Know Your CSI

Executive Committee (2019-20/21)

President
Prof. A K Nayak
(E) aknayak@iibm.in

Vice President cum President Elect
Mr. R K Vyas
(E) rkvyas05@gmail.com

Hon. Secretary
Dr. Santosh Kumar Yadav
(E) secretary@csi-india.org

Hon. Treasurer
Dr. Durgesh Mishra
(E) drdurgeshmishra@gmail.com

Immd. Past President (2017-18)
Mr. Sanjay Mohapatra
(E) smohapatra70@yahoo.co.in

Regional Vice-Presidents

Region-I (2019-21)
Mr. Arvind Sharma
(E) rvp1@csi-india.org

Region-II (2019-21)
Md. Shams Raza
(E) s_raza2000yahoo.com

Region-III (2019-21)
Mr. Jayant Binde
(E) jayantbhide2000@gmail.com

Region-IV (2018-20)
Er. Nachindra K Behera
(E) nachindrabehera@gmail.com

Region-V (2019-21)
Mr. M. S. Prasadbabu
(E) profmspbabu@gmail.com

Region-VI (2018-20)
Mr. Pradeep Rathi
(E) pjrathi61@gmail.com

Region-VII (2019-21)
Prof. Dr. M Sundaresan
(E) bu.sundaresan@gmail.com

Region-VIII (2019-21)
Mr. Konatham Mohan Raidu
(E) kmraidu@informaticsindia.com

Division Chairpersons

Division-I (2019-21)
Mr. Manas Ranjan Pattnaik
(E) manas@anthemgt.com

Division-II (2018-20)
Col. Balraj Anand
(E) b_anand6@rediffmail.com

Division-III (2019-21)
Prof. Suresh Chand Tyagi
(E) sct_35_2000@yahoo.com
sctyagi1963@gmail.com

Division-IV (2018-20)
Prof. Vibhakar Mansotra
(E) vibhakar20@yahoo.co.in

Division-V (2019-21)
Dr. Subhash Chandra Yadav
(E) scy123@gmail.com

Nomination Committee (2019-2021)

Arvind M Nayak
(E) amnayak@hotmail.com

Mr. Deepak Sharma
(E) dsharmaji@gmail.com

Dr. R R Deshmukh
(E) rrdeshmukh.csit@bamu.ac.in

an individual.

2 are friends.

3 is company.

more than 3 makes a society. The arrangement of these elements makes the letter 'C' connoting 'Computer Society of India'.

The space inside the letter 'C' connotes an arrow - the feeding-in of information or receiving information from a computer.

CSI Headquarter :
Samruddhi Venture Park, Unit No. 3,
4th Floor, MIDC, Andheri (E),
Mumbai-400 093, Maharashtra, India
Phone : 91-22-2926 1700
Fax : 91-22-2830 2133
Email : hq@csi-india.org

CSI Education Directorate :
CIT Campus, 4th Cross Road, Taramani,
Chennai-600 113, Tamilnadu, India
Phone : 91-44-2254 1102-03
Fax : 91-44-2254 2874
Email : director.edu@csi-india.org

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

CSI Registered Office :
302, Archana Arcade, 10-3-190,
St. Johns Road,
Secunderabad-500 025,
Telengana, India
Phone : 91-40-27821998

CSI COMMUNICATIONS

Design, Print and Dispatch by
GP OFFSET PVT. LTD.

CONTENTS

Editorial

Prof. (Dr.) S. S. Agrawal
Chief Editor

Dr. Ritika Wason
Editor

Dear Readers

"Anything that can conceive of as a supply chain, blockchain can vastly improve its efficiency- it doesn't matter if its people, numbers, data, money." - **Ginni Rometty**

The above quote by Ginni Rometty, CEO IBM signifies the current economic trend and the surge of interest in the adoption and implementation of Blockchain. Simply said blockchain is a continuously expanding chain of blocks secured by cryptography. A viable, transparent and efficient alternative to conventional modes, the technology since its inception has gained swift momentum. Popularity of the revolution was indicated by the fact that adopting it as the theme for August 2019 issue resulted in large number of submissions that could not be incorporated in a single issue. As a result the Spetember, 2019 issue has also been dedicated to blockchain.

