

Research Report:

Blockchain for Supply Chain Management

Table of Contents

| | |
|---|----|
| 1. Introduction | 2 |
| 2. Methodology..... | 3 |
| 3. How is Blockchain impacting Supply Chain Management? | 4 |
| 4. Poll Analysis: Blockchain in Supply Chain | 5 |
| Conclusions | 16 |
| ABOUT 101 BLOCKCHAINS | 17 |

Table of Figures

| | |
|---|----------|
| Figure 1: Key Business Drivers For Blockchain in Supply Chain | 5 |
| Figure 2: Will Supply Chain Return To The Status Quo in 2021? | 6 |
| <i>Figure 3: Does Data Coming have to come Exclusively from Trusted Data Sources?</i> | <i>7</i> |
| Figure 4: When will Sustainability Become an Integral Part of Supply Chain Management | 8 |
| Figure 5: What Are The Preferred Blockchain Protocols in Supply Chain..... | 9 |
| Figure 6: How Do Participants Get New Updates on Blockchain Ecosystem..... | 10 |
| Figure 7: Do Companies prefer Quality Data or Digital Certificates? | 11 |
| Figure 8: Has COVID-19 Changed Interest in Blockchain? | 12 |
| Figure 9: What Supply Chain Finance Structures Will Gain In Popularity..... | 13 |
| Figure 10: What Are The Main Challenges of In Transparency and Traceability..... | 14 |

1. Introduction

Trends in blockchain are changing following the COVID-19 (COVID) pandemic. While it is too soon to see this reflected in data, we gained visibility through the use of polling questions during a series of seminars on the topic in November 2020. This gives readers an inside view on the coming trends and business preferences around blockchain in the supply chain space.

In a supply chain, the flow of goods moves downstream from the supplier to the buyer, while the flow of money goes upstream, as the buyer pays the supplier. Both flows are connected through the flow of information that activates the operations between all supply chain participants.

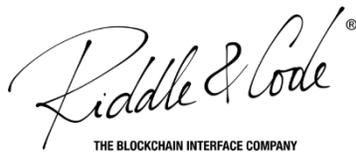
The certainty of the origin of product and the confidence of its quality represent the prerequisites for a full and profitable supply chain collaboration between trading partners. The current centralized server-client enterprise systems create data silos that remain confined and difficult to share, least by building expensive and hard to maintain point-to-point and host-to-host connections.

Companies, banks, logistics providers, certification agencies, customs offices, are shifting their attention to consider blockchain-based solutions not only to improve current processes but- most importantly- to transform and revolutionize them.

This research report –

- Explores the current industry trends and business practices revolving around blockchain for the physical and financial supply chain
- Sets the key priorities for business practitioners so that they can adapt to the new supply chain ecosystems in the coming years
- Analyzes the views of enterprise blockchain practitioners regarding their opinions and anticipations revolving around the enterprise blockchain trends in supply chain

Research Partners



2. Methodology

In November, 2020, 101 Blockchains analysts conducted an online survey with 180 respondents based in North America, Europe, and the Asia Pacific. Considering that a significant number of the enterprise blockchain projects are based in these regions, the result data, although limited in size, provide a directional indication of conditions in the market.

Respondents were presented with multiple-choice questions regarding their prediction and anticipation revolving around the enterprise blockchain trends in supply chain. Furthermore, 101 Blockchains analysts have observed and analyzed the views and opinions of the top-level blockchain experts and executives.

This research report is based on the analysis of 101 Blockchains Virtual Conference on the same topic and the poll responses from the participants of the virtual conference. 101 Blockchains partnered with RIDDLE&CODE and R3 for the creation of this virtual conference, as well as, this research report.

Finally, the poll responses have been analyzed and cross-matched with the current industry trends to provide a list of key priorities for business practitioners when embarking on blockchain-based enterprise projects.

3. How is Blockchain impacting Supply Chain Management?

Supply chain management is a key activity in global commerce. However, traditional supply chain management practices appear stagnant compared to the high-paced industry practices in the e-commerce and trade world, mainly due to the reliance on paper-based legacy systems.

Blockchain technology offers the possibility of a ground-up revision of the traditional supply chain practices that would result in a major revision of the global commerce practices. Blockchain is rearchitecting global supply chains in several identifiable ways Peer-to-Peer (P2P) payments; tokenizing ownership; revising collaboration; and infrastructure overhaul.

P2P payments are making efforts to replace cash with Central Bank Digital Currencies and cryptocurrencies that would facilitate internal settlement and accounting using coins.

Tokenizing assets refers to the process of creating a digital copy of physical goods. It facilitates inferable provenance and fractional ownership. Inferable provenance offers the possibility to track logistical elements, execute faster product recalls, and improve anti-counterfeit monitoring. Fractional ownership offers the possibility to divide indivisible goods, and attribute a single asset to multiple owners.

More blockchain protocols are now seeing the advantages of collaboration as opposed to competition, and all this facilitates the creation of common standards to remove friction points. Blockchain is also showing the possibility to develop integrated infrastructures combined with other modern technologies – e.g., blockchain with artificial intelligence, blockchain with Internet of Things. The following changes in supply chain management are expected by 2021 –

- Expansion of new identity formats for parts and vehicles
- Blockchain embedded into multisystem digital solutions
- Optimized and convenient ERP integrations
- Global tech alliance as rule-making bodies catch up to digital trade solutions
- Acceptance of digital over paper as the new standard of trust

The COVID-19 pandemic has created an urgency among the enterprises all over the world to find an upgraded solution to cope with the upcoming post-COVID economy. The financial aspects of supply chain management are demanding a major uphaul amidst the chaos of COVID-19 pandemic.

