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From the Desk of Chairman, Publication Committee

Dear Fellow Members,

Greetings.

As you would see CSI Communications (CSIC) is coming out regularly every month with a variety of themes and articles under the guidance of Dr. S. S. Agawal and Dr Ritika Wason. Shortly we are going to restart the Journal of Computing. Dr R. R Deshmukh and Dr Brajo Kishore Misra two eminent academicians are at it. In the past also , for this journal, we have had eminent professors as Editors/Editor-in Chiefs. The Publication committee once again invites quality articles from academicians/scientists and research scholars for publication of their original articles. Please send your articles to the President/ any the Chief Editors/ Editors/Me.

Some of the learned Societies are bringing out monograph publications on topics of general interest/importance and – each monograph does not exceed 15 printed pages on average. We feel that CSI should also work out in this direction and bring out one per year, under the auspices of CSI, to be presented at the time of Annual Convention. The author/authors will be suitably recognized. The author should be an expert in the specialized field and could be a foreigner as well. For example, AI is found to help in Seismology!. Can we bring out a monograph on this, emphasizing on AI?. This will be on record. Similarly on Block Chain Analysis, Big Data Analytics etc. This is just a loud thinking.

Your suggestions are most welcome.

With best compliments,

Dr. D. D. Sarma
Chief Scientist (R), CSIR-NGRI, Hyderabad.

CSI COMMUNICATIONS

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Editorial

Prof. (Dr.) S. S. Agrawal
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Dear Readers

"Whereas most technologies tend to automate workers on the periphery doing menial tasks, block chains automate away the centre. Instead of putting the taxi driver out of a job, block chain puts Uber out of a job and lets the taxi drivers work with the customer directly." - Vitalik Buterin

The above quote by Vitalik Buterin, co-founder Ethereum and Bitcoin Magazine does not just indicate a new phenomenon, but it highlights a bold, new entrepreneurial technology revolutionizing how our businesses function, termed "Blockchain." Many over the globe agree to the fact that blockchain holds enough potential to disrupt the banking as well as financial sector. Replacing our conventional modes and means of doing business and handling finances, Blockchain is emerging as the new frontier capable of bringing transparency and efficiency in the existing supply chains and making them proactive as well as predictive. After exploring the domain of Digital Learning in July-2019 issue, we have dedicated this issue to Blockchain and its impact in varied domains.

From this issue onwards, we are starting a series entitled "Titbits from the History of Computing-I ". This shall contain short articles on the history of computing by Prof. V. Rajaraman, Fellow CSI, initiator of the first academic programme in Computer Science in India as well as recipient of many prestigious honors like Padma Bhushan, Shanti Swarup Bhatnagar Prize etc. Currently he is Honorary Professor in Supercomputer Education & Research Centre, Indian Institute of Science, Bangalore.In this month's article, "CP/M and Gary Kildall," sir discusses the case how Gary Kildall developer of first operating system for microcomputers lost the game to Microsoft.

The basics of blockchain have been effectively explained in the first cover story entitled "Basics of Blockchain" by Aparna K. With relatable examples they explain the concept, applications and trends in blockchain. The next story entitled, "Blockchain Technology: Basics, Architecture, Use Cases and Platforms" by S. Balakrishnan and J. Janet further clarifies the fundamentals of Blockchain while highlighting some of its notable use cases. The hidden potential of Blockchain has further been elaborated in "Blockchain: An Overview" by A.R. Revathi and Shwettha M.

The technical trends section showcases the business transformation initiated by blockchain. The first article "Business Transformation through Blockchain- A Technical Approach" by Anitha P. and Srimathi C delves into the specifics of Blockchain when applied to business. The next article, "Smart City: Better Place for Better Tomorrow" by Anupama Pankaj, Sanjay, Fidelis and Dinesh discusses how Smart Cities are enabling better life through effective management of all day to day utilities. The next article, "Blockchain: An Evolving Business Technology" by Amrita Tamang, Vijayakumar S, Samiksha Shukla elaborates blockchain with respect to business. The research front section first discusses a novel approach for software development. The first article "SOLF-A Software Development Life Cycle based on GOLF" by CRS Kumar and Soubhagya Roul introduces the SOLF approach to software development. The next article, "Worm Signature Generation using Honeypot Technology" by Sourav Kundu, Roushan Kumar, Ankita Tewari and Avijit Mondal highlights the new technology for malicious content detection. The last article, "Role of Blockchain in Identity Management– Future Technology for Secure Information System" by Archana Sasi intrigues how blockchain can provide a secure solution for identity management.

The issue also reports important activities, events, collaborations done by various institutions and chapters of CSI and CSI congratulates them for conducting such activities. Various student branch inaugurations and activities have also been highlighted. We would also like to congratulate the state student coordinators for the year 2019-20 and all other award winners who have been recognised in this issue. The issue also contains calls for various upcoming conferences and events like CSI annual convention CSI20, 2nd National Cyber Security Summit etc.

We are extremely thankful to all our contributors as well as readers. Original, plagiarism-free, unpublished articles are solicited throughout the year from CSI members as well as non-members. Our sincere gratitude to the CSI publication committee members, editorial board members, authors and reviewers for their great contribution and support in realising this issue.

Our special thanks to Prof. A. K. Nayak, President, CSI for his constant encouragement, support and guidance in publication of July, 2019 issue.

We look forward to receive constructive feedback and suggestions from our esteemed members and readers at csic@csi-india.org

With kind regards,

Prof. (Dr.) S. S. Agrawal, Chief Editor
Director General KIIT, Former Emeritus Scientist CSIR,
Advisor CDAC, Noida

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Associate Professor, BVICAM, New Delhi

President's Desk

From : President, Computer Society of India
Date : 01 August, 2019
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Blockchain is the distributed database existing on several computers at the same time. It is constantly growing as new sets of recordings, or 'blocks', are added to it. Each block contains a timestamp as well a link to the previous block, so they actually form a chain. The database may not be managed by any particular body; instead, everyone in the network gets a copy of the whole database. Old blocks are preserved forever and new blocks are generally added to the ledger irreversibly, making it impossible to manipulate by faking documents, transactions and other information. All blocks are encrypted in a special way, so everyone can have access to all the information but only a user who owns a particular cryptographic key is able to add a new record to a particular chain. As long as you remain the only person who knows the key, any one can not manipulate your transactions. In fact blockchain is a breakthrough technology which is expected to alter most industries in the coming years. Whether you work in the financial world, healthcare or any other sector, you may probably face the effect yourself soon.

The theme of this issue of CSI communication Blockchain is of great importance as it will focus on technology innovation and trend setting initiatives in the concerned area. The Industry will experience the contribution of this great technology in the current decade but the benefits of the same should be completely and uniformly understood and utilized by the users & the society.

CSI Annual Convention at Bhubaneswar

I have the pleasure to inform you that the CSI Annual Convention shall be organised at Bhubaneswar, Odisha by CSI Bhubaneswar Chapter for which the dedicated & devoted Members of the Chapter are making their best efforts to make the convention excellent & scale of height. I congratulate our IPP Mr. Sanjay Mohapatra for his effective coordination with Mr Manas Patnaik, Chair DIV-I, CSI & Convener, Er. N.K. Behera, RVP-IV & Co-Convener & Chairmen of different Committees for their pioneer effort to bring this great event in to action. I also express my sincere thanks to the Authorities of KIIT university for providing the venue & other support for this great cause. I request all the concerned for their kind presence for enhancing the strength, efficiency, visibility, productivity & effectivity of CSI.

Inauguration of New Student Branches

Expansion of CSI continues all over the country by establishing more & more Chapters & Student Branches. The inauguration & establishment of new Student Branches at Kongu Engineering College Perundurai Erode & Kongunadu College of Engineering & Technology, Tholurpatti Tamilnadu has set the milestone for the clear indication that more & more academic Institutions & students are extending their faith & confidence in CSI by enrolling themselves under CSI domain. The society achieved the substantial growth in Student Membership enrolment in the current year comparison to the previous year. I take this opportunity to congratulate the Management & Student Members of respective student branches for their great efforts.

Chapter & Student Branch Activities

As per the usual practice in every month, many of our Chapters & Student Branches with their dynamic & vibrant efforts have conducted quality activities. Activities conducted by Chennai Chapter, Coimbatore Chapter, Lakhmangarh Chapter, Jabalpur Chapter & other Chapters are praise worthy. I congratulate all the Organisors & Members of respective Chapters for their tireless effort & significant contribution. This Issue also covers the photographs of activities conducted by large number of student branches. We apologize for not covering the detail news because of the space constraint. But CSI is proud for these student activities of such large scale in every month. I congratulate & express my sincere thanks to the management of the respective Institutes/Colleges, Student Branch Coordinators, Students Members of the respective organisations for their pioneer efforts & leadership to organize the various events successfully & effectively in excellent manner.

On 6th July 2019 I along with RVP-VI Mr. Pradeep Rathi visited Sandip university at Nashik where CSI is having 2 Student Branches at two different institutions. I had a very fruitful discussion with Mr. Sandip Jha, Chairman & Col. N. Ramchandran, Vice Chancellor for the mutual benefit of CSI & Student Community. I also interacted with the Dean, Head of Departments, Professors & Faculty Members & addressed the gatherings. On 13th July 2019 I visited the VNR VJ Institute of Engineering & Technology, Hyderabad one of our large student branch having near about 70 faculty are the life members of CSI where I interacted with the Principal, Director, Faculty Members regarding various issues, activities& addressed to the students.

The Call for Academic Awards, Service Awards for the year 2017-18, 2018-19 and State/ Regional/ National Student Conventions are also published in this issue. All concerned are requested for their nominations to take the benefit of same.

Let us come forward to make Clean CSI & Green CSI with transparent activities & visions to make it Swachh, Pardarshi & hara vara.

With warm regards,

AkNayak

Prof. Akshaya Nayak
President, CSI

Titbit from the History of Computing-1

CP/M and Gary Kildall

V. Rajaraman
Emeritus Professor, Supercomputer Education and Research Centre, Indian Institute of Science, Bangalore

"Study the past if you would define the future – Confucius"

The Cambridge dictionary meaning of titbit is "A small and particularly interesting item of gossip or information".

In these short articles I pick up some events from the history of computing that had interesting consequences. They are not in any chronological order. In this article I will describe how Gary Kildall the developer of the first operating system for microcomputers lost the game to Bill Gates of Microsoft.

When the first single chip microprocessor 8008 was announced by Intel in 1972 there was a tremendous enthusiasm particularly among hobbyists who were excited about building their own computer using this chip. Gary Kildall was teaching computer science at the Naval Postgraduate School located at Monterey in California in 1972 and was a part-time consultant to Intel. He was impressed by the capability of 8008 and designed a high-level language PL/M (Programming Language for Microcomputers) and wrote a compiler for it. This was the first language specifically meant for microprocessors and had many low-level features that allowed access to specified bytes in memory, I/O ports, and the processor interrupt flags. PL/M had no I/O routines and to execute it on microcomputers an Operating System (OS) was required. Intel was not willing to support Kildall in designing and writing an OS. Kildall was able to get a microcomputer development system from Intel and bought a floppy drive that had been recently developed by IBM and integrated it with his system. Using this system, he wrote in 1974 a disk operating system - CP/M (Control Program for Microcomputers) - for Intel 8008 in PL/M. To make CP/M portable across different manufacturers' machines with different memory sizes Kildall had the brilliant idea of splitting the OS into two parts. One part called Basic Input-Output System (BIOS) was machine specific and the other part consisting of Basic Disk Operating System (BDOS) and a Console Command Processor (CCP) was machine independent. Hence for a new machine only BIOS had to be written. CP/M became the de-facto standard OS for almost all PCs manufactured between 1974 and 1980.

Dorothy, his wife, convinced him to start a company to market CP/M. The company was named Intergalactic Digital Research and was later renamed Digital Research Inc. (DRI) and was started in his large house in Pacific Grove in northern California. By 1981 CP/M was used by 300 different models of computers and DRI's yearly revenue was over $5 million.

When IBM decided to enter the PC market in 1980,it had taken a policy decision to outsource the development of software and came to Seattle to negotiate purchase of BASIC language interpreter from Microsoft. An OS was required to run BASIC. CP/M being the de-facto standard OS for microcomputers, Gates suggested to IBM to contact Kildall at DRI for the OS. Gates knew Kildall as they were both from Seattle and Gates had used the mainframe computer at the University of Washington at Seattle as a school boy while Kildall was the system administrator of the computer. In fact, Gates had visited Kildall at his home and there was even some discussion on DRI acquiring Microsoft but there was no serious follow-up [1].Gates phoned Kildall that some important customers were coming to negotiate purchase of CP/M. He did not disclose that the customer was IBM as he had signed a non-disclosure agreement. As it happened Kildall had a prior commitment to deliver software to an important customer. As an amateur pilot with his own plane he flew to meet his customer. When he was away the team from IBM came to DRI and Kildall asked his wife and business partner Dorothy to negotiate with IBM. In 1980 IBM was the largest computer company in the world with a turnover of billions of dollars whereas DRI was a pigmy in comparison. The first thing IBM's team that included their lawyer did was to ask DRI to sign a standard non-disclosure agreement which was one-sided. Dorothy and DRI's lawyers balked and the IBM's team was upset as it was a routine procedure. Dorothy wanted her husband to be present for the negotiations.

Dorothy and GaryKildall (Photo thanks to computerhistory.org)

The IBM team was frustrated and went back to Microsoft to find a solution. Meanwhile Microsoft found out that a small company, Seattle Computer Products (SCP), had developed an OS called QDOS (Quick and Dirty Operating System) that was a clone of CP/M for Intel 8086 - a 16-bit computer. (At that time CP/M was available only for 8-bit computers). He negotiated with SCP and bought the source code outright for $75,000 with the condition that Microsoft could modify and resell it. Bill Gates and his team visited IBM in November 1980 and agreed to develop an OS they named PC-DOS for the IBM PC. Gates being a brilliant businessman foresaw that there would be clones of IBM PC and negotiated a deal to licence the OS to IBM for $50,000 with the provision that it would be *non-exclusive* and that he could licence it to other manufacturers as MS-DOS.IBM agreed provided that the strict deadline for delivery of the OS which was July 1981 is met and the project kept top secret.

Microsoft hired Tim Paterson, the programmer who had developed QDOS for SCP. Gates and his team along with Paterson modified QDOS and wrote PC-DOS and met the deadline of July 1981. Meanwhile Kildall, when he saw a copy of PC-DOS was shocked that it had many similarities with CP/M and threatened to sue IBM for copyright infringement. (In early 1980's software patenting was not there and copyright laws had no clarity for software). After protracted correspondence IBM agreed to give its customers choice to use either CP/M or PC-DOS. However, the licence fee fixed by IBM for CP/M was $240 as opposed to $40 for PC-DOS. Kildall could have sued IBM for its partiality but he being an academic at heart and not litigious refrained from doing so. Most customers chose PC-DOS. Microsoft renamed PC-DOS as MS-DOS for IBM PC clones and it became the standard OS for PCs and sold millions of copies. SCP threatened to sue Microsoft as it had not disclosed that QDOS was to be sold to IBM. Microsoft settled the case out of court in 1986 for $1 million.

In computer magazines Kildall is known as one who would have been Gates but lost the opportunity as "he went flying" when IBM came calling. This is refuted by Kildall in his memoirs [1] in which he claims that he went later to negotiate with IBM but was not successful as IBM did not agree to his terms. There has been a long controversy whether PC-DOS was a substantial copy of CP/M as claimed by Kildall and refuted by Gates. A forensic analysis comparing the two codes claims that PC-DOS was not a copy of CP/M [2].

Eventhough Kildall lost the IBM contract,he later sold DRI to Novell in 1991 for $120 million. He continued to be technically active and went on to develop systems to interface optical disks with PCs and file systems for CD-ROMs. In spite of his enormous contributions to microcomputer software he was overshadowed by Microsoft due to his mistake of not clinching the IBM deal. In 2014, IEEE recognized his contributions to computer science by placing a plaque [3] outside the house where DRI was started. Gary Kildall died in1994 at the age of 52 due to an accident.

References

[1] Kildall, Scott and Kildall, Kristin(eds.), "Computer Connections: People, Places, and Events in the Evolution of the Personal Computer Industry" Archived in Computer History Museum, USA. Free download from computerhistory.org.

[2] Zeldman, Bob, Did Bill Gates Steal the Heart of DOS? IEEE Spectrum, July 2012.

[3] Legacy of Gary Kildall: The CP/M IEEE Milestone Dedication - YouTubevideo.

About the Author

Prof. V. Rajaraman (CSI Fellow), Ph.D. (Wisconsin), is Emeritus Professor in the Supercomputer Education and Research Centre, Indian Institute of Science, Bangalore. Earlier Prof. Rajaraman was Professor of Computer Science and Electrical Engineering at IIT, Kanpur (1963-1982), Professor of Computer Science, and Chairman, Supercomputer Education and Research Centre, Indian Institute of Science, Bangalore (1982-1994) and IBM Professor of Information Technology, Jawaharlal Nehru Centre for Advanced Scientific Research (1994-2001).

A pioneer in Computer Science, education and research in India, Prof. Rajaraman was awarded the Shanti Swarup Bhatnagar Prize in 1976. He is also the recipient of Homi Bhabha Prize by U.G.C., Om Prakash Bhasin award, ISTE award for excellence in teaching computer engineering, Rustam Choksi award, Zaheer Medal by the Indian National Science Academy, Padma Bhushan by the President of India in 1998, and lifetime contribution award by the Indian National Academy of Engineering and Computer Society of India. He was awarded DSc (h.c.) by IIT, Kanpur and by Bengal Engineering and Science University, Sibpur. An author of several well established and highly successful computer books, Prof. Rajaraman has published a large number of research papers in reputed national and international journals. (A detailed biodata may be found in en.wikipedia.org/wiki/Vaidyeswaran_Rajaraman).

