Blockchain: Single Source of truth in Shared Services? An Empirical Paper on the Relevance of Blockchain for Shared Services

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Abstract: *There is no moment more opportune to deploy Blockchain technology in Shared Services - so the industry reports say. With a meteoric rise in interest from all quarters, Shared Services that were primarily a proof of concept for Blockchain not very long ago, are now partnering with enterprise business hubs to combine technology, data and creativity in order to solve business problems and create new service offerings. In this context, an attempt has been made i) to study the relevance of Blockchain technology in Shared Services industry by discussing a few use cases and also ii) to understand the potential of Blockchain technology in rewriting the foundation of business in general. The empirical study on Shared Services Organizations has been executed by adopting qualitative and quantitative types of research that included a detailed questionnaire-based survey followed by in-depth interviews with survey respondents and experts in the Shared Services field. The significance of the current research lies in its contribution both to academia and industry i.e., by contributing to the field of Shared Services research and in laying out the possible areas of application of the Blockchain Technology in the Shared Services domain, respectively. Most important findings include: the clear lead taken by the finance and accounting function, closely followed by supply chain in organizations for the consideration of probable deployment of Blockchain technology; the rise of order to cash, reconciliation and procure to pay as the most favoured candidates for Blockchain-enabled transformation, etc. Despite the limitations, challenges and perceived threats facing this nascent technology, the existing and probable use cases of blockchain technology are dominating the vocabulary of techno-business evangelists, worldwide.*

Index Terms: **Automation, Blockchain technology, Digitalization, Shared Services transformation.**

I. INTRODUCTION

The trend towards digitalization or digital revolution in enterprises, in the recent past, has been fuelled by the emergence of Intelligent Automation tools and Blockchain technology. The range of automation tools that are proliferating at an unprecedented speed cater to a wide range of automation needs of enterprises, be it desktop applications designed to automate simple tasks or complex, end-to-end process automation solutions. The use cases are rife in the case of real-time automated processes in various functions cutting across industries. Manufacturing industry was the earliest in adopting automation; the drivers being achieving economies of scale, acquiring higher market shares quickly and reduced human-induced errors, to name a few. Automation found its way into service industry too especially for processing all rule-based activities that require minimal human intervention and activities that do not need human interfacing. At the same time, Blockchain technology gained highest visibility with Bitcoin as its most popular proof of concept or use case, however the enterprise application of the ground breaking Blockchain technology is slowly and consistently gaining momentum especially in the functions of finance and accounting and supply chain, given the nature of volume and complexity of transactions [1]. In the Quintessence magazine, Johann Palychata from BNP Paribas wrote that the software behind Bitcoin i.e., Blockchain ought to be considered as an invention such as the steam or combustion engine that can potentially transform the world of finance and beyond. The current research paper discusses in detail about the impact of technology on Shared Services operations, with a particular focus on Blockchain technology in finance Shared Services. The paper is based on extensive study of industry-recorded and practitioner-reported information on contemporary trends and practices in the area and is also based on empirical study on organizations that have already adopted or considering the adoption of Blockchain technology. The findings confirmed that the top two candidates for the probable rollout of the technology are the functions of Finance & accounting, and Supply Chain Management. The criteria for considering these two functions as good fit for the adoption of Block technology, as listed by business leaders are similar to the considerations for RPA, except for the fact that Blockchain ranks higher when it comes to inter-business transactions(perceived equally good for intra-business transactions too) that need authentication from both (or more) business parties, while RPA finds its usefulness primarily for automating repetitive, rule-based tasks of varying complexity within an organization.

Retrieval Number: F2763037619/19©BEIESP
Journal Website: www.ijrte.org

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Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication

The following sections below are dedicated to explain the technology of Blockchain, its features, benefits, its relevance for Shared Services, research methodology, results, discussion that includes results analysis and finally conclusion that also includes implications, limitations and scope for future research in the area.

II. WHAT IS BLOCKCHAIN TECHNOLOGY?

Blockchain is the brainchild of a person or a group of people known by the pseudonym, Satoshi Nakamoto. By allowing digital information to be distributed but not
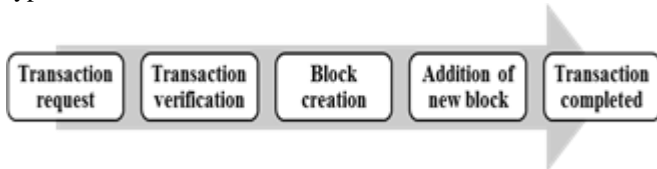copied, Blockchain technology created the backbone of a new type of internet.

