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Blockchain Technology Impact on EDI and ERP Systems

The Opportunities and Benefits of Blockchain

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Blockchain technology is poised to have a revolutionary impact on the way we transact business, particularly the exchange of business document transactions commonly referred to as EDI (Electronic Data Interchange).

About This Paper

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This white paper will educate the reader on the exciting opportunities and benefits of Blockchain Technology in relationship to traditional EDI ecommerce and ERP business processes.

The History

Historically, business transactions were exchanged by mail, fax, phone, and computer. In these exchanges, documents are registered in ledgers and replicated in many different forms of storage - from file cabinets to digital media. Each party had their own copies of the transaction. For example, purchase orders, invoices, and payments. We can call this operating model "throw it over the wall", indicating that there is no immediate feedback when transactions with errors are tendered.

This age-old model remains the typical manner in which business is conducted today.

The inherent challenges recognized by those involved in business transactions include a complex array of information formats and delivery methods. Transactions that are not in agreement require time consuming research, repair, revision, reconciliation, negotiation and hopefully settlement.

Anyone that has tried to reconcile a complex accounts receivable between vendor and customer knows that the systems maintained by both parties can become completely out of sync with each other; "I show this invoice as paid but this one is open" – "no I have it the other way around".

The potential alternative, real-time synchronous transaction processing via webservice, which is used in limited fashion for common interactions such as a webstore checkout, have yet to scale or prove resiliency for end-to-end business document exchanges. Lack of standards (consistency), latency, insufficient ERP capabilities by either party and application inflexibility are just a few of the many roadblocks to the success of "point-to-point" synchronous business transaction processing.

Blockchain technology may prove to be the solution to these dilemmas.

Smart Contracts:

- **Defines all the rules** of the business agreement and execution.
- **It may have thousands of rules** that govern each transaction type in the blockchain.
- **Companies will adopt only the rules** that are meaningful to their business and thus many future challenges abound.
- **The net result?** Integrated business transaction processing will be more demanding than what we experience today.

Breaking the Mold with The Block

The first benefit of Blockchain (we'll also refer to as "the Block") is that related transactions are stored in a single source of truth - the ledger - that is shared on multiple servers for the complete transaction lifecycle. For example, the "Order to Cash" Lifecycle.

If one views the Order to Cash lifecycle as a series of business transactions that starts with a contract between parties, i.e. the purchase order agreement, then the benefit of the block comes into focus. Order to Cash follows a predictable lifecycle primarily from quote, to purchase order, to acknowledgement, to shipment, to invoice, to payment. A shared ledger of the transactions would benefit both parties and their mutual efforts to track and understand what has transpired and what remains to be done.

