

Blockchain Coupled Oracle Fusion

* *Diptikant Satpathy*

Abstract

With stricter compliance and policy requirements, demanding customers, commercial competition, geographically spread businesses, and vulnerable cyber security, today's multifaceted business sees a lot more challenges than ever before. To overcome these challenges, there is a need to track and trace each aspect of the business process. Maintaining an extra protected automated system with transparency, security, reliability, and traceability has a big impact on the bottom line of business organizations. A technology called *Blockchain* provides a viable solution to the problems associated with the complex business process traceability. The blockchain architecture and design is based on distributed ledger technology (DLT).

The Blockchain technology was first theorized to be used for a cryptocurrency called 'Bitcoin' for a peer-to-peer online payment in 2008 (in a white paper published by Satoshi Nakamoto). Off late, it has begun to witness success in finding applications in many other fields like banking, asset management, healthcare, travel, supply chain, logistics, identity management, etc. Here we discuss industrial applications of Blockchain in an Oracle Enterprise Resource Planning (ERP) Cloud environment.

As per a study by Forbes, about 90% of the Fortune 500 companies work on some or the other Enterprise Resource Planning (ERP) platform (single or multi-ERP systems). By 2020, four out of every ten large organizations will have atleast 60% of their businesses on Cloud. Hence, Blockchain in a business scenario needs to have an integration with already existing ERP systems and furthermore with future cloud systems.

Oracle Blockchain Cloud service offers easy application integration with plug-and-play adapters providing PaaS delivery.

Keywords: Blockchain, Distributed Ledger Technology, Oracle ERP Fusion Cloud

I. INTRODUCTION

The combination of Blockchain and Oracle Supply Chain Fusion Cloud is still in a budding state. Oracle Blockchain Cloud service offers easy application integration with plug-and-play adapters, providing PaaS (Platform as a service) delivery [2].

Blockchain technology has the capability to create a paradigm shift in Supply Chain Management arenas. It can provide an innovative foundation for organizations that desire to be more vigilant, transparent, and secure. Blockchain is capable of positively impacting many industries. A few good examples of blockchain application in Supply Chain are Tracr used by De Beers, Driscoll's, SKUChain, Provenance, etc.

All said and done, the technology has to overcome certain short-comings in terms of latency and computational power consumption to be able to find more business applications.

II. BLOCKCHAIN

Blockchain, as the name suggests, is nothing but multiple digital ledgers or records known as blocks connected with each other through a *digital chain*. As it is distributed across multiple computers, it is also known as distributed ledger technology (DLT). This peer-to-peer network is an open source system to record transactions which cannot be removed but can only be sequentially updated with a timestamp. Hence, practically speaking, it does not let the historical trace and sequence of events to disappear at anytime.

Fig. 1 shows a generalized and simplified flow involved in a (public) blockchain coupled supply chain management process in an industrial environment:

- 1) Transaction performed between a supplier and a customer.
- 2) Transaction represented as a 'Block' in the blockchain and released online.
- 3) Block broadcasted and verified by miners (this is true for public blockchain, but not for private and

Manuscript received September 6, 2018; revised September 25, 2018; accepted October 8, 2018. Date of publication November 6, 2018.

* D. Satpathy is Senior Consultant with Infosys Technologies Ltd., Hyderabad, Telangana, India - 500088.

(email : diptikantsatpathy@gmail.com)

DOI: 10.17010/ijcs/2018/v3/i6/141447

permissioned blockchains).

4) Miners rewarded for verification service (in case of private and permissioned blockchain, no miners are involved).

5) Block added to the blockchain as a permanent block.

6) Transaction process complete and records available for users.

❖ Analytics and data management

Oracle Enterprise Resource Planning (ERP) products fulfill most of the existing requirements. However, with more and more stringent compliance-related checks and regulations, existing Oracle platforms fall short of accomplishing business goals.