Fig. 1. Blockchain Technology 1.0

A blockchain is, in the simplest of terms, a time-stamped series of immutable record of data that is managed by cluster of computers not owned by any single entity [4] [5]. Each of these blocks of data (i.e. block) are secured and bound to each other using cryptographic principles (i.e. chain). A simple way to understand Blockchain is to think of it as a simple database that is shared by a number of participants (Fig. 1). At any moment of time, every member of the network has an identical copy of the database on their computer. The database is actually in the form of a secure distributed ledger. This means, in order to access, read and write or update the database, one needs the correct public key which refers to the location, the database name and a private key which is a personalized key assigned to each member, which together enable access to information. The unique public and private key combination are required to access and update the information. This will ensure that the data is truly secure and at the same time democratic in the sense that each member has equal access to the data. Until now restricted access ensured data security. Contra intuitively, in Blockchain, everyone has equal access and with identical security. This makes Blockchain a truly game changing technology (r)evolution. The lynchpin on which Blockchain works is *trust*- the fundamental governing principle for the whole Blockchain framework.

III. BLOCKCHAIN: A DECENTRALIZED TECHNOLOGY

The 'distributed open ledger technology' that underpins Blockchain technology records transactions in a chronological order [2]. The ledger is automatically replicated and maintained by each member to create a single source of truth that is decentralized, consensus controlled, tamper-proof public ledger of assets and transactions [3] [6]. This section attempts to lay out the different components and actors in the Blockchain framework and how they communicate with each other to enable seamless transactions.

A. Block

Multiple transactions are grouped and stored together to form a block (Fig. 1). These blocks can be used to store and process Financial Transactions, receipts, Supply chain contract information or any Digital Asset.

B. Miners

Machines with computational power distributed over multiple systems work to solve the cryptographic algorithm and generate a hash value (values returned by functions that map large arbitrary data sets with a data set that is of a fixed size) which will then enable the linkage of a block to a chain of blocks.

C. Writer

Any entity or member that writes into the database or creates and enhances the Blockchain by increasing the length or number of Blocks in the Blockchain.

D. Reader

Any entity that reads/analyses/audits the blockchain.

Consensus in the network is achieved due to mining, where the whole network creates huge computational power to generate a hash value using the cryptographic algorithm and as blocks get interlinked, it makes it virtually impossible to edit any transaction without changing each of the transactions leading up to it.

IV. BLOCKCHAIN RESHAPING BUSINESS

The impact of Blockchain technology is touted to be enormous with boundless use cases and a potential to redesign the current form of business. Blockchain is set to revolutionize the way finance and accounting transactions are saved, processed and retrieved. [8] The key pivot on which Blockchain rests is that it does not depend on any single entity or individual for validating and accessing. Authentication by consensus runs the blockchain as the record or proof of transactions is shared among all members. This enables the transactions to be more secure, transparent and data governance more democratic. According to Outlier Ventures, around 250 major corporations are active in blockchain, either through in-house developments or investments in start-ups, accelerators, and consortia. All major banks, as well as organizations such as Visa, MasterCard, and NASDAQ, are reported to be working on Blockchain. Dynamic tech enterprises such as Ethereum, Hyperledger, Blockstream, are likely to make a big impact as the technology and implications slowly evolve.

V. RELEVANCE OF BLOCKCHAIN FOR SHARED SERVICES

Blockchain technology allows instantaneous, seamless business-to-business transactions based on pre-agreed and confirmed data nodes, through a network. This capability of Blockchain technology empowers businesses, Shared Services in particular, to process decentralized transactions at a higher speed and lower cost essentially by automating the requirement for authentication or validation (Fig. 2).