Basics of Blockchain

Aparna K
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The history of accounting [2] practices adopted in today's world dates back to the Babylonian period. Any accounting activity will involve a transaction of an asset between two or more parties, recording of ownership, monetary value associated with the asset, etc. Majority of the industries started investing in distributed ledgers which ultimately led to the Blockchain Technology. It is important to understand the meanings of several important terms involved in Blockchain.

Assets (tangible and intangible) are entities that can potentially yield a value when transacted (change of ownership). ***Ledgers*** are a form of record keeping that notes transactions of the assets. ***Transaction*** refers to the transfer of asset. Any restrictions or conditions for the transaction to occur are termed as ***Contract.***

Blockchain is a technology where in the ledger is shared among all the participants [3] (Customer, Supplier, Vendor, Government, Regulatory Body etc.) involved in the business. The ledger contains the digitally recorded transaction data in packages called blocks. The blocks are kept in the form of a linear chain and they are hashed using cryptography to ensure that the blockchain does not get tampered and the data remains unaffected.

Visualize an excel sheet that is replicated innumerable number of times across a Local area network. Assume that this LAN is designed in such a way so as to regularly update every excel sheet. That's just the simple understanding of a blockchain.

Fig. 1 : Analogy for Blockchain

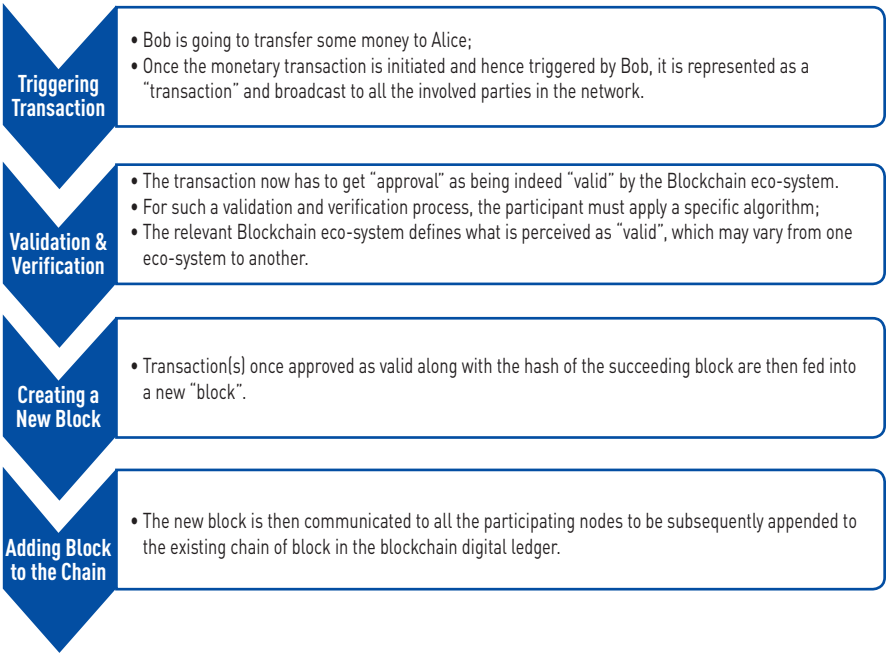

Fig. 2 : Blockchain Operation[2]

A simple analogy to visualize a blockchain can be depicted as shown in the figure 1 [6].

A blockchain, is a chain of records, called blocks. These blocks are connected using the concept of cryptography. Every block consists of a cryptographically computed hash function which enables to link to the previous block, a timestamp and the recorded data. A blockchain is immutable to any changes.

Operation of the Blockchain

The figure 2. summarizes the operation of a blockchain:

To make the understanding of a Blockchain better, consider buying a share. The process of buying a share (without using Blockchain) will involve the customer, the bank, the broker, the stock exchange and the company itself. All these participants will have separate ledgers for transactions. The ledgers cannot be seen by each other and the transactions cannot be verified for accuracy.

The difference in using the Blockchain concept for buying the share involves all the participants looking at the same ledger from the time the order is placed, the transaction involving a debit, the order being placed, and the stocks to be bought being blocked etc. All this information will be broadcasted among all the entities simultaneously. All the transaction that took place thus get appended into the blockchain forming a history of transactions which are immutable.

Consider another example to understand Blockchain that involves transfer of fund between two accounts. Ideally there has to be two records of debits and credits. With blockchain, instead of two separate check books with two records of debits and credits, both the participants involved would be looking at the same ledger (shared / distributed) of transactions. The entire ledger of transactions is encrypted

and decentralized. Only if both the participants validate it, it gets appended to the chain of blocks. The chain is protected by cryptography mechanism. The chain cannot be altered henceforth.

Some of the leading Blockchain Consortiums and Collaborative projects are [4]:

- Hyperledger
- Post-trade Distributed ledger group
- R3CEV
- Interledger
- Domus Tower

Conclusion:

There are some predictions made by researchers about Blockchain. By 2030, it is expected that most of the organizations in the world may start using some form of computer-generated currency. By the next decade, it is expected that a cross-border, blockchain-based, universal identity standard might emerge for the entire society assets. A notable reduction in security breaches, substantial increase in efficiencies and reliability will be experienced by the society at large. Blockchain technology might reduce corruption thereby creating transparency of authorized documents.

References

[1] https://www.blockchain.com/
[2] https://en.wikipedia.org/wiki/Bookkeeping
[3] https://blockgeeks.com/guides/what-is-blockchain-technology/
[4] https://www.investopedia.com/terms/b/blockchain.asp
[5] https://www.coindesk.com/information/what-is-blockchain-technology
[6] https://www.slideshare.net/PeterCochrane/block-chain-basics

About the Author

Dr. Aparna K (LM00146827) is currently working as Associate Professor & HoD of MCA Department at BMS Institute of Technology and Management, Bengaluru. She is a doctorate (Ph.D) in Data Mining from VTU. Additionally, she holds an MCA degree from VTU and an M. Phil degree from Bharatidasan University. Her research interest includes Data Analytics, Machine Learning, Sentimental Analysis etc. She has an overall teaching experience of 16 years and has more than 25 papers to her credit in reputed international journals and conferences. She has always been a source of inspiration and an excellent mentor for students.

Blockchain Technology: Basics, Architecture, use cases and platforms

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Nowadays cryptocurrency (digital currency) has transformed into a prevalent articulation in both industry and the academic world. As a standout amongst other advanced cash, Bitcoin has thoroughly enjoyed a huge achievement with its capital market accomplishing 10 billion dollars in 2016. Blockchain is a term which is constantly brought up whenever we talk about how technology has changed the way we live. For a good reason, blockchain fundamentally transforms our way of life for the better in a multitude of areas. Blockchain is undoubtedly a notable revolution in systems of record. Several of the brightest minds of industries have even described blockchain as the 'magic beans' due to the numerous high-level use cases promised by blockchain. Right from the time of its invention, entrepreneurs in industries across the globe have understood the positive implications of this development. This article presents basics of blockchain technology and architecture of blockchain. Next top use cases has been discussed and followed by top 5 blockchain platforms for digital marketing.

1. Introduction

Blockchain is digital, decentralized technology which maintains a record of all the transactions which happen over a peer-to-peer network. These records are stored in decentralized systems which are interconnected. Blockchains are "tamper evident and tamper resistant digital ledgers implemented in a distributed fashion (i.e., without a central repository) and usually without a central authority (i.e., a bank, company or government)".

Blockchain innovation empowers the "production of a decentralized domain, where the cryptographically approved exchanges and information are not under the control of any outsider association". Any exchange at any point finished is recorded in an unchanging record in a certain, safe, straightforward and perpetual way, with a timestamp and different subtleties.

Blockchain allows industries to store records of any type on the blockchain. Some of them are:

- Identity management
- Business transactions
- Medical transaction records
- Transaction processing
- General documentation
- Management activities

1.1 Key Principles of Blockchain Which Ensure Safety

- Securing applications
- Auditing
- Database security
- Digital workforce training
- Continuity planning
- Proper testing methods

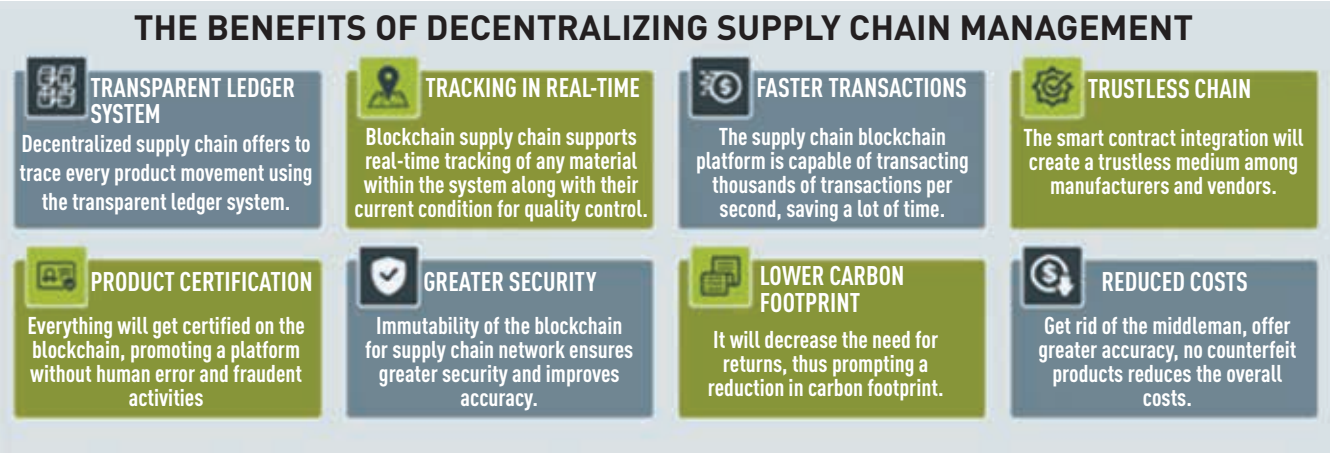

Fig. 1 : Benefits of Decentralized Supply Chain (Source: 101blockchains.com)

1.2 Public and Private Blockchains

In a public blockchain, anyone can participate in the network. It is a permissionless blockchain where even anonymous people can enter. These use the Proof-of-Work and Proof-of-Stake consensus algorithms. Public blockchains have a low transaction speed.

Examples:

Bitcoin and Ethereum

Private blockchains ensure privacy and security of data. Here, participation requires an invitation which is validated by a set of rules. There is an added layer of privacy on public blockchains as participant activity for certain transactions is restricted. It uses the voting or multi-party consensus mechanism. It is a lighter blockchain and hence the transaction speed is high.

Example:

Hyperledger

2. Blockchain Architecture

The architectural components have been summed up and after that changed by different organizations, prompting diverse blockchain ventures like Bitcoin, Ethereum, Hyperledger and so on.

The following is a list of the architectural components:

- **Node** – "client or PC inside the blockchain engineering (each has an autonomous duplicate of the entire blockchain record)
- **Transaction** - littlest structure square of a blockchain framework (records, data, and so forth.) that fills in as the motivation behind blockchain
- **Block** - a data structure utilized for keeping a lot of exchanges (transactions) which is appropriated to all hubs in the system
- **Chain** - a grouping of blocks in a particular request
- **Miners** - explicit hubs which play out the block confirmation process before adding anything to the blockchain structure
- **Consensus (consensus protocol)** - a lot of guidelines and plans to do blockchain activities".

Any new record or exchange inside the blockchain suggests the structure

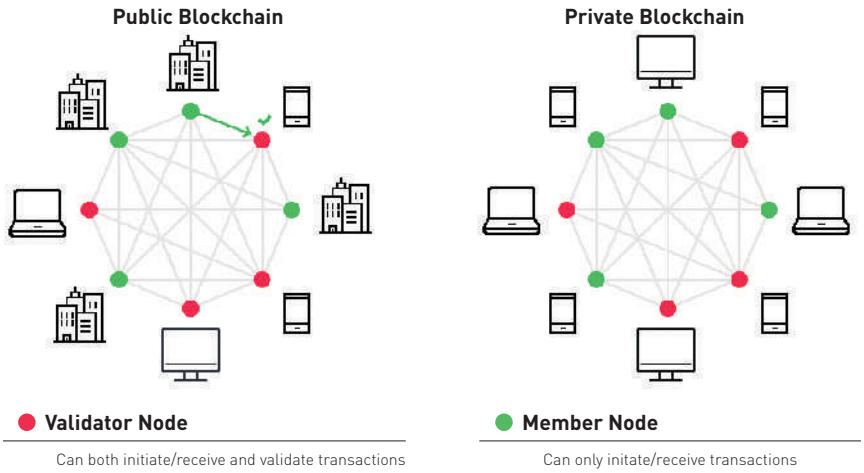

Fig. 2 : Nodes in Public vs. Private Blockchains

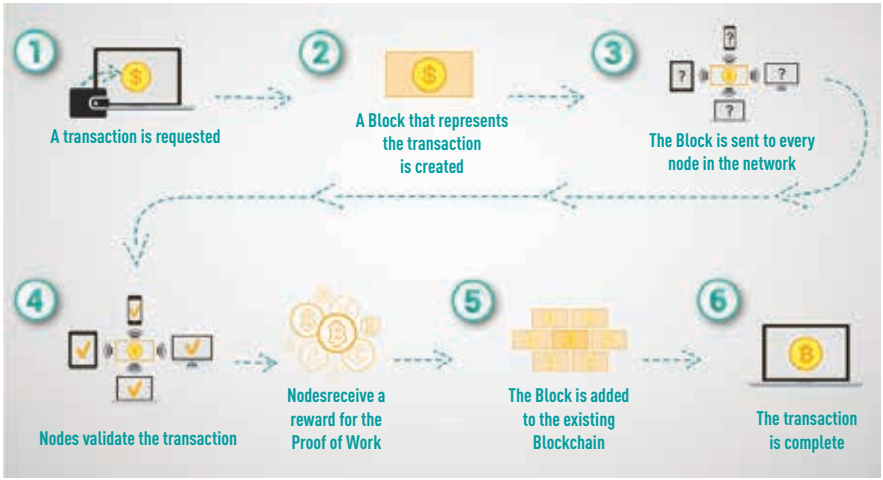

Fig. 3 : Blockchain architecture diagram

of another block. Each record is then demonstrated and carefully marked to guarantee its validity. Before this square is added to the system, it ought to be checked by most of hubs in the framework.

Coming up next is a blockchain architecture diagram that shows how this really functions as a digital wallet.

Each blockchain block consists of:

- certain data
- the hash of the block
- the hash from the previous block

The information put away inside each block relies upon the sort of blockchain. For example, in the Bitcoin blockchain structure, the block keeps up information about the collector, sender, and the amount of coins.

A hash resembles a unique mark (long record comprising of certain digits and letters). Each block hash is produced with the assistance of a cryptographic hash algorithm (SHA 256). Subsequently, this distinguishes each block in a blockchain structure effectively. The minute a block is made, it consequently appends a hash, while any progressions made in a block influence the difference in a hash as well. Essentially expressed, hashes help to recognize any adjustments in blocks.

The last component inside the block is the hash from a previous block. This makes a chain of blocks and is the principle component behind blockchain design's security. For instance, block

14 to block 15. The absolute first block in a chain is somewhat exceptional - all affirmed and approved blocks are gotten from the beginning block.

Any degenerate endeavors incite the blocks to change. All the accompanying blocks at that point convey wrong data and render the entire blockchain framework invalid.

3. Blockchain use cases

In this section, we will discuss the top 5 promising use cases of blockchain across various industry verticals.

3.1 Supply Chain Management

The principle issues looked here are:

- Lack of straightforwardness as the item moves along its production network.
- Issues in item legitimacy as shoppers can now and again get fake merchandise.

The production network is a system which is built up between a business and its providers. Blockchain guarantees to discover a solution for inventory network issues through the digitization of benefits. It takes into consideration items to be labeled and relegated with one of kind characters which are then transplanted onto an unchanging, straightforward, and secure blockchain. Blockchain helps in following significant item data, for example, the condition of the item, time span of usability, time, and area. With blockchain-empowered resource digitization set up, an item's production network can be adequately transplanted onto a store network.

Consumers can verify the authenticity of purchased goods through a blockchain-enabled supply chain. Products can be accurately tracked across different locations and stages in a supply chain. This way, stakeholders will have the capability to isolate and tackle any potential issues.

3. 2 Digital Identity

Today, digital identity is becoming problematic as centralized entities are becoming increasingly susceptible to identity thefts and data breaches. Ownership is concentrated in the hands of applications and services to which we provide consent to use our data. Digital identity can be described as an online record of information pertaining to individuals and organizations.

Fig. 4 : Blochchain Use cases in Supply Chain (Source: 101blockchains.com)

In a blockchain, users can have control over their information. Instead of providing consent to many service providers, users can store their digital identity data in an encrypted digital hub. Individuals can control access to the hub and can also revoke access, if necessary. Using blockchain technology, the user can be in control of their digital data and the way in which it is utilized.

3.3 Healthcare

Current issues:

- Medical practitioners lack a clear and complete understanding of a patient's medical history. This hinders in providing effective healthcare solutions.
- Counterfeit or fake medicines are also a major issue within the medical supply chain.

Blockchain will serve as a tamper-proof and secure database to alleviate the problems faced in the healthcare industry. Patient medical records can be stored on a blockchain. This will make it significantly easier for medical practitioners to get a better idea of a patient's medical history. Blockchain would also help tag and track drugs at every stage of the supply chain. It will act as a medium to assure the authenticity of the drugs. Patients will also have control over the data stored in the blockchain. Others can view their data only if the patients grant them permission for the same.