Continuing with our invited series Titbits from the History of Computing –II by the legendary Prof. V. Rajaraman, this issue reports, "Xerox PARC and Alto Personal Computer". This article beautifully outlines how the Xerox has grown over the years. First article of cover story, "An overview of Blockchain Technology" by Daljit Kaur reiterates the basics of blockchain. The next story entitled, "Blockchain technology- An Overview" by S. Sahana further clarifies the fundamentals of Blockchain while highlighting some of its notable applications. The potential of Blockchain has further been elaborated in "Blockchain: Old(1991) but New (2019)" by Deepak Sharma, Priti Sharma and Vaishnavi Sharma. The intrinsic of the blockchain technology are further elaborated in the article, "Blockchain: A Revolutionary Technology" by Preeti Gulia and Ayushi Chahal. The inter-relationship between blockchain and cryptocurrency has been elaborated in the article "Blockchain and Cryptocurrency" by Mamta Santosh and Avinash Sharma.

The first article of the technical trends section "Cryptocurrency and Cryptography" by S. Balakrishnan, S. Parvathy Nathan and Prasenjit Banerjee delves into the intrinsics of cryptocurrency and cryptography. The next article, "Decentralised and Distributed Applications: Future Trends in Industries" by Navneet singh, Akansha Saini and Navneesh Kaur further recaps how the industry is transforming through decentralised and distributed applications. The research front section showcases the novel connected cars through Internet of Things. The first article "A Great Impact of Connected Cars based on Internet of Things" by S. Suresh Kumar and J. Janet introduces the novel phenomenon of connected cars. The security concerns of blockchain have been discussed in the security corner through the article, "Blockchain: Security and Concerns" by Avinash Sharma and Jatin Arora.

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. The issue also contains calls for upcoming CSI annual convention CSI20.

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

Dr. Ritika Wason
Editor
Associate Professor, BVICAM, New Delhi

President's Desk

From	:	President, Computer Society of India
Date	:	01 September, 2019
Email	:	president@csi-india.org / Cell : (91) 82106 93239

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 time stamp 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, anyone cannot 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 into 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 grand success of the convention as well as for enhancing the glory of the Society.

Inauguration of New Student Branches

Expansion of CSI continues all over the country by establishing Dr. K. V. Subba Reddy Institute of Technology, Kurnool, New Horizon College of Engineering, Bangalore & Sri Kanyaka Parameswari Arts & Science College for Women, Chennai have 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, Bangalore Chapter, Haridwar Chapter, Jabalpur Chapter, Kancheepuram Chapter, Kolkata 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 more than 30 numbers 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.

In the month of August, two International conferences were organized with the technical support of Computer Society of India. The Global DigiSports Conference 2019 was organized on 2nd & 3rd August 2019 at Kanyakumari, Tamil Nadu by International Association of Sports & ICT & Asia Africa Council for Sustainable Peace & Development with technical collaboration of CSI. The conference was conducted in scale of excellence by the presence of large number of invited speakers, author & delegates from India & abroad. I congratulate Dr. Ripu Ranjan Sinha, President, International Association of Sports & ICT & his team for this great event of International Standard. The another Prominent event was 7th International Conference on Innovations in Computer Science & Engineering held on 16th & 17th August 2019 at Guru Nanak Institutions Technical Campus, Hyderabad with technical collaboration of CSI. The conference was significant landmark of CSI for which Dr. H. S. Saini, the Managing Director of GNI & Fellow of CSI & his team are congratulated on our behalf.

Regional Meet & Chapters Visit of RVPs

The Joint Regional Meeting of CSI Region V & VII was held at Mysore on 24th August 2019 which was attended by the Chapter OB Members, State Student Coordinators, Regional Student Coordinators with the participation of Natonal Student Coordinator Dr. P. Kumar, RVP-V, Dr. M. S. Prasad Babu, RVP-VII, Dr. M Sundaresan & National Vice President Sri R. K. Vyas. Very Valuable & fruitful discussions & Interactions were made for which each of them are congratulated.

I also extend my thanks & congratulate Mr. Jayant. S. Bhide for his visit & successful interactions with the Members of Ahmedabad, Baroda, Rajkot, Surat, & Vallabh Vidyanagar Chapters of Gujarat.

