MARKETORDERS

WHITEPAPER

BLOCKCHAIN FOR THE GOLD & DIAMOND JEWELLERY INDUSTRY

HOW TO CREATE A MORE EFFICIENT, TRANSPARENT AND TRUSTED SUPPLY CHAIN FOR THE GOLD JEWELLERY INDUSTRY USING BLOCKCHAIN TECHNOLOGY

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NOTES

The terms Blockchain and Distributed Ledger Technology (DLT) are used interchangeably throughout this document.

This whitepaper focuses on the gold and diamonds jewellery trade industry and is referred to as GDJ (gold, diamond jewellery) as a shorthand.

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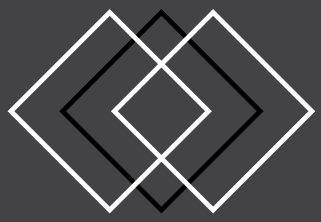

SUMMARY

MarketOrders is developing a platform-based marketplace and provenance chain to enable retailers to source the products they need more efficiently and at better prices, thus turning the traditional model upside down by digitising every element of the customer journey.

For the first time, GDJ retailers can order, pay and have their products delivered securely online. Right now, over 90% of small and independent jewellers have limited or no online presence and less than 5% of the major manufacturers have online capabilities that allow their customers to order, purchase and track products.

The industry is old fashioned and lagging behind. Most retailers wait for a wholesale salesperson or distributor to visit them in-store in order to see the product range and place an order. Digitising every aspect of this supply chain creates scalable efficiencies through the entire operational process. MarketOrders aims to provide an online and seamless end-to-end transaction process for all retailers and manufacturers.

This research paper sets out our vision to develop the next stage of innovation and incorporate blockchain into the customer journey through the creation of www.MarketOrders.io. This secure blockchain platform will provide scalability, as well as offer better security margins, turnaround time and leverage smart contract technologies, whereby all users can pay in cryptocurrency.

The industry also suffers greatly from the difficulties of authenticating jewellery and proving provenance. This whitepaper lays out how blockchain technology can be used to enable secure online payment and certification to significantly enhance trust and transparency within the supply chain, driving further efficiency gains.

SECTION 1.
INTRODUCTION

THE GOLD AND DIAMOND JEWELLERY MARKET

Of all the industries in the world, the jewellery business is one of the most traditional and old-fashioned. It is also the most reliant on direct interaction between master craftsmen and merchants. The most precious metals and stones in the world pass from hand to hand in a supply chain that has barely changed in hundreds of years.

The jewellery market is an industry rooted in ancient times. From the dawn of civilisation, humans have been adorning themselves with gold jewellery. It has morphed into an industry where purchases are driven by emotion and status, worn for prestige and used as investments.

Gold jewellery consumption has been proved to weather economic uncertainty well[1], so there is little surprise that cryptocurrencies such as Bitcoin have been dubbed 'digital gold'.[2] Its continued growth proves that buying and wearing gold jewellery is never out of fashion. Whether bought as a piece of jewellery to wear or as an investment, it continues to account for a large proportion of the global gold supply.

According to the latest gold demand trends[3], jewellery accounts for 47.7% of total gold demand (over 90,000 tonnes). 88% of this gold jewellery is distributed to consumers via SME retailers and boutiques. It is these retailers who MarketOrders helps. We propose to develop a trusted supply chain system, powered by blockchain technology, that will resolve the friction points and inefficiencies faced by SMEs.

> "OF ALL THE INDUSTRIES IN THE WORLD, THE JEWELLERY BUSINESS IS ONE OF THE MOST TRADITIONAL AND OLD-FASHIONED. IT IS ALSO THE MOST RELIANT ON DIRECT INTERACTION BETWEEN MASTER CRAFTSMEN AND MERCHANTS.

WHY NOW IS THE TIME FOR DIGITAL DISRUPTION

While the human-to-human global supply chain worked adequately before, it is ill-equipped to deal with consumers who want

access to products immediately, rather than wait weeks for them to arrive, want an array of options before making a final purchasing decision and seek reassurance they are getting the best possible value. And, of course, the product they are buying has to be ethically sourced with full traceability.

Perhaps it is unsurprising then that the industry has been traditionally slow to embrace change and innovation. There are growing signs, however, that the jewellery business, for so long steeped in tradition, may be about to welcome an injection of digital disruption. It is the consumer who is driving this industry shake-up, and if industries don't adapt to these changing demands, they risk being left behind.

However, the industry we operate in – the gold and diamond jewellery (GDJ) trade industry – is well aware of the need to embrace new technologies. In recent years, the global authority for precious metals trading, The London Bullion Market Association (LBMA), a wholesale over-the-counter market for the trading of gold and silver, has urged the industry to embrace blockchain as it will strengthen supply chain provenance.

They announced plans to help modernise and improve transparency in the industry with an approval process for companies using blockchain technology to track the movement of gold[4]. This came after the revelation that a US refinery had accepted billions of dollars' worth of gold that had been smuggled from South America.

Ruth Crowell, CEO commented: *"The LBMA is continually looking at ways in which investors can be assured their purchase of gold bars addresses supply chain risks, as well as protecting them against issues arising from fraud and breaches of security. The LBMA looks forward to seeing the innovative ways respondents devise technology which can further enhance the Responsible Sourcing Programme."*

WHAT DO WE MEAN BY DIGITAL DISRUPTION?

Simply, the use of new technologies that make it easier to move physical products throughout the supply chain and create new ways of serving customers. This digital disruption is being powered by new technologies consisting of distributed ledger technologies (DLT), often used interchangeably with the terms blockchain, Artificial intelligence (AI), machine learning (ML) and Internet of Things (IoT), to name just a few.

MARKETORDERS: BRINGING THE INDUSTRY INTO THE DIGITAL AGE

In our previous and current ventures, we noticed there are huge inefficiencies in the supply chain in the movement of gold and diamond jewellery products. Each part of the transaction was done in the traditional offline manner, which meant transactions were slow and mistakes common. We knew there had to be a better way to serve retailers and manufacturers and that's when MarketOrders was born in 2016.

MarketOrders is an online global marketplace for the gold and diamond jewellery trade industry. We use technology to help gold and

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MARKETORDERS IS AN ONLINE GLOBAL MARKETPLACE FOR THE GOLD AND DIAMOND JEWELLERY TRADE INDUSTRY.

diamond retailers order products directly from global manufacturers on our digital marketplace, bypassing the traditional middleman. Small orders from individual boutiques are aggregated online to create bulk orders that allow boutiques to benefit from discount pricing without having to place big orders. We're now setting our sights on the power of blockchain technology to transform the jewellery supply chain.

The larger companies in the jewellery sector are the most efficient because they have systems and processes in place that ensure human mistakes are minimised, but the vast majority of players in the industry (88%)[5] are made up of many smaller, unsophisticated companies.

In fact, the 10 biggest jewellery retail chains control only 12% of the industry, according to a report by McKinsey[6], with the vast majority of purchases made in independent boutiques and jewellery stores known as small and medium enterprises (SMEs). Yet most high-street jewellers don't have adequate supply chain processes and systems that allow seamless digital transactions.

THE ISSUES MARKETORDERS ADDRESSES

Without an efficient, transparent and trusted supply system in place, small retailers and manufacturers suffer. Payments take longer than expected, quality issues arise and there is no real way to show consumers that they are buying ethically sourced products.

So how can this industry tackle these inefficiencies? We propose the following recommendations.

Better stock inventory processes: Jewellers need to carefully manage stock inventory so they are not left holding expensive stock. At MarketOrders, we allow our retailers to order exactly what they need to minimise the costs and inefficiencies, as well as the energy and environmental costs that are associated with sending back and melting unsold gold jewellery. In 2018, the World Gold Council released a report[7] highlighting the gold industry's role in improving energy efficiency that particularly highlighted the energy used in melting down unsold items.

Leveraging Data: Both manufacturers and retailers largely operate offline and have no online system to capture orders. By using online systems, they can better spot trends and meet anticipated consumer demand over both the short and medium-term. This also helps to significantly reduce returns.

Embracing tech innovations such as blockchain: Embracing the power of blockchain will put the control back into the hands of the retailers by not only proving provenance of the products but also making the end-to-end sales and supply process more transparent, efficient and profitable. Blockchain technology can be used to significantly reduce the cost of international and cross-border payments, as well as to verify trade finance invoicing and run digital checks on customers.

Ethical sourcing: Blockchain can be used to track items in the supply chain, from the mines of origin through to the refining, polishing, jewellery manufacturing and shipping to the retail store. This adds value for consumers who seek to make ethical purchases.

Overall, the jewellery industry is set to benefit from great efficiency gains if it can embrace technological innovations within its traditionally fragmented supply chain.

> EMBRACING THE POWER OF BLOCKCHAIN WILL PUT THE CONTROL BACK INTO THE HANDS OF THE RETAILERS

The diagram below shows how each step in the supply chain can be digitised from a logistics perspective. As the physical gold is transported from the supplier to retailer, a digital record will be created and stored.

At step 1, the manufacturer produces the gold jewellery items in the factory. At this stage, the manufacturer can embed nanochips into each item and record it with key data, such as metal composition and where the base metals were sourced from. The name of the designer can also be encoded to show any craftsman's stamp of approval and add any certifications to authenticate the item.