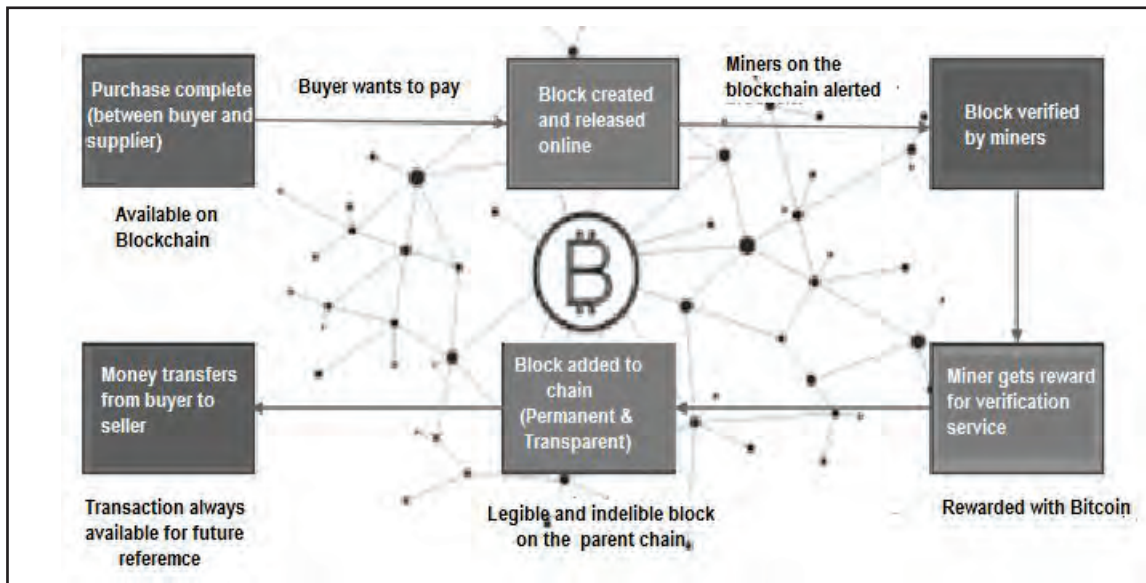


Fig.1. Blockchain Protocol

III. SUPPLY CHAIN MANAGEMENT

Supply chain management has traditionally been a cross-functional activity involving the movement of material and information, which spans across suppliers from manufacturer to customers. It encompasses all the major touch-points in a typical business organization.

Globalization has made access to the best technologies involved in manufacturing or production process easier and smoother. This makes supply chain process in an organization even more critical as it provides scope for direct bottom-line impact.

Major areas of modern supply chain management in an industry are:

- ❖ Customer relationship management
- ❖ Forecasting
- ❖ Inventory management
- ❖ Shipping and logistics
- ❖ Procurement
- ❖ Material and production planning

Globalization and shrinking geographical boundaries pose a great deal of challenges in terms of quality, cost-effectiveness, and timely delivery of product and services. The fast-changing market and technologies coupled with highly demanding customers and strict compliances make it necessary for the organization to be well-informed and up-to-date about each touch point in the supply chain.

Industrial products need to be tracked throughout their lifecycle for authenticity of raw material sourcing, adherence to environmental norms, and eco-friendly regulations after use for disposal. Blockchain based Oracle Fusion enables traceability through certifications and information availability at each point in a supply chain and manufacturing process till its disposal.

Fig. 2 is a diagrammatic representation of the blockchain and supply chain process.

Blockchain works in conjunction with IT layer/protocol and the Fusion ERP layer. Fig.3 is a diagrammatic representation of blockchain and ERP

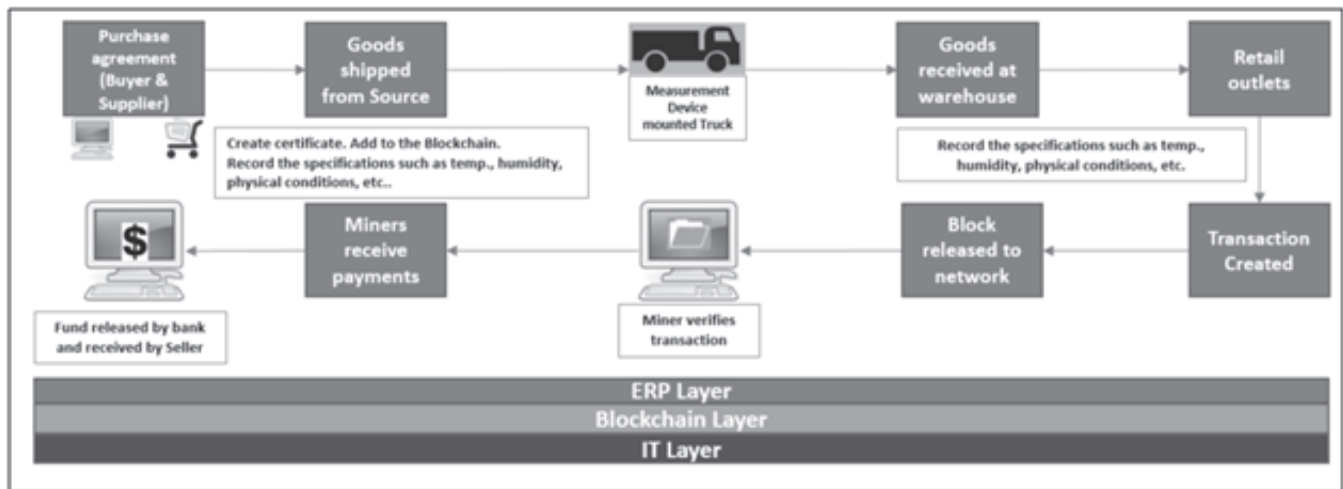


Fig. 2. Blockchain Platform : Supplychain Application

supply chain process architecture:

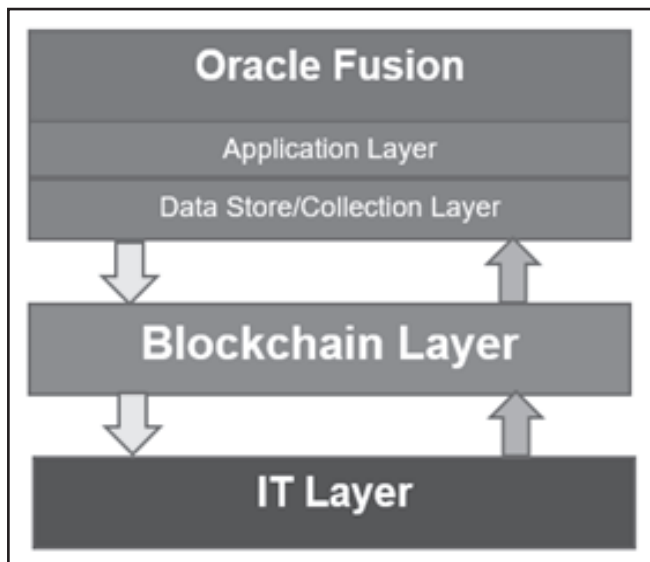


Fig. 3. Architecture of Blockchain Coupled Oracle Fusion

Blockchain, described as a distributed ledger in the previous sections has so far extensively faced trials in financial services, which is just one of its multiple dimensions. The sector which has witnessed the second-highest number of blockchain applications is probably the supply chain industry.

Traceability of materials through blockchain, starting from the origin, through the manufacturing process to delivery, to the final customer (cradle-to-grave), to guard against counterfeiting and to comply with strict regulations in certain industries such as Nuclear, Aerospace, Diamond, etc. has been used.

Visibility and transparency in a supply chain can be achieved in industries such as food processing. Starting

from the source, exact tracking of shipment to avoid spoilage, and counterfeiting is possible with blockchain technology.

Blockchain helps to **tackle pilferages and counterfeiting**, hence improving efficiency, and to adhere to stringent environmental norms.

Blockchain coupled with Oracle Fusion is capable of addressing all the requirements discussed here, and at the same time it fulfils ERP functionalities and business needs. It is not a disruptive technology, but rather an enabler for creating a paradigm shift in the industrial world.

Oracle has released a suite of blockchain-based Software-as-a-Service (SaaS) applications based on its Oracle Blockchain Cloud Service. This new product called **Oracle Blockchain Applications Cloud** is primarily designed to improve **traceability** and **transparency** throughout the supply chain.

Oracle Blockchain Applications Cloud includes four apps, Intelligent Track and Trace, Lot Lineage and Provenance, Intelligent Cold Chain, and Warranty and Usage Tracking.

(1) Intelligent Track and Trace

This application creates digital trails of each activity during procurement, manufacturing, and transportation, hence, warranting end-to-end traceability of goods and transactions throughout the supply chain. It helps in dispute resolution, root-cause analysis, and improved compliance.

(2) Lot Lineage and Provenance

This application allows product genealogy,

serialization, and provenance by managing the lifecycle of hierarchical serial numbers, recording origin, authenticity of product components, and tracking all transformations of the product. It helps in regulatory compliance, targeted recalls, and preventing counterfeit components.

(3) Intelligent Cold Chain

This application aids monitoring and tracking of the temperature-controlled supply chain, creating recommendations to optimize processes. It ensures the quality and safety of refrigerated products in pharmaceutical, food and beverage industries.

(4) Warranty and Usage Tracking

This application removes paper-based processes and automates usage tracking for high-value assets. An auditable and verifiable log for warranty, liability claims, and insurance helps expedite settlements and claim processing and prevents abuse of assets.

IV. CONCLUSION

Blockchain and Oracle Cloud implementations are in a nascent stage and it will take time for these to come to the mainstream, but we can safely say that they have a great potential and will go a long distance.

REFERENCES

- [1] S. Nakamoto, "Bitcoin: A peer to peer electronic cash system," (n.d.). [Online]. Available: <https://bitcoin.org/bitcoin.pdf>
- [2] Oracle Open World, "Oracle unveils business-ready blockchain applications," 2018. [Online]. Available: <https://www.oracle.com/corporate/pressrelease/oow18-oracle-blockchain-apps-cloud-102318.html>

About the Author



Diptikant Satpathy is a Senior Consultant in Enterprise Resource Planning with Infosys Ltd. in Manufacturing and Planning domain. Previously he was a Senior Manager in Supply Chain and Manufacturing in Tata and Jindal Steel respectively. Overall, he has more than 12 years of experience in Steel Manufacturing, Supply Chain, and ERP consulting domain. He has presented a few research and conference papers at national level. He has about seven years of Manufacturing and Planning consulting experience in discrete and process industries with clients in Asia (Malaysia, China), Europe (Hungary, France), North America (USA), and South America (Brazil). His research interest is mainly focused on Customer Centric Supply Chain Management, and Modern Trends in Supply Chain Management. He holds a Masters degree in Business Administration and a Bachelor's degree in Metallurgical engineering. He qualified for NET (UGC) in Management in 2017. He is a certified lead auditor for ISO 9001:2000.