

# SECTION 1

A LEDGER FOR THE 21ST CENTURY

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**What is the problem that blockchain and distributed ledger are trying to solve? Let us start with financial data, and build from there.**

A ledger records transactions. The process (protocol) for adding a financial transaction to the master ledger, usually by way of a manual or automated journal, is unique to each system, organisation, and often, even to each individual department.

The problem in finance – the process and security for adding, amending or viewing the data entry are bespoke to each individual ledger. This is exacerbated further by the geographical and functional fragmentation of organisations, corporate consolidations and multiple technology platforms, among other issues. Finance has become very complicated!

Additionally, the business is only recording and managing their own internal version of the truth. We do not collaborate with our ecosystem very well – not with our suppliers, vendors, clients, nor counterparts. This leaves us vulnerable to human error, and accidental/deliberate failings in controls, leading to potentially disastrous outcomes – Enron, UBS and Barings to name but a few. So, although Luca Pacioli's codification of the double-entry system for ledgers holds true since the 15th century, the who-what-when-how-and-why needs significant modernisation in our digital world.

We need a ledger for the 21st century!

We need to ensure Trust, Transparency, Accountability and Timeliness!

This would be one shared version of the truth, that all parties, internally and externally, can rely on as they have agreed to the process and protocol for updating. Enabling providence and immutability to ledger updates. Sounds like Nirvana to me! So, are the distributed ledger and blockchain the solution?

The really exciting part is that not only can this technology solve many of the challenges that we face in the recording and management of financial transactions, but the data being recorded, managed and shared in the ledger can also be anything that matters. The authentication of artwork, validation of the source of natural minerals, facilitating trust, transparency and security to government and other data record-keeping, management and sharing. Even the transformation of the supply chain.

The list of use-cases is endless, if we combine some key concepts, such as the protocol for adding to the ledger in a safe and secure way through encryption techniques, enabling validation and authenticity to be asserted through consensus, and maintaining a perfect audit trail and providing immutability. This is revolutionary, not just for banks and financial services and finance functions in all firms, but for every sector.

The dream begins with imagining that a protocol for adding data to the ledger is agreed by all stakeholders, and they actually share and work from that same single ledger. Neutral parties are providing the consensus, and ensuring that the encryption is robust. They could actually trust the record, and control who gets to see and change it. They can control the who-how-what-when-and-why.

Dream on, combined with other (emerging) technologies like the Public Cloud, the Internet of Things (IoT), Artificial Intelligence (AI), and the synergistic opportunities enabled by these converging technologies, gives rise to endless possibilities. Imagine being able to track the fish from source to table, and record at all times the storage temperature, in order to ensure it is being delivered in a healthy condition. In short, the use-cases are restricted only by our imaginations.

The power of the distributed ledger and blockchain is far beyond the cryptocurrency use-case. The possibilities are exciting and endless.

...tomorrow's world is here today!

## Silver bullet for everyone?

Of course not. There are a number of common sense tests to apply when determining the right technology to solve a business problem. Distributed ledger and blockchain are no different.

### **For example:**

Is there a trust or accountability issue? Do you need collaboration? Do you need real-time updates of the data set? Does the distribution need to be widespread; not just hundreds, but thousands, and really tens of thousands? Are you positively disrupting the current business practices?

If the answer to some of the above is “no”, then re-engineering current business processes and contracts, combined with established technology, should suffice. Furthermore, many pure distributed ledger and blockchain use-cases today achieve consensus, with lots of powerful computers racing to be the first to validate the authenticity of the update. These are anonymous (see later chapters). In the finance world, we don't like anonymity – thus we need administrators, intermediaries, and others who force transparency.

And don't forget the old adage – rubbish in, rubbish out. If your data is fragmented today, unfortunately this technology will not solve that problem. Similarly, if your data taxonomy is broken – this technology will not resolve.

So, yes, it is powerful, but it's not magic!

By way of simple introduction, distributed ledger technology (DLT) refers to the technological infrastructure and protocols that allow simultaneous access, validation and record updating in an immutable manner across a network that can include multiple entities and locations.

Blockchain is a type of DLT that broadcasts the transaction event, enabling validation and participants all then recording and

updating. Cryptocurrencies are just a single example of how these technologies are used. We will cover these concepts in detail in the following chapters.

Let us have a look at a few use-cases alive today...

## Use-case 1: Marco Polo

The Marco Polo network is a joint venture with technology firm TradeIX and DLT firm R3 (Corda), along with a number of major banks and their corporate clients.



It was conceived in order to facilitate trade finance between banks, their corporate clients, and the wider trade finance ecosystem, hopefully in the process solving the \$8 trillion paper-based current operating model.

Let us ask ourselves the blockchain DLT use-case questions:

### Is there a trust issue?

Yes, credit, paper, records, money transfers = low trust.

### Do you really need collaboration?

Yes. There are many participants in the trade finance ecosystem, all of whom need to use the same data set across geographies.

### Do you really need real-time updates of the dataset?

Yes, credit and operational risk is high in this business model.

### Does the distribution really need to be widespread; not just hundreds, but thousands, and really tens of thousands?

Yes, the trade finance ecosystem is very large.

### Are you really disrupting the current business practices?

Absolutely. The old paper, email and need to physically connect between participants was inefficient, insecure, and not as timely as credit providers and payment instructors would like!

**Note:** Marco Polo are very transparent that their new solution leverages multiple technologies from cloud to a specialised DLT. Only then, when combined with smart contracts, revamped and re-engineered business practices, workflow, logic and rules, was their solution transformative. DLT was merely a component. Collaboration, agreeing protocols, policies, practices and rules, was as critical as the technology! And that's the truth and secret of success for any technology transformation.

## Use-case 2: TradeLens

The logo for TradeLens, featuring the word "TRADE" in a bold, black, sans-serif font, followed by a small orange plus sign, and then the word "LENS" in the same font style.

TradeLens is a DLT and blockchain-enabled shipping solution. It was jointly developed by IBM and shipping giant Maersk, with the purpose of improving the world's global freight supply by leveraging blockchain and DLT.

TradeLens uses IBM blockchain technology as the foundation for digital supply chains, empowering multiple trading partners to collaborate by establishing a single shared view of transactions, without compromising details, privacy or confidentiality.

Shippers, shipping lines, freight forwarders, port and terminal operators, inland transportation, and customs authorities can interact more efficiently through real-time access to shipping data and shipping documents, including IoT and sensor data ranging from temperature control to container weights.

Meets the use-case tests? Absolutely!