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BLOCK CHAIN FOR BUSINESS OPERATIONS: APPLICATIONS, ISSUES, POSSIBILITIES

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Abstract:
Within the context of Industry 5.0, the block chain technology stands out as one of the innovations that is both one of the most important and cutting-edge breakthroughs. A great deal of interest has been created as a result of the fact that block chain technology has the potential to become a powerful instrument for the innovation of business procedures. It is necessary to tie it to other components of the Business Process Management (BPM) system so that it may offer specialized functionality relevant to the applications.The data was collected from 596 respondents from selected business operations on block chain technology used in India using the convenience sampling technique. A standardized questionnaire was used as a data collection instrument for the study. The block chain technology, which is well-known for being open, decentralized, and resistant to fraud, has a wide variety of applications. Some of these applications include: To make the digital ecosystem more accessible to users, several sectors are beginning to use block chain technology. Block chain technology is also being researched by academic institutions. The purpose of this investigation is to get a deeper comprehension of the potential applications of block chain technology in business administration. This is performed by conducting a comprehensive review of the relevant literature in order to investigate its use in a variety of important business processes. It is crucial to first recognize significant components of both block chain technology and business operations in order to correctly integrate them into business processes. This is because it is essential to properly integrate block chain technology into company operations. The use of uneven confirmation settlement, which depends largely on the application of the consensus protocol, dramatically increases the bar for the operations of business process. When you are engaged in activities that need a prompt reaction, it is essential to keep this in mind. In addition to this, it investigates the primary difficulties that come with using block chain technology as well as the advantages that it provides for the administration of corporations. As a direct consequence of this

transformation, the whole of the business process will benefit from increased levels of security, traceability, and visibility, as well as a decrease in costs.

Keywords: Block chain, Business Process Management (BPM), Industry 5.0, Digital Ecosystem

1. Introduction

Transactions may be sent to that site by anybody who has access to the Internet, and anyone can join up to become a validator for the site. They are established with the intention of being entirely decentralized, and they conduct themselves in an honest and open manner in all of their dealings. They are very resistant to censorship and very difficult to remove from the internet once they have been posted there. The public block chains used by Bitcoin and Ethereum are currently two of the ones that have garnered the most attention and are considered to be among the most significant [1]. The primary difference between a public block chain and a private block chain is the level of access that users have to the distributed ledger system (block chain). A private block chain is characterized by its closed network, which restricts participation to only those individuals or organizations who have been granted permission in advance. A "Permissioned Block chain" is another name for this kind of block chain. This moniker comes from the fact that it grants users of the network certain privileges in exchange for imposing certain constraints on those users. In contrast to private block chains, which provide ownership of the network to a single organization or individual, public block chains give ownership of the network to a community of users who have been authenticated. In addition, it is possible to classify these block chains as belonging to the semi-decentralized category. Enterprise adoption, in which several companies join together to deploy the technology in an attempt to improve business operations in a synchronized manner, is sometimes associated with block chain consortiums. In addition to Ethereum and EOS, additional block chains like Quorum and Corda are utilized by consortiums [2].

2. Review of literature

A description of the procedures that are utilized to produce and transfer value, together with the expenditures and profits that are associated with those activities, constitute a business model. Because the procedures that the firm uses to produce value, distribute value, and collect value have all been updated, the organization's business model is now brand new [5]. The process of value accumulation is influenced by a wide variety of factors, including but not limited to resources, capacities, technological breakthroughs, cooperative networks, and activities [6].

These resources are the sources of competitive advantage that are necessary for the company to produce a product line that will fulfil the expectations that have been set by customers. The value delivery function decides how to provide solutions to customers and provides information on those decisions. It entails modelling the product offerings of a firm, classifying markets and customers, and deciding how to reach and advertise to those groups of people [7]. Alterations to business models could be required either in order to better serve already established markets or in order to

break into new markets. The operations that are carried out with the intention of securing the long-term expansion of the business are referred to as "value capture" activities. Businesses may be able to reimagine their methods of value capture by making adjustments to their cost structures and the strategies they use to generate money [8].

