E-Logistics

Can Blockchains turn supply chains into demand chains?

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Mediasonik

- An eCommerce that sells Ultra HD 4k Plasma monitors for medical equipment.
  - Used in surgery operating rooms, for example…
- They have a large number of suppliers for their electronic components. With less than 20 of their suppliers being from the UK and the rest being from China and India.
- The company is not well-acquainted to their suppliers and there is a huge lack of trust.
- They have a huge, complex supply chain, which can become extremely difficult to keep track of.

Our job:

- Advise Mediasonik on whether or not they should follow their competitors into using blockchain to organise their supply chain - effectively making it more ‘customer-centric’ and turning it into a so-called ‘demand chain’.

Mediasonik Supply Chain

- Use less than 20 national suppliers to supply electronic components.
- All other parts are sourced from China and India.
- The supply chain therefore includes:
  - Numerous intermediate storage and production cycles.
- Global scale

Assuming they are using SQL system

Issues with this type of chain relating to scenario (no synchronisation, different values may be in different systems, lots of suppliers may have their own database systems, may lie about orders etc)

Questions we want to answer

Can this be achieved using the distributed trust mediation model promised by blockchains?

Should Mediasonik jump at the opportunities offered by this new technology before it is too late?

Would we advise Mediasonik to use one of the available types of blockchain to implement this IT solution?

What are the possible drawbacks to using blockchain in this way?

Overview of the Blockchain

- A continuously growing list of ‘blocks’ that are linked and secured using cryptography.
- Distributed - no central point of failure. Accessible to EVERYONE.
- Peer-to-peer - no central authority controlling it
- Transparent - every transaction is stored on the blockchain ledger and can be seen by everyone who accesses it.
- Irreversible - once a block has been created, it cannot be modified or removed. This almost ‘forces’ trust in the participants of the blockchain..
- Fast - compared to traditional methods of supply chain.

Why Blockchain can be useful for E-Logistics

- Products can be traced, step by step, all the way from the point of origin to the point of consumption. This is something that is being expected more and more by customers.
- There is no single point of failure, the system cannot be brought down easily.
- Trust is almost ‘forced’ in blockchain, due to transparency and accessibility.
- Blockchain can allow the supply/demand chain to be much more easily automated, allowing for modern technologies to be applied to it such as smart contracts.

Why Mediasonik should consider Blockchain

- Solve trust issues
- Track supplies and ensure they are genuine
- Use of ‘Smart Contracts’
- Transactions automated, documented and controlled
- Assurance of product - especially if used in hospital
- Transparency

Possible drawbacks of Blockchain

- Blockchain is not well known - it is not a widely explored area and very little academic research has been carried out to explore it.
- It is not currently standardised for electronic supply chain documents.
- A high-level of computerisation is required to use blockchain. This may not be available in some countries.
- Pure blockchain is open and has no central authority. This may not be ideal for businesses who want to keep their transactions private.
- Governments and people don’t fully trust blockchain due to its history of being linked to illegal activities. Researchers in Germany in the last week have even said this history may make it illegal.

Alternatives to Blockchain

SQL

- Standard language for relational database management systems (ANSI)
- Usually centralised
- Hard to make scalable, especially smaller businesses
- No help to trust issues
- Slow query execution time

NoSQL

- Graph like system (neo4J)
- Highly scalable
- Already used in e-Commerce (Amazon)
- Different paths = fastest route
- No help to trust issues

Controlled by single entity

SQL vs NoSQL vs Blockchain

	SQL	NoSQL	Blockchain
Scalability	Low	High	High
Performance	Slow	Faster	Faster
Security	High	High	High
Privacy	High	High	Low
Business (Popularity)	High	Medium/High	Low
Economic	High	Low	Low

Our solution - Blockchain

- We suggest Mediasonik should use **permissioned** blockchain and upgrade their system.
- Smart contracts
- Assurances of blockchain - Hospital
- Don’t jump at opportunity, carry out pilot projects and ensure it would work
- Migrating to blockchain may cost a lot of time and effort, need to be sure it works

Revisiting the questions

Can this be achieved with using the decentralised trust mediation model promised by blockchains? … Yes!

Should Mediasonik jump at the opportunities offered by this new technology before it is too late? … No! But they should start working with it.

Would we advise Mediasonik to use one of the available types of blockchain to implement this IT solution? … Yes!

What are the possible drawbacks to using blockchain in this way? … The drawbacks have been discussed in earlier slides.

Outcome and Lessons Learned

- Blockchain is a platform with vast potential beyond its current implementations.
- Companies are already using blockchain technologies (IBM, Walmart and Maersk).

- Bleeding edge technology comes with risks.

- We would recommend its a path with exploring.

Thank you for listening, any questions?

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