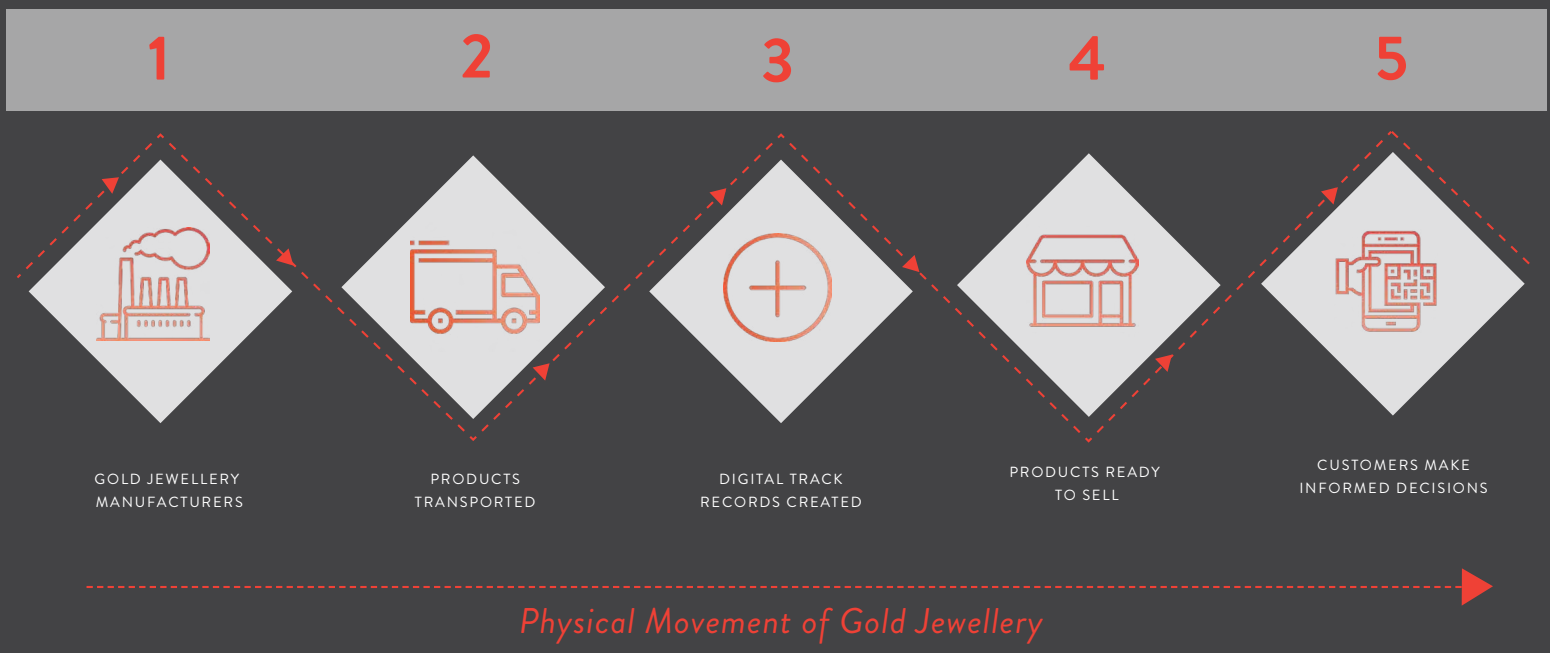
At Step 2, the items are transported and again, the nanochip can be used as a track and trace device to help with logistics and make sure the item arrives promptly. Digital locks can also be used to validate what is inside the packages without having to open the package, which adds an extra layer of security.

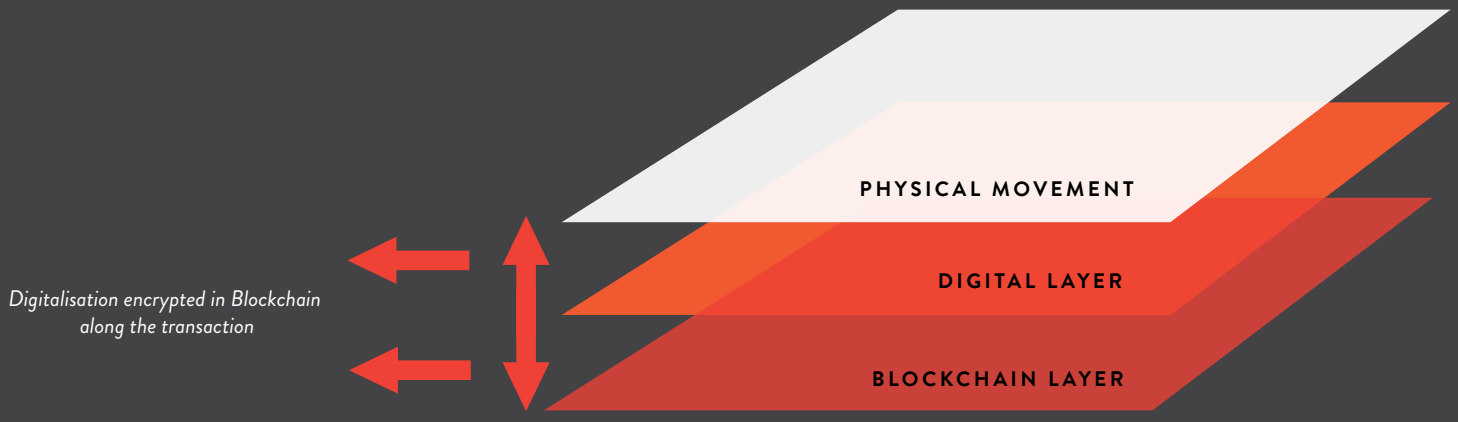
Step 3, digital records are created from all these 'events' taking place that can be shared on the blockchain. For example, if a package is being transported via air cargo, the customs clearance agent can look up the relevant flight number on the blockchain to track if the package has landed and been processed for collection.

Step 4, the items arrive at the retail shop and the retailer can scan them and add them to his inventory automatically. The items are now ready to sell, and by scanning the nanochip, the retailer can look up all relevant details, such as the meal compositions and who designed the item, as well as the journey the item has taken to reach their shop.

Step 5, the end consumer can also look up this information to help them make informed decisions, such as whether the item is carbon neutral, which country the gold was sourced from and whether they can view the fair trade certificates etc. which should be uploaded to the nanochip where applicable.

The physical movement of the items is now supported by digital layers of data collection and storage with the blockchain, adding an extra level of trust and security for all participants in the supply chain.





Platform integrated with Blockchain technology, smart phones, NFID, IOT Networks and Mobility Applications

PURPOSE OF THIS WHITEPAPER

THIS WHITEPAPER WILL:

1. Explore the current challenges SME jewellery retailers face.
2. Demonstrate how MarketOrders proposes to utilise innovative technologies to revolutionise the industry.
3. Explain how blockchain and DLT can be used to improve the whole supply chain.
4. Introduce the concept of a token economy via the MarketOrders Token (MOT).

We envisage a new way of doing business in an industry that has lagged behind for too many years in terms of embracing and adopting technical innovations – not because it doesn't want to, but because it doesn't know how to.

MarketOrders aims to be the end-to-end solution for both small jewellery retailers and manufacturers in this ecosystem. We envisage a new way of operating the gold jewellery trade industry in which blockchain technology powers the supply chain and allows payments to be made in a much more secure and trusted manner with the introduction of the MOT.

DLTS & THE GOLD & DIAMOND JEWELLERY SUPPLY CHAIN

Well-functioning global supply chains are vital for the smooth and timely movements of goods all over the world and they underpin the globalised economy. Yet, it is still surprising to see that most supply chains, which are often complex operations, still run on predominantly manual procedures and processes. For example, global import and export approvals processes can involve as many as 200 communications between 30 individual parties for individual approvals, which are made using paper-based documents[8].

"International trade demands a faster, more secure and more efficient way to handle the document approval workflows needed to move goods across international borders."

– RAMESH GOPINATH,
VP of Blockchain Solutions at IBM[9]

The GDJ industry is by nature an international business, thereby making it one of the most complex supply chains from the get-go. Gold and diamonds are mined and sourced from countries where the commodity is naturally found but will often be processed, cleaned and shaped in other countries all over the world.

WHY USE DLTS IN THE GOLD AND DIAMOND JEWELLERY SUPPLY CHAIN?

DLT, though still in its infant stages, is clearly on a path to disrupt many aspects of business and society, especially those dealing with the coordination of information and trust. It has the potential to become the new layer for economic value transfer within the modern technology stack. In addition, the use of smart contracts (programmable contracts that are automatically enforced) has the potential to automate many processes.

DLT is often discussed alongside its more famous sister, Bitcoin, and unsurprisingly, developments have been primarily focused on its use in the financial services sector. As a result, there has been significant investment and experimentation in this sector. However, the second biggest area where DLT is making an impact is within the supply chain and there's a good reason for that. We are keen to bring this into the GDJ supply chain.

REAL-LIFE CASE STUDIES OF DLT IN ACTION IN OTHER INDUSTRIES

By allowing all parties in the global shipping supply chain to share information through a digitally secure distributed ledger, blockchain technology could revolutionise the GDJ industry by eliminating the current system of complex, fragmented, expensive and time-consuming paperwork.

And it's not just in the GDJ industry where DLT is being used. In fact, there are a number of case studies and pilot projects already underway in other industries suffering from inefficient supply chains. Some businesses are already enjoying the very real benefits it can bring. Here are just a few examples:

SHIPPING INDUSTRY

Objective: a more efficient process

Maersk, one of the world's largest shipping companies, is partnering with IBM to incorporate blockchain distributed ledger technology into its shipping process with the introduction of TradeLens.[10] Maersk, the Danish shipping company, which owns almost 20% of all shipping containers, are using TradeLens to automate and digitise the paperwork associated with the movement of their physical products across a number of different parties they interact with along the shipping route.

