Blockchain is the latest technology to create a buzz throughout the world of shipping and logistics management. Its origin in financial sectors, namely Bitcoin, has offered tremendous insight into the potential of the distributed ledger technology; thanks to blockchain’s immutable nature, the financial industry has experienced significant benefits, such as lower costs, faster execution of transactions, audibility of operations, and increased transparency. Evidence of this revolution has also been seen in the maritime industry, with software developers and shipping giants looking to tap into the value of blockchain through blockchain consortia, privately held, and public platforms. The decision of which to join though is not yet clear to stakeholders operating within the shipping space.

Global companies see blockchain as the end goal to renewed sustainability and immense end-to-end visibility, while key players such as IBM and Maersk have devoted countless resources into developing a company-owned-and-operated blockchain. This paper will clear up confusion and help companies avoid the risks, as it is vital to understand the difference between private blockchain platforms and public blockchains and which is best for the industry at large.

**THE DIFFERENCE BETWEEN AND VALUE OF PUBLIC VERSUS PRIVATE BLOCKCHAIN**

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**DRIVING FORCES OF BLOCKCHAIN INTEREST**

The value of blockchain is clear. Modern supply chains consist of hundreds of locations, the use of dozens of shipping and logistics companies, financial institutions and customs authorities, exceedingly complex contracts and much more. While Incoterms may provide some visibility into who technically owns liability for a given shipment in international shipping, problems still arise. Document management, such as transactions of ownership, become a hassle and failure to track shipments and information at any stage will contribute to a lack of visibility. It is a well-known fact that reduced visibility amounts to considerable uncertainty and increased operating costs; it is simply impossible to improve what cannot be measured and traced back to its root
cause. The following are the current driving forces of interest in blockchain:

• Supply chain leaders want more visibility in supply chain processes to enable continuous improvement.
• Blockchain is well-positioned to eliminate many tracking issues within the supply chain, providing increased accountability for shipments from origin through final delivery.
• The growing consensus that connected sensors are critical to effective supply chain tracking and traceability.
• Demand to meet the challenges created by omnichannel supply chain processes.

WHAT ARE PUBLIC BLOCKCHAINS?
Now that we know the drivers of interest in blockchain, it is essential to distinguish public and private blockchain to understand blockchain’s various nuances and capabilities. Public blockchains openly share information between participating users, which is where the blockchain conversation gets confusing. Any user can join or leave the network at their will, and there is not a central authority acting as a gatekeeper. That being said, many organizations are developing public chains that are targeted to specific industries. Data is still recorded on a block, and multiple copies of that ledger are stored across data nodes.

A data node refers to any computer, server or device that possesses an IP address and can communicate with the blockchain. Multiple types of nodes exist, providing a source for continuous review of entered information and verifying data authenticity, as well as restricted functions based on type. Using a peer-to-peer (P2P) protocol, nodes communicate data with other blockchain nodes for the given system or protocol within the distributed network. Essentially, anyone is allowed to use a public chain, and anyone can run a node to help validate transactions and data within the blockchain. Public blockchains also allow each user to retain data ownership. Data is fully decentralized, and while some developer maintenance and management tasks may exist—such as managing participation in the blockchain and integration of blockchain-based systems with legacy platforms—each user still owns their data.

Due to each user owning their data, public blockchains offer a significant advantage. Unlike a traditional bank, which has a central authority, public blockchains do not require a middleman to make a transaction. In fact, blockchain came into existence to decrease the central authority of banks, institutions or other businesses. The technology allows peer-to-peer (P2P) transactions, and gives control back to the user. This enables individuals and corporations to retain control of their data, without having to be concerned about the risk of data loss in the event a software provider no longer exists or can host their data, and enables those businesses
to authorize that data to be accessed by whom they choose, not who the provider chooses for them.

Increasing the level of detail within supply chain management offers vital benefits to companies and consumers. Businesses and trading partners can validate product history, authenticity, warranty details, and more. However, blockchain is still a new technology, and companies have altered the idea of an open blockchain to take on components of a privately held organization: i.e. a private blockchain platform.

WHAT ARE PRIVATE BLOCKCHAINS?
Private blockchains are somewhat antithetical to the spirit of the decentralized nature of blockchain. In a private blockchain, privately held organizations combine traditional supply chain management tools with a blockchain-based system. This may sound great on the surface, with the system seemingly more controlled, but due to the central authority of a single entity or organization, who also picks the user group of the platform, private blockchains have an additional layer of risk: a middleman is reintroduced into the equation. Transactions are limited to the privately held user group, and while this increases transaction processing speed, it opens the door to questions about data ownership.