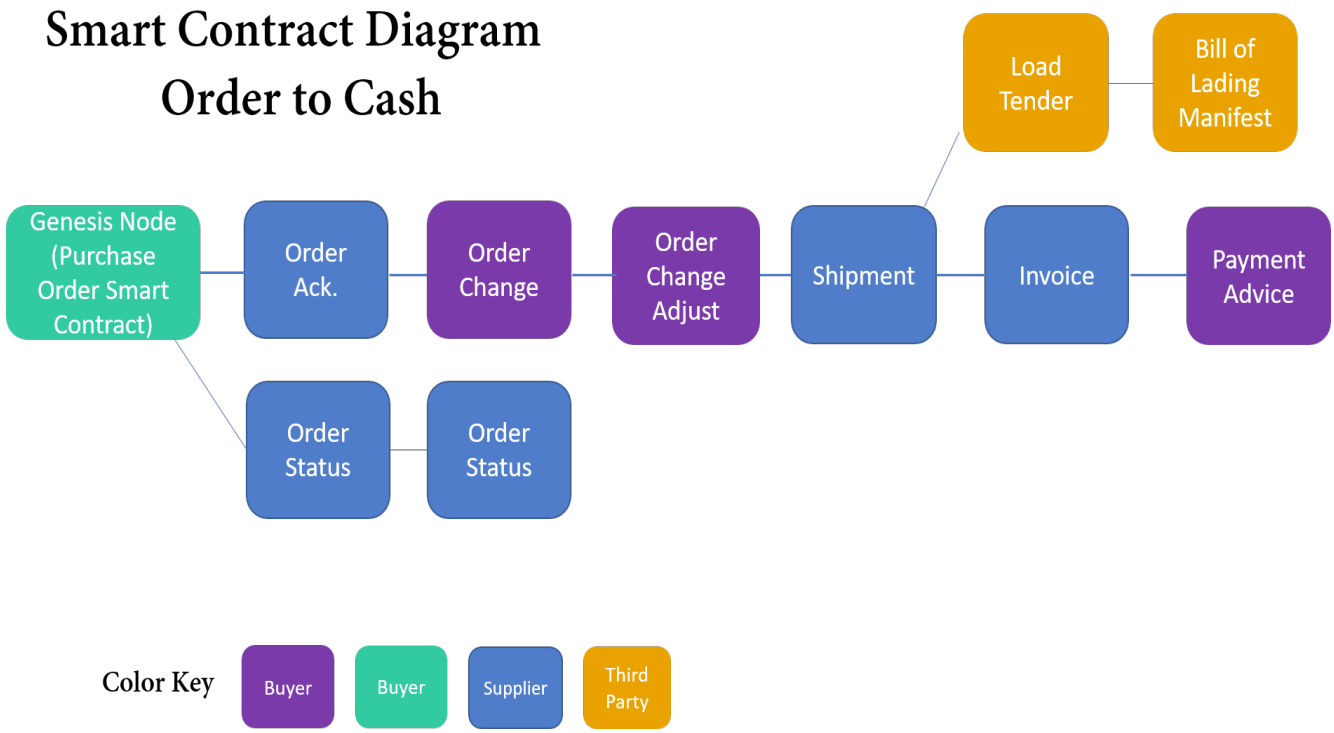
The contract on the Block (we'll call this a smart contract) defines all the rules of the business agreement and execution. Transactions that are inserted into the Block are either accepted or rejected based upon the terms of the contract, providing real-time feedback to each party so that only transactions that conform to the contract will be accepted.

Mistakes, misunderstandings and other problems that commonly require weeks and months to unwind are detected during the insertion of the transaction into the Block. This represents a monumental improvement over today's method which often relies on validation from disparate and disconnected systems.

How is this information stored on the Block?

The Block consists of a limitless chain of linked transactions or blocks. Each time a transaction is processed, the chain branches and a copy is distributed throughout the network which results in a decentralized, distributed ledger.

The blocks themselves are immutable which means that modifications require a separate correcting transaction rather than changing the transaction itself after it has been created. The following diagram represents a simplified example of such a lifecycle.



Blockchain Security

Security is a hallmark of the Block. This is accomplished using the principles of preservation, immutability, and consensus. The ledger is preserved through replication of data across a distributed network of peer servers in order to maintain an accurate account. It is nearly impossible to experience data loss.

Data on the Block cannot be altered and is virtually invulnerable to fraudulent manipulation. A malicious peer cannot introduce spurious transactions because it is unable to achieve the required consensus.

How does the emergence of Blockchain impact ERP/EDI?

Interfacing with data on the Block is a critical technology that businesses should be prepared to implement. For companies that use Value Added Networks (VANs) to transmit data, Blockchain technology will likely replace those that are predicated on antiquated technologies such as pre-internet point-to-point communication and local storage. Blockchain will likely replace direct protocols such as FTP and AS2. The concept of exchanging data between remote servers is monolithic and inferior to the shared transaction repository found on the Block.

The impact on ERP/EDI systems that generate business transactions will be significant. At first glance, it seems that the Block would help unwind some of the complexity and inconsistency inherent in today's EDI interactions. The truth is a bit more nuanced. Today's EDI "standards", wherein data and partner interactions can be quite inconsistent and illogical, the rigidity of the Block will add pressure on companies to be more accurate and compliant to their partners' requirements.

