IST 621 Information Management and Technology
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Business value of technology

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IBM: Blockchain

Image source:- https://upload.wikimedia.org/wikipedia/commons/5/51/IBM_logo.svg

About IBM

International Business Machines Corporation (IBM) is an American multinational information technology company headquartered in Armonk, New York, United States. The company launched in 1911 as the Computing-Tabulating-Recording Company (CTR) now operates in over 170 countries. In 1924, the company got its first logo that had a shape of globe suggesting a worldwide expansion of the company computer business.

Image source: https://www.designhill.com/design-blog/wp-content/uploads/2014/03/1-min-1.jpg

Nicknamed Big Blue, IBM made its start in hardware and advanced in the same industry for decades as the top supplier of the mainframe computer systems. Over the time, the company turned its center from hardware to software and services. By the 2010s, fields such as cloud-based service and cognitive computing were the new focus of their business mix. In the latter technology segment, a cognitive system named IBM Watson became the company's high-visibility offering.

IBM, one of the world's largest employers, has constantly shifted its business mix by focusing on higher-value, more profitable markets. This includes spinning off printer manufacturer Lexmark in 1991 and selling off its personal computer (ThinkPad/ThinkCentre) and x86-based server businesses to Lenovo (2005 and 2014, respectively), and acquiring companies such as PwC Consulting (2002), SPSS (2009), and The Weather Company (2016).

IBM, while still a major IT player, has lost the dominance it enjoyed during the mainframe era. The company, as of October 2016, had seen 18 consecutive quarters of revenue declines amid its transition into new technologies and lines of business. IBM had a 2015 revenue of $81.7 billion compared with $106.9 billion in 2011.[IBM (International Business Machines)]

About Blockchain

As the IBM suggests 'Blockchain can do for business what the internet did for communication'. IBM Blockchain is a public cloud service that customers can use to build secure blockchain networks. The blockchain is a notion that came into the public consciousness around 2008 as a way to track bitcoin digital-currency transactions. At its core blockchain is a transparent and tamper-proof digital ledger. Just as it could track bitcoin's activity in a secure and transparent fashion, it's capable of tracking other types of data in private blockchain networks. This could allow any private company or government agency to set up a trusted network, which would allow the members to share information freely, knowing that only the members could see it, and the information couldn't be altered once it's been entered. Jerry Cuomo, VP of blockchain technology at IBM, says his company is offering a set of cloud services to help customers create, deploy and manage blockchain networks. This fits in with IBM's broader strategy to offer a wide range of cloud services to its customers.[Miller, R. (2016).] Let's take a look at how IBM visually explains blockchain:

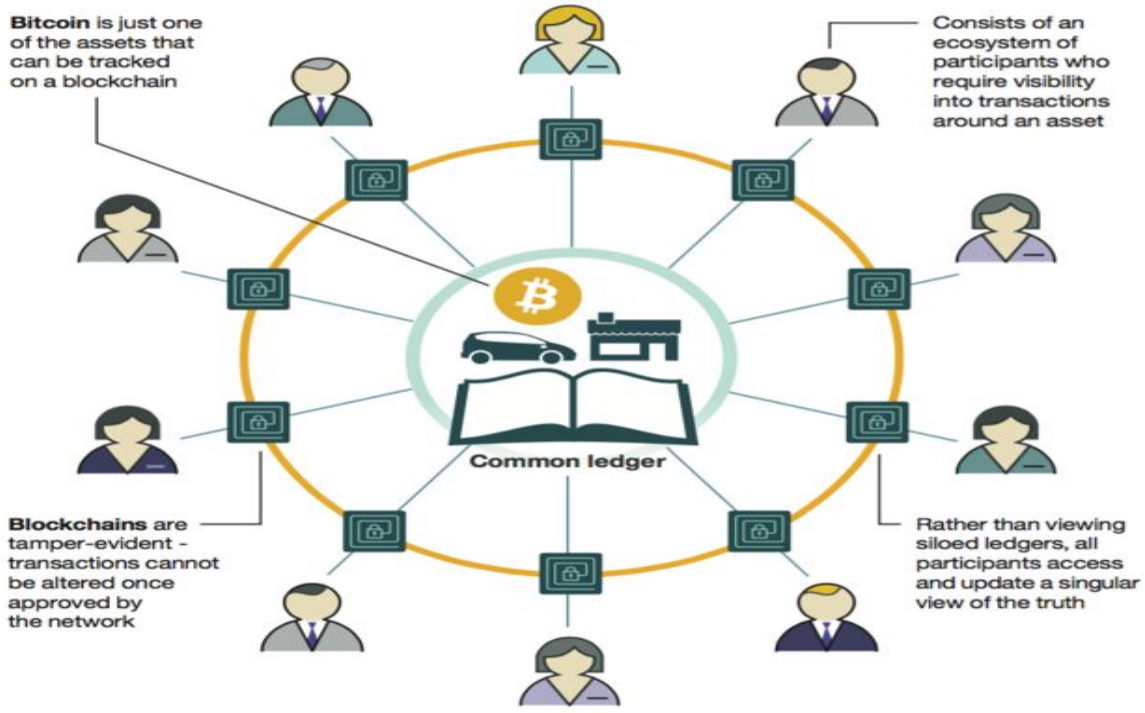

Image Source:
https://static.seekingalpha.com/uploads/2017/8/22/2312271-15034096193349986_origin.png

Chief Information Officer's pitch to the business leaders

CIO (Chief Information Officer) find digital transformation often demands not only technological change but also a re-imagination of roles, skills and culture [The Economist Intelligence Unit Limited, 2018]. CIO play a crucial role to pave the way for incoming digital transformation keeping in regard the people involved in making the change happen and people experiencing the change, the end users. The cloud, blockchain, artificial intelligence technologies are the emerging ones in the market and products and services based on it will be very beneficial. Everyday the number of transactions and interaction between two interfaces is increasing at a very rapid rate. All these cost value in terms of time, effort, data, goods and money. Thus, each successful transaction becomes even more valuable. Successful transactions need to be fast, precise and easily agreed on by parties participating in the transaction. Blockchain for business provides a way to execute many more of these transactions — a much better way.

A **blockchain**, is a growing list of records, called blocks, which are linked using cryptography. Thus, the blockchain platform will help to reimagine the industries by providing a ease of use in accessing blockchain technologies, reduction in development costs and time, scalable and secure environment. Clients can develop, govern, and operate this technology through one single platform. For instance, in food industry considering picking the food from farm, processing and distributing it can be traced through blockchain which will reduce the manual effort of days to minutes will improve the efficiency and lead to higher risk management steps [IBM Blockchain Platform, n.d.]. Its implementation, infrastructure maintenance, getting the right set of skilled people trained to work on it all includes a huge amount of investment which all companies cannot afford. On the other hand, if this feature is provided as a service with monthly charges depending on usage will have huge monetary returns.

Impact of IBM Blockchain platform on the four components of information systems

People-
Blockchain technology will have a direct and indirect impact on people. Blockchain basically will be connecting those who do not have the liberty or knowledge to manage assets, utilize them in a better way and in turn make better decisions. More people will be hired, trained to use and implement this technology in the company. Huge user base, all clients will be targeted to use this technology and also provide feedback so as to improve it further. Leadership is affected as well as they are responsible to handle a disruptive technology carefully with a vision and mission to utilize it in a successful manner.

Process-

Blockchain will help reduce the cost and complexity involved in various interactions happening in all business sectors like the food industry, healthcare, banking, manufacturing, supply chain management, etc. At its essence, blockchain is a distributed ledger shared via a peer-to-peer network. Each participant has a copy of the ledger's data, and additions or changes to the chain are propagated throughout the network—but only after the parties in the transaction agree on it. This approach enables participants to dispense with a great deal of reviewing and verifying that adds to the cost and time it takes to complete transactions [Hamm S., 2017]. The whole objective behind transforming the traditional blockchain approach and designing IBM Blockchain Hyperledger Fabric is to make it more scalable, efficient and modular. This follows execute-order-validate architecture unlike the usual order-execute architecture [Vokulic M., 2018]. Blockchain creates a shared system of record among business network members, eliminating the need to reconcile disparate ledgers [IBM blockchain, n.d.].

Technology-
Blockchain technology is a way to structure data without the need for a central authority. A blockchain is a distributed database that hosts a continuously growing number of records. The database stores records in blocks rather than combining them in a single file. IBM Blockchain platform is powered by Linux Foundation's open source Hyperledger technology. Blockchain is written in GoLand, Java for UI Apps / JSON for interchange. It will also be consuming technologies like cloud and artificial intelligence. It is implemented on three layer infrastructure - firewalls; blockchain - API's; permissions & endorsement policies; node management. UI / App layer controls. It can be deployed anywhere be it local systems or cloud with firewalls and provide seamless access.