3.4 Notary

A noteworthy part of possession resources is in paper structure. This leaves space for the records to be altered or exposed to deceitful action. Authentication is a cheat hindrance process which guarantees the gatherings of an exchange that a record can be trusted and is bona fide. Blockchain innovation will increase the value of the procedure of legally approbation. The alter safe and straightforward component of blockchain makes it an appropriate possibility for legally approbation. Blockchain can be utilized in legally approbation to guarantee evidence of-presence. Blockchain helps in demonstrating the presence of the record since the time it was made and alterations can likewise be recognized. Checking if a record has been adjusted or not should be possible by hashing the archive. On the off chance that there has been any change, the report will bring about an alternate hash and the proprietor will end up mindful of the adjustment.

3.5 Intellectual Property (IP)

Poorly maintained IT protocols cause unnecessary legal disputes. Adding a blockchain system can serve as a platform which provides accurate and clear ownership of IP assets. Tamper-resistant blockchains can provide a timestamp to indicate the exact recording time of an idea. This will solve any disputes regarding the origin of an idea. Blockchain also gives

intellectual property owners the added advantage of protecting their IP assets infringers, for example, patent trolls.

4. Top 5 Blockchain Platforms for Digital Marketing

In this section, we will understand the top five blockchain platforms which would suit digital marketing.

4.1 Ethereum

Ethereum is the world's leading programmable blockchain. Ethereum is a distributed public blockchain network. Ethereum's primary focus is on running the programming code of any decentralized application. The Ether cryptocurrency of the Ethereum blockchain fuels the network and it is used by application developers to pay for services and transactions on the Ethereum network.

In digital marketing, hyperledger can be used as the internet to build in money and payments. It assures the security and transparency of data in digital marketing. The tokenization feature of the Ethereum blockchain helps protect credit card numbers and bank account numbers in a secure, virtual vault which can be transmitted across wireless networks. Ethereum will help set up a payment gateway which is needed for tokenization to work in order to store sensitive data which will allow the generation of the random token. The ERC-20 token can also be used for digital marketing transactions as it allows for uniform and fast transactions and confirms the transactions in an efficient manner.

4.2 Hyperledger

This is an open-source collaborative project which has been created to advance cross-industry blockchain technologies. It is a global collaboration which is hosted by the Linux Foundation. Hyperledger will be highly useful in digital marketing as it helps build a new generation of transactional applications which helps establish trust, transparency, and accountability for digital marketers and helps them streamline business processes and legal constraints.

Its peer-to-peer distributed ledger technology uses a system of smart contracts and other assistive technologies to help digital marketers secure the data related to their company, customers, and business processes. It reduces the cost and complexity of reaching out to customers as it stores information over a shared network which can be viewed by any marketer and customer who has access to the blockchain network. It acts as a decentralized digital operating system for marketplaces and data-sharing networks.

4.3 Quorum

Quorum is a version of the public Ethereum blockchain which has been developed by JP Morgan Chase. Quorum equips the Ethereum blockchain with a top layer and this enables it to perform private transactions and use different consensus algorithms which make it more robust. Quorum is an open source blockchain platform which is designed to support enterprise needs. It is specifically designed to ensure the privacy of private transactions between nodes. The quorum network does not charge for transactions. Security is the cornerstone to any business and digital marketing is no exception. As digital marketing reaches a wide audience, sharing a link to a website that hosts malware and running outdated versions of plugins, themes, and core components makes a network more prone to hacks and security breaches.

The quorum blockchain is ideal for digital marketing as it meets the organizational requirements of high speed and high throughput of private transactions. Quorum protects information greatly as information which is agreed to be private is never broadcast across the network. Privacy is of utmost importance in a quorum blockchain. Transactions are usually verified through the consensus algorithms. The constellation-transaction manager component of Quorum is responsible for the privacy of transactions. Though the transaction manager stores and allows access to encrypted transaction data and exchanges encrypted payloads, it does not hold access to sensitive private keys. Constellation enclave is another component which leverages cryptographic techniques for historical data preservation, transaction authenticity, and participant authentication. The enclave and transaction manager components of the quorum blockchain work hand in hand to secure and strengthen transaction privacy.

4.4 Recordskeeper

Recordskeeper is an Open Public Mineable Blockchain which is used for record-keeping and data security. It comprises of a full suite of structured and easily accessible record keeping for both individuals and organizations alike. RecordsKeeper capitalizes over the advantages of the blockchain network such as secure transfer, authorization, integrity, and authenticity of data.

The servers used in centralized systems are prone to tampering, whereas RecordsKeeper is designed in such a manner that the data used for digital marketing is stored and protected over a secure network. RecordsKeeper cuts down costs for saving data as it stores a hash of data which acts as the digital fingerprint.

4.5 Corda

Corda is a flexible and agile open source blockchain platform which can scale to meet the needs of any business. A robust community of developers supports corda by working on enhancements, functionalities, and added features. Corda provides privacy to businesses by enabling them to transact directly in a secure manner using smart contracts. Corda helps streamline business operations and reduces transaction and record-keeping costs.

Apart from Quorum, digital marketers can also think of leveraging the capabilities of the Quorum blockchain for ensuring transaction privacy and securing business information. Transaction history and transaction data on the corda ledger are encrypted and are shared only with necessary parties. Its interoperable nature allows businesses to transact with each other on the corda network in a free and commercial manner. Digital marketers can use corda as the foundation to help solve the real-world problems of the digital marketing

industry and build robust solutions.

5. Summary

Blockchain is making the impossible possible by allowing people to secure digital relationships. Thanks to the advent of the blockchain, data is now being recorded, disclosed, and secured differently. Due to its tremendous potential, blockchain is being leveraged by many smart and innovative companies for enhancing their business processes and eventually becoming the business leaders of their respective industries.

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Blockchain : An Overview

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"Anything that you can conceive of as a supply chain, blockchain can vastly improve its efficiency – it doesn't matter if it's people, numbers, data, money."

GinniRometty, CEO of IBM

Introduction

Living in the 21st century, everyone wants their work done in just one touch without lavishing money and time. The technology is blooming that makes everyone's work done in no time. Privacy is a threat in the technology world. Blockchain is technology that gains our trust and makes our work easier and comfortable. Blockchain is the new evolution of internet as stated in [1]. The principle of blockchain is to distribute the information among the users without creating a duplicate one. It is believed that the rapid growth in blockchain will improve everyone's lifestyle.

The blockchain actually is a growing collection of records; these records are named as blocks and are connected to every other block using cryptographic concepts.

Every block in the network contains the data, the previous block hash value and a time stamp. The insertion of any information is easier but not the same in the case of alteration.

Bitcoin,[2] is a connected network that allows the users to transact money directly between them. It increases the efficiency of the system. Larry Summers states that "Bitcoin has the same character a fax machine had. A single fax machine is a doorstop. The world where everyone has a fax machine is an immensely valuable thing". The transfer of cash can be done from any corner of the world efficiently. According to [3] Steven Olshansky, blockchain plays a key role in Identity and Access Management (IAM).

However, nowadays, this era is hired now not only for crypto currencies, however also for document preserving, virtual notary, and smart contracts.

Types of Blockchain

The types of blockchain as represented in Figure 1, which includes

a. Public Blockchain

They are open source that allow anyone to be engaged in as users, miners, developers, or community members. The transaction details are available to anyone in the network. Public blockchain are fully decentralized and highly censorship-resistant.

b. Private Blockchain

In this type of blockchain it is essential to get authorization to join the network. They are more centralized and the transactions are private. They are also known as permissioned blockchain.

c. Hybrid Blockchain

Both the privacy and public blockchain benefits are combined. The security sake and transparency helps the business people to have more trust. It allows multi-chain network of blockchain.

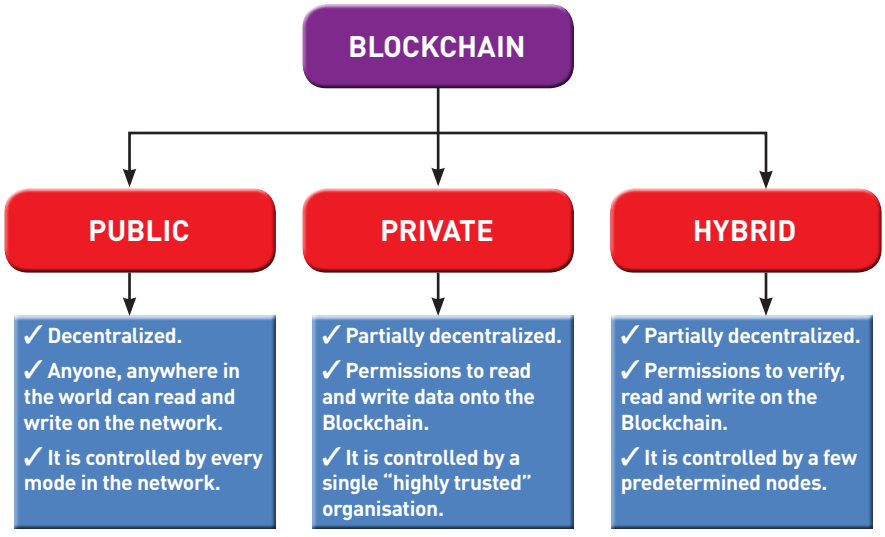

Fig. 1: Types of Blockchain

Blockchain Architecture

The blockchain technique lets in digital information to be dispensed, in preference to copied. This dispensed ledger affords transparency, belief, and data security. Blockchain architecture is getting used very broadly inside the monetary which is shown in Fig. 2.

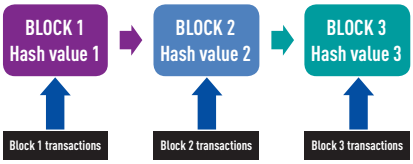

Fig. 2 : Architecture of Blockchain

The conventional engineering of the World Wide Web utilizes a customer server arrange. For this situation, the server keeps all the required data in a single spot so it is anything but difficult to refresh, because of the server being a unified database constrained by various heads with authorizations. On account of the conveyed system of blockchain engineering, every member inside the system looks after, favours, and updates new sections. The framework is controlled by isolated people, yet

by everybody inside the blockchain organizes. Every part guarantees that all records and methods are together, which results in information legitimacy and security.

In this manner, parties that don't really believe each other can achieve a typical agreement. To condense things, the blockchain is a decentralized, circulated record (open or private) of various types of exchanges orchestrated into a P2P arrange. This system comprises of numerous PCs, however such that the information can't be adjusted without the agreement of the entire system. The structure of blockchain innovation is spoken to by a rundown of squares with exchanges in a specific request. These rundowns can be put away as a level record or as a basic database. Two fundamental information structures utilized in blockchain include:

- **Pointers** - factors that keep data about the area of another variable. In particular, this is indicating the situation of another variable.
- **Connected records** - an arrangement of squares where each square has explicit information and connections to the accompanying square with the assistance of a pointer.

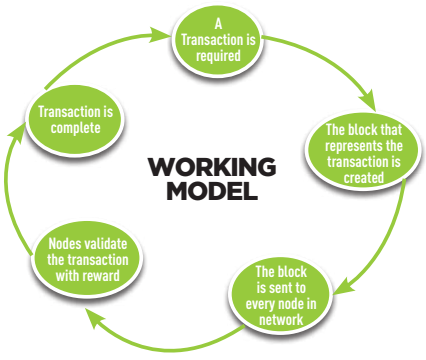

Fig. 3 : Working model of blockchain

Working Process Of Blockchain

A transaction is requested by a person through a device. A block that represents that transaction is being created and is sent to everyone in the network. The transaction is validated and some rewards are given for the proof of work. The process is then accomplished by attaching the block to the other blocks in the blockchain network.

Applications

Blockchain can be employed in a wide range in multiple areas as indicated in Figure 4. Here are some companies, confirming to [4], that have already implemented blockchain to make their work secured.

FedEx : They are one of the world's biggest cargo company. They turnover billions of dollars annually. FedEx uses blockchain technology to track their high value cargo products and they are the first shipping company to make use of blockchain. This technology helps them to check if the goods are delivered at the right place. In addition to that it helps them to survey whether the goods are safer and are not mixed with any illegal drugs.

KIK : It is an online message platform with nearly 300 million users. It is a Canadian company mobile app that is free for everyone to use.Their primary goal is to make sure that the data is delivered safely. This also ensures, no mischief has taken place.

This is done by using the cryptography encryption and decryption process stakeholders say, they feel pleasant to use it.

Walmart : Blockchain plays a key role in food industries too. One such good example is Walmart. They use this to track their food globally. The duplication of food like fake eggs and expired packed items has decreased.

Their name in the market has gone up because of the assurance they provide to the customers. This makes them one of the most trusted companies. This has also made the job of the employers easy.

Microsoft: As we all know Microsoft is a multinational company. They use blockchain for making payments in a much easier and secured manner.

They also provide tools for business developments. In May, they have launched the complete managed Azure Blockchain service. This helps to protect the information very carefully.

Mastercard: It is a financial service company that uses blockchain to transact huge amounts safely worldwide. They fall under public blockchain.

In addition to this one can also make instantaneous payments. Bitcoin based payments are done.

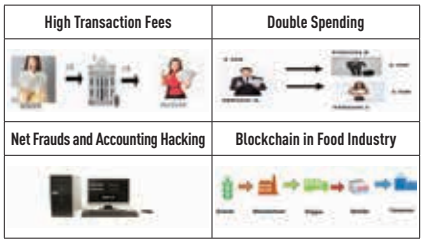

Fig. 4 : Blockchain Services

Recently, they have been granted a patent to partition a blockchain so that they can used to store multiple transaction types and formats.

Benefits

There are number of features that takes this technology to a higher level as summaries in Fig. 4.

- Blockchain is entirely a decentralized system. Anyone who is a part of the network takes the complete responsibility of that specific network.
- The data structure of the blocks can be appended only and cannot be altered in any way because cryptography is used to protect the data ledgers.
- There is no need to spend any cost for transaction of money.
- The transactions are very quick that they take place within a few seconds.
- It becomes a great hardship for anyone to hack the personal details of a person.
- The problem of double spending, is ignored by using hashing algorithms and tricky encryption

- There is no space for duplication, so it becomes difficult for net frauds to do wrongdoing.

Challenges

Though blockchain concepts are used for various purposes, they have only few flaws in number. Since the virtual currency and decentralized systems are new to the market they are highly strained to be used by the people. The revise of any data is relatively very laborious. Blockchain makes use of loads of energy that is to create a new block we will need to make change in the hash value of all the blocks from the genesis(first block) block. Scalability endures as another disadvantage in the system.

Summary

Overall, it may be said that blockchain is the growing technology that is changing the world by using cryptography. With the help of this the transactions can be done globally anywhere. The Bitcoin and Blockchain are entirely different. It is that bitcoin uses the concept of blockchain technology. It is widely used around the world for several purposes.

References

[1] https://blockgeeks.com/guides/what-is-blockchain-technology

[2] https://www.blockchain.com/learning-portal/bitcoin-faq

[3] Steve Olshansky, Internet Society, Steve Wilson, Lockstep Consulting, "Do Blockchains Have Anything to Offer Identity?" https://www.internetsociety.org/resources/doc/2018/blockchain-identity

[4] https://www.blockchain-council.org/blockchain/top-10-companies-that-have-already-adopted-blockchain

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President of CSI Prof. A. K. Nayak with in the Managing Committee Member of CSI Bengaluru Chapter

The Chairman of CSI Bengaluru Chapter Dr. Anbunathan. R is felicitating the CSI President Prof. A. K. Nayak while his visit to the Chapter to discuss about various activities with the MC Members.

Business Transformation through Blockchain- A Technical Approach

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What is a Blockchain? – An Introduction

Blockchain is the digital, decentralized, distributed ledger that stores the information about financial transactions without an external authority like a bank overseeing the transactions. In simple words, it is a new technology for digital currencies like Bitcoin, Ethereum Blockchain uses hash-based cryptography mechanism for storing the data which is shared across network of computers. Data shared by Blockchain is immutable and tamper-proof. Fig. 1 shows the difference between central and distributed ledger[1]

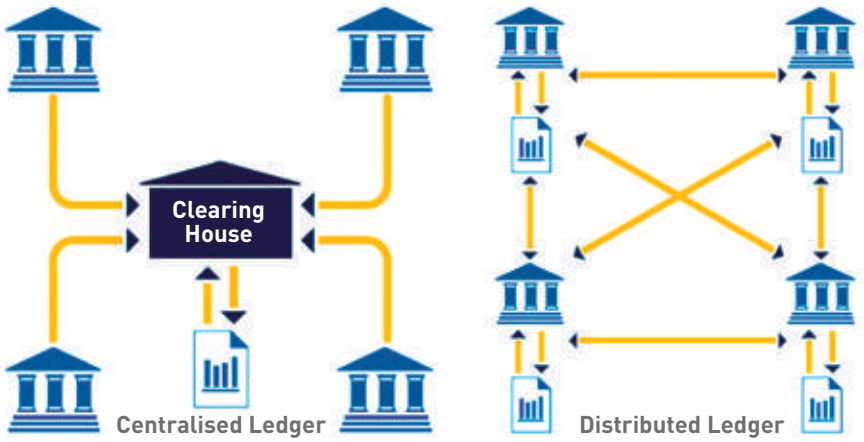

Fig. 1 : Difference between Centralized Ledger and Distributed Ledger

The Blockchain Benefits

Blockchain is a peer-to-peer (P2P) network in which many stakeholders who may not know each other and may be located in diverse geographical locations, share their data through a common ledger called data blocks inorder to perform their business activities effectively. Information flow through these blocks is clearly visible and traceable from various points. Blockchain benefits are many. Some of them are listed [2] below in Fig. 2.