Today, companies often accommodate their partners' limitations with special mapping and business handling on their end to fix bad data and inconsistent formatting. With the Block, there is no concept of "data fixing" available - data will have to be accurate before it is inserted into the block. Once committed, the data in the Block cannot be changed. In other words, there is no concept of a replacement transaction and thus a new set of adjustment transactions will be needed to marshal the contract cycle to conclusion – another challenging paradigm shift.

One might conclude that with rigid smart contracts that there will be a consistency that simplifies current compliance challenges, however a smart contract may have thousands of rules that govern each transaction type in the blockchain. Naturally, each company will only adopt the rules that are meaningful to their business and thus many future challenges abound.

The net result, integrated business transaction processing will be more demanding than what we experience today. Does this mean that ERP systems need to be smarter and more capable in the future?

ERP systems are geared to help enterprises manage and measure their resources and operating results. ERP systems can help companies differentiate from their competition and make them more competitive. The ideal ERP system is flexible enough to enable creativity but still manage all business activities from sales to engineering to finance. The downside of these systems is that they can become progressively more complex and thereby restrictive.

"Best practice" implementations become business process revisions that accommodate the design limitations of the ERP system and not the optimization of the enterprise's business process. Add the challenges of today's omnichannel eCommerce interactions, the changing technology landscape, and the requirements and limitations of the enterprise's value chain then you start to see the perfect storm of struggles coming to information technologies.

Data Masons and the Block

Data Masons has already developed technology that is ideally suited for connecting systems to the Block. The challenging nature of data transformation and integration that accommodates, not dictates, business processes, augmentation of ERP systems, and compliance validation are the hallmarks of our eCommerce platform – Vantage Point EDI. These skills and capabilities will be key differentiators in the future state of commerce for our customers.

Key value propositions that can be leveraged by Data Masons' Vantage Point customers:

- Block integration and support without ERP customization or forced ERP upgrades
- Native support for adjusting transactions
- Validation before committing transactions to the Block
- Reconciliation of the transactions to the Block
- Proactive monitoring, extraction and ERP integration of transactions to the Block
- Secured visibility of data into the Block and back into the ERP platform
- Ability to react to feedback from the Block, generate alerts and intelligently correct the errors and resubmit
- Cryptocurrency support

Data Masons is staffed by business analysts and technologists that know how to:

1. Define smart contracts
2. Understand security and cryptography
3. Seamlessly integrate business transactions on the Block
4. Support advanced business processes
5. Manage compliance and governance requirements
6. Reconcile transactions between ERP systems and the Block

Conclusion

The future is an exciting one for eCommerce and business transaction processing but there will certainly be challenges during the transition to blockchain technology. Regardless, radical advancements in business collaboration are coming that can increase enterprise efficiency by improving accuracy, reducing non-value-added business costs and enabling companies to focus their capital on innovation and growth.

Read the Data Masons Executive Brief, "EDI Made Simple - A New Approach" for more information on EDI integration without customization.

About Data Masons

The information contained in this document represents the current view of Data Masons Software as of the date of publication. This white paper is for informational purposes only.

Since 1996, Data Masons has demonstrated its commitment to a comprehensive understanding of customers' environments by informing them about customizations and other modifications to optimize their EDI solutions. When combined, our team's expertise, extensive library of trading partner specifications, and industry-leading, Certified Vantage Point EDI solution for Dynamics 365, Dynamics AX, Dynamics GP, Dynamics NAV and Macola makes Data Masons an ideal choice for your EDI support partner.

By putting the customer first, and delivering quality solutions and unparalleled customer service, Data Masons has become the leading EDI provider and would like to assist you with your EDI integration project.

Contact us for a private product demonstration and consultation, and learn more by visiting datamasons.com.

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