The Call for Academic Awards, Service Awards for the year 2017-18, 2018-19 and State/ Regional/ National Student Conventions are also published in August 2019 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

Condolence Meeting

Held on August 17, 2019 at CSI Kolkata Chapter Premises

A Condolence Meeting of **Late. Anirban Basu**,
Past President of CSI, was held on
August 17, 2019. at CSI Kolkata Chapter Office premises.

Colleagues, his friends, Wife and his Son were present in this meeting.

Condolence by CSI

The members of Computer Society of India expressed their deep Condolence for the Sad Demise of their Past President **Dr. Anirban Basu** with whom members have spent many pleasant moments by working together for the growth and benefit of the Society. Really it is very painful and a great loss to the Society as a whole. The members of the entire Society pray to the God for keeping his soul in peace and bless his entire family with strength and confidence to overcome this sad moment.

Condolence by CSI

The members Computer Society of India expresses deep Condolence of the sad demise of **Mrs. Sudha Raju**, Past Chairperson, CSI Bangalore Chapter and Regional Vice President of Region-V. She passed away on 19th August, 2019 (Monday evening). She was the Chairperson during 2001-2002 and 2003 to 2005. She got fellowship during 2018.

The members of the entire Society pray to the God for keeping her soul in peace and bless her entire family with strength and confidence to overcome this sad moment.

Call for Paper for CSI Journal of Computing

(e-ISSN: 2277-7091)

Original Research Papers are invited for the CSI Journal of Computing, published on line quarterly (e-ISSN: 2277-7091) by the Computer Society of India (CSI). The Journal of Computing, offers good visibility of online research content on computer science theory, Languages & Systems, Databases, Internet Computing, Software Engineering and Applications. The journal also covers all aspects of Computational intelligence, Communications and Analytics in computer science and engineering. Journal of Computing intended for publication of truly original papers of interest to a wide audience in Computer Science, Information Technology and boundary areas between these and other fields.

The articles must be written using APA style in two columns format. The article should be typed, double-spaced on standard-sized (8.5″ x 11″) with 1″ margins on all sides using 12 pt. Times New Roman font and 8-12 pages in length. The standard international policy regarding similarity with existing articles will be followed prior to publication of articles. The paper is to be sent to Dr. R R Deshmukh, Chief Editor in the email id: rrdeshmukh.csit@bamu.ac.in with a copy to Prof. A K Nayak, Publisher, in the email id : aknayak@iibm.in and Dr. Brojo Kishore Mishra in email id: brojomishra@gmail.com.

Prof. A K Nayak
Publisher

Titbit from the History of Computing-2
Xerox PARC and Alto Personal Computer

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

"The farther backward you can look, the farther forward you can see" – Winston Churchill

Genesis of Xerox PARC

In 1970 Xerox was an extremely successful copier manufacturer with an annual revenue of $ 1.6 billion. Its president C. Peter McColough decided to open a new research centre far away from its headquarters in Rochester, New York so that it could invent future technologies without day-to-day pressures. An area was leased in Palo Alto, California near the Stanford University. This was an inspired decision as students and faculty of Stanford University could interact with the scientists at the research centre that was named Xerox Palo Alto Research Center (Xerox PARC). The broad mandate given to the centre was to develop "the office of the future". The director of the centre gathered a compact group of brilliant researchers and gave them considerable freedom to work. The head of the computer systems division, Bob Taylor who was earlier a manager at the Advanced Research Projects Agency (ARPA) of the Department of Defence of the US government had funded many projects to universities and had met and heard many young promising researchers. He recruited a group of brilliant computer scientists including Alan Kay, Butler Lampson, and Charles Thacker who later got the ACM Turing award for the research work they had initiated at Xerox PARC. Besides these there were also a galaxy of computer scientists that included Robert Metcalfe, David Boggs (Ethernet), Richard Shoup, Alvy Ray Smith (Paint program), John Warnock, Chuck Geschke (Page description language), Adele Goldberg (Smalltalk), and Lynn Conway (VLSI design) to mention a few. I have written the inventions they made at Xerox PARC in the parentheses next to their names. These researchers were given full freedom to pursue their passion and "invent". All ideas were discussed threadbare in an atmosphere of constructive criticism. Xerox PARC scientists credit Bob Taylor as a great research manager who catalysed their research, fully supported them, and insulated them from the bureaucracy.