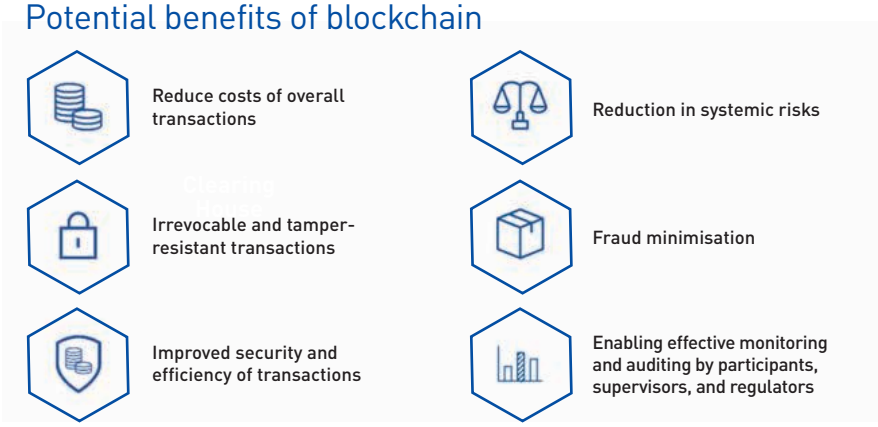

Fig. 2 : Benefits of Blockchain

The Working of Blockchain

Blockchain is a collection of data blocks wherein each block stores digital signature, timestamp and other relevant details in it. Each block is linked with its previous block. Thus it creates a chain of data blocks. Data inside every single block is verified by network of nodes before it is added to the chain. Proof of work is a task which is performed by a special nodes called miners in the Blockchain network with the intent of verifying the correctness of data. Thus miners are responsible for verifying and adding the data block into the chain by solving the complex mathematical operation.

As the number of blocks increases in the chain, the complexity of solving the problem increases. Thereby miners have to really work hard to solve the mathematical functions. Here Miners are rewarded with bitcoins for every single block created in the chain. Figure 3 explains how Blockchain technology works [3]

Blockchain in Business Applications

Banking & Financial Services

Bank is a financial institution that provides financial services to the people and business.All the financial services are provided via bank's central server. This central server provides not only services but also stores all the transaction details verified by bank

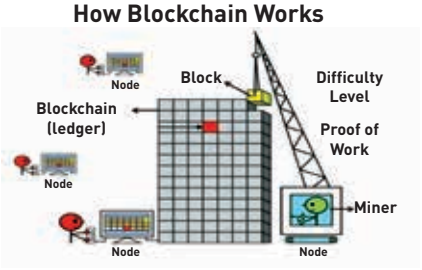

Fig. 3 : Working principle of Blockchain Technology

authority. The current issues with the banking system are

- For every transaction, customer needs to pay transaction fee to the bank.
- Banking authorities check and validate every transaction in central database.
- Since information is stored in a central server, hackers can potentially hack the server and steal the transaction information.

Blockchain provides a solution for these problems by maintaining a decentralized digital ledger which is commonly shared between many entities who are not known to each other. This decentralized digital ledger does not require any authority to verify and clear the transactions. Data in the Blockchain is immutable and it can't be accessed without authorization. Hence hacking becomes almost impossible with Blockchain approach and at the same time transaction fee charged by the banks can be eliminated. Figure 4 describes Blockchain enabled bank transaction [4] where customer initiates financial transactions from one account to another account and all details are stored in Blockchain.

Healthcare Supply Chain System

Medicines are an essential part of human life to combat diseases and live happy lives. Providing quality drugs is a top priority for Healthcare system. Pharmaceutical Supply Chain (PSC) helps deliver the drugs from pharmaceutical industry to the people in need of medicines. PSC is a process flow that contains set of activities that ensure that the drug is supplied to the

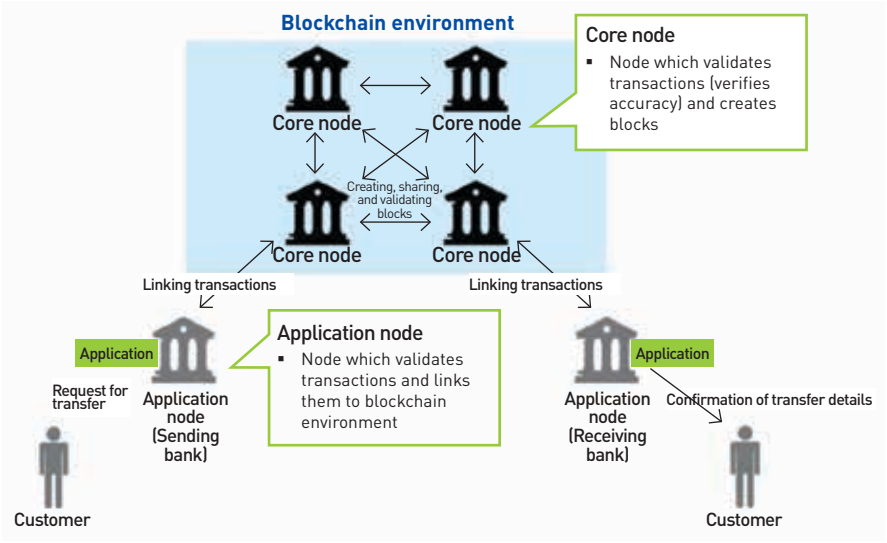

Fig. 4 : Blockchain enabled bank transaction

Fig. 5 : shows the process of PSC and Blockchain enabled PSC

intended recipient in a timely manner and in the right quality. Any flaws or failure in this process could be fatal. Hence clearly defined processes and rules have to be adapted throughout the PSC and sufficient transparency has to be maintained throughout. There are many places in the traditional PSC

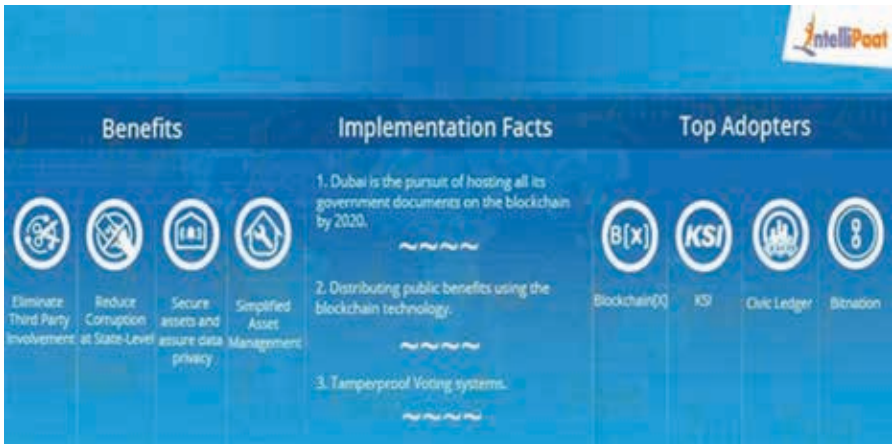

Fig. 6 : Blockchain benefits in Government System

process in India where adulteration & counterfeit drugs could get into the system. These weak spots have to be identified and monitored closely to mitigate chances of adulteration. Due to the complex process of pharmaceutical supply chain, it is very hard to track the drugs authenticity from manufacture to customer. With the help of Blockchain technology, the pharmaceutical supply chain can be easily tracked end-to-end and many of the risks and challenges involved during drugs supply in the Indian context can be overcome.

Government Systems

Governments across the world are planning to enhance e-Governance by using Blockchain technology. Transparency in policy enforcement, secure storage of citizen data and minimization of bureaucratic delays are key goals supported by use of Blockchain. A Blockchain helps the government to create Digital Identity for every single person in the country and store it securely in a data blocks. This will reduce a lot of manual and paper work for the government in order to store the citizen's information. Figure 6 illustrates some of the benefits of introducing a Blockchain in Government system [5]

Conclusion

Blockchain technology is rapidly emerging as a game changer for resolving complex computing challenges in different domains while delivering benefit in lieu of democratization of reliable data storage and availability. Tools are today evolving to aide in implementation of Blockchain and developers are enhancing their skills to handle this technology. For an enterprise, implementation of the Blockchain technology is a complex undertaking and is likely to be time-consuming as compared to the established technologies. There are some hurdles to overcome before the full benefits can be realized. Blockchain technology in current form has environmental impact; it requires large amounts of computing power. In the government sector, its use must be validated and regulated since it involves gathering, storage and disbursement of citizen's personal data.Despite some of these pitfalls, the advantages of leveraging Blockchain technology outweighs the negatives.

References

[1] https://www.ft.com/__origami/service/image/v2/images/raw/http%3A%2F%2Fcom.ft.imagepublish.prod.s3.amazonaws.com%2F930291d8-8010-11e6-8e50-8ec15fb462f4?fit=scale-down&source=next&width=601

[2] https://imarticus.org/wp-content/uploads/2018/07/61f582d5-58f4-4161-a0fc-fdbf74d44c2f-1024x547.png

[3] http://cryptoroom.org/wp-content/uploads/2019/01/blockchain-31-638.jpg

[4] https://blockboard.net/wp-content/uploads/2018/10/blockchain-inter-bank-settlement-system-to-be-tested-in-japan.jpg

[5] https://cdn.intellipaat.com/mediaFiles/2019/02/Government.jpg

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Smart City: Better Place for Better Tomorrow

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Cities that flourished till last decade now face many problems like poor traffic management, poor water and energy management need to be handled. "Smart city" is thebest solution we find in this case. Smart city uses modern techniques like Big Data, IOT, Sensor Fusion, Artificial Intelligence, Machine Learning and many more. A "Smart City" is a city where devices are given equal importance as the citizens. Every device and citizen can be tracked and analyzed in a "smart city". This paper explores the overview, features and technologies used in"Smart City" and how are the critical resources managed for better consumption.

Keywords: *Smart city, machine learning, RFID, RTDA, Internet of Things, Big Data, Interconnectivity, Resource Sharing, Real Time Processing.*

1.0 Introduction

"Smart City" is the latest tech trend in field of research and innovation. The rapidly increasing population in major cities over the globe makes themthe prime center of "smart city" development. "Smart City" makes a city more livable. Humans and devices are based on "smart city". Many major cities like Singapore, Barcelona, London, San Francisco, Oslo, Dubai and many more cities over the world have implemented different "smart city" technologies and programs. A "smart city" uses uniquedata collecting sensors and use the collected information for managing different resources like energy, water efficiently. This data may include data collected from traffic lights, GPS of vehicles and mobile phones, road sensors, home sensors etc. which is collected and analyzed to monitor and manage transportation system, traffic system, water supply plants and power plants, waste management, law enforcement, schools, libraries, etc.

"Smart City" uses Information and Communication Technology (ICT) andvarious physical devices like sensors, cameras, GPS, etc. which are interconnected througha local network based on Internet of Things (IOT) which optimizes the collected data for better decision making and for better resource management.

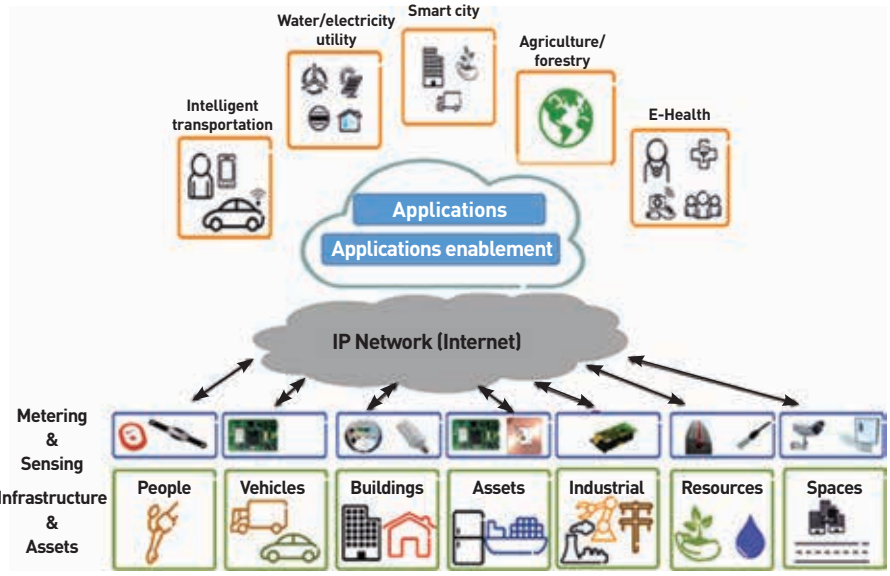

Fig. 1 : Smart City Components

The city officials or the government officials can interact directly with every device/sensor and citizen to monitor what is happening in the city in contrast to primitive cities where it as impossible. Basically, the main difference in the "City" and "Smart City" is that in a smart city, the government can interact with every citizen and the physical devices installed in the city and they can reach every corner of the city whereas it is impossible in primitive cities to do so.

Overall, we can say a smart city is a city which purpose to magnify human way of life, way of living, and manner of living and to provide superior development using new technology for example brand – new software's which is related to internet of things, Big

data, data mining, machine learning and so on . For making a cityis 'smart city', it should have certain features and some dimensions. As 'smart city' is a fresh concept in this generation,so the sources may consider different dimensions for it. So, all are thinking about the following two main objectives: enhancement the quality of life and sustainable economic growth. Over the last decade, the concept of 'smart city' has been put forward in different countries. On the other hand, numerous challenges have turned the concept of smart cities into a serious must; by 2013, around 150 cities in the world have started smartening plans, most of which are belongs tonorth America, Europe, and East Asia.

1.1 Technologies used in making a "Smart City"

A "Smart City" is supported by different physical devices connected to a local network based on Internet of Things (IOT).The below image shows the basic devices used with different techniques in a smart city.

A city is made a "Smart City" after different technologies are used to perform specific tasks like using GPS installed in vehicles and RTDA (Real Time Data Analytics) to control traffic lights. In a smart city, everything is smart including everything from whole energy management system to a refrigerator which is connected to the internet. If the fruits stored in the refrigerator are over, then a signal is sent to nearby store and anotification is sent to the owner of the house. If the owner allows the process, then an order of fruits is placed which is delivered to the house. This above example uses technology of RFID (Radio Frequency Identification).

Another technology used in the irrigation systems is based on sensor technology called "Sensor Fusion" where real time data is transmitted to the gardening crew about the amount of water, temperature and moisture in the greenhouse for better crops. This technology is being used in Parc del Center de Poblenou in Barcelona.

There are different core elements of a smart city for example Big Data, Machine Learning, Internet of Things, and Artificial Intelligence. They are associated with each and every technology used in a Smart City. Big Data stores all the data collected by different devices installed in the city which is analyzed by IOT and AI for making future decisions.

Smart Lighting is used to refine the roadway lamp keennessaccording to the time, as per the weather conditions and existence of people. We can also make a Smart Parkinghaving road sensors and intelligent display facility that guide the drivers to the most suitable parking spot in the city. The advantage of using this service is less time taken in locating a parking spot thus helping in maintaining the fuel, which helps in reducing diffusion of CO, HC, PM and many other greenhouse gases.

2. Need of ICTin Smart Cities

The ICT (Information and Communication Technology) plays a pivotal role in the development of the smart city. It acts as the thread which binds all the other partsof the smart city in the form of an anchorage platform which is presented in all interlink age of smart city components, in the form ofm-to-m (machine to machine),h-to-m, or h-to-h communication. Hence, ICT platform must achievesome set of requirements to fulfil the desired goals without becoming a hindrance/ obstacle to the routine activities of the city.

2.1 Networks related Security

Once an instruction and core management systems which is append to the energy management systems and various security threats must be resolve. In general, security must be guaranteed: behind the scenes of data, we have to allow only authorized users to access the data; dataintegrity (which assures that data is not duped); dataauthenticity (which guarantees that the data is sent by a dedicated user); anddata availability (guaranteeing that data is available when needed).

2.2 Cost-Effectiveness

Sensors or devices which issmart enough to traffic analyzers that will be deployed extensively should be designed to reduce those costs and provide better results. The devices should cover the aspects of the budgets that are:capital and operational expenditures (CAPEX) and operations expenditures (OPEX), for instance longer battery backup, low energy consumption, minimum infrastructure, low installation costs, low maintenance and low hardware/ software equipment costs.

2.3 Quality of Service

Qualities of Services covers various measureswhich is used to analyze and elect the communication technologies. The important are(Throughput or bit rate, network capacity in terms of number of connected devices at the same time, glitch and delay).

2.4 High Reliability and Long Lifetime

Different devices can be set or put in differentsurroundingsbut it all depends on the applications. For example: smart grid, smart meters and also the communicationtechnology supporting them ought to be able to stay operational and online for at least 20 year without any requirement of replacement or direct maintenance. Therefore, metering communication devices should be reliable and designed in order to perform normally even in every environmentalconditions of shock, degeneration, temperature, vibration, humidity, and interferences with other equipment and machines in the surroundings.

3. Challenges in a smart city

The term "Smart City" came up in early 1990s and it signified how citygrowth was changed over towards technologies, globalization and innovation. The challenges faced by a Smart city can be of two types i.e. human based and technology based.

3.1 Non Awareness of IT Techniques and Unplanned City

A smart city needs smart people. If a person wants to live in a smart city, he should be intelligent enough to use the technologies provided by the Smart city. An illiterate person can never live in a smart city. Illiterate person here means who doesn't know how to use the technology or who doesn't cares about the laws and rules and will be impossible to understand the environment. It is almost impossible to convert a city like Mumbai into Smart City due to its high population

density(numberof livingpeople per square kilometer). Places that were developed unplanned before and do not have a proper structure are also impossible to be converted into Smart City. A proper planed city is needed to implementthe concept of smart city. Converting an unplanned city into a smart city would be economically challenging.

3.2 IT Support

Smart Cities will open up more opportunities for cloud computing, thus memory management issues will also increase along with them. With so many simple or complex devices sending different form and different amount of data, failure of even one of them would imbalance the core of smart city. Development of smart cities brings more challenges to the governments and their citizens. As cities become more reliable on technology, so in this case IT professionals will be more important than ever. In case of any city in India, it faces different seasons throughout the year. The data collected about the intensity, time of turning on and off of the street lights will be of no use once the season changes but still needs to be stored for next year.