Aspects of marketing management include the identification of target markets, the acquisition, retention, and recruitment of customers, and the production, supply, and communication of better customer value. All of these objectives may be accomplished by providing higher customer value. This objective might be accomplished by a method referred to as target market segmentation [9]. For this reason, exercising control over the marketing function requires selecting the optimal target market and growing market share by increasing the value offered to customers. According to the research that is currently being done on the topic and published in academic journals, using block chain technology might potentially be beneficial for a variety of facets of marketing management [10]. By personalizing promotional aspects like advertising and bypassing middlemen, it is feasible to lower expenditures and earn savings. It's possible that ad management will become more targeted at certain target audiences, and that the process of making sales will be automated, publicly recorded, and done in real time [11].

Technology enables disintermediation because it accelerates and improves the efficiency of the distribution of marketing materials, which in turn enables disintermediation. Digital and email marketing would be more effective as a component of marketing communications, and they would be less susceptible to fraud. The production of value, the delivery of value, and the capture of value may all be affected by the introduction of new activities, a new structure, and/or a new kind of governance for company operations. All of these different aspects have the potential to have an effect on one another. It is possible that the online sharing of new information is also meant to be understood as being under the umbrella term "activities," which also includes the provision of new services tied to digital commerce.

The framework that is now used for digital transactions may be seen as either a new manner of bringing parties together or as a different way of conducting transactions. Both interpretations are possible. Governance refers to the process by which the power to guide the flow of transactions and the provision of services emerges over the course of time. This process takes place over a period of time. Four different value driversnovelty, lock-in, complementarity, and efficiency have an impact on an organization's operational effectiveness. These alterations may result in an improvement in the effectiveness of the operations [12].

3. Objectives

- To investigate the source of revenue on Blockchain-2022.
- To performance Forecasting Source of revenue on Blockchain-2025.
- To discuss top 10 Blockchain Technology company growth.
- To understand the source of revenue (Block chain)in future.

- To estimate the Trust of block chain significantly influences the behavioral desire to implement block chain.

4. Research Methodology

The purpose of this research is to get an understanding of the many applications that block chain technology may have in the administration of businesses. It intends to do research on applications in a wide range of significant business processes. The innovation has both positive and negative aspects, and individuals have a natural tendency to oppose change. Because of this, the authors would want to bring attention to the challenges that come with using block chain technology.

- ***Sampling Design-***For the study, the descriptive research design was adopted. As the study involves surveying various business operations on block chain technology in India, the Correlation research design was adopted.
- ***Sampling Unit -*** The goal of the prevailing work is to find out Forecasting Source of revenue on Blockchain 2025.
- ***Sampling Techniques -***In the prevailing observation, stratified sampling was used for the selection of the sample.
- ***Sample Size -*** The sample size of 596Senior Executives was determined by using a sample size. The inputs were gathered by a structured survey and the analysis was carried out based on the response from the respondents.
- ***Tool for Data Collection-*** Senior Executives from around the world.
- **Tools Used For Data Analysis**

1. Analysis of Variance
2. Correlation Analysis
3. Reliabilitystatistics
4. Validity statistics

Hypothesis

- **H0:**There is no association between Source of revenue on Blockchain-2022 (Billions USD) and Forecasting Source of revenue on Blockchain-2025 (Billions USD)
- **H0:**There is no significant difference between the groups of the first factor Source of revenue on Blockchain-2022 (Billions USD) and Forecasting Source of revenue on Blockchain-2025 (Billions USD) (measurement repetition) in relation to the dependent variable.
- **H0:**There is no significant difference between the groups of the second factor Category in relation to the dependent variable.
- **H0:**There is no interaction effect between the factor Source of revenue on Blockchain-2022 (Billions USD) and Forecasting Source of revenue on Blockchain-2025 (Billions USD) and Category.

Table 1:Top 10 Blockchain Technology

Category	Top 10 Blockchain Technology
Digital currency	33.2%
Data access and sharing	32.5%
Data reconciliation	31.0%
Identity protection	31.2%
Payments	30.3%
Track-and-trace	27.5%
Asset protection	27.2%
Asset transfer	25.5%
Certification	23.4%
Record reconciliation	23.5%