Xerox Alto Personal Computer

One of the projects dreamed up by Alan Kay was to develop what he called Dynabook. His dream was to invent a personal laptop computer with interactive capabilities. In 1970s the technology of integrated circuits had not advanced enough for an entire computer to be put in a notebook size device. However, his idea was liked by Lampson and Thacker and the three of them teamed up to design and develop a Personal Computer (PC), the first of its kind in the world, they named Alto which was ready in1973. The most important innovation in Alto was the use of a bit-mapped display along with a mouse that had been invented by Doug Engelbart the previous year along with Bill English (who had shifted to Xerox PARC). The primitive mouse of Engelbart was improved and used in Alto. The group also introduced the idea of multiple overlapping windows as well as icons. The mouse was used to point to icons to initiate programs. The concept of windows, icons, mouse, and pointer was incorporated in Alto. As Alto was to be used as a PC on the desk of every office worker and the workers were expected to communicate and cooperate, the idea of networking computers was mooted. This led Metcalfe and Boggs to invent the Ethernet protocol to communicate among computers connected to a cable. A word processor was an essential requirement for every office. Charles Simonyi developed Bravo software that was the first WYSIWIG document preparation program that provided multi-fonts on the Alto's bitmapped display. It used the mouse extensively to point to words for editing. In 1972 the object-oriented language Smalltalk was designed and implemented on Alto by Alan Kay, Adele Goldberg and their group. Another pair of computer scientists Chuck Geschke and John Warnock developed a page description language they called Interpress meant for Desk Top Publishing (DTP). Another notable work done at Xerox PARC by Lynn Conway was creating graphics tools for drawing integrated circuit sketches on Alto's display. She and Carver Mead (who was visiting from Caltech) collaborated to develop a structured VLSI design methodology and a wrote a famous book on VLSI design. The Altos in Xerox PARC were networked and email was extensively used. The concept of Remote Procedure Call (RPC) was invented by Bruce Nelson and Andrew Birrell and with that distributed computing.

Xerox PARC Alto Personal Computer (Photo thanks to Wikipedia)

From our current perspective Alto was too expensive as a PC. It used MSIs and LSIs as microprocessors had not been invented

when it was designed. Charles Thacker noted that it cost $12,000 to make and would have cost $40,000 if marketed in 1975. Alto was not developed as a product by Xerox. Around 2000 machines were built out of which 1000 were used in various Xerox offices and 500 given to Universities and the rest used in Xerox PARC.

Steve Jobs visits Xerox PARC

Jeff Raskin who was working in Apple in the team designing the Macintosh computer had seen Alto and its capabilities. He requested Steve Jobs to visit Xerox PARC and see the path-breaking research they were doing. In December 1979 Steve Jobs and his team visited Xerox PARC and Jobs was astounded to see the graphical user interface and the use of the mouse. He immediately saw that the future of PCs would be based on these technologies. He wanted a deeper technical discussion by his team with Xerox PARC engineers. Even though the engineers at Xerox PARC were not very enthusiastic, the management of Xerox struck a deal with Apple to share the technology in return for 100,000 Apple shares at $10 each. (The million dollars investment in shares later appreciated to over a billion dollars). The Apple team was then given all the technical information they requested. Apple team refined the mouse, made it reliable and cheap, improved the icons and made the system much more user friendly and cost-effective. Apple implemented windows, icons, mouse, and pointer technology in Mcintosh and it was a hit. When Macintosh was released in January 1984 its price was an affordable $2,495.

When Microsoft also followed with Windows OS in November 1985, Steve Jobs accused Bill Gates of stealing his idea to which Bill replied "Well Steve, I think there is more than one way of looking at it. I think it is more like we both had this rich neighbour named Xerox and I broke into his house to steal the TV set and found out that you had already stolen it". Apple filed a case against Microsoft for copying the Graphical User Interface (GUI) concept. However, the US court dismissed it as it opined that GUI and the desktop metaphor cannot be protected by patent or copyright. Seeing the success of Apple using its technology, Xerox entered the PC market with Xerox Star. It was too late and the system was expensive, not as good as Apple and failed in the market.