For example, waiting time involved in the clearance of prescribed activities with multiple suppliers is eliminated, as, distributed ledger technology that holds all the required transactional information enables preapproval or instantaneous clearance. Similarly, the need for reconciliation becomes redundant if a shared ledger exists between the customer and supplier/s. Shared Services are increasingly seen as the use case of Blockchain technology where the needle can be clearly seen moving in terms of transactional spend and volume. For example, all the processes in Supply Chain, where there could be a lag or snag such as ordering, procurement, invoicing, acknowledgement can be carried out faster and cheaper on a Blockchain platform (Fig. 3).
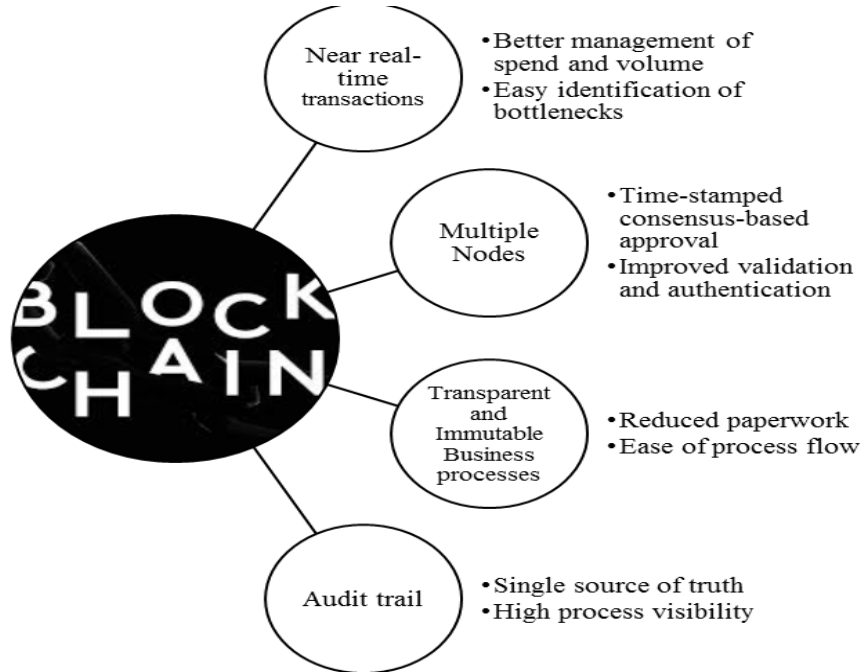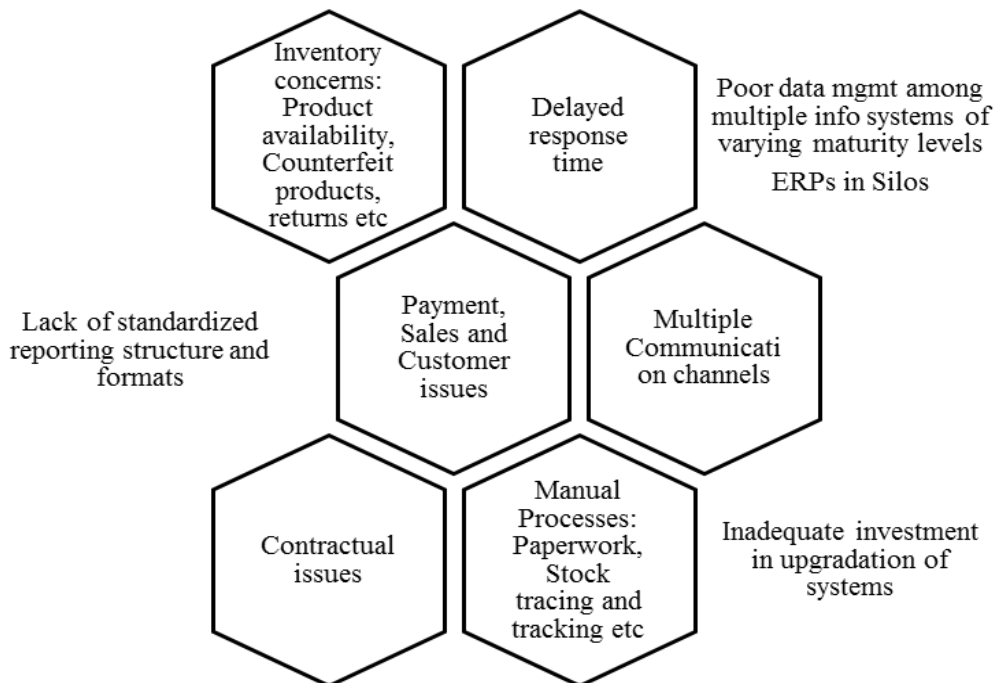

Fig. 2. Benefits of Blockchain Technology

Fig. 3. Common challenges in Supply Chain and underlying reasons

VI. RESEARCH OBJECTIVES

The study attempts to fulfil the following research objectives:

1) To understand what technologies are driving business transformations
2) To understand the relevance of blockchain for Shared Services
3) To identify use cases in Shared Services for Blockchain.

VII. RESEARCH GAP

Over the past few years there has been a sea change in the way finance transactions are performed, handled and tracked due to changes in technology and tools. Of these, Blockchain and Intelligent Automation (including Artificial Intelligence AI and Machine Learning ML, among others) are the two most prominent technologies which seem to have a profound impact on how transactions and processes are handled. This paper tries to address the research gap of what the above technologies bring to the table, the various use cases the technology can handle and the implications of the same. A survey was conducted to identify the impact and implications of these two technologies in various industries in general and Shared Services in particular, the details of which are given in the sections below.