FOOD SAFETY

Objective: trust and traceability

Carrefour and Nestlé are part of IBM's Food Trust Network[11] that uses DLT to connect participants across the food supply through a permissioned, permanent and shared record of food system data. This provides both the manufacturer and end consumer with full information on the product's origin. They recently added Mousline purée, a popular instant mashed potato mix that is available in France, into the Food Trust blockchain network.

Mashed potato is a much-loved dish in France since it was invented there in the 1800s, so ensuring that potatoes are grown in France is important to French consumers, which makes this an ideal food to provide traceability. A barcode on the 520g packages can be scanned with a smartphone, giving consumers key information about the contents of the product. This information includes the region where the potatoes were grown, the varieties used, quality control in the Nestlé factory and the places and dates of storage before it reached the grocer.[12]

HEALTHCARE

Objective: waste reduction

Millions of pounds worth of unused medication in good condition is discarded each year. MediLedger aims to serialise each package of medication so that it can be returned and verified as being authentic and then resold to health authorities, such as pharmacies, thereby creating less wastage and moving this industry from a linear to a circular economy (where items can be reused and resold). It requires all items to have a serial number so that when they are returned, they can be verified as authentic, and anything that cannot be verified is disposed of so that no patient risks taking counterfeit drugs. MediLedger aims to be an open network addressing the entire pharma supply chain.[13]

HOW MARKETORDERS WILL USE DLTS IN THE GOLD AND DIAMOND JEWELLERY SUPPLY CHAIN

These examples show that we have moved forward from just the ideation phases and organisations are beginning to understand the power of implementing DLT solutions into their business models.

It is for this reason that MarketOrders has started to look into how DLT can be incorporated into the business model to solve the pain points of retailers and manufacturers who are impacted by complex and fragmented supply chains.

We have identified the key problem areas that DLT can provide solutions for and grouped them into the following categories. It is in these areas that MarketOrders can implement DLT within the GDJ industry and improve the current supply chain process.

TABLE 1: KEY PROBLEM AREAS THAT DLT CAN PROVIDE SOLUTIONS FOR

CATEGORY	SCOPE
PRODUCT TRACING	· Product provenance · Track and trace · Anti-counterfeit
LOGISTICS	· Supply chain management · Optimising inventory · Digital records (no paperwork) · Environment history recording
FINANCIAL TRANSACTIONS	· Smart contract payments · Direct selling · Token-based payments · Reconciliation · Audits
RETAIL OPERATIONS	· Customer identification · Loyalty management · Refunds management
CIRCULAR ECONOMY	· Reduce · Reuse · Recycle (supporting secondary uses) · Resale

SECTION 2:
BLOCKCHAIN

WHY USE BLOCKCHAIN IN THE GOLD AND JEWELLERY SUPPLY CHAIN?

There is increasing evidence that businesses who are involved in the movement of physical products along complex supply chains can – and are beginning to realise – the value of using blockchain and DLTs as part of their business models.

Awareness of the use and benefits of such technologies is beginning to increase in the retail space, with nearly 90% of people working within the industry convinced that the blockchain and DLT will become an increasingly important part of the future of retail and contribute to making operations more streamlined and efficient.[14] As supply chains become increasingly global, we see the information flow that is associated with the products is not. This needs to be addressed.

A blockchain is, in the simplest of terms, a time-stamped series of immutable records of data that is managed by a cluster of computers (not owned by any single entity). Each of these blocks of data records (i.e. block) is secured and bound to each other using cryptographic principles (i.e. chain). This is the definition we will use throughout this whitepaper. The blockchain is based on three key concepts:

1. DISTRIBUTED DATA
2. DATA BLOCKS
3. A CONSENSUS MECHANISM

DISTRIBUTED DATA

What is distributed data?

Traditionally, data is typically stored on a single central server or database, which is owned and maintained by the owner (the company or entity, such as a bank or customs clearance agent).

In a distributed decentralised ledger, this data is not held and owned by one entity. Instead, it is stored on multiple different computers (or nodes) with access to the network and the data is replicated across all the nodes on this network. Therefore, the data can be accessed and added to by anyone on the network. In terms of supply chain content, this means that all participants in the network, from the manufacturers to the customs agents to the retailers, work from the same data and can read and write to this ledger. No one – either an entity or person – owns this data. For example, a retailer could access the database to see where his supplier bought the raw gold from.

What advantage does it have over a traditional database?

The table below shows the different types of ledgers that exist. Centralised databases are owned and maintained by one entity who thereby effectively controls the data. Traditional distributed databases can have multiple people inputting and accessing data but the ultimate control remains with one entity. Then you have distributed ledgers (this is where blockchains come in) where no one entity controls the data. It is maintained and accessed by multiple entities, thereby giving it its decentralised status.

TABLE 2: DATABASES VS DISTRIBUTED LEDGERS[15]

	CENTRALISED DATABASE	TRADITIONAL DISTRIBUTED DATABASE	DISTRIBUTED LEDGER TECHNOLOGY
Data Input	Multiple entities	Multiple entities	Multiple entities
Data Storage	Single entity	Multiple entities	Multiple entities
Data	Single entity	Multiple entities	Multiple entities
Data Output	Single entity	Multiple entities	Multiple entities
Control	Single entity	Single entity	Multiple entities

DATA BLOCKS

What are data blocks?

A blockchain is a type of DLT which records secure 'blocks' of data with the use of cryptography. All this data is stored on a network (or protocol) that can be accessed by multiple parties.

These parties can view and read the data, as well as write new data or create new blocks which contain new information. This is also known as a peer-to-peer network, as the participants are interacting directly with each other.

THE FACT THAT NO ONE CAN EVER GO BACK AND CHANGE OR TAMPER WITH THE DATA MAKES BLOCKCHAIN PARTICULARLY USEFUL FOR THE RETAIL SUPPLY CHAIN FOR PHYSICAL PRODUCTS.

Therefore, the blockchain is a 'chain' of data stored in 'blocks' in an append-only manner (i.e. data can only be added to it and cannot be removed). The fact that no one can ever go back and change or tamper with the data makes blockchain particularly useful for the retail supply chain for physical products. This allows you to see the full history or journey of the data or product in question.

The table below shows the key features of blockchains and what they mean.Table 3: Key features of blockchains and what they mean

FEATURE	EXPLANATION
A NETWORK OF COMPUTERS	A network of computers (or nodes) connected through the internet in which participants can access the network and send or receive information directly to another node.
PEER-TO-PEER NETWORK	The blockchain facilitates the peer-to-peer (P2P) transfer of value without the need for a third (or central) entity. The data is also replicated across this P2P network so that every participant has the same information.
APPEND-ONLY STRUCTURE	Transactions are recorded chronologically so that data cannot be deleted or tampered with once it is on the blockchain. Entries are permanent and can be viewed by all participants (so are transparent).
CRYPTOGRAPHICALLY SEALED DATA	Digital signatures and cryptography seals ensure the security of the data.

What are the advantages of a blockchain over a DTL?

The table below shows the differences between blockchains and a distributed ledger. The key difference between the two is that no one entity controls the data in a blockchain. In distributed ledgers, there may be one entity that controls the data, for example, an organisation or company that wants to maintain control over its source data.

TABLE 4: THE DIFFERENCES BETWEEN BLOCKCHAINS AND A DISTRIBUTED LEDGER

BLOCKCHAIN	DISTRIBUTED LEDGER
Consists of an extensive set of records called blocks that are linked cryptographically.	Is a single shared and synchronised database of transaction records of assets.
Is a dynamic form of DLT based on chains of blocks of data.	Not all DLTs employ a chain of blocks, as in blockchain technology.
Contains rules and standards for how the ledger is created and maintained without a central authority or any third-party involvement.	Represents the data-sharing technologies through which participants (computers or nodes) can participate in a peer-to-peer network and read and validate records of digital data.
The organisation and development of the blockchain are decentralised.	The corporate organisation of a distributed ledger may not necessarily be decentralised.

CONSENSUS MECHANISM

What is a consensus mechanism?

Consensus is a way of effectively getting peer-to-peer approval. In a blockchain, no one entity is overseeing operations, so how can you make sure only trusted data is being shared? The validity of the data on DLTs is enforced by the participants themselves on the peer-to-peer network in a voting mechanism called a consensus mechanism.

Since there is no central authority, when new data is added to the blockchain, each node (or computer) will attempt to validate whether the information is correct and then vote on it accordingly. If a certain percentage of computers agree with the update, this entry is then deemed to be correct and will be added to the blockchain. This is where the concept of 'distributed trust' comes from. There is no single person or entity that decides what can be added. Any new data has to be agreed with a majority of computers from across the network who independently come to a decision. In a DLT, the network must be set up in such a way that the consensus mechanism in place is reliable.

The way the consensus works will be determined by whether the DLT is private or public. In a private DLT, where the participants are known, simple majority voting will

For example, this could be used within a logistics firm who wants to share data with their in-house customer services team. In a public DLT, a much more robust consensus mechanism will be required (as is the case with the Bitcoin protocol).

What is the advantage of a consensus mechanism over a single authority?

The advantage of using a consensus mechanism over a single authority is that you don't have to rely on just one entity to process and confirm transactions. This mechanism creates trust across a network that cannot be tampered with and is inherently more trustworthy because transactions are being independently verified.

There are many start-ups and large corporations who are beginning to realise the value that blockchains can bring and, according to a report by Ernest and Young, the most significant area in which this technology can create transformational change is the physical product supply chain.[16]

The use of blockchain could really improve the GDJ supply chain in the following three areas:

1. Establishing a secure, comprehensive digital store of records – these vital records could include identities, inventory or stock details, the composition of metals within each jewellery item etc.

2. Creating smart contracts – switching to smart contracts means that code can be used to automate certain rules and trigger certain actions within the contract process. For example, a manufacturer getting payment as soon as a courier has delivered the goods.