Xerox Laser Printer

Another notable invention at Xerox PARC was the laser printer. Gary Starkweather, an engineer who was working in the Webster research centre of Xerox had a brilliant idea of converting a Xerox copier to one that would directly print material displayed on a computer's screen. This was considered ridiculous by his superiors who wanted him to do something more useful. He secretly continued his work and built the printer parts but not the interface to the computer. He requested transfer to Xerox PARC where no idea was considered bizarre. In this environment he pursued his passion and designed a prototype laser printer in 1971 he named SLOT (Scanned Laser Output Terminal). A character generator and a digital control system for the printer was developed by Lampson and his group in 1972. This resulted in a laser printer that was attached to Alto. Subsequently it was developed into a product - Xerox 9700 in 1977 – the first commercial laser printer in the world.

Epilogue

Xerox management has been criticised for not commercialising the technologies developed at Xerox PARC. Many ex-employees profited from it. 3Com was started by Metcalfe who monetised Ethernet and networking technologies. Warnock started Adobe Systems that developed the Postscript page description language based on his research at Xerox PARC. Simonyi who had developed Bravo at Xerox PARC joined Microsoft and developed office software. Xerox top management was focussed on copiers and did not see the potential of emerging technologies. The only technology that they profited from was the laser printer. In 2002 Xerox PARC was spun off from Xerox as an independent company and re-named PARC.

Suggested Reading

[1] The Xerox PARC Visit, https://web.stanford.edu/sites/mac

[2] The Xerox Alto: A Personal Retrospective (Talks by Charles Thacker and Butler Lampson) YouTube

[3] Tekla S. Perry and Paul Wallich, Inside the PARC: the "information architects", IEEE Spectrum, October 1985, pp. 62-75

∎

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).

An Overview of BlockChain Technology

▶ **Daljit Kaur**
Assistant Professor, Lyallpur Khalsa College, Jalandhar Punjab(India). Email: jeetudaljit@gmail.com

Introduction

Blockchain, the foundation of bitcoin, is the buzzword of the digital world in present days. This technology has gained its popularity in past couple of years.

Don & Alex Tapscott have defined blockchain as an incorruptible digital ledger of business transactions. It can not only keep the record of monetary transactions but anything significant or valuable can also be recorded [1]. In simple words, blockchain is combination of two words block+chain. The word Block means collection of data and chain means the connection between these data blocks in chronological order. Each data block in blockchain is encrypted using strong cryptographic algorithm in order to make it more secure. These encrypted data blocks are then connected to each other. In other words, Blockchain can be defined as a sequential arrangement of blocks, that contains all the transactions as records like a typical shared ledger [2]. A special network called "peer-to-peer" is used by blockchain in which workload is distributed among peers, who are all equally privileged. This blockchain network is decentralized i.e. there is no central authority to manage it.

Key Features of BlockChain

- **Decentralization:** It refers to the distribution of the information, which means instead of keeping the data at one place or one peer in the network it is distributed among all peers. Every peer in network stores the full copy of the information i.e. everybody in the network is the owner of the information. In such a network user can directly interact with other user directly without the involvement of any third party. Bitcoins follows the same principle, where users can send their money to anyone they wish without going

through a bank [3-4].
- **Transparency:** Transparency means whatever transaction is performed and saved in blockchain is visible to everyone in the network, which eliminates the probability of fraud. While showing the transactions, identity of the user is secured using very complex cryptography mechanism and only their public address is represented in the transactions. This is much needed feature in financial transactions and before the Blockchain technology such level of transparency in transactions was just a dream.
- **Immutability:** Immutability means unable to alter the data. In the context of blockchain, this feature is achieved by cryptographic hash function which does not allow the information entered into blockchain to be tampered.
- **Persistency:** It refers to the continuity of the information in the same state. In blockchain, transactions once entered cannot be deleted or (undo) brought to the previous state. Transactions can be validated quickly before admitting to blockchain.

A Real World example of Blockchain

When an air/railway ticket is purchased online, the plastic money company charges fee for handling the operation. While, on the other hand, with blockchain technology any third party can be eliminated from the ticketing process. The transaction will take place only between the traveller and air/railway company. Here, e-ticket can be considered as a block inserted in ticket blockchain. It contains set of all the operations/transactions for, say, a certain train route, or even the complete network of trains, consisting of all tickets ever vended,

each route ever taken.