4. Benefits of Smart City

A "smart city" is a metropolitan area where differentsectors (public, private) cooperate with each other to gain better lifestyle by analyzing the data collected from different devices and people and using it to take future decisions. Data collected from roads and intersections could help improve traffic control and it becomes very easy to identify accident locations for quick emergency responses. The government would become more like an elder brother with each corner of the city under digital eye to help reduce crime. Crime level will go nearly zero as there will be no place out of reach of the authorities.

As the name suggests, a smart city has everything in it, which would benefit the people living in and around the city. Better resource management like fuel management, water management, energy management and health management means lower expenditure and pocket friendly life where everything is in budget. It would take less time to travel around the city saving fuel and time. A smart city can help avoid many diseases and give the citizens a better and healthy life. Shortest way to hospital without any traffic can help save lives. Control over pollution makes the air clean and fresh. A planned city means a green city. A Smart City would be green enough to keep the air pollution free. Low cost, affordable housing for the middle class family makes a happy city. Smart City means Smart People. People who do not believe in myths. A Smart City with a better social structure would help to overcome problems related to religion, caste, racism, etc. Smart City means Smart Government, smart people, smart environment. The economy basedreservation has been further morethan religion or caste based reservation that is followed by the Indian Government making it still a developing country rather than a developed country.

5. Conclusion

In this paper, we have discussed the concept of "Smart City", which help to turn a city into smart city by including the citizens and the data collected from the devices for making better future decisions.There are a lot of technologies that are used for making a Smart City (Internet of Things, Sensor Fusion, Machine learning, big Data, Artificial Intelligence, Real Time Processing), etc. which help in converting the data into better decisions at real time. Many different technologies have been applied in different cities across the globe for a better life. Conversion of a city to smart city depends on the economic feasibility of the decision. A poorly planned city is very difficult to be managed and may require a lot of capital and investment to make it a smart city where as cities like Chandigarh which were perfectly planned before their development are favorite of the investors.

A smart city gives many facilities to its citizens like better transportation through-out the city, better water management, waste management, power management, water management, fuel management, and a better governance which makes it cheaper to live without wastage of any resource or money. A smart city would be the cleanest city. Almost zero crime would also make it a "HAPPY SMART CITY".

6. References

[1] SriharshaMallapuram, Nnatubemugo Ngwum, Fang Yuan, Chao Lu, and Wei Yu," Smart City: The State of the Art, Datasets, and Evaluation Platforms", 16th International Conference on Computer and Information Science (ICIS), May, 2017

[2] Hans Schaffers, NicosKomninos, Marc Pallot, Brigitte Trousse, Michael Nilsson, Alvaro Oliveira "Smart Cities and the Future Internet: Towards Cooperation Frameworks for Open Innovation", Part of the Lecture Notes in Computer Science book series (LNCS, volume 6656)

[3] AbdelfattehHaidine, Sanae El Hassani, AbdelhakAqqal and Asmaa El Hannani "The Role of Communication Technologies in Building Future Smart Cities", Open access peer-reviewed Edited Volume,Smart Cities Technologies

[4] Amir Navidi, Forough Al-Sadat Khatami "Energy management and planning in smart cities", 24th International Conference & Exhibition on Electricity Distribution (CIRED), June 2017

[5] https://www.intechopen.com

[6] https://en.wikipedia.org/wiki/Smart_city

[7] http://motivateme.in/7-benefits-of-smart-city-project- of-indian-government/

[8] http://smartcities.gov.in/content/

[9] https://realty.economictimes.indiatimes.com

[10] https://www.forbes.com

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Blockchain - An Evolving Business Technology

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"Blockchain could slash the cost of transaction and reshape the economy"

Introduction

In the present era of communication and networking, internet has become the mainstay allowing individuals all across the world to use voice and video calls and pictures to communicate. Business transactions linking transfer of money from one person to another and between business houses are entirely digitalized. This has necessitated the existence of a trusted third party [1] to operate between the sender and receiver and has paved way to the onset of blockchain technology. The **blockchain** is an incorruptible digital ledger of economic transactions that can be programmed to record not just financial transactions but virtually everything of value." (*Don & Alex Tapscott, authors Blockchain Revolution (2016)).*

Simply said, Blockchain is a distributed or decentralized mainstream technology of digital crypto currency Bitcoin. Blockchain starts with the collection of records where each record is called a "Block" and, all such Blocks are linked through cryptography to form a chain of events.

Blockchain technology [5] can be applied in various real time domains and in this mechanism, each block is made to consist of a cryptographic hash of previous block, the time stamp and the transaction data. Since cryptography has the feature of mapping data of arbitrary size it is the most suitable mechanism for Blockchain (as each block may differ in size). One-way communication of the technology makes it infeasible to revoke or invert. It ensures secure and efficient communication. The first block in a Blockchain is called as Block 0 or Genesis Block. Each block is secured using cryptography.

Features of Blockchain Technology

Basic features of blockchain technology is shown in Fig. 1.

Fig: 1 Features of Blockchain

Decentralized

- Blockchain Network is decentralized; it does not keep the participants' data at one location and so there is no dependence on a single authority. This further increases the reliability of the system. Blockchain can be used [3] to keep important digital documents, cryptocurrency, smart contracts and the like. Each participant in the blockchain can control the digital assets using a private key. Due to the decentralized mechanism, recovery of data is fast and easy in case of failures.

Secure

- Blockchain uses cryptographic hash to ensure security. All the information on the Blockchain is hashed with cryptography i.e. a key is used to protect data. All the participants will use the public key for transactions and private keys for the data access.

Irreversible

- Blockchain uses the concept of hashing and due to the complexity of the hash function, it is impractical to alter or revoke. It is impossible for an individual to use the public key and find the private key. In case some malicious participants try to corrupt the system, they need to change every data stored on different nodes. Since this could involve millions of copies of the ledger, hacking millions of computers is very expensive and next to impossible.

Reliable

- Since the blockchain network is decentralized, failure of one system will not affect the functioning of individual participants or organizations.

Efficiency

- Blockchain technology works on a decentralized mechanism, i.e. it is up for 365 days a year, 24 hours a day, and participants can carry out transactions at their convenience. As transactions are not under control of any central authority it reduces processing time.

Smart Contract

- A participant in the Blockchain technology cannot manipulate data according to his whims and fancies because the kind of transactions allowed is agreed upon between the participants in advance and stored in the Blockchain as a "Smart contract".

Types of Ledger

Blockchain is the distributed ledger that records the transaction between every user who is connected to the chain. Blockchain has the potential for application in many industries including accounting, finance and business.

Depending upon the need of application, blockchain technologies have been divided into three types. Fig. 2 shows different types of ledger.

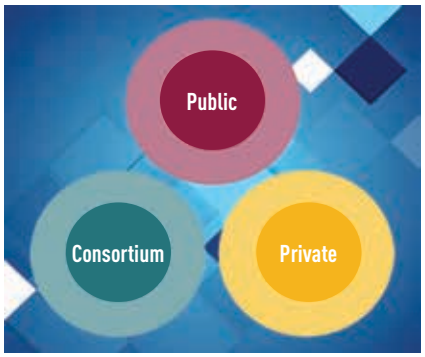

Fig. 2 : Types of Ledger

- **Public ledger:**

Public ledger allows anyone to participate as users, miners, developers, or community members which are an open source.

- A public ledger or blockchain is designed to be fully distributed and decentralized. All the transactions are recorded as blocks and linked together to form a chain. Each new block must have a timestamp and should be validated by all the nodes (computers) connected to the network before it is written into the ledger.
- The users can check the transaction and verify it as well as participate in the process of getting consensus. The transactions are unchallengeable and the data cannot be altered after they are verified.
- Bitcoin and Ethereum are both best known public blockchain which are used as cryptocurrency. These bitcoin transactions are completely transparent and not suitable for organizations dealing with the sensitive information.
- **Private ledger:**

Private organizations that keep individuals' personal information or commercial contracts are more likely to join private ledger or blockchain.

- The private ledger allows only the invited users to transact without making the data public. Therefore, private ledger consists of different levels of permissions for its members.
- The private ledger also allows the organizations to utilize distributed ledger technology without making data public. Since, private ledger lacks the defining feature of blockchain, some critics argue in favour of decentralization of the transaction
- Private ledgers are more centralized than public ledger where the transactions are private and are only available for permitted participants.
- **Consortium ledger:**

Consortium ledger provides 'semi-private' access which allows the user group to have control across different organizations. Therefore, consortium ledgers are governed by a group of organizations and not by a single entity.

- They are often associated with a group of companies which collaborate together to leverage blockchain technology for the improvement of business.
- Consortium ledger provides more efficient transactions, both individually and collectively.
- Currently, Hyperledger is developing business consortium blockchain with distributed ledger frameworks to support business transactions.

Fig. 3 : Applications of Blockchain Technology

Blockchain Security

Nowadays people prefer cashless transactions and during these cashless transactions the only concern raised by an individual is data security and anonymity. The Blockchain technology provides a secure solution for value exchange. In Blockchain a private key is owned by all the participants. As [1] it utilizes decentralized storage concept, it divides the data into small chunks and distributes them over the network.

It uses encryption mechanism and validation techniques to ensure security. In case of any changes to the record, the signature becomes invalid. With this decentralized mechanism, encryption and cross check is nearly impossible for malicious users to successfully hack Blockchain. If someone mysteriously tries to control the system, it cannot be achieved without being noticed or invalidating the signature. Here, every real time transaction is confirmed by multiple nodes and for this Blockchain uses consensus algorithm.

Application of Blockchain

Blockchain Technology has various real time applications. Some of the applications are discussed below: Fig.3 shows various applications of blockchain technology.

- **Non Reliance on Third Party**

Many companies including Uber, Expedia and HashCash Consultants have a centralised platform to connect providers of service with customers who need their service. They act as aggregators who fix their own terms and conditions and levy a charge as fee on each transaction. The use of blockchain technology helps to do away with the services of middlemen and creates a secure and decentralised means for service providers to connect and transact directly and safely with customers. Therefore, a secure way to manage the identity of customers is ensured by not sharing personal information in the digital world.

Large tourism companies like TUI Group and Winding Tree have begun using blockchain as a means to replace travel aggregators like Expedia. Such companies have initiated the creation of public blockchain where customers can engage directly with hotels. These multinational companies are creating decentralised travel booking systems with the use of blockchain and are expected to revolutionise hotel and travel bookings in the short future.

- **Efficient Healthcare Services**

Secure information sharing methods, which allow both healthcare providers and their users to verify the correctness of data, are critical for guaranteeing proper medical services. In this regard [2] blockchain comes in useful, as one of its main advantages is data integrity. When information is recorded and encrypted, it becomes impossible to change or remove. Blockchain providers in the health industry like SimplyVital, ConnectingCare and Health Nexus have already created blockchain products meant to help with tracking of patient progress after they are discharged from hospital and to provide decentralised blockchain patient records. Companies like Gem are working with the Centre for Disease Control to build a blockchain solution for storing disease outbreak data to provide timely relief to the affected. Data managed by medical organizations includes Patient health information (PHI); Electronic health records; and Medical insurance claims.

- **Enhanced Banking Service**

Blockchain has great potential in bringing about a collective effort among banks to create a network necessary to support global payments. This can further help to convert the method of executing universally accepted transactions by banks. Renowned banks like Barclays and Bank Hapoalim [4] have launched several blockchain initiatives for tracking financial transactions, detecting and battling fraud, managing bank guarantees and also releasing automated payments. With the use of blockchain banks can reduce the cost of processing payments and create new products and services that can generate important new revenue streams.

- **Effective Supply Chain Management**

Success of business success depends on knowing the status, condition and provenance (origin) of every product in the supply chain. Provenance is emerging as an important issue for customers. Companies have begun to trace the origin of the products and their route right up to the stage of consumption in order to provide transparency that allows them to verify that the chosen products are free from conflict. A classic example is DeBeers which plans to use blockchain technology to trace diamonds all the way from the mine to the end customer. Yet another example is Walmart which is using blockchain to track the safety of farm produce so that farm products, free of contamination, can be offered to customers. Here, farmers are required to upload details of their produce into a blockchain so that Walmart will be able to identify possibly contaminated batches of products easily.

- **Enhanced Insurance Solutions**

Insurance companies have begun using blockchain solutions called RiskBlock to acquire proof-of-insurance information. This is in order to assist insurers and the insured verify insurance coverage in real time and make the process of making claims faster and more efficient. Use of blockchain solutions have helped to reform insurance business by ensuring that only valid claims are paid out. For instance, the blockchain would instantaneously know if numerous claims have been filed for the same accident. Furthermore, when conditions for a satisfactory claim have been fulfilled, payment could be activated automatically without any human involvement. In this way, resolution of claims is considerably accelerated.

Challenges in Blockchain Technology

Blockchain technology has made a significant impact for addressing large number of applications like decentralization, data integrity, security, scalability and data-driven solutions. However, it has significant implementation and adoption challenges.

- **Consensus**

How to reach a consensus in distributed environment is the key challenge that Blockchain technology faces, especially where there is no centralized node that ensures all the transactions are on the same network. Further, a majority of research towards identifying and improving limitations of Blockchain from privacy and security perspectives do not have concrete evaluation on their effectiveness.

- **Latency and Throughput**

Latency and **Throughput** of transactions are yet to achieve the efficiency of the Blockchain network. The potential throughput of transactions per second in the Bitcoin network is 7tps (transactions per second) whereas VISA transaction processing networks have 2,000 tps. Complete cycle of making a block and confirming the transaction is slower compared to other processing networks.

- **Security**

Security is one of the challenges in the value exchange protocol. Such challenges are encountered by blockchain technology as well. In this context, 51% attack refers to the group of miners that are controlling more than 50% of the network's mining hashrate. That means they could reverse the transactions before the completion. More research on security is necessary to overcome this situation.

- **Wastage of Resources**

There's a huge waste of energy resources which occurs while mining the Bitcoin. Also, the usability of Bitcoin API for developing services needs to be developer-friendly.

Conclusion

Blockchain can be considered as sustainable and secure solution for future generations to come. Blockchain technology is considered the fourth industrial revolution for the advantages it can bring to businesses during current times. Blockchain is the most talked about technology in recent years as it has the potential to support various applications from finance to agriculture. Some of the techniques introduced are already successfully used by a few business types. However, for a wider acceptance it is expected to take a few decades to gain further popularity. The adoption rate of blockchain technology into businesses will depend on the pace at which they integrate into the network.

References

[1] A Survey of blockchain security issue and challenges (Iuon-Chang Lin1,2 and Tzu-Chun Liao2), 2017.

[2] A. Azaria, A. Ekblaw, T. Vieira, and A. Lippman, Medrec: Using blockchain for medical data access and permission management, in 2016 2nd International Conference on Open and Big Data (OBD), pp. 2530, Aug 2016.

[3] G. Zyskind, O. Nathan, and A. Pentland, Decentralizing privacy: Using blockchain to protect personal data, in Security and Privacy Workshops (SPW), 2015 IEEE, May 2015.

[4] Ye Guo & Chen Liang, Blockchain application and outlook in the banking industry, 2016.

[5] https://www.blockchain4innovation.it/mercati/legal/blockchain-24-carati-cosi-everledger-digitalizza-diamanti.

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About National Student Coordinator

Dr. P. Kumar, Professor and Director, Alumni Affairs has been with Rajalakshmi Engineering College since June 1998.He has 22 years of teaching and published more than 30 papers in the referred National and International Journals. He has guided many UG and PG projects and one of his project have won Best Project in IBM TGMC. He also published a book on Computer Programming. He is the Life Member of Computer Society of India and served as a Chairman of CSI Chennai Chapter during 2013 - 14. He was Chairman of Division V (Education and Research) of CSI during 2017 - 19. He was instrumental in training and organizing CSI School Students Software Contest for a decade. He took many school students to International Software contest and won prizes at the International Level.

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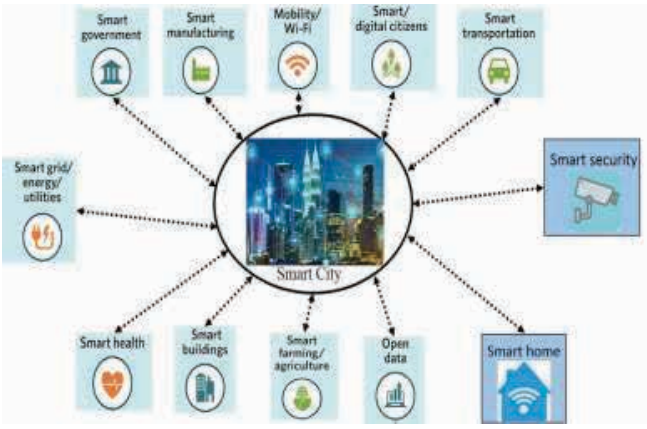

Benefits	Platinum	Gold	Silver	Associate	Other**
Exclusivity	Category				✔
Built up space to exhibit their product & services* (sq m)	18	12	9		
Venue branding with logo presence in the Event "Smart Urbanation"	✔	✔	✔	✔	✔
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Senior Official would be a part of the Jury panel for joint discussion on Winners selection	✔				
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Acknowledgement of the Partnership at the conference & awards through Emcee mentions & plug ins	✔	✔	✔	✔	
Branding in the registration area and entrance hall along with visible sized logo Branding of visitor bags	✔	✔	✔	✔	✔
Complimentary Invitation passes	10	8	5	3	3
Networking meet with Chief Guest, Winners, Jury and VIPs in lounge during networking sessions	✔	✔	✔		
All lanyards during the 2 day event would have exclusive logo branding (1)					✔
Opportunity to come on stage before the Lunch break to invite all delegates & speakers (2)					✔
Opportunity to raise a toast for the evening cocktail and invite all delegation (3)					✔
Stand-alone pull ups	2	1			
Opportunity to distribute corporate brochures / Pamphlets to the participants in the kit	Brochure	Pamphlet (2)	Pamphlet (1)		
Inclusion of Senior Officials at the panel discussions mapping relevant topics	2 panels	1 panel	1 panel		
Corporate video to be played	90 secs				
Copy of the Final delegate list with complete contact details of Public & Private sector	✔				
1-2-1 business meetings with different Smart Cities Project Team for future business	8	5	3		
Inclusion of Video interview of Senior Official in website & Youtube	✔				
Mention in all Press Releases & Media Coverage	Yes				
Post Event Coverage in ASAPP Publications	Yes	Yes	Yes	Yes	Yes
Investment (₹)	25,00,000	15,00,000	7,50,000	5,00,000	6,00,000
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Worm Signature generation using Honeypot Technology

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In cyber world, the major problem is to detect malicious objects mainly newly invented programs. Though there is some pre-used methodology to detect old attacks, because they have previous signature generation approach. But when a new attack comes in situation, it's very difficult to detect the attack pattern.