Creating a private blockchain will naturally require a third-party-managed database, which could render the effectiveness, transparency, and ultimate data visibility of blockchain-based systems moot. A central authority could presumably alter data to benefit the developer itself or charge additional fees to simply validate information, including the possibility of creating false records and more. Since private blockchains reside within a company-owned database, a traditional form of encryption is necessary. Thus, conventional cryptographic auditing will be included with the overhead of maintaining such systems, which is the critical weakness of privately held platforms; blockchain managers of the private platform could alter blockchain-held data as needed, eliminating the whole idea of why blockchain exists in the first place: trust in the data.

ADDITIONAL PROBLEMS WITH PRIVATELY HELD BLOCKCHAIN-BASED SYSTEMS
A 2018 study of third-party logistics providers found that as few as 2% of shippers are actively engaged in the process of blockchain implementation, including the exploration of blockchain options. The reason for such low interest goes back to the potential problems posed by blockchain, specifically concerns arising in private blockchains. Unfortunately, the problems of private blockchains are not limited to the increased risk of data corruption; consider these potential issues of a private blockchain-based system:

• Private blockchains limit the number and type of systems that can be used with the blockchain, creating problems for companies that have already invested millions into new technologies and resources.
• Private blockchains have a significant risk of conflict of interest. Hosts of said private blockchain still hold the metaphorical keys to the castle and can view, modify, and tamper with data as they please. This presents a massive competitive risk for businesses not looking to share private data with one another, such as lane pricing.
• Private blockchains carry a potential antitrust risk. Because this is a private consortium of potential competitors, narrow industries such as maritime are presented with the risk of anticompetitive practices being facilitated in a private blockchain. This risk is mitigated in a public blockchain, as competitors cannot have administrator access to said public chain.
• Private blockchains may be incompatible with existing systems. It is not a question of whether a company that develops blockchain is actively seeking to restrict access; it may simply be incompatibilities within the company-owned platform and other systems. For example, the use of internal blockchain to track IBM functions might sound great, but it may lack the value in tracking the unique characteristics of a food-driven supply chain.
• Private blockchains also have limited known value. Since the private blockchain is wholly maintained and owned by a company, as well as leaving data ownership in the hands of the developer, another risk arises. The value of the blockchain is limited solely to the overarching company’s assessment, not necessarily the value achieved in existing blockchain partners.
• Inability to leverage a blockchain across an entire supply chain network, including suppliers and vendors. While visibility is integral to the supply chain today, the value of blockchain is in its ability to increase traceability and tracking across your entire network, including companies that fall outside of your ownership. In other words, your suppliers and vendors must use the same blockchain-based platform as your company to maximize its value, which may not be possible with privately held blockchains for the above reasons.

WHICH BLOCKCHAIN-DRIVE SOLUTION IS THE BEST OPTION?
The potential value gain from leveraging blockchain is too significant to ignore. While public blockchain advocates may exist to increase adoption and develop this technology, the focus must be on making data accessible and ensuring ownership of data stays in the hands of its users. This principle is evident by looking at the number of shippers and partners that have joined existing blockchain consortiums, hoping to implement a privately held blockchain as the next frontier. Suspicion, however, is rampant among today’s supply chain leaders. They are not blind to the nature of larger corporations, and basic business principles imply no corporation should pursue anything that will not benefit their own company first and foremost.

FINAL THOUGHTS ON DIGITAL TRANSFORMATION VIA BLOCKCHAIN
In a recent podcast on the value of public over private blockchains, a common theme emerged: visibility effectively opens the door to efficiency. Trust unlocks that visibility. Blockchain will increase both visibility and trust among blockchain users, making it the key to true efficiency. The future may reveal that today’s private blockchain consortiums choose to pursue a public blockchain path, but the more likely option is that companies will rise to provide a public blockchain to supply chain players faster and gain the momentum necessary to drive blockchain innovation and development across the global supply chain.

ABOUT THE AUTHOR
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ABOUT THE ORGANIZATION
ShipChain’s multimodal technology connects with your existing systems, enables your supply chain to communicate globally, and provides end-to-end visibility on one screen.

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