Blockchain can solve some of the financial aspects of supply chain, like improved efficiency, open up financing options, reduce fraud, improve flow of cash, reduce waste and mistakes.

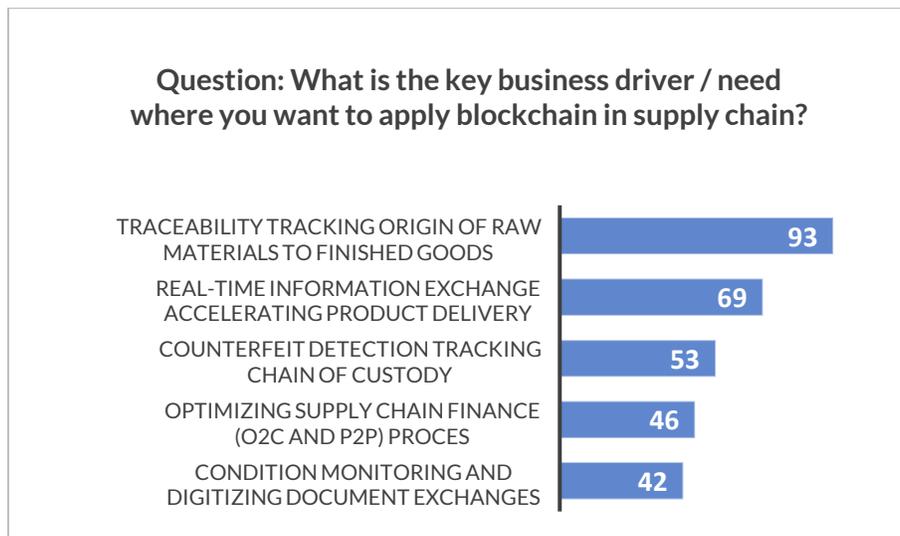
4. Poll Analysis: Blockchain in Supply Chain

Traceability Holds the Highest Priority for Blockchain in Supply Chain Application

The first level of analysis reviews the opinions of poll respondents regarding the key business driver for blockchain application in supply chain. Respondents were given the possibility to choose multiple options.

It can be observed that *Traceability tracking origin of raw materials to finished goods* is the highest voted business priority (a total of 93 votes - Figure 1). 101 Blockchains research analysts expected to find this response given the high number of use cases offered by enterprise blockchain solutions that offer better traceability and tracking of raw materials.

Figure 1: Key Business Drivers For Blockchain in Supply Chain



SOURCE: 101 BLOCKCHAINS- NUMBER OF RESPONSES 134

The second most voted key business driver is the Real-time information exchange accelerating product delivery with a total of 69 votes. This particular business driver is directly connected to the logistics and physical movement of goods.

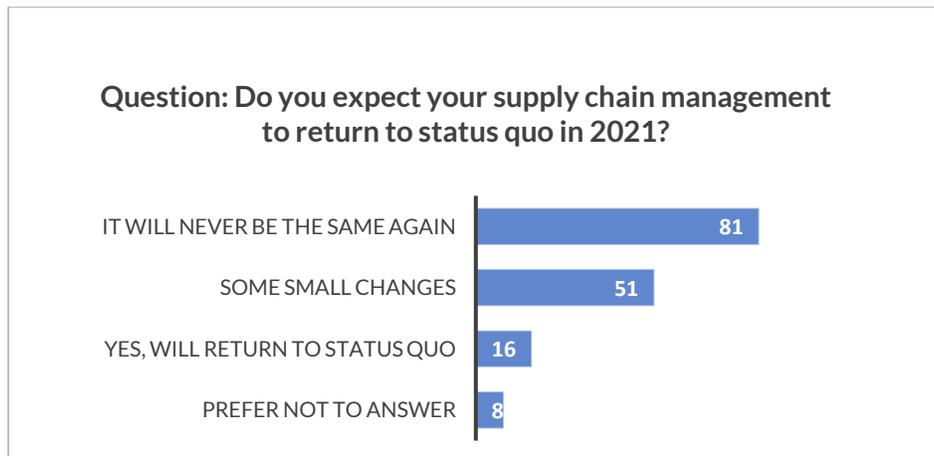
101 Blockchains analysts also observed that counterfeit detection holds the third-highest priority from the poll respondents, receiving 53 votes. This particular business driver fully utilizes the strengths of blockchain in supply chain as it can offer critical business information – e.g., certificates of origin or provenance of goods.

Supply Chain Management Practices Are Unlikely to Return to Status Quo in 2021

This level of analysis reviews the opinions of respondents regarding the shift in trends for supply chain management mainly due to COVID-19 pandemic and the disruptive nature of blockchain technology.

The relative majority of the respondents (81 out of 156, 52% - Figure 2) feel that supply chain management trends *will never be the same again*. As the enterprises have ‘upgraded’ to more modern and convenient supply chain management solutions, they prefer not to return to the legacy practices.

Figure 2: Will Supply Chain Return To The Status Quo in 2021?



SOURCE: 101 BLOCKCHAINS- TOTAL RESPONSES: 156

101 Blockchains research analysts also noticed that about one-third of the poll respondents (51 out of 156, 33%) feel that their organizations’ supply chain management practices will only undergo *some small changes*. This trend likely indicates that these enterprises are already operating to improve flexibility and already being prepared for disruptive events. Some enterprises opt for better software solutions and some seek advanced consultation.

101 Blockchains research paid keen eye to the fact that only a handful of respondents (16 out of 156) feel that supply chain management trends *will return to status quo* in 2021.