In this paper we have proposed a methodology to detect malicious objects specially worm attacks and a proposed algorithm to generate signature for Worm. Our proposed technique is optimal cost technique too. We have used Double-Honeypot architecture to implement the technology.

Keywords: Honeypot, Malicious objects, Worm, Double-Honeypot

Introduction:

We know that malicious objects are an important issue in modern day's security. We can take an approach to detect this malicious activities. Let there is an e-mail server which is responsible to send and receive the e-mails of the persons in an organization. As, all of us know that e-mail is a big carrier of malicious attacks. For detection of E-mails with malicious attacks, we can take a tricky approach.. We can create dummy e-mail account having no restrictions to receive e-mails. We do not forward this account to any one for the communication. As E-mails with malicious attacks are forwarded to all the e-mail accounts of the E-mail server, so, for the dummy account also. Therefore, to detect those type of attacks we can check the dummy account first as e-mails received in those account will be having maximum chance of worm attack. To protect our network form such types of malicious attacks we can delete all the e-mails from all the e-mail accounts of those server [1]. Honeypot works like that. Honeypot is an information resource whose value lies in unauthorized or illicit uses of that resource [2]. Anything will come through a honeypot will be taken as an attack or probe. It is generally two types. High interaction and low interaction honeypot. High interaction honeypot gives the user access to the real operating system where nothing is restricted. Honeynet is an example of high interaction honeypot and low interaction honeypot does not provide any security, only it collects information about the attack. Outbound honeypot example is Honeyd.

Extended Double-Honeypot architecture:

The idea of double honeypot system is inbound honeypot is not authorized to make an outbound connection [3]. As we are much concern about worm attacks because worm has its self replication property, it can replicate very easily to the intended machine, we are proposing this double honeypot system architecture. When an attack comes into inbound honeypot it tries to make an outbound connection because of its replication property and all the attack signature are transferred to the low interaction honeypot [4]. We are using worm replication property to generate signature. Fig. 1 illustrates Double Honeypot Architecture.

But we also know that intranet is a connection of more than one LAN. We know that distinct LAN contains different vulnerable systems. Now in this situation if we design architecture of Honeypot for whole intranet it will be very difficult to implement [5]. For this we have used extended architecture with sticky honeypot concept and Figure 2 describes this architecture.

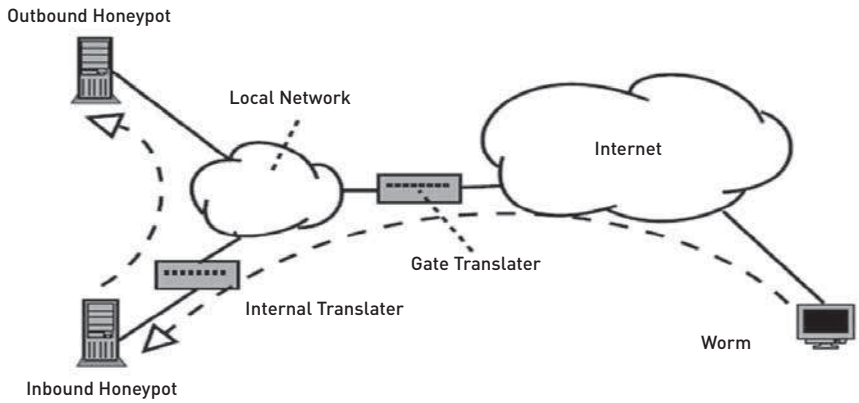

Fig. 1 : Using double-honeypot detecting Internet worms

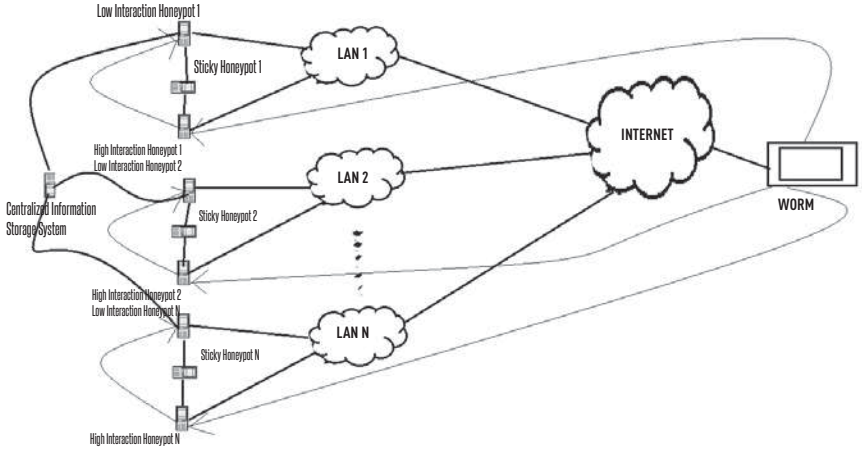

Fig. 2 : Extended Honeypot Framework

Signature generation approach for Worm using Honeypot:

To generate automated signature we have used Antivirus Engine which consist of behavioural detection engine and 3 High Interaction Honeypot and 1 Low Interaction Honeypot. We have also used Sticky Honeypot to slow down worm propagation rate, such that signature generator can get more time to analyze the attack pattern. Figure 3 illustrates the system architecture of signature generator.

Proposed Algorithm:

1. Gate translator will collect all the traffic and will redirect them to the first Inbound Honeypot.
2. Internal translator will redirect the malicious traffic to the second Inbound Honeypot.
3. Sticky honeypot is adjusted between Honeypot 1 and Honeypot 2 to slow down the worm propagation rate. Different TCP tricks are there for Sticky Honeypot.
4. Honeypot 3 consists of Antivirus Engine. All the malicious traffic will go through the Engine and it consist of behavioural detection engine and corresponding signature will be generated and will go through a Low Interaction Honeypot.
5. Low Interaction Honeypot will send the signature to a centralized storage system through which IDS can get the information. So analyzing the signature IDS can protect any attack, as it will get its generated signature.
6. If the Antivirus Engine in Honeynet 3 unable to detect any Signature then that payload will be automatically redirected to internet through unused IP system.

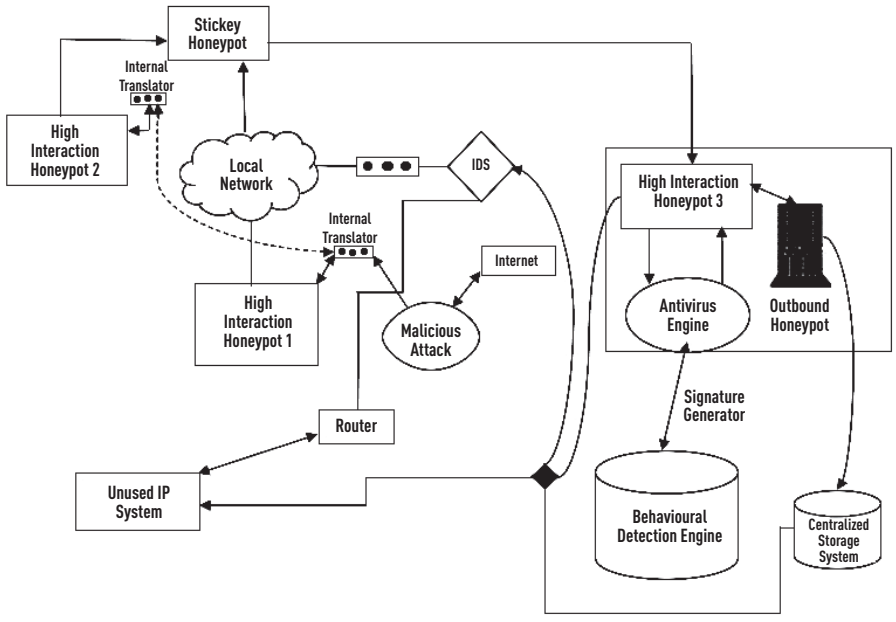

Fig. 3 : System Architecture

Conclusion:

The paper provides an idea about honeypots and their usage. As honeypot is a new technology and have a good scope for future works. Honeypot can be used with security tools such that IDS or Firewalls or Application Server or database Server to make them more effective. Malicious program can be easily detected by honeypot technology concept.

We have also used Extended-Double-Honeypot Architecture to detect malicious programs like worm attack. These technologies are new and have a very good prospect in market because it examines a malicious code which is not seen before. Substring Extraction from worm signature is also a popular methodology to detect signature pattern [6].

Reference:

[1] Zhou, J.; Heckman, M.; Reynolds, B.; Carlson, A.; Bishop, M. (2007). Modeling network intrusion detection alerts for correlation. ACM Transactions on Information and System Security (TISSEC), Volume 10, Issue 1, pp.-1-31.

[2] Yong Tang, Shigang Chen," An Automated Signature-Based Approach against Polymorphic Internet Worms," IEEE Transaction on Parallel and Distributed Systems, pp. 879-892 July 2007.

[3] Bio Intrusion Detection System. Available: http://www.bro-ids.org/, 14 February 2011. International Journal for Information Security Research (IJISR), Volume 1, Issues 1/2, March/ June 2011 Copyright

[4] B.K.Mishra., N.Jha., SEIQRS model for the transmission of the malicious object in computer network, Applied Mathematical Modeling, 34, pp.710-715,2010.

[5] Yong Tang and Shigang Chen., Defending Against Internet Worms: A Signature- Based Approach, Department of Computer & Information

Science & Engineering, University of Florida, Gainesville, FL,USA., pp. 32611-6120,2010.

[6] Tang,Y.; Chen, S. (2005). Defending Against Internet Worms: A Signature-Based Approach. In Proceedings of IEEE INFOCOM- 2005, Miami, Florida, USA, pp.1-11.

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Hyderabad ExecCom Meeting

The view of second Executive Committee Meeting of Computer Society of India held at Hotel Radisson High Tech City of Hyderabad on 13, 14 July, 2019.

The Executive Members of CSI.

Role of Blockchain in Identity Management- Future Technology for Secure Information System

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Blockchain - An Introduction

In today's digital world, various systems communicate with each other for information exchange. As a user they expect every interaction between the devices to be safe and reliable. Blockchain is one of the evolving technologies promising a well-organized, reliable, cost-effective and secure system to conduct and record any transaction without the need for intermediaries with powerful cryptographic foundations. It is a data structure that maintains time-stamped sequence of record list called as "Blocks" that is governed by a cluster of computers. Each of these blocks will contain a cryptographic hash of the previous block, timestamp and transaction data. These data blocks are secured and linked together using cryptographic principles. Figure 1 shows the schematic diagram of a blockchain technology.

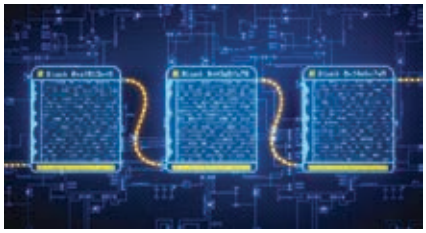

Fig. 1 : Schematic diagram of a Blockchain Technology

Blockchain - Characteristics

Blockchain is predominantly a decentralized distributed ledger that retains a complete list of frequently rising data records tenable from unauthorized tampering, manipulating and alteration. Since blockchain is a shared and unchangeable ledger, the information contained in it is open to all. So anything that is constructed on blockchain will be transparent and their activities will be accountable to everyone involved. Fig. 2 shows the characteristics of Blockchain technology

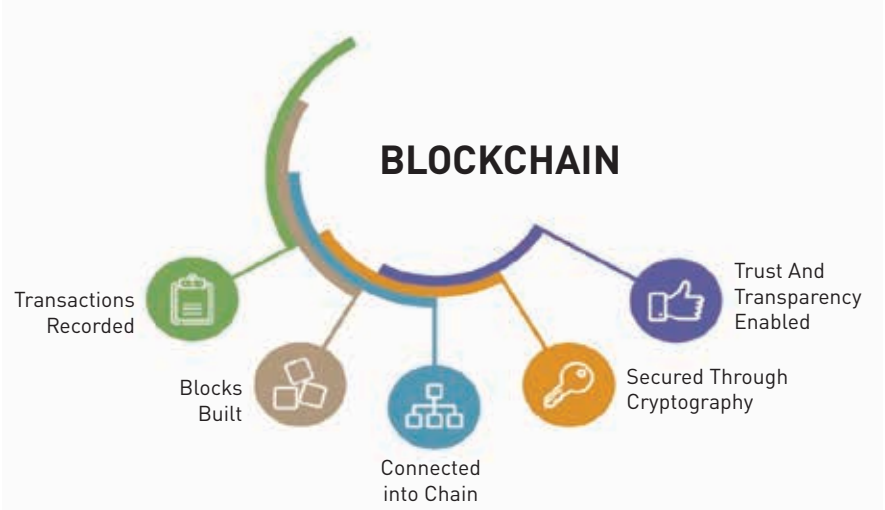

Fig. 2 : Characteristics of Blockchain Technology

Blockchain – Real time Applications

Blockchain technology has obtained significant attention, with increasing interest in the abundance of several applications, ranging from cyber security, government, identity, healthcare.. These blockchain applications extended far beyond the system of financial services, ranging from sharing economy through digital voting and smart contracts to logistics chain management. Thus, the areas of application exceed financial sectors and the blockchain is already in a position to alter all current industries. This technology is designed to completely transform transport organization, advertising, supply chain, energy production and distribution, real estate, insurance, and so on. It also changes the future by bringing us to autonomous objects from the Internet of Things. The various applications of blockchain is shown in the Figure 3. In this article we concentrate on how blockchain can transform the process of identity management.

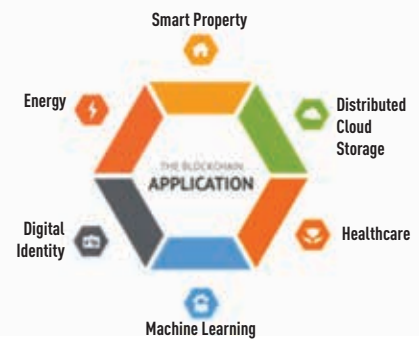

Fig. 4 : Real time Blockchain Applications

Identity Management – An Overview

Identity management is an administrative method designed to authenticate, identify and authorize people to access networks and applications by connecting user rights and limitations with known identities. The schematic representation of Identity Management is shown in the Fig. 5.

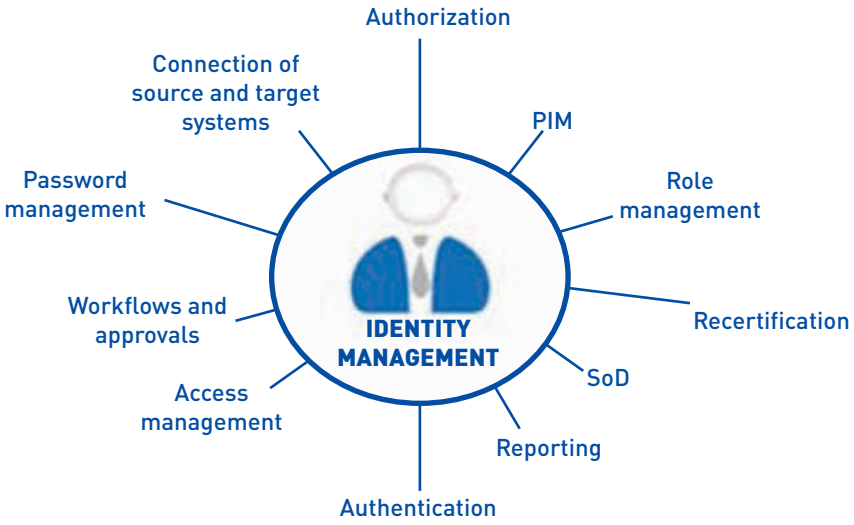

Fig. 5 : Schematic representation of Identity Management

Identity Management – Challenges

Everyone regularly uses identity document which, without their explicit approval is shared with third parties and stored at an unknown place. Companies like government institutions, credit agencies and banks are regarded the weakest point in the present identity management system because they are susceptible to data theft and hacking. Some of the challenges in the Traditional Identity Management are identity theft, Lack of security and privacy, KYC Onboarding, Lack of Control, Provisioning and De-provisioning etc.

Role of Blockchain in Identity Management

In the internet age, the need for a blockchain based identity management system is highly evident. Blockchain promotes multiple industries with security, transparency and numerous features that add value to their businesses. This technology offers the ideal engine for powering digital identities. While digital identities evolve as an inevitable aspect of our linked world, how we safeguard our internet data is under investigation. Our present approach is to identity management strategy is broken. Everywhere you are being asked to identify yourself with multiple government approved IDs such as Voter ID, Pan Card, and Passport etc. Multiple ID sharing leads to privacy concerns and infringements of data. As of today, there is no sufficient system for safeguarding either online authentication of your personal or digital identities.