VIII. RESEARCH METHODOLOGY

Qualitative and quantitative research has been conducted to investigate the research problem. Qualitative research strongly supported by secondary research and literature review was carried out with an objective to gain a thorough understanding of the research gap in terms of impact of technology adoption in Shared Services, with a particular emphasis on Blockchain Technology and the use cases thereof. Quantitative methods included questionnaire-based survey method, followed by semi-structured interviews with survey respondents and experts in the field

A. About the survey

Shared Services practitioners in the functions of Finance and Supply Chain working for both Indian and international organizations with centres in the South Indian cities of Bangalore, Chennai and Hyderabad were surveyed. Of over 100 responses representing over 14 industry segments and covering over 60 SSOs, the responses from professionals belonging to the business functions of Finance & Accounting and Supply Chain were analyzed for this survey. In order to understand the applicability of the Blockchain technology and to identify the probable use cases of the technology in various businesses and functions, a detailed survey was administered. Few of the questions that were asked as part of the survey include:

1) Is the system a database or transaction based system?
2) Does the legacy technology provide adequate security options, if yes, then why was there a fresh need to revisit security?
3) What are the top requirements of system in addition to speed and performance?
4) Can the data be made available on shared network?
5) Does the system need to be transparent and public?

6) What are the most common barriers to the adoption of Blockchain technology?

The findings and result analysis are presented in depth in the following sections.

IX. TOP FINDINGS/RESULTS

1) About 60% of the companies surveyed were considering implementing Blockchain in one or more use cases, as shown below (Fig. 4).
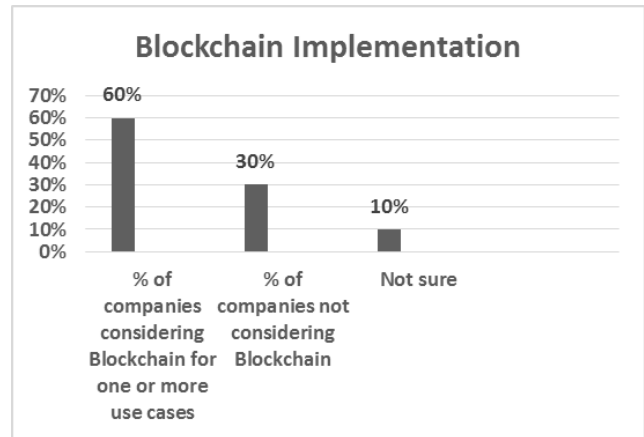

Fig. 4. Blockchain Implementation in Companies

2) Of these 90% are companies which have Finance and Accounting as a Shared Services function.
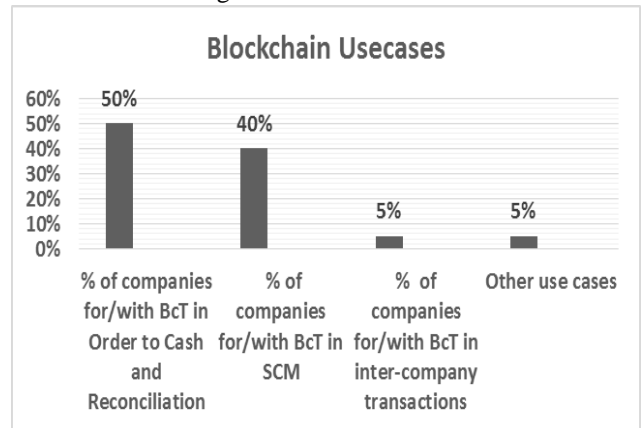

Fig.5. Blockchain use cases in Companies

3) 50% of the respondents said that the areas where they are considering implementing Blockchain are order to cash and reconciliation, as depicted below (Fig. 5).
4) 40% of the respondents said the SCM is the second function that they would be implementing Blockchain
5) Out of the Respondents 40% have SCM has a Shared service function.
6) At the same time, 50% of the respondents said that the whole complexity in terms of establishing and maintaining the Blockchain network is a barrier to its understanding and implementation.

7) A lack of proven implementation which has shown to withstand the various complexities and uncertainties of how businesses are run is a barrier to its implementation by 60 % of the respondents.

8) A majority of the respondents (close to 80%) felt that the most difficult part in implementation would be finding a viable group of vendor partners and common agreement on the contracts and rules of engagement.

9) 30% of the respondents said that the cost of implementation and ongoing maintenance is an impediment for Blockchain implementation.

10) Finance & Accounting and Supply Chain have emerged as the top use cases of Blockchain Technology in Shared Services.