3. Facilitating the exchange of digital assets – DLTs allow participants on the network to transfer value directly with each other (because it is a peer-to-peer network) removing the need to use any middlemen. For example, payments can be exchanged with the use of cryptocurrencies instead of using a bank (middleman) to settle the transaction. This avoids the payment of hefty bank fees, especially for international payments.

KEY FEATURES OF BLOCKCHAINS

Although you could use a database to do all the above, there are advantages of using blockchains, as outlined below. It is for these reasons that, as a business, we at MarketOrders are looking at the potential use of blockchain and DLTs in the supply chain for our industry.

TABLE 5: THE POWER OF BLOCKCHAINS AND WHAT THEY MEAN

FEATURE	WHY IT'S IMPORTANT
TRANSPARENT AND AUDITABLE	Auditing becomes much easier because all transactions on the ledger are viewable to all participants.
IMMUTABLE	Transactions on the ledger cannot be deleted or modified without approval and they are traceable on the distributed ledger.
VARYING DEGREES OF PRIVACY	Depending on how the DLT is set up, there can be varying levels of anonymity. On public blockchains, you could have fully anonymised accounts. Within an enterprise distributed ledger, you could choose to have the known participants in the private ledger.
EFFICIENT	Transactions can be done much more efficiently on a peer-to-peer network, without the need for middlemen. This could be a huge advantage for the GDJ industry, where payments are often global and have to pass through many entities before they reach their destination (often with many delays).
RELIABLE	Distributed ledgers are more robust and reliable because they are not exposed to a single point of failure. This means increased levels of security, since a hacker would need to hack into all the nodes (or at least a large majority of them) at the same time to overwrite data or tamper with it.
LOW COST	Blockchains are powered by computing energy, as opposed to manpower, so will be significantly cheaper (in the long-term) than employing a workforce to do the same job). This means that repetitive back-end tasks, such as auditing, legal and accounting work, could be streamlined and automated, increasing efficiency and reducing the risk of human error.

WHY USE BLOCKCHAIN IN THE GOLD AND DIAMOND JEWELLERY SUPPLY CHAIN?

The table below outlines the key pain points faced by this industry (which also apply to those within any physical product supply chain) and provides an overview of how blockchain could potentially solve them.

TABLE 6: KEY PAIN POINTS FACED BY THE INDUSTRY

AREA	SUPPLY CHAIN PAIN POINTS	BLOCKCHAIN AS A SOLUTION
TRACEABILITY	Products can pass through many 'events'[17] and this generates data, which can be difficult to manage.	DLT provides a transparent and fully auditable history and audit trail, creating an immutable record along the full supply chain.
REAL-TIME AUTOMATION	Many processes are done offline and are paperwork-heavy, as there is little standardisation of processes across global borders.	Smart contracts could be utilised to release payments automatically once the product reaches the next destination, which happens in real-time.
COMPLIANCE	Supply chains can be bogged down by different regulations, depending on the geographic location, causing delays.	Transactions on the blockchain are time-stamped and have digital signatures and can be viewed by anyone.
IMPROVED COMMUNICATION	With so many different stakeholders involved, it can be difficult to manage communications effectively,	Blockchain allows peer-to-peer communication so communication is faster because middlemen are removed.

A BRIEF HISTORY OF MARKETORDERS

MarketOrders is an established UK-based company, founded in 2016 by Ram Krishnna and Sukhi Jutla, ex-bankers and technologists who stumbled upon an industry which had archaic processes that were ripe for disruption.

Being 'industry outsiders', it became very clear to us that this industry needed to be brought into the digital age and we knew we were the right people to do this!

In creating MarketOrders, we brought with us over a decade's experience of running previous ventures in this industry where we started out as traditional wholesalers and distributors. MarketOrders was created because we knew we couldn't build a truly global and efficient business when the supply chain (vital to this business) was completely broken. Processes and transactions were largely done offline and in-person and records were difficult to track, keep and maintain. MarketOrders is our answer to this problem.

Over the course of the past few years, we are really proud to have built a marketplace model that has won multiple awards for innovation, as well as building a strong and trusted team.[18]

Our innovative marketplace allows small independent and boutique jewellery retailers to place orders directly from large manufacturers online. Our marketplace aims to be the first online global hub for the gold and diamonds jewellery trade industry, which is powered by technology that creates an efficient supply chain and logistics.

We have proven ourselves by building a product and a loyal customer and supplier base. It is for these reasons that we are now looking to implement blockchain-powered capabilities within our business, as we are already equipped for real-world applicability and to solve a real problem. The next stage is to incorporate and build blockchain technology into the business.

Our core values of bringing the highest levels of trust, transparency and integrity to jewellery retailers also align with the core components of blockchains and DLTs. We have seen first-hand the struggles that our retailers and manufacturers face daily in an industry which is so complex and fragmented. We aim to present a simple, single solution to this issue by bringing more transparency and trust to an industry that is reliant upon slow, paper-based processes.

MarketOrders turns the traditional model upside down by digitising every element of the customer journey. For the first time, retailers can order, pay and have their products delivered securely online. Although this may sound like an everyday occurrence to the average online customer, many of the boutique jewellers we deal with have limited or no online presence, mainly because they find technology too hard to implement or do not have the resources to develop it.

In addition, major manufacturers do not have online capabilities that allow their customers to order, purchase and track products. The industry is old-fashioned and clearly lagging behind. When most retailers want to see the product range and place an order, they wait for a wholesale salesperson or distributor to visit them in-store. Digitising every aspect of this supply chain will create scalable efficiencies throughout the entire operational process.

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MARKETORDERS TURNS THE TRADITIONAL MODEL UPSIDE DOWN BY DIGITISING EVERY ELEMENT OF THE CUSTOMER JOURNEY.

AWARDS & PRIZES

We are excited about this new technology and the new ways of doing business it will bring about. We are a young, vibrant start-up based in London, and our supportive business environment[19] means we have been named as one of the preferred places for blockchain start-ups to be headquartered in. We are already making waves in our industry, due to our strong leadership team who have won multiple awards and completed renowned accelerator programs[20] to help us get to this stage. Here are just a few of our accolades[21]:

ACCESS A FULL, UPDATED LIST OF OUR AWARDS AT **MARKETORDERS.NET/AWARDS/**

TRASTRA
Top 10 Crypto Influencers in 2020

MarketOrders was named as one of the Top 10 crypto influencers in 2020[22] alongside notable influencers, including: Changpeng Zhao, founder and CEO of Binance, Brian Armstrong, co-founder and CEO of Coinbase, Vitalik Buterin, co-founder of Ethereum, and Brad Garlinghouse, founder of Ripple, to name just a few.

TURGENSEC
The Most Influential Individuals in Blockchain

MarketOrders COO, Sukhi Jutla, was listed as one of the most influential people in blockchain alongside other influencers, including Jack Dorsey of Twitter and Square.[23] Buterin, co-founder of Ethereum, and Brad Garlinghouse, founder of Ripple, to name just a few.

WOMEN in TECH
TOP 10 TECH COMPANIES FOUNDED BY WOMEN

MarketOrders was named as one of the Top 10 tech companies founded by women alongside other inspiring female-founded companies, including Canva, co-founded by Melanie Perkins; Starling Bank, founded by Anne Boden; Bumble, founded by Whitney Wolfe Herd; and Eventbrite, co-founded by Julia Hartz.[24]

MarketOrders won the Excellence in Supply Chain Optimization award in the Business Elite Awards run by Small Medium Enterprises News, which shines a spotlight on those championing small and medium enterprises including retailers in the UK.[25]

MarketOrders co-founder Sukhi Jutla was named as one of the most popular cryptocurrency influencers by Master The Crypto alongside other prominent role models, including Mark Zuckerberg, Elon Musk and Twitter founder Jack Dorsey[26]

MarketOrders was announced as a Top 100 European Digital Pioneer by The Financial Times & Google. Sukhi Jutla was listed alongside other leading pioneers, including Niklas Adalberth, co-founder of Klarna; Anne Boden, founder and CEO of Starling Bank; Daniel Ek, founder and CEO of the music-streaming company Spotify, and Taavi Kotka, Estonia's first-ever chief information officer, to name just a few.[27]

MarketOrders was awarded the Digital Innovation Award by the Federation of Small Business and named as the winner of the London area finals, which further cemented their status as an innovative and disruptive start-up bringing technological changes to the jewellery sector.

Professional Jeweller names MarketOrders as a Rising Star in the 2020 Power List which celebrate the movers and shakers in the UK jewellery trade.

MarketOrders COO, Sukhi Jutla, was identified as one of the top 33 individuals that are 'Making A Difference' in the MAD33 list. Other notable names in the list included Chris Witty, the UK Government's Chief Medical Advisor, and Nik Storonsky, CEO of Revolut.

MarketOrders COO has been appointed as a Board Member on the Skills for Londoners Business Partnership. Sukhi Jutla was chosen by the Mayor of London Sadiq Khan to be part of the group, which is charged with shaping London's skills system.[28]

MarketOrders COO appointed Brand Ambassador & Mentor for the DIT Women In FinTech Global Initiative Sukhi Jutla is an Ambassador & Mentor for the UK Department Of International Trade's 'Women In FinTech Global Initiative', which brings together like-minded women working in the Fin-Tech space, uniting those who want to bring their enterprises to the UK with those who already have. It offers support and guidance on how best to scale and raise investment from the UK.