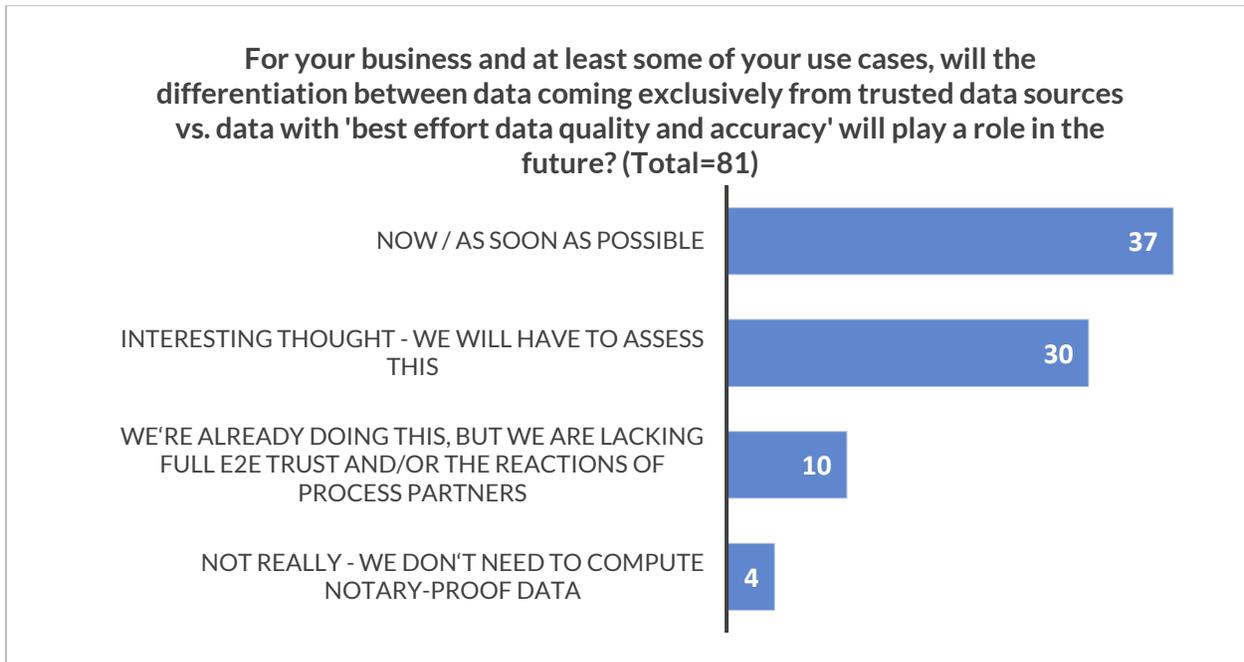
This result is a decisive indication that supply chain management trends are highly unlikely return to status quo in 2021.

Reliable and Accurate Data is Desired Disregarding the Trustiness of Data Source

The third level of analysis reviews the opinions of poll respondents regarding their organizations’ view on the *differentiation between data coming exclusively from trusted data sources vs. data with ‘best effort data quality and accuracy’*. The low number of participants to this poll indicates that not many of the enterprise blockchain practitioners have given much thought to this issue.

101 Blockchains analysts observed that the relative majority of the poll respondents (37 out of 81, 46%) want receive data as soon as possible disregarding the trustiness of the data source. Due to the tactical advantage gaining from new information, enterprises are welcoming to the 'non-trusted' data sources as long as they are reliable, accurate, and of high-quality.

Figure 3: Does Data Coming have to come Exclusively from Trusted Data Sources?



SOURCE: 101 BLOCKCHAINS

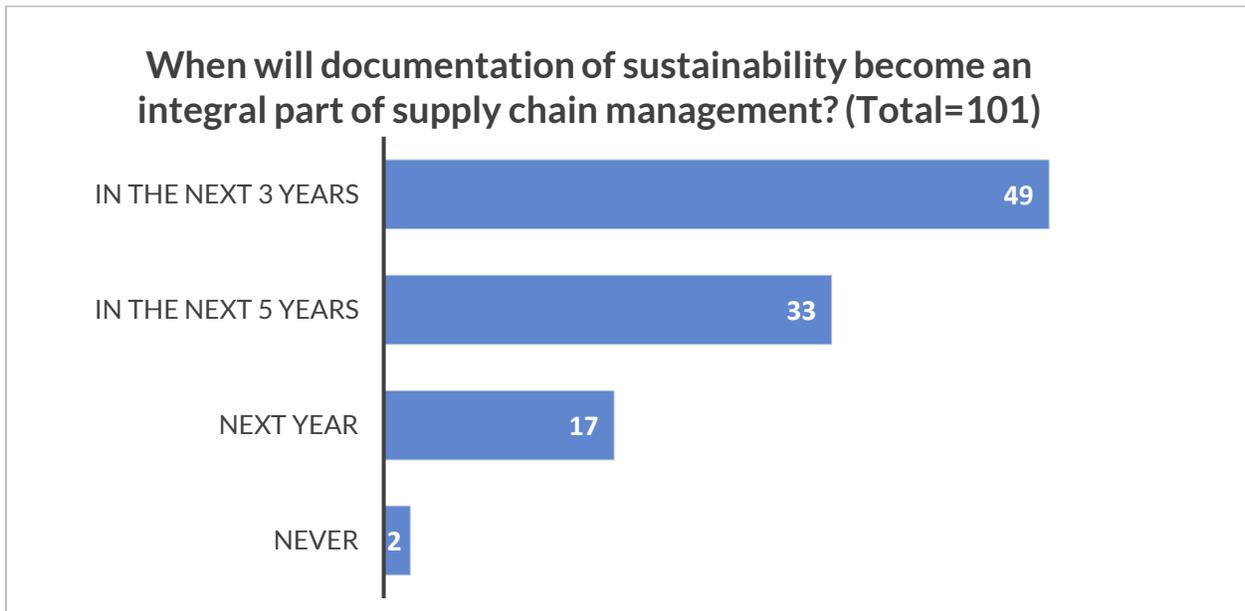
It can be observed that more than one-third of the poll respondents (30 out of 81, 37%) need time to assess the possibilities of using reliable, accurate, and of high-quality coming from 'non-trusted' data sources. The blockchain technology offers a great solution to mitigate their dilemma. As blockchain technology prevents anyone tampering with data, users are less concerned about the exclusivity of the data source.