Applications of Block Chain

There are some key features of this technology that makes its use in variety of areas which include financial services, public services, smart contracts and Internet of Things(IoT)[5]. Presently Blockchains are taking control over financial transactions, which will terminate bank accounts. Moreover, after understanding and implementation of this technology, all the utilities offered by banks for the purpose of performing various operations will be eliminated as it can completely remove the third party transaction fee.

In other words, this technology has the capability to construct the future networks.

References

[1] Tapscott, Don, and Alex Tapscott. Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World. , 2016.

[2] D. Lee Kuo Chuen, Ed., Handbook of Digital Currency, 1st ed. Elsevier, 2015. [Online]. Available: http://EconPapers.repec.org/RePEc:ieee:monogr:9780128021170

[3] Zibin Zheng, Shaoan Xie, H.N.Dai, An Overview of Blockchain Technology: Architecture, Consensus, and Future Trends, conference Paper june 2017 DOI: 10.1109/BigDataCongress.2017.85. available at : https://www.researchgate.net/publication/318131748

[4] G. W. Peters, E. Panayi, and A. Chapelle, Trends in crypto-currencies and blockchain technologies: A monetary theory and regulation perspective," 2015. [Online]. Available: http://dx.doi.org/10.2139/ssrn.2646618

[5] G. Foroglou and A.-L. Tsilidou, "Further applications of the blockchain," 2015.

[6] Ibad Sadiqui, What The Hell Is Blockchain And How Does It Works, April 2018. available at https://medium.com/coinmonks/what-the-hell-is-blockchain-and-how-does-it-works-simplified-b9372ecc26ef

■

About the Author

Dr. Daljit Kaur is currently working as Assistant Professor at Lyallpur Khlasa College, Jalandhar, Punjab, India. She has completed Ph.D from Guru Nanak Dev University, Amritsar in 2018. She has published 25 research papers in various reputed journals and conference proceedings. Her research area includes networks, web security and security implementation in software development life cycle. Her CSI Membership No is: 2010000269. She can be reached at jeetudaljit@gmail.com.

Blockchain Technology – An Overview

▶ **S. Sahana**
Research Scholar, Department of Computer Science, Tamil University, Thanjavur. Email: jeetudaljit@gmail.com

1. Introduction:

Next Evolution Technology after the internet is **"Blockchain Technology"** (*golden record*), the foundation was initially circumscribed in 1991 by Stuart Haber and W. Scott Stornetta. According to them, **"Block"** routes the digital information and **"chain"** specify the stored public database. The objective of this article is to disseminate the building criteria and the application areas of block chain to the readers.

2. Blockchain Technology:

According to Wikipedia, a blockchain, is a growing list of records, called *blocks*, the cryptography technology are used to link. Every block includes a cryptographic hash of the earlier block, a transaction data and timestamp. Transactions are verified by network nodes through cryptocurrency is named "Bitcoin" and recorded in a public **"Distributed ledgers Technology"** (DLT) and decentralized.

3. Blocks:

"Blocks" are combined upon digital pieces of information, which are:

- Transaction information such as time, date and amount purchase from flipkart.
- The participating transaction information is stored.
- The Stored blocks of information that discriminate from other blocks.

4. Blockchain is interdisciplinary:

These are the fundamental computing interdisciplinary principles that drive blockchain.

- **Distributed computing -** network of computers working stable as one system.
- **Theoretical computer science –** the economic value of protocols and algorithms, are optimal.
- **Formal Methods –** includes cryptographic primitives, protocols and smart contracts.
- **Programming Languages –** intended for writing smart contracts for ethereum-based blockchains.
- **Database -** It is a digital ledger that stores information in data structures.
- **Cryptography and Security –** Ensuring and Securing the transactions and past records.
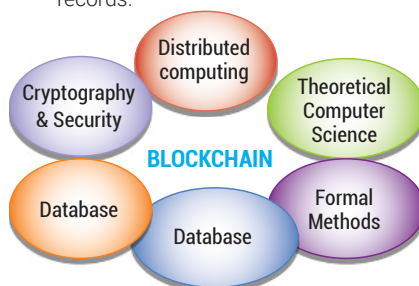
Fig. 4.1 : Represent the blockchain interdisciplinary.