PRESS COVERAGE

We believe that increased education and understanding about this technology is the best way to help innovative technologies get greater adoption, which is why we spend time on building our profile, marketing and educating our customers and manufacturers to understand how this technology can be used to help them in the future. We have achieved international press coverage about our work, which to date[29] includes:

- 600+ print and online press articles where MarketOrders is mentioned or profiled
- 27 podcasts, radio and video interviews
- 36 awards and list nominations
- Articles featured in 20 + countries, including Germany, France, the UK, the USA, China, the UAE, India, Portugal, Spain, Brazil, Russia, Lithuania, Japan, the Czech Republic, Vietnam, Italy, Turkey, South Korea, Sweden, Belgium, Romania

FOR THE LATEST PRESS COVERAGE VISIT **MARKETORDERS.NET/PRESSCOVERAGE**

SECTION 3.

WHY MARKETORDERS IS UNIQUELY POSITIONED TO SOLVE THE PROBLEMS OF THE SUPPLIER, RETAILER & END CUSTOMER

WHY MARKETORDERS IS BEST PLACED TO BRING DLT TO THE JEWELLERY INDUSTRY

At MarketOrders, we are creating a new way for retailers and manufacturers to access and source the gold jewellery products they need. We envision a seamless digital experience coupled with the use of innovative technologies, such as blockchain and artificial intelligence, to improve the end-to-end supply chain process.

Our goal is to not only make it easy for retailers to get the products they need at the best prices but also be 100% confident about where the products have been sourced from. Our manufacturers can access a wider breadth of retailers to sell to and this transparency makes it easier for both retailers and manufacturers to access what they need in a safe and trusted marketplace.

Our industry expertise, learnt over many years, has shown us that now is the right time for the GDJ industry to fully embrace the power of technology and digital processes.[30] Constantly changing consumer preferences demand that products are not only delivered faster and cheaper but are also ethical and sustainable.

In the past, the industry could pick and choose what they wanted to offer customers, but not anymore. Customers are now demanding what they want, and with so much choice available, retailers and manufacturers risk losing out on vital sales if they don't serve customers what they want, or perhaps even their businesses and livelihoods.

Here are a few more reasons why we think we are best placed to bring blockchain innovations to our industry.

We have:

1. **A game-changing, ambitious idea that will lead to new products, processes and services**.

This technology will overturn the currently inefficient market and build a supply chain provenance capability that has not been seen before in the industry, as well as allow access to new verticals and export markets.

2. **An idea that is significantly ahead of the others, and all set for rapid commercialisation.**

MarketOrders is a pre-revenue seed-funded business with tremendous potential for growth. This technological leap will enable a step-change in growth and speed to market.

3. **A strong and deliverable business plan that addresses clear market needs.**

Having spent over 10 years researching the challenges in the industry, we are confident that our solution uniquely solves all the issues faced by retailers and manufacturers.

4. **A clear plan to deliver significant economic impact, ROI and growth.**

We are developing a disruptive technology, which will improve efficiency in a traditional market and create new market opportunities because it will remove barriers.

5. **Team, skills and experience to run and complete the project successfully.**

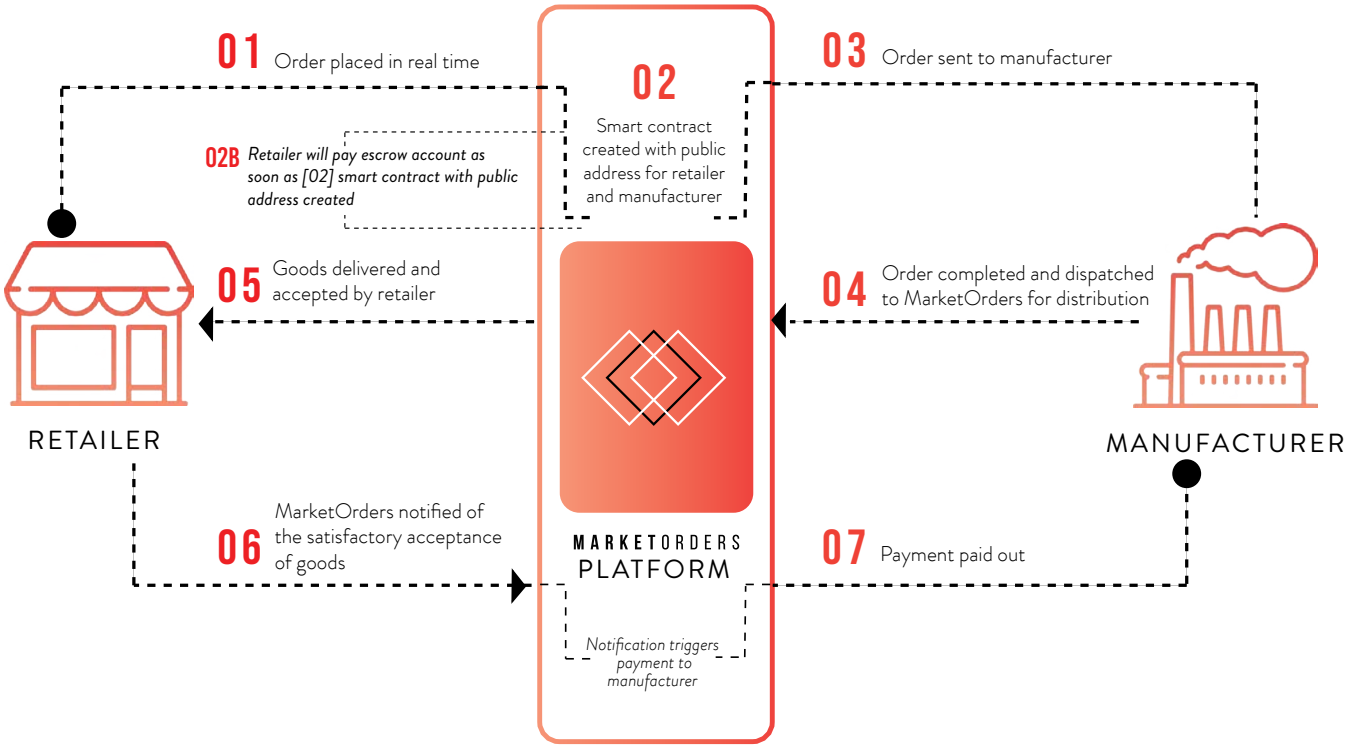
We have an experienced and committed team in place, ready to execute this industry-changing project.

6. **An awareness of the main risks and mitigations.**

After carrying out a detailed risk assessment, we and have a strong mitigation plan in place.

7. **Clear potential to positively and significantly impact the UK economy/productivity**We will dramatically improve the livelihoods of the independent retailers, through higher earnings and better cash flow.

The diagram below outlines how we envisage the blockchain-powered supply chain will operate. Orders will be digitally placed and smart contracts will execute payments automatically in real-time.



WHY BLOCKCHAIN MAKES SENSE FOR THE JEWELLERY INDUSTRY

For consumers inundated with choices and selections, the traceability of a product is of paramount importance. While the jewellery industry has tried to address this concern, it has been very slow to embrace new technology-driven solutions. Indeed, the supply chain for precious stones, such as diamonds, is among the most complex and fragmented of any industry.

But this entrenched conservatism, with all its inherent inefficiencies, is starting to give way as the industry begins to recognise the potential of blockchain. Below are examples of how the industry as a whole is recognising the potential of blockchain and the need to embrace it today.

THE LONDON BULLION MARKET ASSOCIATION (LBMA) ANNOUNCED ITS PLANS TO IMPLEMENT BLOCKCHAIN

The LBMA announced its plan in 2018 to modernise and improve transparency in the industry with the help of blockchain.[31]

They stated that the technology could help to exclude metal that is "illegally mined or traded or used to finance conflict" from the global supply chain, which is an industry-wide problem.

For instance, in March 2017, the FBI accused three NTR Metals employees of importing $3.6 billion worth of gold from South American countries, and then refining and selling it, before sending the earnings back to drug traffickers.[32]

THE ROYAL MINT EMBRACES BLOCKCHAIN

The Royal Mint, owned by the UK government, is the world's leading export mint. It has embraced blockchain technology by transforming physical gold into a "modern digital asset, making it the perfect medium to record and transfer ownership".[33]

According to its website: ''RMG (royal mint gold) is an alternative way to invest in and trade physical gold. It aims to provide the investment performance of the London Gold Market with the transparency of an exchange-traded security. Each RMG represents direct ownership of physical gold bullion held in the form of fully allocated, segregated London Bullion Market Association (LBMA) Good Delivery bars within the highly secure storage facilities, The Royal Mint vault. Real gold that can be digitally traded – 1 RMG represents ownership of 1g of real gold.''

DIAMOND GIANT DE BEERS LEADS THE BLOCKCHAIN REVOLUTION

The world's largest diamond mining firm, Russia's Alrosa, has joined the pilot of fellow industry giant De Beers' diamond supply chain blockchain platform Tracr[34]. This aims to improve transparency and consumer trust across the diamond value chain from mine to retail. Tracr was developed by De Beers in conjunction with other industry leaders, including Diacore, Diarough, KGK Group, Rosy Blue NV and Venus Jewel.

De Beers' first successfully implemented the blockchain solution to track 100 high-value diamonds and then rolled it out. The solution creates a digital certificate for each diamond that records key attributes and transactions. The data is stored immutably on the blockchain, allowing buyers to verify that the diamonds they purchase are natural and conflict-free.

BANKS ARE TOKENIZING GOLD

The world's largest bank, JPMorgan, started to use its blockchain to tokenize gold bars[35]. This enables sustainable miners to earn a premium on global markets and allows the ownership of gold bars to be represented by electronic tokens rather than paper certificates. The advantage of this is threefold:

- Ownership/transactions are recorded/executed openly and indelibly
- Ownership can be more easily divided up
- The resulting shares can be bought and sold without the involvement of a third party

CURRENT ISSUES FACED BY GDJ MANUFACTURERS

Most manufacturers operating in this industry are small-scale independent manufacturers who specialise in different designs. Due to the large set-up costs associated with manufacturing units, manufacturers will choose to specialise in the production of certain types and designs of jewellery. Therefore, the market is filled with thousands of manufacturers all producing different niche products.

