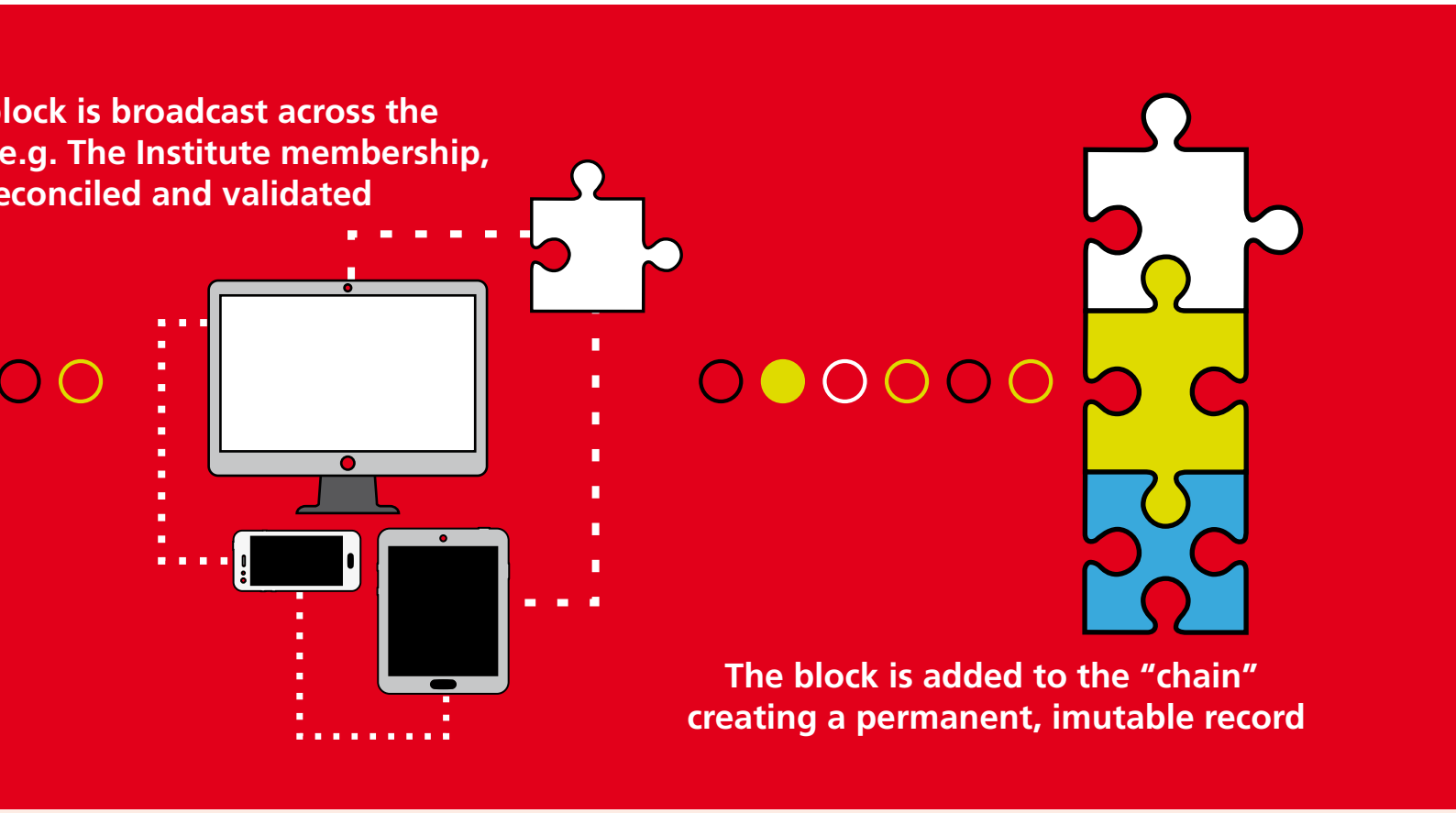
Blockchain could help avoid payment disputes by managing delivery and escalation, requiring the parties involved to move through agreed protocols before payment is made.