5. Blockchain Technologies characteristics:

- Ledger – the technology uses to provide full transactional history.
- Secure – blockchains are cryptographically ensure and secure.
- Shared – shared amongst multiple participants across the node.
- Distributed – shared the memory area with distributing system.

6. Working Principles of Blockchain

The blockchain consists of multiple blocks strung together and a new data is added in the block stores by the following format:

1. A transaction need to appear.
2. Verified the transaction.
3. Block stores the verified transaction.
4. Block is needs to specified given hash value.

7. General Features of Blockchain

- Cannot e corrupted
- Decentralized Technology
- Enhanced Security
- Distributed ledgers
- Consensus
- Faster Settlement

8. Advantages of Blockchain

- Upgraded efficiency by eliminating involvement of human in authentication.
- Eliminating third-party is reduce the cost
- Private, efficient and secure transaction process.
- Clear technology

9. Disadvantages

- Cost of technology high.
- Performance Speed Ineffective.
- Central Bank involvement.
- Speed of transaction is low.
- Susceptibility of Hacking.
- Perform prohibited Activity.

10. Practical Application Areas of Block chain Technology:

- ✓ Banking
- ✓ Healthcare
- ✓ Property Records
- ✓ Smart Contracts
- ✓ Supply Chain
- ✓ Voting
- ✓ IOT

11. Conclusion:

This Technology has involved powerful challenges that are mentioned to show its ability for converting traditional industry with its leading aspect: Auditability, decentralization, persistency and anonymity. It retain quite interdependent in a circumstance space for the scope of future world that encompasses both centralized and decentralized models.

References:

[1] https://en.wikipedia.org/wiki/Blockchain
[2] https://www.ethos.io/understand-blockchains

■

About the Author

Mrs. S. Sahana, Ph.D., (Pursuing) Computer Science, Tamil University, Thanjavur, Tamilnadu. She has having 5 years experience in teaching. His research area includes "Smart Environment Technologies", "Ubiquitous Computing" and "Internet of Things". Reach him through 25sahana@gmail.com.

Block Chain: Old (1991) But New (2019)

▶ **Deepak Sharma and Priti Sharma**
Department of Computer Science & Applications, Maharshi Dayanand University, Rohtak, Haryana (India)
Email: erdeepaksharmabwn@gmail.com, pritish80@yahoo.co.in

1. Introduction

In 21st century, data has become as improtant as gold. Almot everything is going under the process of digitization and hance more prone to threat. In successfully securing data and to protect it from further change technology named as "Block Chain" emerges in 2009. Although it was introduced in early 90's but rarely used back then.
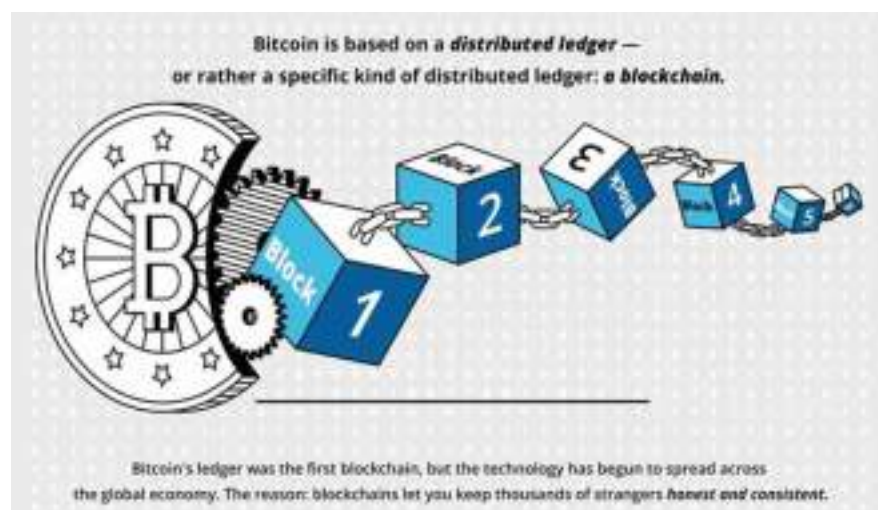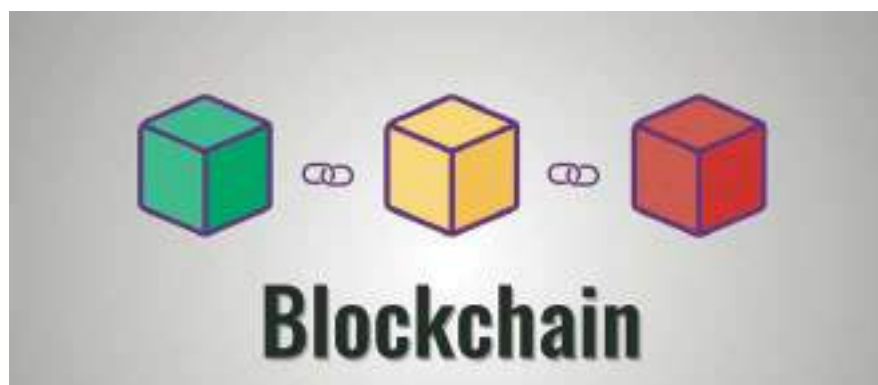
Block Chain is a specialized series of block like structure in which every block stores some data. Every block in a block chain is linked to his previous block cryptography using hashing. Each block contains some very sensitive information which need not to be changed such as transaction data or land ownership information. The main purpose of Block Chain is to make sure that a data once stored in a block cannot be changed and if someone tries to change the data inside a block results in constraction of a new block.