This presents several issues for manufacturers. To remain profitable, they must prioritise bulk orders and work with wholesalers who can bring volume orders to them. This often means wholesalers can dictate terms and prices to manufacturers, who often operate on small profit margins.

Most manufacturers also rely on word of mouth to sell their products as they have a limited online presence to showcase the catalogue of items they have in stock. This means they tend to miss out on sales they could get from a global retail audience.

Another issue is the cost of compliance. Large levels of smuggling and tax avoidance exist in this industry because gold is a portable and untraceable asset, meaning huge amounts of gold jewellery is smuggled to avoid taxation and for money laundering. In addition, honest importers do not trust the existing import infrastructure and prefer to transport valuable items in person, which is an expensive way of doing business. Currently, when a transaction takes place, the Assay Office must verify that the item matches the certificate, which is both time-consuming and expensive.

PROPOSED SOLUTION: HOW MARKETORDERS CAN USE BLOCKCHAIN TECHNOLOGY TO SOLVE THE CHALLENGES FACED BY JEWELLERY MANUFACTURERS.

There are thousands of jewellery manufacturers around the world who operate in fragmented markets with inefficient manual processes. The table below outlines the key challenges faced by manufacturers and how it affects them.

> “
>
> THE FUTURE FOR RETAILERS SITS AT THE INTERSECTION OF E-COMMERCE AND BRICK AND MORTAR SHOPS.
>
> THERE IS SOLID DEMAND FOR THEM BOTH AND THEY CAN SUPPORT EACH OTHER.

TABLE 7: KEY CHALLENGES FACED BY MANUFACTURERS AND HOW THESE OBSTACLES AFFECT THEM

PAIN POINT FACED BY MANUFACTURERS	WHY THIS CAUSES A CHALLENGE
RESTRICTED TO BULK ORDERS	To remain profitable, manufacturers must sell in high volume quantities so they have to deal in bulk quantities. MarketOrders will develop a digital marketplace whereby manufacturers can directly showcase the products they stock to a global audience of retailers to get more customers and not be overly reliant on third-party distributors to help them get sales.
HIGH PRODUCTION COSTS	Unless manufacturers can sell high volume quantities, they face very high production costs per unit sold, which means they miss out on retailers who are unable to stock their designs.
LITTLE OR NO ONLINE PRESENCE	Without an online presence, manufacturers miss out on potential sales from retailers who may want to shop online.
FRAGMENTED SUPPLY CHAIN	Manufacturers operate in an opaque environment where it is difficult to find the right place to source raw gold that has been mined and processed ethically and to the right standards.
HIGH OPERATIONAL COSTS OF PROCESSING PAYMENTS	Manufacturers deal with global wholesalers and are therefore hit with the excessive costs and admin issues that are associated with having to handle orders and payments in multiple currencies.

CURRENT ISSUES FOR GDJ RETAILERS

As the internet continues to drive the digital revolution in e-commerce, it's little surprise that the high street has suffered a huge downturn in recent years. According to an analysis by Pricewaterhouse-Coopers (PwC) and the high-street analysts, the Local Data Company (LDC), almost 16 shops closed their doors on a daily basis in the first half of 2019.[36]

High-profile brands are also not immune to these trends as they have failed to keep up with the changing habits and trends of e-commerce consumers. One of the sectors hit the hardest is the fashion business. This includes jewellery retailers who have suffered particularly badly in recent years as digital trends have taken over. Below we outline the main reasons why this is.

TABLE 8: CHALLENGES FACED BY HIGH-STREET RETAIL JEWELLERS

ISSUE	CHALLENGE THIS CREATES
HIGHER OVERHEAD COSTS	Their products are more expensive than those of e-commerce retailers, who don't have the high overheads that come with running a physical store.
Lack of purchasing power	They pay higher prices for their stock than larger retailers who benefit from negotiating power.
Little or no online presence	Without an online presence, they miss out on sales from customers who prefer to shop online.
Fragmented supply chain	Sourcing products from many different vendors makes it difficult to know exactly where everything was sourced and extra admin is created by managing the orders and payments.
Slow order fulfilment	Without integrated logistics facilities, retailers are slow to ship out products to consumers who expect same day or next day secure deliveries.

We believe, however, there is still a role for the high street to play. Consumers value positive in-store experiences with old-fashioned customer service and many choose to collect their purchase in-store.

The data shows that consumers are no longer interested in just buying products, they are also looking for an experience[37]. The provenance and validation of the certified product is an experience in itself. It's clear to see that in-store experiences are critical to a retailer's success.[38]

The future for retailers sits at the intersection of e-commerce and brick and mortar shops. There is solid demand for them both and they can support each other.

We believe that retailers need to integrate both experiences (online and offline) seamlessly to compete and grow. A vital component of this is their ability to source the stock they need in a timely and trusted manner. Consumers want products on-demand and faster so the only way that jewellery retailers can keep up is by adapting and embracing technology, as well as creating a more simplified, trusted and efficient supply chain.

MarketOrders can really help here by becoming the world's largest blockchain-based convergence platform. For us, convergence means enhancing the offline experience in retail stores through the use of better technology.

By creating an e-commerce platform, offering transparency, credibility and efficiency through the use of blockchain technology, we can help to simplify a fragmented and complex supply chain.

PROPOSED SOLUTION: HOW MARKETORDERS CAN USE BLOCKCHAIN TECHNOLOGY TO SOLVE THE CHALLENGES FACED BY JEWELLERY RETAILERS.

Blockchain offers the perfect solution to the problems that retailers are tackling, such as the fragmented supply chain, by combining trust, security and transparency.[39] We propose a solution that utilises this technology to create an ecosystem of trusted transactions amongst all participants, and this will be done transparently.

Our vision is the creation of a new way of sourcing and procuring products, which will verify the sources of the precious metals and stones to ensure they are not tampered with during their movement throughout the supply chain. We will also set out to establish efficient processes and systems that will enable retailers to procure their products directly from the manufacturers. We firmly believe that now is the time to bring the industry into the blockchain era.

Every transaction and trade can be held securely using end-to-end encryption whilst being openly authenticated if necessary, which will eliminate the piles of paperwork that usually accompany such processes. The blockchain ledger would also be able to document information that is related to the transactions. As this would be validated by a consensus mechanism, control would no longer be ceded to one entity and records would then have a higher degree of trust and validation.

The table below outlines how MarketOrders is proposing to use blockchain technology to solve the challenges faced by retailers.

TABLE 9: HOW MARKETORDERS CAN RESOLVE RETAILER CHALLENGES

AREA	CURRENT ISSUES FOR SME RETAILERS	MARKETORDERS' PROPOSED SOLUTION
COUNTERFEITING	The retailer is never 100% confident what products really contain because of widespread counterfeiting. This occurs even when products have a stamp of authenticity.	MarketOrders will supply Smart Jewellery (using Internet of Things technology) with a small chip so that retailers can track the entire product lifecycle and provenance of an item along the whole supply chain, starting from the raw materials. Retailers will know exactly which process and materials were used to make the products they sell.
ETHICAL CONSUMPTION	Ethical consumers are on the rise[40] and they want proof they are buying a product produced in a country with robust legislation and that neither a person nor the environment has suffered in its production. Currently, retailers cannot give ethical consumers the assurance they need.	The retailer can share the entire provenance of the product by using blockchain technology, which can ensure buyer confidence – this in itself is a competitive advantage over other retailers.
LACK OF PRICE TRANSPARENCY	Retailers have to bargain and negotiate the best price with limited information in the hope that they can secure the lowest price to protect their small profit margins.	Blockchain brings transparency to the murky area of commodity pricing so that retailers can be sure they are paying a fair price and are not being ripped off. Every transaction is publicly auditable.

AREA	CURRENT ISSUES FOR SME RETAILERS	MARKETORDERS' PROPOSED SOLUTION
OFFLINE PROCESSES	Retailers have no direct access to the thousands of global manufacturers who are ready to supply stock to them. With no digital interface or secure way to transact and send payments, retailers are forced to purchase stock from the same local wholesalers who charge premium mark-ups and commissions.	The technology allows retailers to trade directly with the manufacturer, securing great prices for a broader range of products.
REDUCING WASTE	Cashflow is hard to manage as retailers have to purchase stock upfront from wholesalers and make an educated guess about which items will sell best. As a result, they suffer losses if they are unable to sell items and have to melt the gold items when they don't sell.	By tagging jewellery products, unsold products can be resold to other retailers and re-enter the ecosystem, thereby creating a circular economy and minimising waste.
CREATING A GLOBAL ONLINE MARKETPLACE	Retailers are limited by shop size and how much stock they can afford to invest in and stock.	MarketOrders will create a global marketplace that allows retailers to order from a very wide and constantly growing online catalogue.

AREA	CURRENT ISSUES FOR SME RETAILERS	MARKETORDERS' PROPOSED SOLUTION
DIGITAL PAPER	Retailers have old-fashioned, paperwork-heavy systems that often cause delays and are more expensive to maintain. Document errors make inventories difficult to manage and audit.	Blockchain provides fast digital systems for ordering, inventory management and signing contracts.
NO ONLINE PRESENCE	Their lack of e-commerce is costing SMEs millions in potential lost sales.	MarketOrders provides retailers with a low-cost, ready-made e-commerce platform, from which orders are sent directly to manufacturers.
CROSS-BORDER PAYMENT DELAYS	Order fulfilment is slow as international payments to wholesalers can take as long as 2-4 weeks to clear, leaving their customers waiting.	MarketOrders can fulfil orders within days, giving customers what they want when they want it. Payment via the blockchain can be cleared in seconds as opposed to days.
LIMITED DATA INSIGHTS	Lack of reporting makes it difficult for retailers to see which products are selling well. Data collection is poor when all the transactions are done offline. This creates a lot of unnecessary paperwork and makes it difficult to see trends and plan for the future.	Online transactions will allow real-time data to be collected and shared with retailers and manufacturers. This will show which products sell best, to which demographic, and when. They can then better plan inventory and stock control, which will help them to be more efficient, reduce waste, and cut the cost of having stock they cannot shift.