A platform can be designed using blockchain to protect identity of individuals from thefts and breaches. This technology safeguards your identity from spammers and marketing schemes by encrypting and protecting it. Blockchain does not store information or data from the user. Instead, the transactions taken between identity owners and companies will only be registered on the blockchain. Figure 6 shows how blockchain leverages identity management to increase data security and reduce data breaches.

We could generate a digital ID that would function as an incorruptible watermark by using a decentralized open-source blockchain and connecting it to identity management. For any transaction in real time, this watermark could be used to authenticate an identity. In this way, the blockchain provides a potential remedy to the above-mentioned challenges by allowing users a feel of security that their Personally Identifiable Information (PII) cannot be shared to any third party without their consent. The blockchain thus comes with the option of removing intermediaries while allowing individuals to manage their own identity. Figure 7 shows the role of blockchain in leveraging digital identity management.

Conclusion

Leveraging the advantages of transparency and reliance offered by blockchain frameworks, several organizations and countries are linking hands to guarantee cross-border interoperability. The concept of identity management using blockchain provides end-users full access. This allows them to address the data they want to share for transactions by maintaining the archived information safe from the theft accidents and thereby making operations easier for the maintenance of new digital clone. Eventually, when enterprises use blockchain in identity management, it will be feasible to

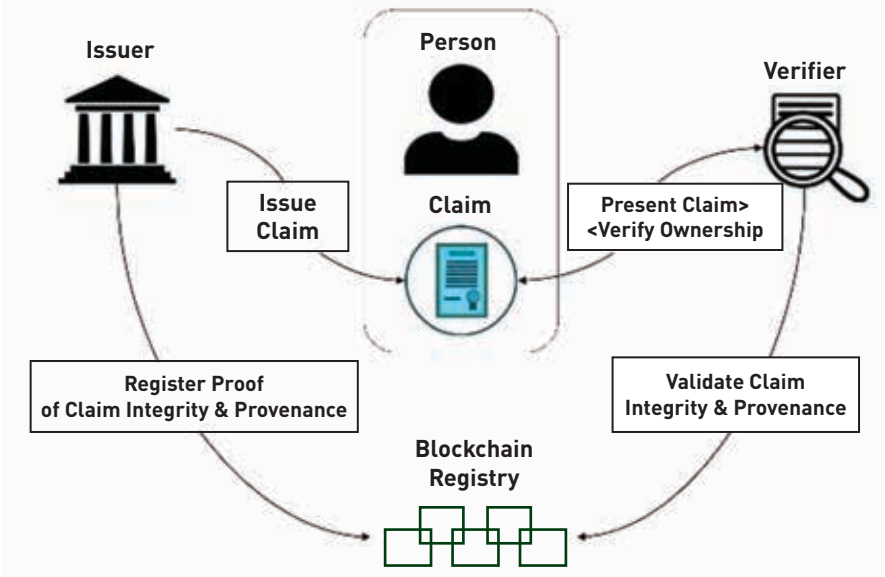

Fig. 6 : Blockchain in Identity Management

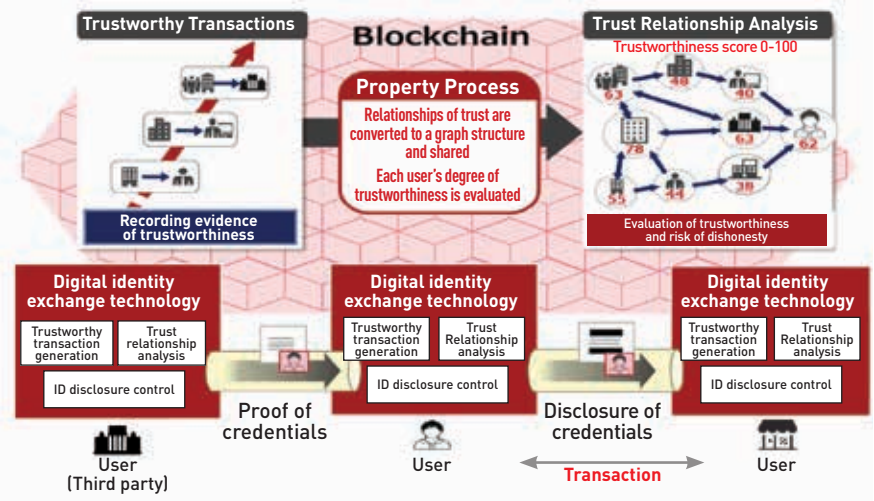

Fig. 6 : Blockchain in Identity Management

achieve veracity and authenticity of data.

References

[1] https://www.hoyes.com/blog/can-blockchain-technology-save-the-credit-scoring-system/

[2] https://identitywoman.net/topics/big-ideas/blockchain/

[3] https://www.zdnet.com/article/fujitsu-develops-blockchain-based-digital-identity-play/

[4] https://www.tuv.com/qatar/en/identity-und-access-management-(iam).html

[5] https://www.testingxperts.com/services/Blockchain-Application-Testing

[6] https://medium.com/embrace-technology/blockchain-applications-and-potential-across- Industries-apart-from-cryptocurrencies-415897707f22

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Archana Sasi received her B.Tech and M.Tech in Computer Science and Engineering and Computer and Information Science from College of Engineering Cherthala in 2012 and 2014 respectively. She is currently working as Assistant Professor in Computer Science and Engineering Department at Presidency University Bangalore, Karnataka. She has published Articles and Technical trends under CSI Communication Magazine. Her research area includes Supply Chain Management, Internet of Things and Big Data Analytics.

Sathish Kumar Ravichandran received his B.Tech, M.E, and Ph.D in Information Technology, Computer Science Engineering and Information and Communication Engineering from Anna University Coimbatore and Anna University Chennai, Anna University Chennai in 2011, 2013, and 2019 respectively. He is currently working as Assistant Professor in Computer Science and Engineering department at Presidency University Bangalore in Karnataka. He received best paper award in IEEE sponsored International Conference on Advanced Computing & Communication System, India. He serve as Editorial review member for many UGC journals. He published many research papers in SCI, Scopus indexed Journals. His research area includes Supply Chain Management, Big Data Analytics, IoT, and Bio Inspired Optimization algorithms.

Congratulations

Prof. A. K. Nayak, the President Computer Society of India and Director, Indian Institute of Business Management is receiving **BHARAT RATNA DR. ABDUL KALAM GOLD MEDAL AWARD** at Hotel Bijay Residency, Bengaluru on 20th July, 2019. The award has been conferred on him by the Global Economic Progress & Research Association, Tamilnadu for his significant contribution for IT Education in the Country.

Collaboration and Future prospects with Computer Society of India

FDP by Computer Society of India

Organised by **SOET, Sandip University, Nashik Campus**

On 6th July 2019 at 11.00 AM to 1.00 PM at Conference Hall, Y Building, Sandip University

An FDP event was organized to introduce CSI activities and faculties had an enlightening session with Prof. A. K. Nayak, President, CSI and Mr. Pradip Rathi, Regional Vice President (Mh. And Goa). Respected dignitaries had fruitful interaction with the faculties and discussed about expanding relationship between CSI and Sandip University. Also, all ware appraised of the future plans of CSI regarding different activities helpful for students as well as faculty development. Event was well organized by Professional coordinator Dr. P. M. Sonwane.

Col. N. Ramachandran, VC Sandip University facilitating Prof. A. K. Nayak, CSI President

Dr. Arun Dwivedi, Dean, Sandip University facilitating Mr. Pradeep Rathi RVP-6, CSI

Prof. A. K. Nayak, CSI President and RVP-6 CSI with Col. N. Ramachandran, VC and faculty members of Sandip University

Prof. A. K. Nayak, CSI President and CSI with Dr. Sandip Jha, Chairman and Col. N. Ramachandran, Vice Chancellor, Sandip University

CSI President with Management & Faculty Members of Sandip University

One day workshop on Leverage your professional skills for the era of Artificial Intelligence

Organised by CSI Chennai Chapter in association with Department of Data Science, Loyola College

By **Prof. J. Jerald Inico**, Hon. Secretary, CSI Chennai Chapter

Computer Society of India, Chennai Chapter in association with Department of Data Science, Loyola College organized a one day workshop on "Leverage your professional skills for the era of Artificial Intelligence", on Saturday 27th July 2019.

The day started with introduction from Prof. Jerald Inico, Hon. Secretary, CSI Chennai Chapter and followed by the welcome address by Dr. Iniya Nehru, Chairman, CSI Chennai Chapter. He briefed face recognition techniques and revolution in the communication data by giving examples from telephone to mobile phone growth. The inaugural function came to an end with the vote of thanks by Mr. Anantha Padmanaban, Treasurer, CSI Chennai Chapter .

Dr. C .Muthu, Head -Department of Data Science, Loyola College, Chennai started with an introduction to Artificial Intelligence, concepts of Machine learning, Deep learning and connectivity of Chat bots. The key note on "Can we make the machines Intelligent?" was discussed with the participants and the interaction was good. The session went on well with the discussion on fixing of sensors in refrigerators, Factors affecting the productivity using machine learning or deep learning, Analysis of data with various types of machine learning techniques, Association rule mining concept and predictive analysis.

Mr. Balasubramani demonstrated "What can we do with AI?", Big data was introduced with a live demo program, Reinforcement learning was briefed with the application of Bellman equation and finally a live demo to run cars with sensors using AWS deep racer was demonstrated using concept-python with strong neural GPU(Graphics processing Unit).

Dr. Jesudoss Jeyapal, explained 5 T's-Time, Trimness / tidiness, Temptations, Temperament and Talk. Examples from various day to day life, were given and the listeners were fully engaged with the power packed speech of Dr. Jesudoss.

Mr.Shabarinath Ramlal, Founder Repco Labs, explained m to m-machine to machine, man to man, machine to man, man to machine concepts. Applications of IoT were discussed in detail by taking the sample of Cattle grazing in a Farm. Predictive analysis and differentiation of Deep learning and machine learning was explained through a role play.

Mr. M. S. Ramachandran explained how to become a good entrepreneur and the types of entrepreneurship skills. He stressed on how to start and run the new businesses successfully. The evolutions of door to door business to online business were discussed. The profit and loss in running a business was explained from his own personal experiences.

75 delegates participated in the workshop. Ms. Joyce of CTTE College for Women, Mr. Sreenivasalu of VISTAS Mr. Kumar of Patrician College of Arts and Science and Mr. Rajaram, MC member, CSI Chennai Chapter requested the CSI Team to conduct many more similar programs. Certificates along with a complimentary bag sponsored by "Challenger Computers, Chennai" were distributed to all the participants. Dr. A. Prema Kirubakaran, MC member, CSI Chennai Chapter briefed the entire summary and the workshop came to an end with the vote of thanks by Prof. P. V. Subramanian, Vice Chairman, CSI Chennai Chapter. It was really an enriching experience for all those who have attended.

Computer Society of India™

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Region-II

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Region-V

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Region-VI

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Region-VII

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State: Kerala

Vallurupalli Nageswara Rao Vignana Jyothi Institute of Engineering and Technology

Invited Lecture on Mezzanine Technologies and career in IT Sector

By **Prof. A K Nayak**, President, CSI

Prof. A K Nayak, President, CSI along with RVP-2 & 6 during discussion

An Invited Lecture on Mezzanine Technologies and career in IT Sector was Organized by CSI Student Branch of VNR Vignana Jyothi Institute of Engineering Technology on 13th July 2019 for the students of CSE Department. The Program was inaugurated by Prof. A K Nayak, President, CSI and also the Guest of Honor along with Mr. Pradeep Rathi, RVP-6, Mr. Md Shams Raza, RVP-2, Mr. N Sandeep Chaitanya, Mr. Sri Sumanth Coordinators for the Event & SBC, CSI Student Branch of VNR VJIET, Dr. C Kiranmai Former Principal & Professor in CSE Dept, Mrs. B V Kiranmayee, Head Dept. of CSE, Dr. G Ramesh Chandra Head Dept of RCC, Dr. Chennakesava Rao Bandaru, Director, and Principal Dr. C D Naidu.

Prof. A K Nayak, President, CSI during expert talk

Mr. N Sandeep Chaitanya, Mr. Sri Sumanth Coordinators for the Event & SBC's CSI student Branch introduced the department activities conducted under the CSI Student Branch. Then Mrs. B V Kiranmayee, Head Dept. of CSE Summarized the achievements in the Department. Dr. Chennakesava Rao Bandaru, Director discussed about the changing trends of Information & Communication Technology by explaining the Latest Technologies and Innovations. Dr. C D Naidu, Principal Appreciated the efforts of the CSI faculty and Student coordinators for conducting such a great event.

CSI President, RVP 2 & 6 along with Student Committee members

Mr. Pradeep Rathi, RVP-6, appreciated the efforts of Management & CSI student Branch for conducting the Outreach & E-outreach activities, In his enlighten speech he emphasized the importance of start-ups and incubation centres for the growth of the country. Prof. Md Shams Raza, RVP-2 educated the students on the career opportunities in the IT sector.

The Guest of Honour, Prof. A K Nayak, President, Computer Society of India shared his knowledge on the Digital India, how India should become self-sufficient in IT sector with Implementation and Development, Importance of women education and E-outreach programs to uplift the rural Education. He emphasized the research in natural language processing as in India alone there are more than 800 languages. He educated the students saying every individual is born with hidden talents but taking the right decision at the right time helps his/her for the future growth. He discussed about the importance of 3D's Dedication, Devotion & determination. He broadly explained the career opportunities' in the Big Data, Data Sciences, IoT & IoE. In his discussion, he encouraged the faculty members to register in Society of Indian Science Congress will helps in collaborative research.

CSI President, RVP 2 & 6 along with Student Committee members

Computer Society of India™

Academic Awards 2017-2018 & 2018-2019

Call for Applications

Computer Society of India has been honouring academic excellence through Academic Awards every year. The awards will be presented during the CSI Annual Convention which is scheduled during January 2020 at Bhubaneswar. Applications are invited for the following awards for the period from July 2017 to June 2018 and July 2018 to June 2019 from the CSI accredited student branches who meet the criteria and are currently in good standing.

Sl. No.	Name of the Award	Criteria	To be submitted by
1	Best Accredited Student Branch Award	Good standing – during the award year and currently, large student strength & large number of activities as defined in the specified form	Student Branch Counsellor (SBC) with necessary recommendation from Regional Student's Coordinator (RSC) and approval from Regional Vice President (RVP)
2	Largest Student Branch Award	Continuous good standing for the past 3 years with highest 3 years averaged strength	Decided by Awards Committee
3	Best CSI International Students Event Host Award	Institutional member hosted maximum student's competition participated by minimum 10 foreign students	SBC with necessary recommendation from RSC and approval from RVP
4	Highest Sponsorship of CSI Events Award	Institutional member extending maximum support for CSI events during the award year	SBC with necessary recommendation from RSC and approval from RVP
5	Longest Continuous SBC Award	Longest continuous tenure as SBC over the last 3 years	SBC with necessary recommendation from RSC and approval from RVP
6	Faculty with maximum publishing in CSI Publications	Publishing maximum articles in CSI publications / digital library during the award year	Self with necessary recommendation from RSC and approval from RVP
7	Paper Presenter at International Conference for Faculty	Presentation of paper at prestigious International Conferences during the award year	Self with necessary recommendation from RSC and approval from RVP
8	Students with maximum publishing – CSI publications	Publishing maximum articles in CSI publications / digital library during the award year	SBC with necessary recommendation from RSC and approval from RVP
9	Highest Committed Student Branch Activist Award	Most active CSI Volunteer from the Student Branch during the award year	SBC with necessary recommendation from RSC and approval from RVP
10	Best Ph D Thesis Award	CSI member, who submitted a high-quality thesis (Thesis quality to be evaluated by a panel of eminent research scientists) leading to acceptance for Ph D degree by a recognized University	Research Scholar (who got the Ph D during the award year) / the Research Supervisor / Current Employer

The application for the academic awards are invited only from the CSI members or from CSI Accredited Student Branches in good standing during the year 2017-2018, 2018-2019 to till date. Application forms can be had from awards@csi-india.org

The completed applications as soft copies should reach via email to awards@csi-india.org with CC to ipp@csi-india.org as specified in the form, latest by 30th September 2019. Incomplete application will not be considered for scrutiny.

Mr Sanjay Mohapatra
Chairman Awards Committee

Mr Pradeep Rathi
Member

Col Balraj Anand
Member

Prof Vibhakar Mansotra
Member

Computer Society of India™

CSI Service Awards 2017-2018 & 2018-2019

Call for Applications

There are various awards which are to be given to the Chapters and Individuals to acknowledge and encourage for their extraordinary contribution towards growth of the society and IT Industry. Applications are invited from Chapters and Individuals for their significant contributions to the society during the financial year 2017-18 (July 2017 to June 2018) and 2018-2019 (July 2018 to June 2019). The Awards will be presented during CSI Annual Convention which is scheduled during January 2020 at Bhubaneswar.

The CSI Awards constituted for encouraging the chapters / individuals are indicated below

Sl. No.	Name of the Award
1	Best National Chapter Award*
2	Best Regional Chapter Award (Category A)
3	Best Regional Chapter Award (Category B)
4	Best Regional Chapter Award (Category C)
5	Best Chapter News-Letter Award
6	Chapter Patron Award
7	Significant Contribution Award
8	Active Participation Award (Youth - under 28 years)
9	Active Participation Award (Woman)

Chapters and Individuals interested in participating for these awards, may mail their nominations in a prescribed format. Application forms can be had from awards@csi-india.org

The nomination should be routed through respective Regional Vice Presidents, so that the scrutiny can be done by CSI-ED at Chennai and forwarded to "AWARDS COMMITTEE".