Leadership-
For implementing a new technology, all the leaders at all levels like team leaders, managers, board members play a crucial role. They act as intermediaries in such cases and maneuver the way between bringing in the right set of people, training people, managing funds, motivate employees. In addition to al this, leaders of a company are needed to keep the IT and technical skills up to date in the company and thus, focusing on every upcoming, potentially beneficial new technologies, investing in training people, involved in design thinking aspects as well. All this done in the right way and in the right amount will only lead to the success of an innovative idea. Identification of areas where such a new and developing technology can be most impactful is also a major responsibility. The three areas where blockchain could be valuable: Financial services, shipping, and healthcare.

Risks in implementing new technology

The blockchain isn't a single technology. Rather it's an architecture that allows disparate users to make transactions and then creates an unchangeable, secure record of those transactions. While it has great potential, blockchain technology is in its infancy and CIOs and their business counterparts should expect setbacks in deploying the technology, including the real possibility of serious bugs in the software used atop blockchain to create business-specific applications – for

example, a mobile payments system [Mearian L., 2018]. The whole platform is a complex distributed system and its performance will be depending on many parameters. Cyber risks and cloud security also act as threats to this technology. The huge risk is also involved in currently identifying the appropriate need of end users. Or another case can be what is the technology is disruptive but, easy to adapt, code and implement that other competitors can bypass your growth. Reacting towards a consumer's demands and needs is important but, constantly innovating, researching and growing is also required.

Business Impact: Why should a company invest in this technology

The current trends of blockchain being used in bitcoins are not very encouraging but, blockchain has the potential of having a huge impact on each domain of the society. The growing consensus among business leaders and entrepreneurs: The future of blockchain technology will be about a lot more than Bitcoin. It will impact every major area of business from accounting to operations, and there's evidence the revolution has begun. The technology as strong as blockchain in addition to a great business model will act as a value proposition here. This is an opportunity to leverage data, technology, and software all together to save costs and increase efficiency and effectiveness.

Considering an example to understand the application of blockchain and its importance. Imagine supply chains where blockchain is put to work. An aircraft manufacturer, for example, might create a blockchain-based system for holistically managing all of its relationships with suppliers of parts and components. All of the suppliers will share the exact same information about a new aircraft model–every step in the process of planning, designing, assembling, delivering and maintaining it. At the same time, the manufacturer will use other blockchain-based systems for managing the financial relationships and transactions connected to each step [Hamm S., 2017]. This instance nails the use of blockchain technology in an existing business model to save time and money and maintain a record for each interaction happening in the system.

To be excelling in the industry, it is mandatory to pick the right technology and being innovative simultaneously. Currently, distributed and decentralized is the future of every infrastructure where data is involved, which is everywhere.

The innovation on blockchain will help to create a pool of trusted data as data is shared in the form of an immutable block which can not be altered by anybody, not even the administrator in the system. This will help gather data in a scalable manner in every type of industry like finance, automobile, supply chain etc. This pool of data will help further in analytics and can be used for responsibly sharing information for the greater good in business.

Lessons learned

Software and hardware are designed to improve user flexibility for the system or to restrict it, to increase the operator decision making or constrain it, to automate all the manual functions or to enable clients to decide what to manually and what to automate. things get better with enhancements and upgrades. As a pragmatic circumstance, it is important for purchasers and

vendors, and in-house development and design personnel, to closely diagnose and consider in what aspect the technology change will influence people's work and their lives.

The study suggests that the quality of an organization's technology planning and implementation go a long way toward deciding the achievement or failure of a technology change. Stated simply, a company that has a solid innovation strategy and a user-guided implementation policy tend to have more success in these attempts than contrarily. The former requires a practical business strategy, management backing for innovation, and a remarkable degree of sophistication among top managers regarding new technology. The latter requires customer engagement in development and deployment, decent enough training and technical assistance, and lots of quality communication.

Skills of the CIO

The Chief Information Officer of IBM's Blockchain must possess certain soft skills to drive the business to a height that it deserves. The Blockchain is a huge step for IBM, despite all the initial talks about it being IBM's big hype, the IBM still continued with this bold move. The success of the IBM's blockchain completely rests in the hands of its clients, whether they will willfully acquire the technology in their business or not. The CIO must have excellent communication skills to make the clients realize how Blockchain can help transform their business and gain profits in an easier way. For the CIO, it would take a serious amount of good convincing skills and soft skills to describe the complete system to the clients and persuade them to use the system.

Technical knowledge in great depth is not required from the Chief Information Officer. Of course, she/he must know the basics of the system well, but that would be more like a stranger’s view of the system. It is critical for the Chief Information Officer to possess analytical skills that would help the business decisions regarding how the information collected can be used to generate a knowledge base and hence make profitable business decisions.

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