The diagram below outlines our ideas on how a blockchain-enabled supply chain would look compared to the traditional way of doing business.

MINE

Provides gold bars based on serial numbers/paperwork

MANUFACTURER

- Does not know the source of the goods
- Only focuses on manufacturing the jewellery

WHOLESALER

- Cannot trace the goods' origin
- Has to suffer delays for goods and payments to clear
- Can only choose from very limited designs

RETAILER

- Uses entirely manual systems
- Has very limited information about the design, manufacture and provenance of the goods
- Is giving poor customer service

Data transaction records will be uploaded on MarketOrders platform database

Product/inventory data/processors will update records for gold/gold jewellery/ diamonds on MarketOrders platform

MINE

- Uploads digital data on the source and origin of the gold/ diamond
- Tags materials with nanochip/ QR code

MANUFACTURER

- Carries out quality checks on the gold/diamond by scanning the product and accessing the information in the database

WHOLESALER

- Gets all the information about the raw materials: source, destination and design spec
- Has full visibility on orders/ designs/delivery times
- Provides timely updates to retailers

RETAILER

- Is fully informed about the products and confident in their delivery time
- Can better offer customer service

SECTION 4.

INTRODUCING THE MARKETORDERS TOKEN (MOT)

In order to fully embrace the capabilities of blockchain, we would look to create a token economy within the MarketOrders ecosystem.

SO, WHAT IS A TOKEN ECONOMY?

Simply put, it is when everyone in the ecosystem uses the same form of value transfer (such as a token) that participants can directly trade with one another. These transactions could be the movement payments or information in any country.[41]

Using tokens will help retailers to embrace blockchain technology into their traditional bricks and mortar stores because they will be able to make purchases via MarketOrders' blockchain-enabled platform. The token would be accessible on the website and mobile apps.

HOW WOULD THE TOKEN WORK?

MOT is a unique cryptocurrency specific to the jewellery industry and would be for participants within the MarketOrders ecosystem. Each MOT would represent a unit of payment towards jewellery items that can be purchased by retailers on the MarketOrders platform. Both retailers and manufacturers will be incentivised to use the MOT token to pay for and supply products as opposed to fiat as a unit of payment. In this way, the ecosystem will grow and flourish.

Blockchain technology allows for:

- All payments to be made with MOT, which are 100% transparent and non-corruptible.
- A transparent audit trail of the movement of the physical products along the supply chain.

ADVANTAGES OF USING THE MOT

It has become increasingly clear that the current supply chain is fragmented and complex. This leads to many instances of counterfeiting, fraud and waste issues. By moving to a token economy – where transactions can be processed with greater speed thanks to digital innovations – it is only a matter of time before the industry wakes up to the potentially game-changing impact and benefits that blockchain can bring.

At MarketOrders, we aim to provide a dedicated global network specifically designed to support existing industry infrastructure whilst making it easy for retailers to transition to a blockchain-based platform in order to source, pay and track the origin of the products they need.

Developing a consolidated marketplace that brings manufacturers and retailers together and enables them to interact directly with one another will result in greater efficiency and transparency in this industry. There are a plethora of friction points involved in this industry and the introduction of the MOT token will allow transactions to take place both faster and more efficiently.

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IT IS ONLY A MATTER OF TIME BEFORE THE INDUSTRY WAKES UP TO THE POTENTIALLY GAME-CHANGING IMPACT AND BENEFITS THAT BLOCKCHAIN CAN BRING.

The MOT will:

- Ensure the highest levels of trust, transparency, integrity and quality because all transactions are recorded on the blockchain.

- Quickly verify and execute payments on the blockchain.

- Improve efficiency in managing the movement and provenance of diamonds and precious metals.

- Enable both retailers and manufacturers to build a reputation by establishing a history of trusted transactions on the MarketOrders network. Bad actors and fraudulent activity on the network would essentially cost the user their reputation and access to the network. Any bad actions would immediately be flagged by the blockchain and blocked.

ADVANTAGES OF USING THE MOT FOR TRANSACTIONS FOR GOLD MINES

Companies that oversee operations of mineral extraction, including exploration, mining and production, are the first participants in this ecosystem and would be the first to enter data onto the blockchain. By using MOT they would benefit from:

- **Trustworthy provenance:** This will improve the efficiency of managing the movement and provenance of diamonds and precious metals.

- **Lower transaction costs:** They can avoid the costs and admin that is associated with having to handle orders in multiple currencies from retailers all over the world.

- **Greater operational efficiency:** The shorter turnaround time between an order being placed and a product being shipped due to faster payments means they can sell more products in a shorter timeframe.

- **Secure payments:** Settlements are performed automatically and irrefutably within a smart contract.

ADVANTAGES OF USING THE MOT FOR RETAILERS AND MANUFACTURERS

The second wave of participants would be manufacturers and retailers who can benefit by using MOT in the following ways:

- **Cheaper prices:** Not only does MarketOrders cut out the middleman and offer lower prices than wholesalers, but retailers will receive a discount on their orders when they use tokens to pay.

- **Better credit terms:** Retailers will be able to benefit from extra credit terms when using tokens as opposed to when fiat is used.

- **Lower transaction costs:** Cross-border payment costs will be reduced by up to 95% when tokens are used as retailers will no longer have to deal with hefty bank charges to move funds on an international basis.

- **Transparent pricing:** The majority of transactions are conducted privately offline,

which leaves the retailer vulnerable to being charged whatever the middleman thinks he can get away with. By using our online marketplace, pricing becomes more transparent.

- **Faster payments and order fulfilment:** Suppliers will no longer have to wait up to 60 days for payments to clear before they can start to process the order. This means retailer orders can be fulfilled up to 50% faster.

- **Real-time data**: This is available on the orders they place with the manufacturer, as well as on the orders their customers have placed with them. This level of data has not been made available before and can inform critical business decisions.

- **More efficient and transparent business processes:** Digitising and automating ordering and business inventory processes makes the running of jewellery retail stores more efficient and profitable.

- **Loyalty and rewards**: tokens can be used as a way to increase loyalty by rewarding those who use tokens with other benefits, such as discounts and special offers.

ADVANTAGES OF USING THE MOT FOR JEWELLERY CONSUMERS

The benefits of using blockchain technology are not only limited to those in the business to business sector (B2B) but can also bring huge benefits to end consumers who purchase jewellery products from high street or online jewellery retailers in the following ways:

- **Convenience:** Consumers can access and pay for a wide range of goods and services using tokens on a decentralised app (DApp).

- **Better range of competitively priced products:** Retailers can become more responsive to customer demand and some of their cost savings can be passed on to the customer to generate loyalty.

- **Ethical provenance credentials:** Consumers can be confident about where the raw materials came from when buying an ethical product from the mine. This includes the credentials of the factory that produced the jewellery.

TECHNICAL DETAILS OF THE MOT TOKEN

We propose to build the MOT token based on the ERC-20, the standard of Ethereum, which is one of the most established and trusted network platforms. The benefits of using Ethereum include:

1. Superior smart contract computations

2. Network effect and a strong ecosystem, which will encourage an increasing number of users onto the platform

3. Easy integration with third-party smart contracts and applications

4. ERC-20 token standard and easy integration with wallets and exchanges

5. Prolific open-source community with very robust tools and technologies

After a MarketOrders account is opened, an electronic wallet will be created. Users may then top up their electronic wallet with tokens by using bank cards, other traditional payment systems, or the transfer of other cryptocurrencies.

THE MARKETORDERS TOKEN INCENTIVISATION MODEL

Of course, for the token to work, we will need it to be used and adopted by the participants on the MarketOrders platform. One of the best ways of incentivising participation is to create incentives.

We know from our experience and many conversations with retailers that what they value most is the ability to source products faster and to benefit from better payment terms.

In attempting to avoid a scenario whereby the MOT token becomes a passthrough mechanism, an incentivization discount model has been developed that focuses specifically on user purchase volumes in MOT over a 30-day rolling period. The table below explains this model, which grades users into 'VIP tiers' based on their total purchases, using MOT tokens in any 30-day period. This ensures that users are incentivised to use MOT tokens more regularly when paying for goods via the MarketOrders marketplace platform[42].

TABLE 10: MOT INCENTIVISATION MODEL

VIP TIER:	30-DAY ROLLING TRANSACTION VOLUME (IN MOT)	PROPOSED DISCOUNT
Level 0	<$10,000 worth of MOT	0.15% on all purchases within an appropriate threshold
Level 1	$10,000 worth of MOT ≤ $15,000 worth of MOT	0.30% on all purchases within an appropriate threshold
Level 2	$15,001 worth of MOT ≤ $25,000 worth of MOT	0.70% on all purchases within an appropriate threshold
Level 3	>$25,001 worth of MOT	1% on all purchases within an appropriate threshold

DRIVING BLOCKCHAIN ADOPTION IN THE SUPPLY CHAIN

Blockchain technology is still very much in its early stages, and we are far from reaching its full potential.

As a growing business ourselves, we want to use blockchain technology to help brick and mortar stores reduce their costs, operate more efficiently and sell a more targeted range of products by embracing these technologies.