The completed applications as soft copies should reach via email to awards@csi-india.org with CC to ipp@csi-india.org as specified in the form, latest by 30th September 2019. Incomplete application will not be considered for scrutiny.

*The best national chapter award will be given on the basis of nomination for best regional chapter award, so, a separate nomination for this award is not required.

Mr Sanjay Mohapatra
Chairman Awards Committee

Mr Pradeep Rathi
Member

Col Balraj Anand
Member

Prof Vibhakar Mansotra
Member

Computer Society of India™

Call for Proposals from CSI Student Branches to organize

National / Regional / State Level CSI Student Conventions

during the year 2019-20

Computer Society of India (CSI) organizes National, Regional, and State Level Student Conventions annually, to enhance the awareness on technological developments and applications, and foster creative professional orientations among the academic community. The Conventions, held at Student Branches, offer excellent opportunities to the students to manifest their technical proficiency and prowess through paper presentations, discussions and extensive interactions with peers and pioneers.

CSI invites Proposals from Student Branches to conduct the National / Regional / State Level Student Conventions to be held during the academic year 2019-20 (April to March).

Criteria: The proposing Student Branch should be very active, with a track record of several CSI activities, and be in good standing through the years 2018-19 and 2019-20.

The proposals for convention will be evaluated, broadly based on the parameters given below:

a) Number of years of continuous valid Student Branch at the college (without break)

b) Average student strength over the past three years

c) Number, quality and level of activities at the student branch

d) Prompt submission of activity reports and financial accounts

e) Ability to attract good speakers from Industry

f) Availability of infrastructure and other resources

g) Financial strength and potential

h) Accessibility and other general conditions

Schedule:

Regional & State Student Conventions: To be conducted before 31st December 2019

National Student Convention: To be conducted after 1st January 2020 before 28th February 2020

All the National, Regional & State Student Conventions are to be completed according to the above schedule.

The CSI Student Convention Manual describes the guidelines and norms to conduct the student conventions.

The Proposal: Interested Student Branches are requested to send electronic proposals in the prescribed format with all necessary data, including the information stated below.

a) Type of convention proposed: National / Regional / State level

b) Proposed dates (at least two days) – please indicate two sets of dates

c) A statement of case why the SB should be considered favourably for the proposed event

d) Signed undertaking by the Head of the Institution to provide all the required support (Document with scanned signature)

e) Name & contact details of SBC and the coordinator-designate for the proposed convention

How to send: The Student Branches may send the proposals in the prescribed format on or before 13th September 2019 through the respective Regional Vice President, to the Hon Secretary (secretary@csi-india.org) and Vice President (vp@csi-india.org), with a copy to Education Directorate (admn.officer@csi-india.org)

Selection: A Committee constituted by CSI, including the Honorary Secretary and Vice President, will assess the proposals to select the host institutions.

CSI Support: CSI extends partial financial assistance, in accordance with the availability of budgetary resources, subject to the approval of the Executive Committee. CSI also supports the publicity efforts for the Conventions.

Convention Helpline: CSI-Education Directorate shall be pleased to offer any information or help on the convention. Please do contact Mr. Gnanasekaran (email: admn.officer@csi-india.org Mobile: 98403 41902) for any assistance.

Shri R K Vyas
Vice President

Dr Santosh Kumar Yadav
Hon Secretary

ANNEXURE - I

Computer Society of India™

Application for hosting National / Regional / State Level Student Convention

Full Name of the Institution						
Complete Postal Address						
State :			Region :			
Institution Phone Number						
Institution membership No & Commence date						
Contact details of the Head of the Institution / Principal	Name					
	Mobile :		Email :			
SBC Details	Name					
	Mobile :		Email :			
Type of Student Convention (tick the appropriate column)	National		Regional		State	
Proposed Date(s)						
Alternative Date(s)						
Theme Name (3 alternatives desired)	1.					
	2.					
	3.					
Proposed Events						
Estimated Revenue						
Estimated Expenses						
Estimated Audience Size						
Event Chair & Contact Details						
Program Chair & Contact Details						
Organizing Chair & Contact Details						
Any other information						
Recommended by the Head of the Institution / Principal						
Signature & Seal:						

Endorsement by		
State Student Coordinator	Regional Student Coordinator	Regional Vice President

STUDENT BRANCHES INAUGURATION

REPORTS

KONGU ENGINEERING COLLEGE, PERUNDURAI, (REGION – VII)

Kongu Engineering College has organized the CSI Student Branch inaugural function on 10th July 2019. Prof. S Kuppuswami, Principal, Dr. V Balusamy, Principal Designate, and the Chief Guest Mr. John Samuel, Head-IT Infra Solution, TEG Global Infrastructures PVT, Ltd, Coimbatore inaugurated the CSI Student Branch. The faculty members, Computer Science Head of the Department Dr. R R Rajalaxmi, the student coordinator Dr. K Kousalya and more than 500 students have participated the function. Mr. M Vijayakumar, Secretary, CSI Student Branch proposed the activity plan for the year. The chief guest addressed about the future intelligence. He investigated that looking into the future is easy to predict a world in which artificial Intelligence plays a more significant role in our daily lives. Finally, the additional secretary Mr. M Akash delivered the vote of thanks.

CSI-KEC Student Branch Office Bearers for 2019-2020

KONGUNADU COLLEGE OF ENGINEERING AND TECHNOLOGY, THOLURPATTI (REGION-VII)

Kongunadu College of Engineering and Technology has organized the CSI Student Branch inaugural function and conducted a guest lecture on "IoT and Its Application" on 5th July 2019. The students of CSE & IT has participated in this

function. Dr. PSK R Periaswamy, Chairman of Kongunadu Institutions has presided over the function. The event started with the welcome address by Mr. M Purushothaman, Secretary and Final Year CSE student. Dr. J Yogapriya Dean (R&D) has delivered the Felicitation address by suggesting the research opportunities in the field of IoT. Mr. N Premkumar HoD, IT Department has delivered the Felicitation address pointing out the opportunities and the importance of being a student member in CSI Chapter. Dr. R Asokan, Principal has addressed the students about the importance of CSI Student Chapter and its benefits. Mr. J Jerald Inico, Hon Secretary, CSI Chennai Chapter & Assistant Professor, Dept. of Compute Science, Loyola College, Chennai has presented the Inaugural address and acted as a resource person for this event. Before initializing the guest lecture, he had referred the quote of former Prime Minister Mr. Rajiv Gandhi that is doesn't matter where we come from but it refers where we go. CSI is platform for the CSI student members to recognize and realize their leadership skills and talents. It should help every member to collaborate in learning and experience it by exploring. He also explained the trends in Industry that the skillful employees only can survive due to high level competition within organization. He ended his speech by quoting the golden words of Swami Vivekananda that set your goal and try until you reach your goal. Strengthen your strength and weaken your weaknesses was the mantra learned from his inaugural address. He started his presentation by explaining details about IoT. He has shown the architectural diagram of IoT and presented IoT yesterday, today and tomorrow with plenty of examples and the changes in representation for objects and things. He explained how ARPANET began its journey in the field of IoT. He shared the first app to turn on a machine through internet. He also presented the challenges of IoT today. He also emphasized on the skill sets to grab the opportunities in IoT like Security and Data Analytics, Business Intelligence, UI / UX Design, Mobile/Remote with feedback session. The event concluded with vote of thanks by Ms. R Padmavathi, Joint Secretary, III Year CSE.

COIMBATORE CHAPTER

The installation of the new office bearers for the year 2019-2020 of the CSI Coimbatore chapter was held on 4th July 2019. Dr. R V Ramani, Founder and Managing Trustee of Sankara Eye Foundation - India, the Padma Shri awardee of this year was the chief guest. The session started with invocation followed by a welcome address by Prof. A Sivabalan, Immediate Past Chairman of the chapter. Prof. Sivabalan also presented the activity report of the chapter for the year 2018-2019. Dr. Rangarajagopal, Chairman of the Nomination Committee introduced the management committee members of the chapter for the year 2019-2020. Dr. Ranga also mentioned that the chairperson Dr. N R Alamelu is the first woman chairperson of the Chapter, since its inception in 1994 and this year the chapter also has more women in the Management Committee. Dr. NR Alamelu, the Chairperson addressed the gathering that the CSI Coimbatore Chapter would take all steps to create knowledge and exposure to all the members on the industry expected skills including disruptive technologies. Dr. R V Ramani the chief guest expressed his appreciation for all the good activities of the Chapter and shared that Information Technology is highly helpful for complex, healthcare management to achieve patient delight. He motivated all the members in particular the youngsters to be passionate about continuous lifelong learning. As the founder of Sankara Eye Foundation, Dr. R V Ramani offered to conduct preventive vision screening in smaller groups of 25 members for CSI members who extensively use computer systems. All the members were quite happy about this ready support from Sankara Eye Foundation. Mr. P R Rangaswamy, life member, CSI presented the memento to the Chief Guest. The session concluded with the vote of thanks by Mr. Sivaramasamy, Secretary of the Chapter. The program saw an overwhelming response of more than 100 members both from academia and industries.

LAKSHMANGARH CHAPTER

One day Faculty Development Program on "Structuring a Good Research Proposal" was held on June 14, 2019, which is jointly organized by CSI Lakshmangarh Chapter and School of Engineering and Technology (SET), Mody University of Science and Technology, Lakshmangarh, Sikar. The FDP was conducted by Porf R K Gaur (Head, Department of Bio-Sciences, SoS, MUST, Lakshmangarh). Dr. Anand Sharma, Secretary, CSI Lakshmangarh Chapter presided over the inaugural function and gave presidential remarks and briefed the significance of Structuring a Good Research Proposal. More than 20 participants from different departments of School of Engineering and Technology participated in the FDP. First session of FDP was on 'Research Proposal'. The speaker shared his knowledge regarding the research proposals that included "what is research proposal?", "why is it necessary?", and "what are the ingredients?". The afternoon session started with Brief overview of Good Research Proposal and it was focused on structuring the overall research proposal. This FDP helped the participants in understanding the importance of research proposal and structuring the good research proposal. The FDP was concluded with the vote of thanks by Dr. Anand Sharma in the valedictory session.

FROM CSI STUDENT BRANCHES

REGION-II

Supreme Knowledge Foundation Group of Institutions, Hooghly

8-7-2019 to 14-7-2019 - In-house Summer Workshop

REGION-III

B V M Engineering College, Vallabh Vidyanagar

29-6-2019 - Workshop on Big Data & its Applications

REGION-III

B V M Engineering College, Vallabh Vidyanagar

6-7-2019 - Workshop on Blender Animation Tool

REGION-V

G Pullaiah College of Engineering & Technology, Kurnool

19-6-2019 to 24-6-2019 – FDP on Data Science and its Engineering Applications using Python

REGION-V

Chalapathi Institute of Engineering and Technology, Guntur

8-7-2019 & 9-7-2019 – FDP on Outcome Based Education

15-7-2019 & 16-7-2019 - Workshop on Cloud Computing with AWS

Vidya Jyothi Institute of Technology, Hyderabad

4-7-2019 to 6-7-2019 - International Conference on Computational Intelligence & Data Engineering (ICCIDE-2019)

KKR & KSR Institute of Technology & Sciences, Guntur

24-6-2019 - Technical Event on Robust Routine

FROM CSI STUDENT BRANCHES

REGION-V

PBR Visvodaya Institute of Technology & Science, Kavali

24-6-2019 to 30-6-2019 - Workshop on Problem Solving Skills using Python

20-7-2019 - 8th National Level Conference on Advanced Communication and Computing

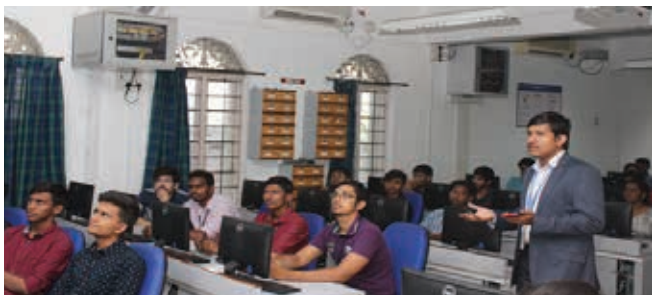
Alva's Institute of Engineering and Technology, Mangalore

27-6-2019 to 29-6-2019 – Inter College Level Workshop on Development of Web Oriented Applications using PHP & MySQL

4-7-2019 & 5-7-2019 – National Level Workshop on Applications of Python Programming in Data Analytics and Machine Learning- Research Perspective

REGION-V

B N M Institute of Technology, Bangalore



3-5-2019 & 4-5-2019 - Workshop on I/O Interfacing with Embedded System

REGION-VI

Guru Gobind Singh Polytechnic, Nashik

10-7-2019 - Expert Session on Automation using IoT

REGION-VI

Guru Gobind Singh Polytechnic, Nashik

12-7-2019 - Hands-on Session on Cyber Awareness & Cyber Security

REGION-VII

Jeppiaar Institute of Technology, Sriperumpudur

26-6-2019 - CSI Event on Mock Placement

FROM CSI STUDENT BRANCHES

REGION-VII

SRM Valliammai Engineering College, Kattankulathur

12-6-2019 - Staff Development programme on Adobe InDesign

19-6-2019 - Motivational Talk by Dr. S Sivakumar, Psychologist

Shri Krishnaswamy College for Women, Chennai

19-7-2019 - Intercollegiate Workshop on Python Programming & Machine Learning

Student branches are requested to send their report to sb-activities@csi-india.org

Chapters are requested to send their activity report to chapter-activities@csi-india.org

Kindly send **High Resolution Photograph** with the report.

CSI JABALPUR CHAPTER

An event was jointly organised by CSI, Jabalpur Chapter and Rotary Club of Jabalpur West on Prevention of "Cyber Crime" on Sunday, 28th July 2019.

Shri Ashutosh Jain from M/s IBM India Ltd, Pune and Shri Jitendra Kulkarni, Treasure, CSI Jabalpur Chapter, delivered nice presentations on the topic.

All the office bearers of Jabalpur Chapter and members of the Rotary Club alongwith their families participated. Shri Arvind M Nayak, National Chairman - NC, CSI graced the occasion.

Computer Society of India™
http://www.csi-india.org

Computer Society of India - Annual Convention 2020
@ KiiT, Bhubaneswar, Odisha (16-18 January, 2020)
Theme: "Digital Democracy - IT for Change"
CALL FOR PAPER

Computer Society of India - is the largest association of IT Professionals in India with membership strength of over 1lakh in 76 chapters and 550 Student Branches all over the Country.

Computer Society of India is holding its prestigious Annual Convention (CSI2020) in world renowned University - KiiT, Bhubaneswar, Odisha from 16-18 January, 2020 in conjunction with an International Conference with the Theme " Digital Democracy - IT for Change " . Like previous years, the proceeding of the conference is likely to be published by Springer CCIS.

The articles for this International Conference should be within 8 pages in the Springer one-column format. All submissions are subject to screening for plagiarism by Turnitin. Double blind review system will be followed and each paper will be reviewed by at least three reviewers. At least one of authors of each accepted paper must register for the conference and present the paper in person at the conference.
For more details regarding submission, visit: www.csi-india.org/csi2020
Papers are to be submitted through the Easychair portal:
https://easychair.org/my/conference?conf=csi2020
Original research papers are invited in the following broad areas (but not limited to):

Digital Democracy
- E-Democracy
- E-Governance
- E-Judiciary
- E-Learning
- E-Commerce
- E-Participation
- Crowd Sourcing
- Social Network

Digital Communication
- Distributed Computing
- Internet of Things
- Cloud Computing
- Mobile Communication
- Edge Computing
- Fog Computing
- Wireless Sensor Network

Digital Analytics
- Web Analytics
- Data Analytics
- Big Data Analytics
- Business Analytics
- Software Analytics
- Medical Informatics
- Deep Learning
- Machine Learning

Digital Security
- Digital Forensics
- Information Security
- Network Security
- Blockchain Technology
- Social Network Security
- Cyber Security
- Intrusion Detection System

Important Dates:
Last date of Submission: 15th October 2019 **Date of Notification**: 30th November 2019
Camera Ready Submission & Registration: 15th December 2019

Sd/-**Prafulla Kumar Behera**
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Computer Society of India™

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Computer Society of India - Annual Convention 2020

@ KiiT, Bhubaneswar, Odisha (16-18 January, 2020)

Theme: "Digital Democracy - IT for Change"

Dr. Achyuta Samanta
Patron

Justice B K Patel
Advisor

Dr. Subash Pani, IAS
Mentor

Prof. (Dr.) Lalit M. Patnaik
General Chair

Mr. Manas R Pattanaik
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Chairman, Industry Committee

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Chairman, Pre Convention Tutorial

Sri Chakradhar Panda
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Chairman, Exhibition Committee

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Chairman, Media Committee

Dr. R N Satapathy
Chairman, CSI Bhubaneswar Chapter

Mr. P K Mohapatra
Chairman, CSI Cuttack Chapter

Dr. Brojo K Mishra
Regional Student Coordinator-IV

5th August,2020

Computer Society of India is holding its prestigious Annual Convention (CSI 2020) in world renowned University - KiiT, Bhubaneswar, Odisha from 16-18 January, 2020 in conjunction with an International Conference with the theme "Digital Democracy - IT for Change".

Digital Democracy is an initiative by the Computer Society of India for better democratic transparency governance in the system. Like previous conventions of Society, the mega event **"CSI-Nihilant e-Governance Awards"** will attract many participants from all over the Country.

For the first time in history, Computer Society of India is launching **"CSI-STPI IT Excellent Awards"** for Young IT Professionals and Entrepreneurs during the Annual Convention 2020 at Bhubaneswar.

The Annual Convention will be preceded by a Tutorial popularly known as **"Pre-Convention Tutorial"** on 15th January 2020.

We hope that the Members of CSI will take part, contribute and enrich the CSI 2020 Convention @ Bhubaneswar.

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