Interpretation: The adoption of blockchain technology is expected to eventually become widespread, as indicated by 88 percent of senior executives. According to the results of a survey, 39% of senior executives from all around the world said that their companies had already used blockchain technology. More than one hundred million dollars in sales were made by forty-one percent of these companies. The greatest acceptance of blockchain technology as a primary strategic objective may be found in China, where seventy percent of respondents agreed that blockchain is one of their top five objectives. In the meanwhile, 46% of businesses had revenues that were more than $1 billion. Digital currency accounts for 33.2% of the most popular use cases for blockchain technology among businesses worldwide, followed by data access and sharing (32.5%) and data reconciliation (31.0%). In comparison, just 42% of businesses in Germany consider it a priority in their operations. According to the findings of another poll, 37% of IT executives are actively searching for blockchain security solutions. Protection of identification (31.2% of use cases), financial transactions (30.3%), and tracking and monitoring (27.5% of use cases) all fall under this category. While sixty percent of companies said that they planned to invest five million dollars or more in blockchain technology in the next year, fifty percent of IT executives claimed that they had no interest in developing blockchain security solutions. China is the country that stands to benefit the most from the widespread use of blockchain technology. By the year 2030, it is anticipated that China's gross domestic product would have increased by 1.7%, or $440.4 billion. Furthermore, researchers anticipate that by the end of the next decade, between 10 and 15 percent of the world's infrastructure will have adopted blockchain technology. It is anticipated that the United States will gain $407.2 billion, Germany will gain $95.3 billion, and the United Kingdom will gain $72.2 billion. Furthermore, economists anticipate that between 10

and 15 percent of the world's infrastructure will make use of blockchain technology within the next decade.

Table 2:Forecasting ofBlockchainrevenue

Category	Source of revenue on Blockchain-2022 (Billions USD)	Forecasting Source of revenue on Blockchain-2025 (Billions USD)
United States	4.21	4.81
Western Europe	2.92	3.23
Others	1.93	2.14
China	1.44	1.75
Asia Pacific and Japan	0.75	0.92
Middle East and Africa	0.57	0.73

Interpretation: In 2020, the industry with the largest blockchain spend was banking at 29.7%. Other big spenders on blockchain technology are process manufacturing (11.4%), discrete manufacturing (10.9%), professional services (6.6%), and retail (6%). The professional services industry is expected to have the fastest growth in blockchain spending, at a CAGR of 54%. This is followed by healthcare (43.9%) and state and local government (48.2%). The US is projected to spend $4.21 billion in 2022, which will make it the largest regional spender on blockchain solution. The Source of revenue are Western Europe ($2.92 billion), the People's Republic of China ($1.44 billion), Asia Pacific and Japan, ($0.75 billion), Middle East and Africa ($0.57 billion), and others ($1.93 billion). The Forecasting Source of revenue are US ($4.81 billion), Western Europe ($3.23billion), the People's Republic of China ($1.75 billion), Asia Pacific and Japan, ($0.92 billion), Middle East and Africa ($0.73 billion), and others ($2.14 billion). Blockchain spend from the automotive industry will increase from $849.5 million in 2019 to $14.731 billion by 2025.

Table 3: Block chain Spending Worldwide in 2022

Top Block chainSpendingWorldwide	Percentage
Banking	29.70%
Process Manufacturing	11.40%
Discrete Manufacturing	10.90%
Professional Services	6.60%