Documentation of Sustainability Is Expected to Become an Integral Part of Supply Chain Management in the Next Three Years

The opinions of 101 poll respondents regarding the expected timeframe for the documentation of sustainability become an integral part of supply chain management.

101 Blockchains analysts note that almost half of the respondents (49 out of 101, 48%) expect documentation of sustainability to become an integral part of supply chain management within the next three years. Analysts interpret that enterprises have a mid-term expectation regarding the issue.

Figure 4: When will Sustainability Become an Integral Part of Supply Chain Management



SOURCE: 101 BLOCKCHAINS

It can also be noticed that about one-third of the poll respondents (33 out of 101, 33%) push the timeframe to five years. The analysts perceive that this delay could be the result of the over-abundance of standards that will force practitioners to take time before agreeing on a subset that will accelerate full adoption of blockchain in the supply chain. Also, it should be noted that each brand has its own bespoke solutions for sustainability rather than following an industry-wide common set of standards. This factor certainly does not help companies to adopt a common set of guidelines for sustainability.

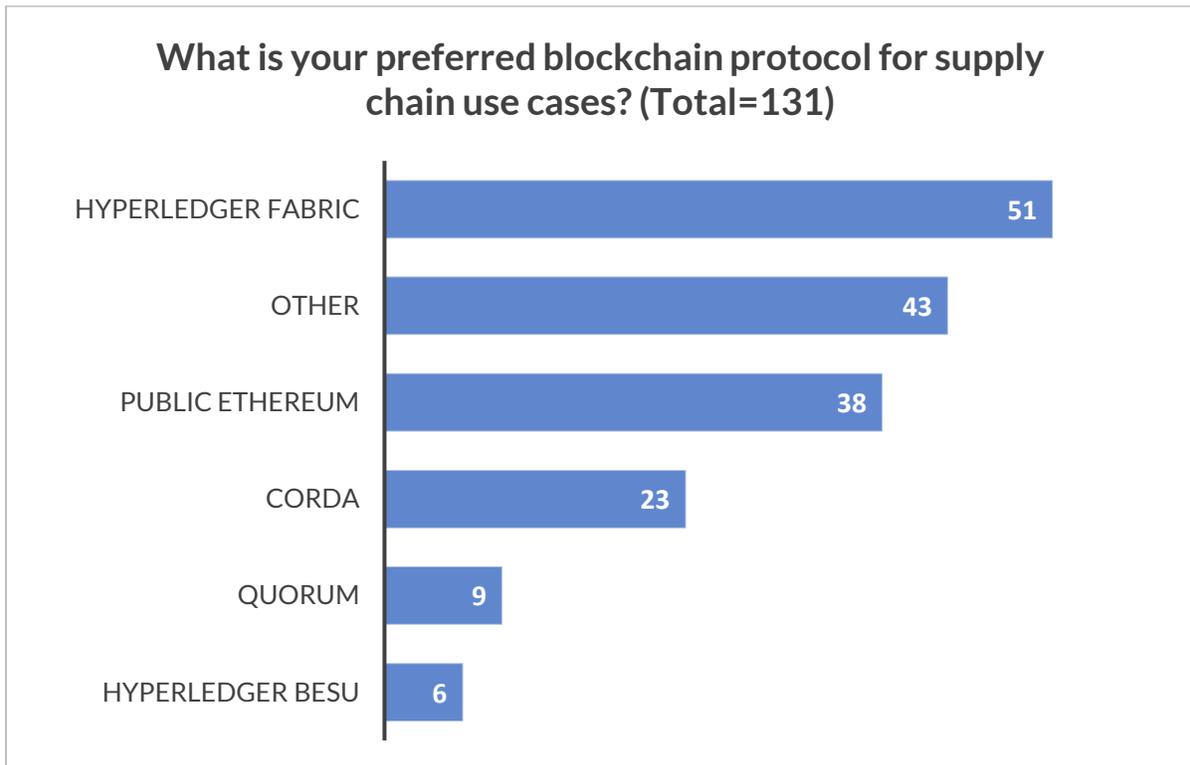
Observing the current trends in the industry, 101 Blockchains research analysts predict that the possibility of having in a medium time frame (e.g., 5 years) an industry-wide standard for sustainability in terms of supply chain management is very low.

Hyperledger Fabric is the Preferred Blockchain Protocol for Supply Chain Use Cases

This level of analysis reviews the poll results regarding their choice of blockchain protocols for supply chain use cases.

101 Blockchains research notices that the relative majority of respondents (51 out of 131, 39%) prefer Hyperledger Fabric. The sheer number of supply chain enterprise projects running on the Hyperledger Fabric blockchain protocol is a clear indication of its popularity.

