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Information and Communication Technology in Supply Chain Management (Retail)

Overview of Retail Sector

The retail sector includes any business or individual involved with selling products directly to consumers. The related sectors to the retail sectors are:

1. Wholesale Sector – Supplies Retailers
2. Logistics Sector – Connects the wholesalers and producers with retailers
3. Manufacturing Sector - produces the products sold by retailers

The retail sector includes shops, department stores, supermarkets, market stalls, door-to-door salespeople and internet retailers.

The four biggest retailers in the UK are Tesco, Sainsbury's, Asda and Morrisons meaning that the industry is dominated by supermarkets.

Information and Communication Technology

Information and Communication Technology is most vital and has become a part in our day to day life. I am focusing on ICT in Supply Chain as it is playing important role in managing complex retail operationsin an organisation for the following:

- Enhance Speed and Flexibility to evolve in the marketplace
- To collect and analyse Customer Data
- Stock/inventorytracking across multiple stores
- Improve Business Process

Information and Communication Technology can speed up processes and deliver cost saving benefits to the company.

There were rapid changes in technology and IT applications viz; Electronic Data Exchange (EDI), Radio Frequency Identification (RFID), Bar Code, Electronic Commerce, Decision Support system, Enterprises Resource Planning (ERP) package, Cloud Computing etc. The most recent Technologies which is in Trends in the past couple of year are use of Artificial Intelligence (AI) and Block Chain Technology. We are now mainly focusing on Cloud Computing, AI and Block Chain Technology in detail.

Artificial Intelligence

Artificial Intelligence helps in automated decision-making with accuracy and speed, based on data analytics, coupled with self learning abilities. The retail sector has witnessed the dramatic evolution with the rapid digitalization of ICT such as smart phones and devices etc. Customer has lot of options as they have access to smart devices This has entirely prevailed their expectation, habits, shopping style and investigating the shops.

According to Global Market Insights, investments in AI by retail segment will exceed USD 8 billion by 2024. As more applications for machine learning, predictive analytics and deep learning technologies are experimented with success, digital disruption in retail segment is bound to happen at a much rapid pace.

AI can serve as a benefit for retail companies that gather and possess customer data. It is helpful to read the vast descriptive data it can be in different formats such as images, videos, customer behaviour and response. AI can derive meaningful reports and decisions from massive amount of data and help organisation to create personalized shopping experiences via highly structured web shops, intelligent in-store bots and online chatbots.

This technology advancement has helped the retail sector to become more smarter to provide the customer satisfaction, better service, better response to customer demands and supply.

The following way AI will transform the retail experience for shoppers:

- Digital Racks for Apparel & Fashion Products
- Virtual Trial Rooms for Swift Decision Making
- Robotic/digital assistance will be a reality
- Behavioural Analytics Powered by AI-backed Surveillance
- Better Customer Support via Chatbots

TO illustrate, Mc Donald's has implemented Automated Kiosk which helped to remove the Cashier and Customer representative. It helps them to takes orders quickly and use the staff efficiently in processing the orders.

Blockchain Technology

A blockchain is a database that is shared across a network of computers (distributed ledger). Once a record has been validated, it's added to the block (ledger), after which it cannot be changed. To ensure all the copies of the database are the same, the network nodes make constant checks to ensure they have the latest version of the blockchain.

A major difference between the current design of the Internet and blockchain technology is that the Internet was designed to move information (not value) and to move copies of things (not original information). In blockchains, value is represented in transactions recorded in a shared ledger and secured by providing a verifiable, time-stamped record of transactions, which provides secure and auditable information (English, Auer, and Domingue 2016). These transactions appear through a verification process that is consistent with network consensus rules. Once the new record is verified and added to the blockchain, multiple copies are created in a decentralised manner to create trusting chain.