Retail	6.00%

Chart 1: Top Block chain Spenders Worldwide

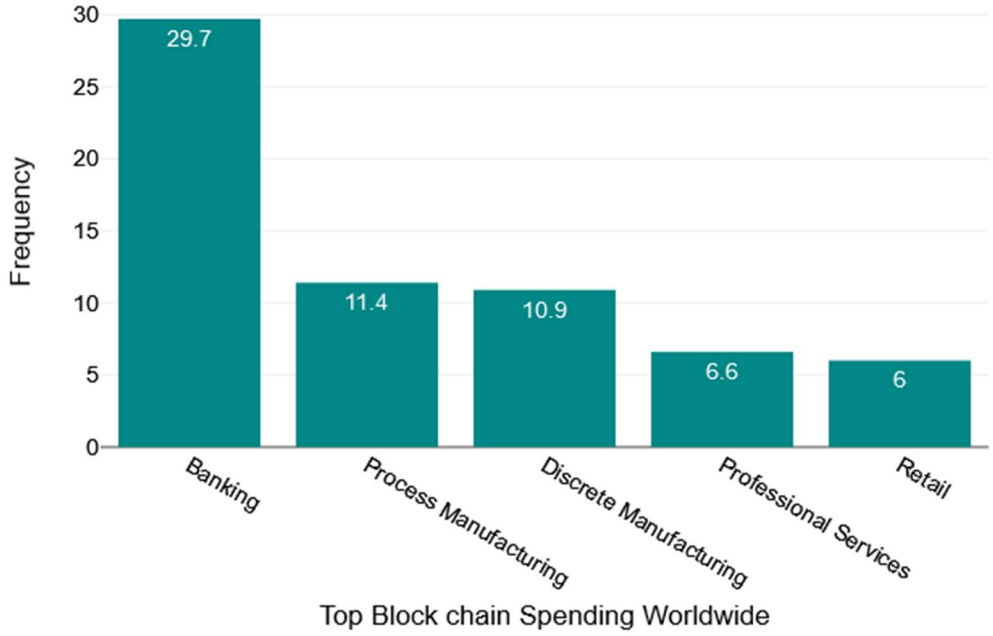


Table 4:Correlation

		Category	Source of revenue on Blockchain-2022 (Billions USD)	Forecasting Source of revenue on Blockchain-2025 (Billions USD)
Category	**Correlation**	1	-0.97	-0.96
	p (2-tailed)		.001	.002
Source of revenue on Blockchain-2022 (Billions USD)	**Correlation**	-0.97	1	1
	p (2-tailed)	.001		<.001
Forecasting Source of revenue on Blockchain-2025 (Billions USD)	**Correlation**	-0.96	1	1
	p (2-tailed)	.002	<.001	

Interpretation: The estimated significance value is greater than 0.05 for all of the items meaning the null hypothesis is rejected. Therefore there is no significant difference in the factor of Source of revenue on Blockchain-2022 and Forecasting Source of revenue on Blockchain-2025.

5. Present applications of block chain in business management

Innovation and the growth of technological competence have actual costs and rewards. The process of transformation is also met with opposition. Therefore, the authors would want to concentrate on the difficulties associated with implementing a block chain in order to advance the discussion. A relatively new technology, the block chain, is often discussed but not necessarily well understood. It is OK for someone to not fully understand the complexities of the technology if they choose not to work in an industry that heavily relies on block chain technology or continue in the line of work that they have previously established for themselves. On the other hand, if company owners have a basic grasp of what block chain technology is and how it can change the world of commerce, they might be able to better prepare themselves for the future.Let's explore how block chain technology may be used in the corporate sector to simplify and secure different processes in light of the numerous advantages it has to offer.

6. Challenges associated with block chain application in business

In addition to its use in business operations, potentials, and the problems that lie ahead, another subject that is being investigated is the future of both the researchers and the corporation. Businesses that are involved in the block chain business have difficulties when trying to manage a large number of simultaneous users. Multiple complicated algorithms are required for block chain technology in order for it to successfully perform a single transaction. As of the end of October 2017, customers from all around the globe have registered a total of 11.7 million accounts with Coinbase. The average number of transactions has significantly increased as a result of the substantial development in the number of users who are used to using the system. Since there were a greater number of users, there were also a greater number of computers reading from and contributing to the network. Due to the intricacy of the technology, it may be difficult for a non-technical person to understand and comprehend the benefits of block chain. Before use this ground-breaking technology, one must first familiarize themselves with its distributed ledger and encryption principles via extensive reading. When compared to the costs that are involved with block chain technology, the fact that financial institutions are able to provide secure payment gateways and other services at prices that are more affordable is another barrier to the broad use of block chain technology.

7. Opportunities in Block chain

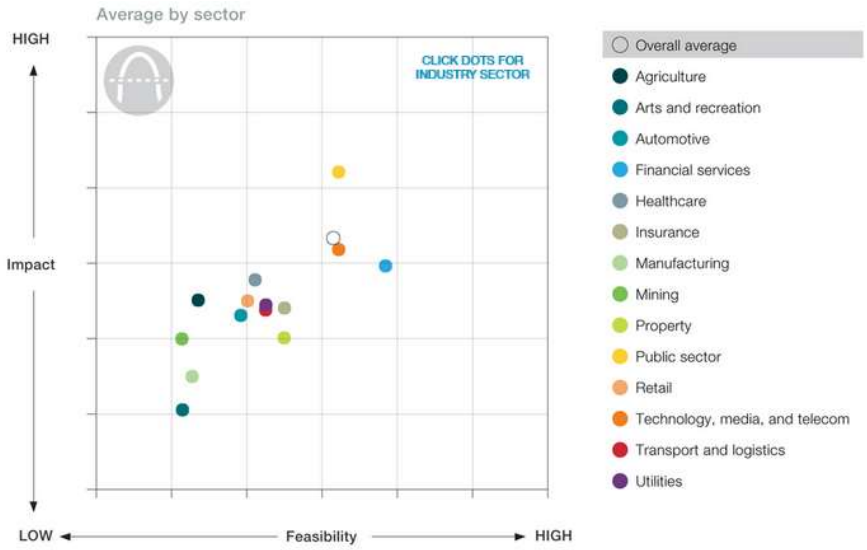
There is an increasing need for block chain developers that can provide assistance to companies that are studying block chain technology. Considering how hungry people are to benefit from all