Figure 5: What Are The Preferred Blockchain Protocols in Supply Chain



SOURCE: 101 BLOCKCHAINS

The analysts find interesting that almost one-third of the respondents (43 out of 131, 33%) are not favoring the major blockchain protocols. The existence of proprietary blockchain protocols used for project pilots and proof of concepts may be the core reasons behind such trend in the market.

It can be seen that Public Ethereum is also very popular as 38 out of 131 (29%) respondents sided with this option. The ability of develop smart contracts – which can be game changers in the management of supply chain processes – is the main reason behind the popularity of the Public Ethereum.

101 Blockchains research analysts note that Corda is quite suffering in the field of supply chain management – judging by the poll responses (23 votes out of 131, 18%).

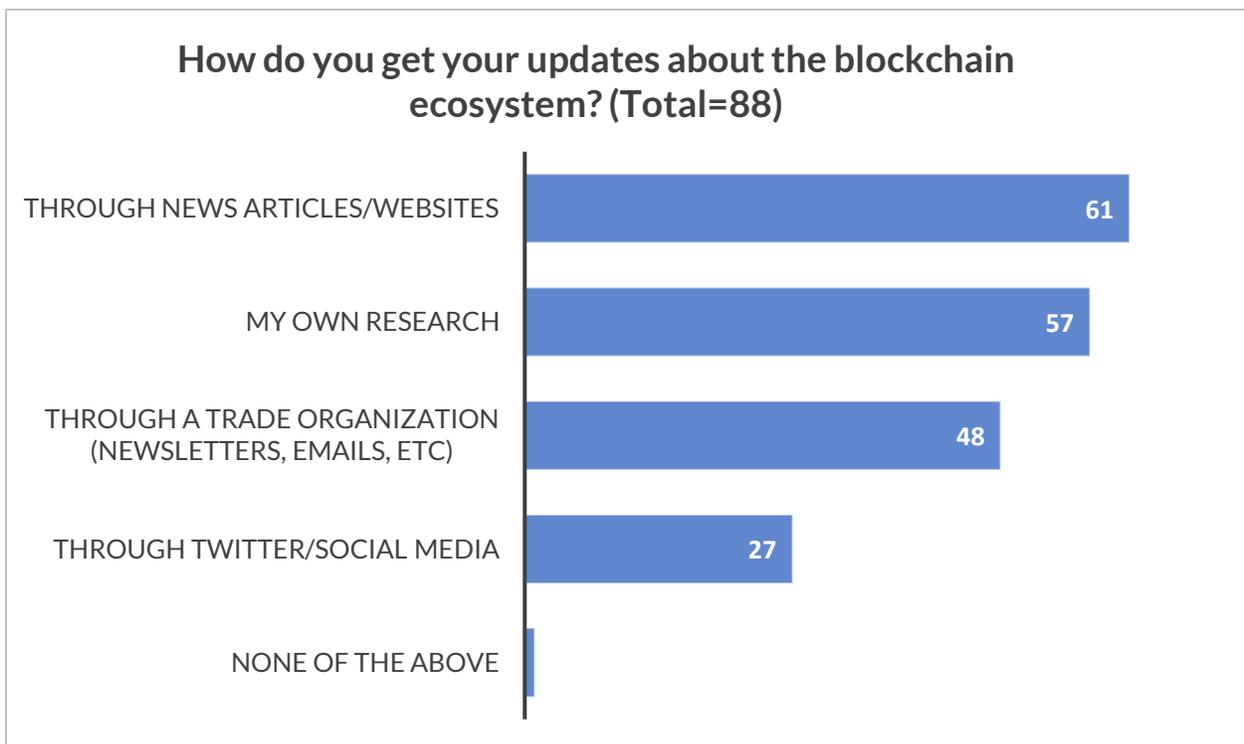
Business practitioners mostly identify Corda to be suitable for banking and other financial sectors and relate Hyperledger Fabric to the non-financial sectors. This is likely the reason behind trend for preferring Hyperledger Fabric over Corda.

News Articles and Websites Are the Preferred Ways to Get Updates on Blockchain Ecosystem

The analysis continues by reviewing the opinions of respondents regarding their choice of the preferred procedure to get new updates about blockchain. Respondents were given the possibility to choose multiple options.

101 Blockchains research notices that two poll responses that go hand-in-hand – *Through news articles/websites* and *My own research* that received 61 and 57 votes (Figure 6), respectively. The analysts derive from this that respondents are adaptive enough to do their own research and regularly get updated through blockchain-centric websites. The result is also indicating that there is a sufficient number of news articles and websites that allow individuals to continue their own research as they like to proactively do their own comprehensive research.