We know that the only way we can do this is to build a product that works and provides them with a convenient and user-friendly experience through our marketplace platform.

Below are the key components that we believe are vital in ensuring adoption:

> WE ARE UNIQUELY POSITIONED TO ESTABLISH A GLOBAL LARGE-SCALE DECENTRALISED MARKETPLACE AND PROVENANCE TRACKER FOR THE GOLD AND DIAMOND JEWELLERY INDUSTRY

1. **Speed and scalability:** We need to be able to process transactions and accommodate millions of retailers and manufacturers on the MarketOrders platform.

2. **Intuitive user interface:** It must be easy to buy, store, trade and transfer value seamlessly.

3. **Efficient supply chain process:** This will enable efficient logistics, as well as product authenticity validation.

4. **User growth:** We will continue to build a growing, dedicated user-base of engaged retailers and manufacturers through brand building and ongoing marketing efforts.

By combining the above, we believe that we are uniquely positioned to establish a global large-scale decentralised marketplace and provenance tracker for the gold and diamond jewellery industry where transactions are executed using our tokens.

SECTION 5.
CONCLUDING NOTES

Just as the emergence of the internet gave rise to many new ways of doing business that we could not have foretold, blockchain will be the next development to give rise to a new way of doing business, shopping as a consumer and even living. The scope is just as big, and the time to explore and exploit it is now.

The gold and diamond jewellery industry is plagued by issues caused by fragmentation and suffers greatly from the fundamental difficulties of authenticating jewellery and proving provenance. The aim of this whitepaper is to set out why we should look to develop blockchain technology to enable fast, secure online payment and certification, and it explains how this will significantly enhance trust and transparency within the supply chain, driving further efficiency gains.

Implementation of our blockchain technology and installation of our tracking chips will help to build trust in the sector and reduce fraud. The ability to smuggle valuable items will be diminished and individual retailers will have enhanced buying power, which will drive better profitability.

The blockchain ecosystem, though still young in its potential, is making significant strides in the start-up ecosystem. It is only a matter of time before these technologies start to mature. It is vital that we continue to innovate and foster creativity to solve the issues within this technology to allow it to scale and to make it accessible to all.

No doubt we are entering an exciting new Web 3.0 which will put trust and security at the forefront of the decisions we make. This is why we believe it is important to be part of this process, add to the conversation and embrace this new reality to create and shape the future of tomorrow.

CONNECT WITH MARKETORDERS

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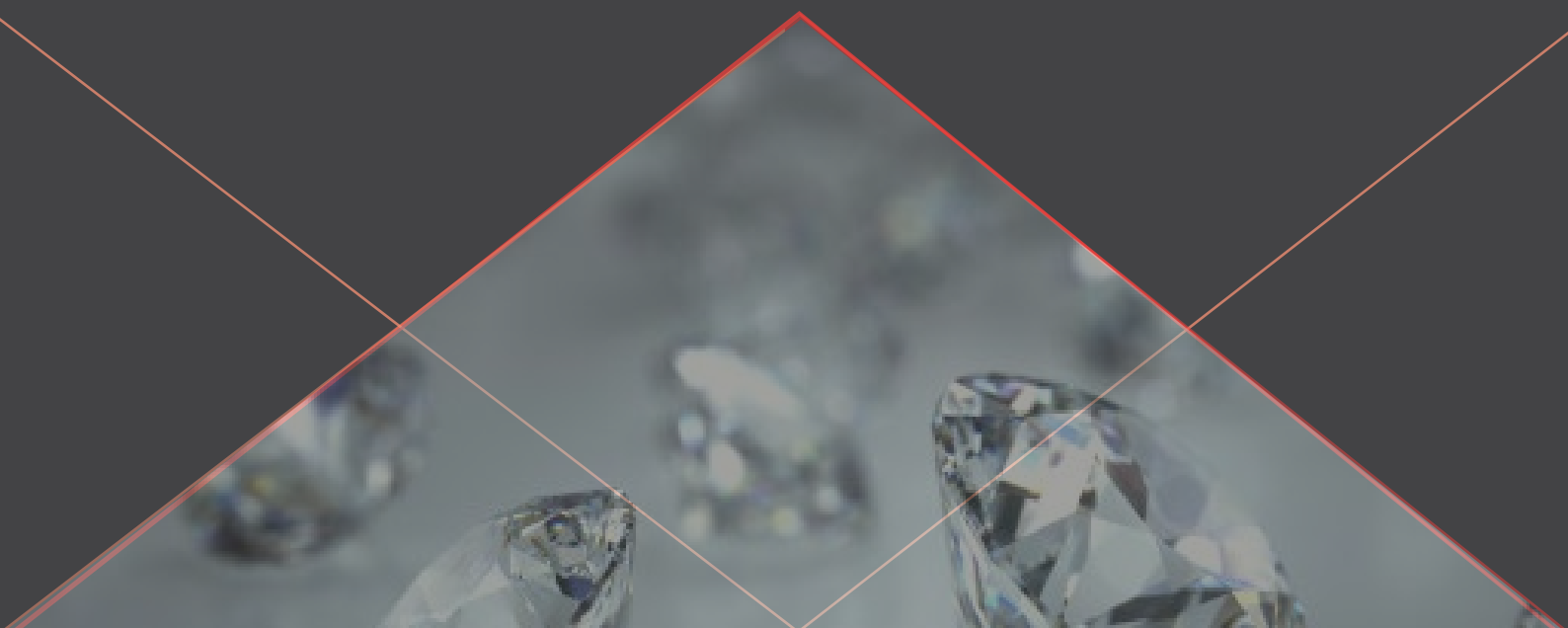
INSTAGRAM.COM/MARKET_ORDERS

WWW.MARKETORDERS.NET | WWW.MARKETORDERS.IO



MEDIA ENQUIRIES

If you would like to learn more about our blockchain initiative, partner up or collaborate with our research initiatives, please contact us at:

HELLO@MARKETORDERS.IO

and visit our website:

WWW.MARKETORDERS.IO

For press and media please contact:

MARKETORDERS@WCOMMUNICATIONS.CO.UK

London's blockchain ecosystem is hugely varied and marked by open and continuous communication between government, industry, incubators, research institutions, start-ups and students. Read more about why London is the best place to develop your blockchain project:

HTTPS://BUSINESS.LONDON/INVEST/SECTORS/TECH/BLOCKCHAIN

ABOUT MARKETORDERS

MarketOrders is a London-based online marketplace that helps retailers connect directly with manufacturers to source the jewellery products they need faster and cheaper.

A growing start-up, MarketOrders has been named as a **Top Digital Pioneer** and received awards for excellence in Supply Chain Optimization and **Best Digital Disruptor.** It has also been named among the Top 10 Crypto and Blockchain Influencers in 2020 for its innovative approach to technology.

THE MARKETORDERS TEAM CELEBRATE THEIR 2019 CROWDFUNDING CAMPAIGN

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RAM KRISHNNA RAO

Founder and CEO, MarketOrders

Ram is an experienced serial entrepreneur, CEO of MarketOrders, and has 13 years' experience in Forex, arbitrage, and online Bullion trading. He is an IBM qualified blockchain developer and was named as a Top 100 European Digital Pioneer by *The Financial Times* & Google for his work as CEO at MarketOrders where he leads the overall vision and strategy for creating the most trusted marketplace for the gold jewellery trade industry.

SUKHI JUTLA

Co-founder and COO, MarketOrders

Sukhi Jutla is an award-winning entrepreneur, author of 3 books and co-founder of MarketOrders. A sought-after international speaker, thought leader and qualified IBM Blockchain Developer, she has won numerous awards, including Asian Women of Achievement and Female Entrepreneur of The Year. She was also named as a Top 100 European Digital Pioneer by *The Financial Times* and Google.

In April 2018, Sukhi made global headlines becoming the World's first #1 bestselling 'Blockchain' author and regularly appears on Top Crypto and Blockchain Influencer lists. She holds board positions with the Mayor of London's Digital Skills Partnership and the Department of International Trade in the UK and is an Industry Associate of the University College London Centre for Blockchain Technologies (UCL CBT).

ENDNOTES

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17. An event could be 'product broken', 'product refund', 'product loaded onto cargo plane' essentially anything that describes the process or stage of the product during the supply chain.
18. You can check out our latest wins here: https://marketorders.net/awards/ and meet the team here: https://marketorders.net/about-us/
19. Analysis of global start-up hubs has revealed that London may be one of the most preferred hubs for blockchain start-ups to headquarter themselves. Read the full report here https://outlierventures.io/research/london-blockchain-firms-raise-over-500-million-in-equity-funding-since-2013/
20. MarketOrders have completed and graduated from the following accelerator programs that are designed to help start-ups grow: Business Growth Programme (Mayor of London), Virgin StepUp Programme (Virgin), Female Founders Accelerator (Hatch Enterprise).

21. Check out our full list of awards here: https://marketorders.net/awards/
22. https://marketorders.net/pressreleases/marketorders-coo-named-as-one-of-the-top-10-crypto-influencers-in-2020/
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39. Forbes outline the key areas where blockchain can impact the retail sector: https://www.forbes.com/sites/nikkibaird/2017/08/09/blockchain-and-retail-four-opportunities/#7321e1b372bf
40. https://www.theguardian.com/women-in-leadership/2015/apr/02/the-rise-of-the-conscious-consumer-why-businesses-need-to-open-up
41. For more on blockchain-based token economies read: https://blogs.wsj.com/cio/2018/08/03/the-emergence-of-a-blockchain-based-token-economy/
42. Note: all numbers are purely indicative of a future structure incentive for MOT usage and are not to be taken literally at this stage.