that block chain technology can provide, working in block chain development could be the most marketable employment choice available today. Due to the high status that these individuals occupy, it is imperative that they pay meticulous attention to every facet of their work. Block chain developers are computer programmers who create apps using the block chain technology. They often have a great deal of experience working with C++, Python, and Javascript prior to becoming Block chain engineers.The architect of the block chain solution is the one who is responsible for designing, assigning, and integrating the several components of the block chain solution with the experts on the team who specialize in development, network administration, user experience design, and IT operations.This individual is in charge of developing relationships between Block chain projects and specialists whose jobs consist of creating solutions using Block chain technology. Block chain project managers are expected to exhibit the same skills as traditional project managers working in the cloud. They also need to be technically savvy in order to have a complete understanding of the technology. When working with non-technical personnel, providing useful updates, or seeking to get resources from higher authorities, having excellent communication skills is an essential quality to possess since you will need to use them in all of these situations.

8. Potentials

A survey conducted by the World Economic Forum predicted that by 2027, block chain technology would be used to store 10% of the global GDP. Several nations have published papers on the potential repercussions of block chain technology, and in only the last two years there have been over 500,000 new publications on the subject, in addition to 3.7 million search results on Google connected to block chain technology.Perhaps most indicative is the fact that substantial investments are being made in block chain technology. As a block chain-specific investment model, initial coin offers (ICOs), also known as the sale of cryptocurrency tokens inside a new enterprise, have skyrocketed to reach $5 billion in total value. Major investments are also being made in block chain technology by industry-leading information technology businesses.

Figure 1: Block chain Potentials by industrial sector



9. Features Of Block chainin Business Management

In order to provide a response to these three study subjects, the following methodologies have been used. In order to achieve the objectives of this study, academic material that had been subjected to a review process by peers and that addressed the use of block chain technology in business administration was searched for and mined from academic databases such as Scopus and Google Scholar. During the course of doing the search, the terms "Block chain in Business Management," "Block chain in Marketing," "Block chain in Human Resource," "Block chain in Manufacturing and Operations," and "Block chain in Finance" were all used. A comprehensive review of previous research in all aspects of company management, including but not limited to marketing management, operations and supply chain management, financial management, and human resource management, is carried out as part of this study.

10. Conclusion

It is becoming more apparent that the block chain technology has a tremendous potential to revolutionize the operations of companies. Because of the characteristics of block chain, such as its permanency, validity, auditability, and intermediaries, contemporary business practises have the potential to benefit significantly from significant enhancements in the areas of digitalization, automation, and transparency. The resultant model was then evaluated using structural equation modeling with partial least squares (PLS-SEM). This combination was developed to solve the problems of varying confirmation settlement periods and the possibility of bias in the selection of consensus nodes. It is economically possible for tiny transactions, and it has minimal marginal costs, if the block chain is in place to detect and monitor processes. In the event of a catastrophe involving food contamination, the internet of things will make it straightforward to identify the origin of the contamination and remove just the products that have been tainted. It will eliminate

the time-consuming and difficult process of recordkeeping on paper by providing digitally signed contracts in addition to protected storage and communication. The immutability of data may make audits easier, which might ultimately lead to a reduction in the cost of regulatory complianceIn order to maintain quality control, devices connected to the Internet of Things may gather data on the temperature, humidity, motion, and chemical composition of various pieces of machinery. It is possible that after then, consumers, manufacturers, and distributors will have access to this data. The network is made more dependable by the implementation of a distributed block chain that includes permissions and conducts identity verification. Cost reduction is one of the supply chain key performance indicators that is improved by block chain technology as a result of its various benefits and the many use cases it enables for operations management. Increased dependability and reliability, as well as decreased potential danger.

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