Figure 6: How Do Participants Get New Updates on Blockchain Ecosystem



SOURCE: 101 BLOCKCHAINS

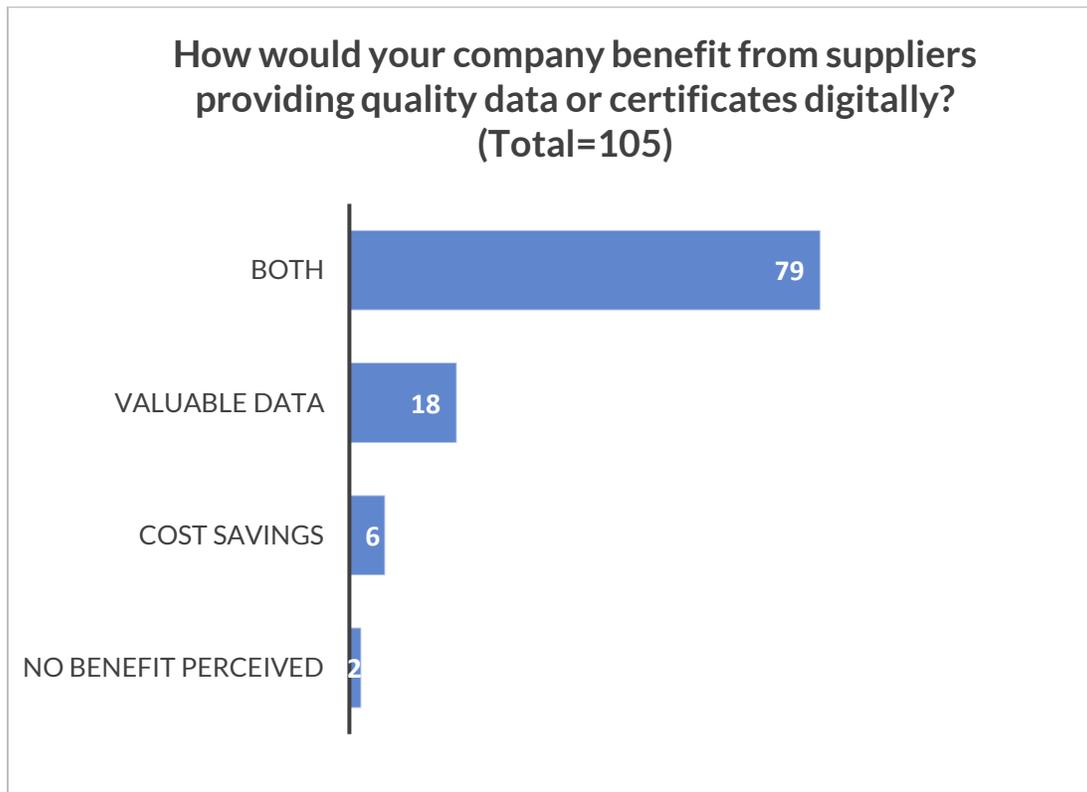
The 48 and 27 votes (for, respectively, Through a trade organization (newsletter, emails, etc.) and Through Twitter/social media, imply that business practitioners are very proactive now as they opt for pushed notifications.

Digitizing Supplier Data Collection Offers Both the Valuable Data and Cost Savings

This level of analysis reviews the benefits that respondents would enjoy should their suppliers provide quality data or digital certificates.

The vast majority of the poll respondents (79 out of 105, 75%) feel that such digitization will benefit their companies with valuable data while saving costs, as they have chosen the *Both* option that implied that companies will benefit from the combination of *Valuable data* and *Cost savings*.

Figure 7: Do Companies prefer Quality Data or Digital Certificates?



SOURCE: 101 BLOCKCHAINS

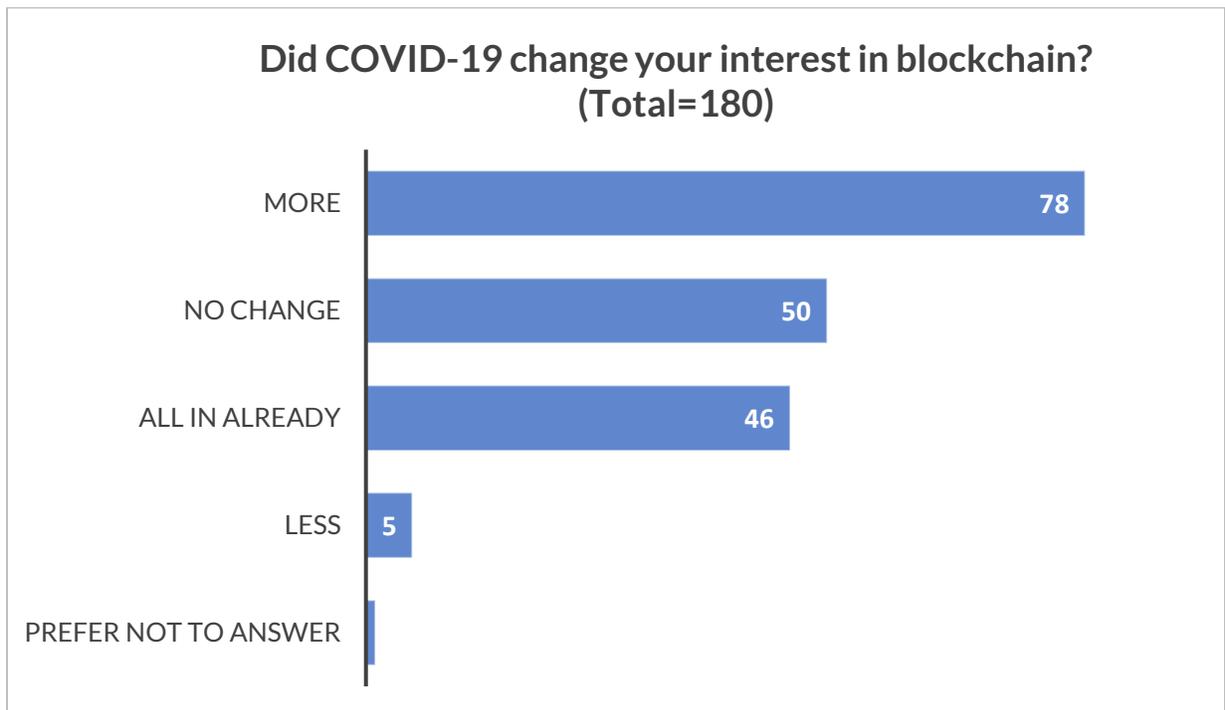
101 Blockchains research analysts perceive that implementing blockchain solutions to digitize the process will enhance the quality and reliability of the data. At the same time, this process eliminates the use of paper-based transactions and the all the costs related to the legacy procedures.