Operations, communications and proof of fulfilment

Nowadays material, equipment and parts are rarely made or supplied by a single source; supply chains are complex as is their management. Failure to deliver at one stage will result in a backlash from the customer. Using blockchain provides a digitally permanent audit trail that shows the company and the customer the state of the deliverable at each value-added step.

Equipment service and operating performance records

Private blockchains are being deployed to monitor regular maintenance and service visits from contractors, providing traceability and accountability. A process of executing smart



contracts to release payment once work has been verified as completed can be developed to handle and record transactions and the work involved.

As an example, most HVAC equipment now comes with the option of on-board smart interfaces, sensors and controls, which can verify once regular maintenance and servicing work has been completed. Once the specific set of tasks has been completed, embedded smart contracts can be executed; automatically releasing payments and updating maintenance records.

Education, education, education

By nature, academic credentials must be universally recognised and verifiable. In the primary/secondary schooling, university and professional environments, verifying academic credentials remains largely a manual process.

Deploying blockchain solutions in education could streamline verification procedures, thereby reducing fraudulent claims of un-earned educational credits. Sony Global Education, for example, has developed a new educational platform in partnership with IBM that uses blockchain to secure and share student records.

The same issues face professional bodies, and are exacerbated by the need for members to undertake specified CPD. Blockchain could assist at all points; from joining a body as a student member, through qualification and membership to CPD and beyond.

Retail therapy?

Often, consumers' sense of trust in the retail system is linked to their trust in the marketplace where their purchases are being made, eg trust is a key element of Amazon's success with customers. Currently, Amazon is the United States' biggest online retailer. The company accounts for about 4% of all retail and about 44% of all e-commerce spending in the US10.

Amazon was one of the original 'dot com disruptors', but some of the new pretenders to the throne believe Blockchain could decentralise that trust, attaching it more to the sellers on various marketplaces and platforms than to the sites themselves. Many are developing decentralised blockchain utilities to connect buyers and sellers, without a middleman and the associated charges. One example of this is OpenBazaar (https://openbazaar.org/) which operates as an open-source, peer-to-peer network, offering merchants no fees and no restrictions on what can be sold. Reference to our previous article, 'eBay in China' will emphasise the strategic power of this particular approach. Customers purchase goods using any of 50 cryptocurrencies, and sellers are paid in Bitcoin, with all associated data distributed across the global network instead of stored in a central database.

Authentication and brand theft is a massive issue, and blockchain offers some solutions. Global luxury brand Moët Hennessy Louis Vuitton (LVMH) created a platform, AURA, with Microsoft and blockchain start-up ConsenSys to authenticate luxury goods through blockchain. The platform enables customers to trace their products from design to distribution. For the brand, AURA adds additional protection from counterfeit goods and fraud.

Walmart and Sam's Club joined IBM's Food Trust network, which uses a blockchain distributed ledger. The retailers have asked their suppliers, especially those of leafy green vegetables, to add their produce data to the ledger. The system is used to make it easier to quickly trace the origins of food

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a key advantage in cases such as trying to trace the source of contaminated produce. Blockchain start-up BanQu is working with AB InBev to facilitate payments to cassava farmers in Zambia. BanQu's platform tracks the farmers' products through the supply chain and then provides digital payments to farmers via their mobile phones, even if they don't have bank accounts.

In the UK, similar systems are reportedly being trialled by three large retailers in the run up to Brexit. In a different but no less important development, the government of Rwanda is working with UK-based start-up Circulor, with the goal of tracing and removing sources of funding for conflict materials.

The public gets what the public wants

The management of public services is yet another area where blockchain can help lessen paper-based processes, minimise fraud, and increase efficiency, accountability between authorities and those they serve, as well as increase and validate value for money.