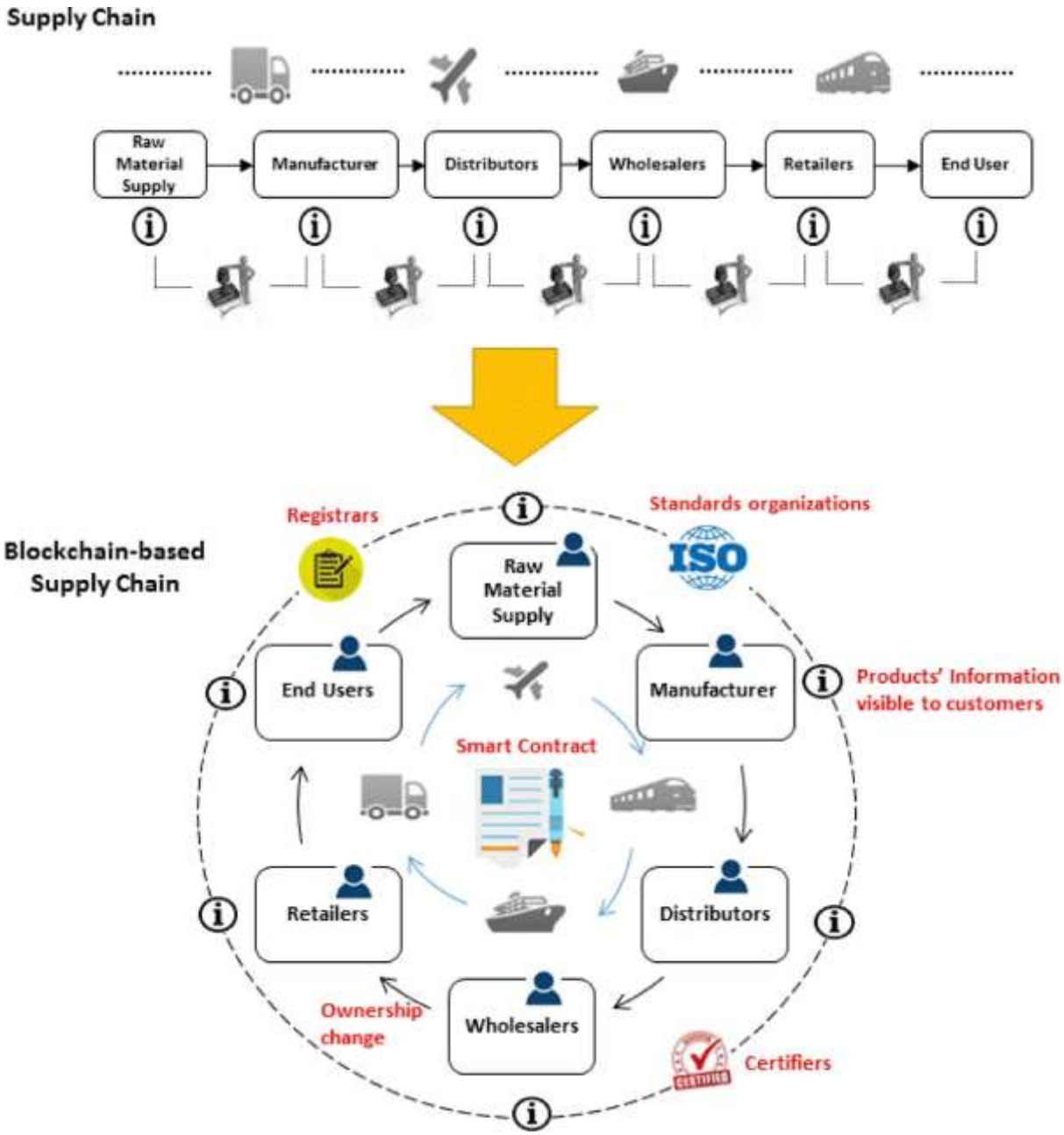
Blockchain Supply Chain allows for the authenticity of raw materials, supporting claims of Fair Trade, sustainability, ethical sourcing and organic goods.

The visibility of supply chain is a biggest challenge for business, where a few companies have no information on their second and third tier supplier. This end to end supply chain transparency and visibility can help model the products flow from raw materials to manufacturing, testing, and finished goods, enabling new kinds of analytics for operations, risk and sustainability.

Supply chain in manufacturing systems contains a series of system entities including people, knowledge,physical resources, processes, and financial contracts and transactions that facilitate moving a product from supplier to customer. In a large supply chain organisation, it is very hard to get an overall picture of all transactions within the entire supply chains. This all information's are typicallystored in various locations and are accessible to certain system entities. In such systems. the customers (the final consumers or the larger organisation within the chain) usually have limited access to the overall information. In most of the cases, part of theinformation is treated as a commodity for a supplier. Therefore, due to the low level of transparency and the tractability oftransactions is based on the trust between the system actors.

The blockchain technology can improve the transparency and traceability issues within the supply chain using immutable record of data, distributed storage, and controlled user accesses
Using blockchain technology in the retail supply chain resolves some of the following pain points:

- **Provenance:** authenticity of raw materials, including component suppliers
- **Compliance:** proof of certification of regulatory conditions being met
- **Transparency:** visibility for all parties across the full supply chain
- **Faster Payments:** self-executed smart contracts facilitate automatic payments
- **Reduced Costs:** reducing administration resource cuts costs
- **Improved Accuracy:** digital transactions without human intervention can improve data accuracy



Barriers in Implementing the Blockchain technology

To successfully Implement blockchain technology to trace sustainable practices and managing supply chain processes and products through the supply chain begins with the identification of challenges and barriers to be managed.

Below are the four barriers for the blockchain technology adoption and implementation:

- Intra-organisational barriers – Financial Constraints, lack of management commitment / support, lack of new organisation policies for using technology, lack of knowledge and expertise, and difficult in changing organisation culture

- Inter-organisational barriers – Cultural difference, Challenges of Information disclosure between partners in the supply chain and integrating sustainable practices (blockchain technology through SCM), Problems in collaboration, communication and Co-ordination in supply chain & lack of customer awareness of blockchain technology
- System-related barriers – Security challenge, access to technology, hesitation to adopt blockchain technology etc
- External barriers – lack of government policies, market competition and uncertainty, lack of external stakeholders' involvement, lack of industry involvement in ethical and safe practices etc

Conclusion

In this topic, we touched the overview of retail and how IT also plays an significant role in Supply Chain and how it can be integrated in the Organisations into entire supply chain and to react quickly to any predictable market changes, thereby gaining competitive advantage by effectively using Technological advancement such as Artificial Intelligence and Blockchain in Supply Chain. To becompetitive in marketplace, organisations will find that their conventionalsupply chain integration will have to be expanded beyondtheir boundaries to integrate all stakeholders.Adoption of recent ICT tools is vital forsuch efforts.

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