COVID-19 Has Only Increased the Interest Towards Blockchain

The analysis also reviewed the opinions regarding whether COVID-19 pandemic has changed the interest of practitioners in blockchain.

Almost the relative majority of the poll respondents (78 out of 180, 43%) feel that COVID-19 pandemic has increased their interest in blockchain. 101 Blockchains research analysts understand that the crisis emerging from the pandemic forced business practitioners to adopt digitized solutions over the traditional ones.

Figure 8: Has COVID-19 Changed Interest in Blockchain?



SOURCE: 101 BLOCKCHAINS

The research points out that 28% poll respondents (50 out of 180) felt *no change* in interest towards blockchain and 26% poll respondents (46 out of 180) were *All in already*. This information implies that most of the poll respondents (54%, combining 28% and 26%) were already interested in blockchain despite the impacts of COVID-19.

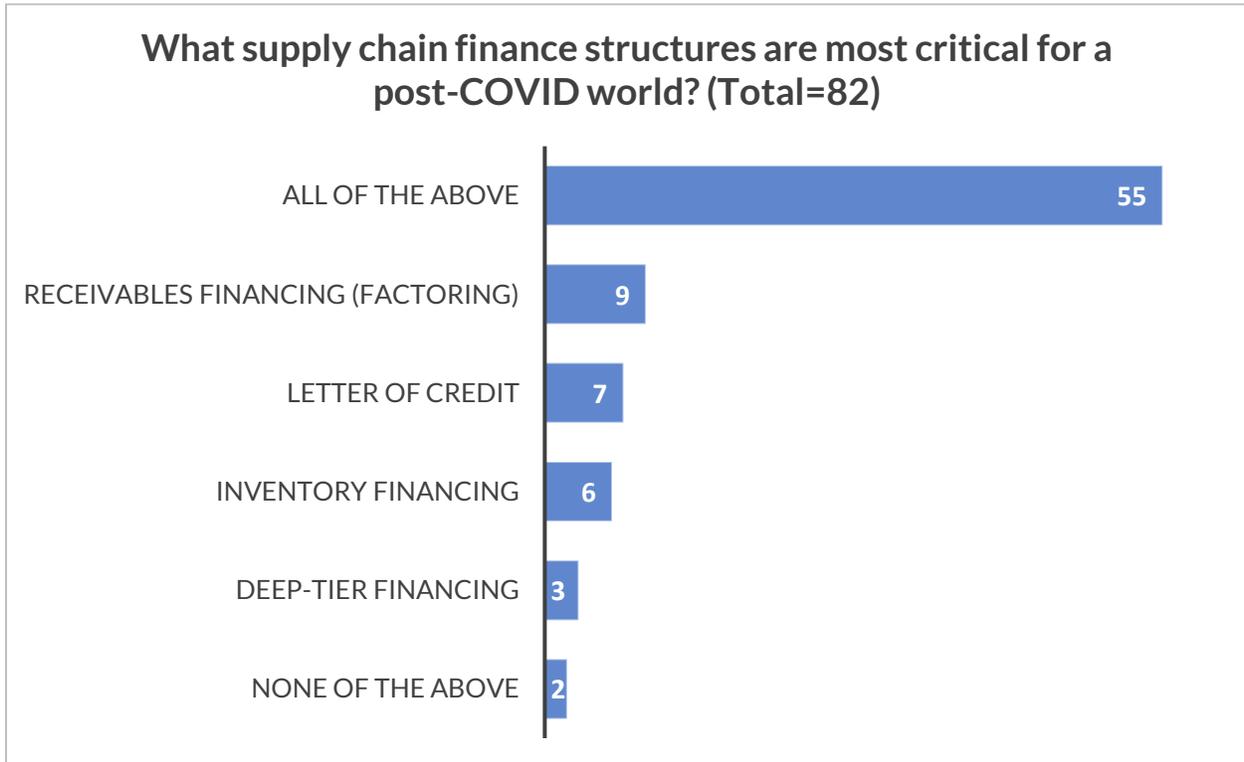
With all these pieces of information, 101 Blockchains analysts conclude that COVID-19 pandemic has only accelerated the already increasing popularity of blockchain technology.

Post-COVID World Demands All of the Major Supply Chain Finance Instruments

The research analysis reviewed also the opinions of the poll respondents regarding the most critical supply chain finance structures for the post-COVID world. Most business practitioners prioritize relate to the physical aspects of supply chain – i.e., logistical components – over the financial aspects. This is likely the potential reason behind the low poll participation of 82.

The presented options of supply chain finance instruments in this poll were – *Receivables financing (factoring)*, *Letter of credit*, *Inventory financing*, and *Deep-tier financing* that received 11% (9 out of 82), 8% (7 out of 82), 7% (6 out of 82), and 4% (3 out of 82) respectively (Figure 9).