In the US, the Delaware Blockchain Initiative, launched in 2016, aims to create an appropriate legal infrastructure for distributed ledger shares, to increase efficiency and speed of incorporation services. Illinois, Vermont, and other states have announced similar initiatives. Startups are assisting in the effort as well: in Eastern Europe, the BitFury Group is currently working with the Georgian government to secure and track government records and contracts.

In police investigations, maintaining the integrity of the chain of evidence is paramount, so a distributed, hard-to-falsify record kept via blockchain could provide an added layer of security to the evidence-handling process. In addition, blockchain can be leveraged for flagging certain kinds of transaction patterns, giving police additional investigative resources when an individual or company engages in suspicious financial activity.

One company in the US is developing sealable, tamper-proof containers with 'near-field communications chips' that register container contents through a blockchain system, creating a secure audit chain for evidence management in law enforcement.

With the ever-increasing squeeze on public services, libraries are often cited as being in the firing line when it comes to funding. In December 2017, San José State University's School of Information received a $100,000 grant from the Institute of Museum and Library Services to fund a year-long project exploring the potential of blockchain technology for information services.

The researchers report their findings on a dedicated blog, and SJSU faculty members are leading a national forum with technical experts in library science, blockchain technology, and urban planning. So far, the potential uses for blockchain in libraries include helping libraries expand their services by building an enhanced metadata archive, developing a protocol for supporting community-based collections and facilitating more effective management of digital rights. The American Library Association's Centre for the Future of Libraries are currently with the ALA on a book project involving case studies of how blockchain is affecting libraries and what they project will be accomplished in the future.

Blockchain could help streamline the benefits system, which is often bogged down by bureaucracy. In the, the Department for Work and Pensions has been working with start-up GovCoin Systems in 2016 to conduct trials for developing a blockchain-based solution for welfare payments. GovCoin mimics what in the accountancy profession used to be called 'jam-jar accounting': dividing money into separate 'jam jars' for different expenses. It gives welfare recipients instant access to their benefits, although these are controversially paid in cryptocurrency via a mobile phone app. Recipients can create their own digital jam jars for rent, utilities, etc.

Waste management is another hot topic in public services management. Recycling is one of the best ways to reduce landfill waste, but it can be confusing and laborious. A blockchain-based solution could help optimise recycling systems that are already in place. A number of companies are seeking to partner with local government to incentivise recycling. 'The Plastic Bank' offers money or digital tokens in exchange for used plastic, and is working with IBM to expand its recycling solution globally. Recereum is an example of a more localised platform that allows communities to reward people who properly sort their recycling with coins.

Conclusions

This is by no means an exhaustive treatment of blockchain and its potential applications; such would need a larger tome. Indeed, we run academic and professional development courses on this very subject. Rather, we have tried to explore the basics of the technology: what it actually is and is not, what some of the jargon actually means and where is it being applied, with real life examples in business today.

We have purposely not gone into explanations on issues such as tokenisation, Initial Coin Offerings (ICO), fungibility, hard forks or lightening networks. After all; what have you done to us? These and many more are all areas that may be of interest if you do apply blockchain technology depending on your level of engagement: purely strategic or hands on application. Hopefully we have de-mystified some of the reported facts and dispelled some of the misconceptions.

It is certainly here to stay: or at least to be the springboard for the next evolutionary leap. As well as the examples given, two notable high-profile cases are worth acknowledging:

Dubai: The Smart City.

In 2016, the 'Smart Dubai' department introduced a Blockchain strategy. Using this platform, entrepreneurs and developers are able to connect with investors and companies interested in partnering. The objective is to use blockchain as the base system to encourage the development of specific industry types which will contribute to making Dubai 'the happiest city in the world.'

Blockchain for Humanitarian Aid

In January 2017 the United Nations world food program instigated a programme of humanitarian aid in in rural areas of the Sindh region of Pakistan. By using blockchain technology, beneficiaries received money and food, with all transactions registered on a blockchain to ensure the security and transparency of the process.

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Private blockchains are being deployed to monitor regular maintenance and service visits from contractors, providing traceability and accountability.

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