X. DISCUSSION - RESULT ANALYSIS

Nearly 60% of the companies surveyed considered blockchain technology to be transformational in the way Information/data is stored, validated, processed and retrieved. They were looking at use cases within their business to pilot Blockchain technology. The finance Shared Services seem to be leading the implementation. The technology enables real time inter-business and intra-business platform where series of pre-cleared transactions or blocks are carried out in an open, transparent manner. For this reason, top candidates for the probable technology deployment were order to cash and reconciliation, closely followed by procure to pay, and employee recognition and reward systems.

The immature or nascent stage at which the technology is currently in could probably be the biggest limitation where the projected benefits could be unrealistic or inflated. The other limitation being the absence of fool-proof way to back ground check the participants before they enter the open/closed network. The other limitations as listed in the findings include the high cost involved for early adopters or early-movers; barrier to its understanding and implementation, given the whole complexity in terms of establishing and maintaining the Blockchain network; lack of proven case studies or proof of concepts with demonstrated implementation success; finding a viable group of vendor/external partners and finally, arriving at a common ground on the contracts and rules of engagement.

Consensus-based exchanges; reliable transaction trail and history that includes information on *what, who* and *when* of transactions is common across all participants' provenance, making transactions tamper-proof, instilling highest levels of trust and accountability. Highest levels of transactional security, transparency and accountability are assured with a potential to reduce complexities and costs of transactions [8] [9] Data integrity and transactional security are the greatest pluses of this technology as transactions are simultaneously recorded at multiple points rendering it impossible to alter retroactively. Broadly, two types of Blockchain implementation were mentioned during the survey and the following discussions with the Organizational leaders [10]:

A. **Permission-less Blockchain**: A Blockchain which is open and decentralized, and where a peer can join or leave the network at any time. There is no single central authority which monitors the activity within the network. In this type of network, the underlying content written by a writer(s) can be read by any peer without any explicit permission being required. There are some security protocols being developed that would prevent basic private information being available publicly.

B. **Permissioned Blockchain:** A blockchain where a peer can become a member and rights of use are assigned by a centralized Eyes entity. In this type of a network only authorized peers would be able to participate as a writer or as a reader. To further increase the network security and reliability, two parallel networks are established with one focusing on the 'write' function and the other focusing on the 'read' function which are then interconnected. This helps is in segregating the write vs. read traffic thereby increasing the security of the whole network.

XI. CONCLUSION

Finance & Accounting and Supply chain Management are the two use cases that clearly emanated from the empirical study as the use cases that are going to see maximum disruption and impact. The very nature of these two processes where the same data needs to be shared and processed across multiple entities and in some cases across nation boundaries make a compelling case for implementation for the two functions.Blockchain framework is disrupting Finance and Accounting F&A like no other. F&A function is based on twin concepts of trust and audit trail. To achieve these, data is replicated across multiple systems alongside establishing mechanisms to secure and access data. Errors and misinterpretations in data are commonplace, despite high costs incurred on securing and accessing data. Further, valuable time and effort of employees is spent in verifying and correcting the same, adding to indirect expenditure to the company. This is where Blockchain emerges as "the Single Source of Truth" as the data is available in its entirety to one and all with no tampering. Direct procurement is one of the high-impact areas in Supply chain, where procurement, invoicing, payment can be blockchain-enabled for quick transactions and automatic reconciliations.In addition to the above, Shared Service Centres, with their wealth of subject expertise, transactional data and processing capabilities should actively forge partnerships with business innovation hubs for the technology to be tested on their real business data and develop more use cases for Blockchain., Both business and technology professionals ought to look at Shared Services as a great place to experiment with blockchain. Building knowledge base and promoting collective learning about the probable applications of Blockchain technology opens up opportunities for Shared Services to offer new range of services or solve real business problems.

However, ensuring the standard of external participation in inter-organizational transactions ahead of transaction, is still a challenge that organizations are grappling with. To keep the unwarranted traffic that might clog blockchain at bay, concerted efforts towards developing a well-defined ecosystem with well laid out rules, regulation and standards by large global organizations grouped into forums or consortia should be looked at.

Humungous effort and investment in the technology notwithstanding, Blockchain might need some time to become fully functional inter-organizational decentralized shared platform. The future of Blockchain lies primarily on the extent of harnessing its ability to positively influence our lives through its innate qualities of efficiency, immutability, irreversibility and disintermediation. Despite skepticism from many a quarter, this nascent technology is clearly revolutionary. So long as it contributes to greater governance and trust in both the real economy and in our domestic lives, it is difficult not to see the case for its mass adoption.

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Retrieval Number: F2763037619/19©BEIESP
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