Figure 9: What Supply Chain Finance Structures Will Gain In Popularity



SOURCE: 101 BLOCKCHAINS

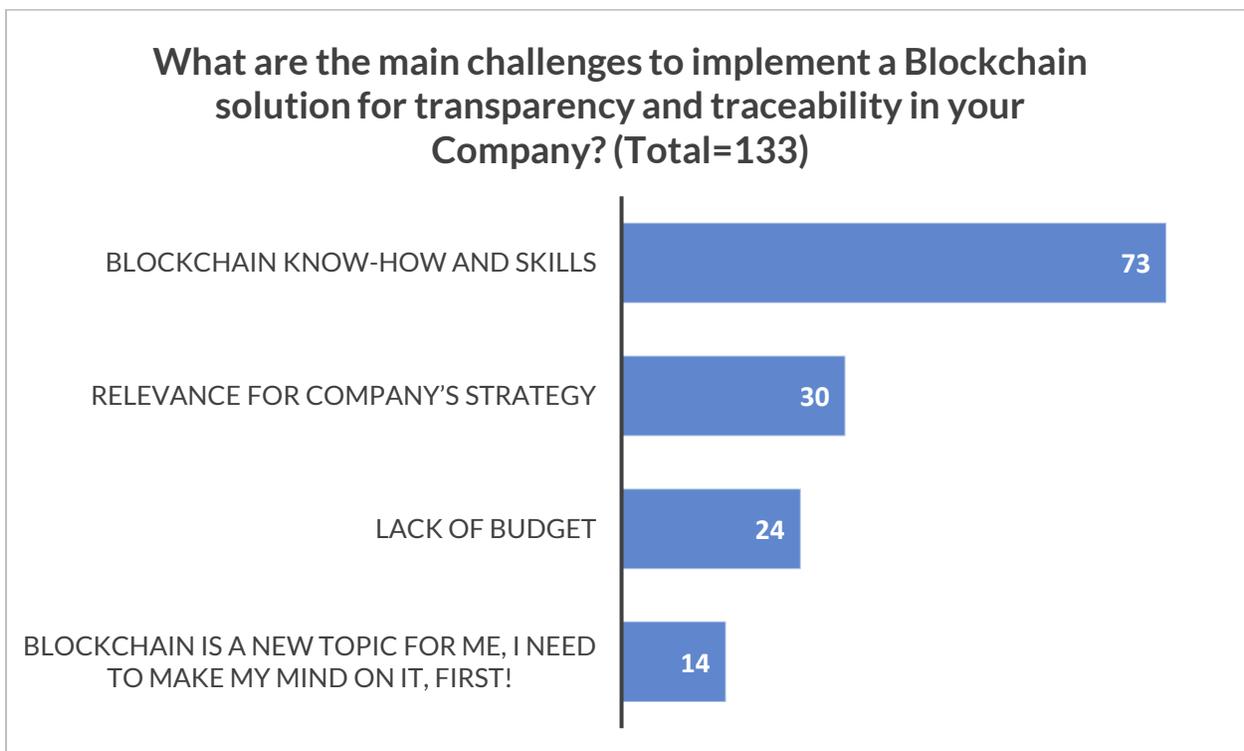
101 Blockchains research analysts find that a combination of supply chain finance instruments is the best applicable solution, considering that the vast majority of the poll respondents (55 out of 82, 67%) favored all of the common supply chain finance instruments equally.

Lack of Knowledge and Skills is the Main Challenge for Blockchain-based Solution Implementation for Transparency and Traceability

The final level of analysis reviews the opinions of 132 poll respondents regarding their opinions on the main challenge of implementing a blockchain-based solution for transparency and traceability.

The relative majority of poll respondents (73 out of 133, 55%- Figure 10) feel that the lack of knowledge and skills of blockchain is the biggest challenge in their companies for a successful blockchain-based solution implementation. 101 Blockchains research analysts believe that it is high time for enterprises to focus on educational efforts to keep up with the changing trends.

Figure 10: What Are The Main Challenges of In Transparency and Traceability



SOURCE: 101 BLOCKCHAINS

It can also be noticed that about one-fourth of the respondents (30 out of 133, 23%) feel that blockchain-based solution implementation for transparency and traceability does not have any *relevance for company's strategy*.

101 Blockchains research analysts find this response intriguing as it indicates that top management and the board of directors of the companies now view blockchain as a strategic tool, and assess its viability during the strategic planning phase.

The analysts of 101 Blockchains also note that mere 18% of the respondents (24 out of 133) feel that their companies cannot implement blockchain solutions due to *Lack of budget*. This result implies that the relative majority of the companies now understand blockchain-based solution implementation is not a resource-hungry procedure.

Conclusions

This report introduced some key findings from a survey of trade participants. This provides an interesting preview of what we can expect to see in 2021 in the blockchain space. In particular 101 Blockchain analysts identified key categories of findings:

The research offers the following key findings on blockchain for supply chain:

- Traceability holds the highest priority for blockchain in supply chain application
- Supply chain management practices are highly unlikely to return to status quo in 2021
- COVID-19 has only increased the interest towards blockchain
- Lack of knowledge and skills are the main challenges to implement blockchain-based solutions for transparency and traceability

ABOUT 101 BLOCKCHAINS

101 Blockchains is the world's leading online independent global network for enterprise blockchain practitioners. We are a professional and trusted provider of enterprise blockchain research, advisory, and professional training. Our core mission is to help leading enterprise professionals to become global blockchain experts by providing them with practical up-to-date knowledge and upskilling.

101 Blockchain's contents are created and delivered by our world-renowned global team of enterprise blockchain experts. Innovative certification programs, shared contents, and virtual events serve one to keep updated with the latest innovations and market breakthroughs to excel as an enterprise blockchain professional.

© 2021 101 Blockchains. All rights reserved. This document may not be distributed, transmitted or reproduced in any form or by any means without 101 Blockchains' prior written permission. While the information contained in this document has been obtained from sources believed to be reliable, 101 Blockchains disclaims all warranties as to the completeness or accuracy. Although 101 Blockchains research may address business, financial, investment and legal issues, 101 Blockchains does not provide any business, financial, legal or investment advice and this document should not be construed or used as such. 101 Blockchains shall not be responsible for any loss sustained by any person who relies on this publication.