Block Chain is highly rebellious if there is some tempering with the data stored inside it. It is emerging as a technology which is used to store data in a confirmable and durable way. Block Chain is completely open to anyone. It was primarily introduced in 1991 by a association of reserchers to time stamp digital documents like a notary system. Using Block Chain, it is almost impossible to temper with a digital document or to back date them. However the concept of block chain was not found very assurable at this point by most of the people and hence not used by many. It was adopted by "Satishi Nakamoto" in 2009. Satishi Nakamoto used the concept of block chain for digital cryptocurrency such as Bitcoins. Nowadays Cryptocurrency is one of the most trending topic which portrays a grey character. People have mixed opinion about Cryptocurrency and bitcoins.

2. Evolution of Block Chain

In today's world you will find people talking about block chain and how it is making data secure. Block chain is neither a new concept nor old. It is in the developing state and maturing day by day. People around the world are working on projects using block chain for example cryptocurrency such as bitcoins are widely popular are secured using block chain mechanism. The evolution of block chain is broadly divided into three phases.

Phase 1: 1991 to 2008: Introduced but rarely used

In 1991, Block Chain is a specialized series of block like structure in which every block stores some data introduced initially by **Stuart Haber** and **W. Scott Stornetta**. It is used to timestamp the digital documents so that no one can temper with them or back date them just like a notary. The concept of block chain that was introduced originally have some problems such as every new block must be signed by a trusted party which somehow lack the concept of distributed ledger.

Phase 2:2008 to 2014: When it all started

The block chain concept which we are using now is conceptualized by a person or group of persons known as Satoshi Nakamoto in 2008. Nakamoto added the hashing mechanism with the earlier concept. After adding the hashing mechanism the central entity or trusted party needed to sign the new blocks are no longer needed. This feature acts like the last brick of the wall and

block chain comes with the big picture of crypto currency. The word block and chain were used as two different words originally by Satoshi Nakamoto in his research paper based on block chain but later combined.

### Phase 3:2014 to 2019: Gained popularity with respect

The concept of crypto currency was introduced as a pilot project in 2009 but now gained a huge popularity. The size of file which contain the entire block chain for bitcoins are increasing with a very high rate. Earlier it was of a smaller size but reached to 20 GB in august 2014. Furthermore block chain containing bitcoins reached to a size of 30 GB in January 2015. Many global groups and industries have joining together to set up labs for improving this technology.

3. Mechanism behind Block Chain

Block Chain is a specialized series of block like structure in which every block stores some data. Every block in a block chain is linked to his previous block cryptography using hashing. The property which makes this concept worthy is that data once stored a block chain it becomes almost impossible to change or temper with it. Basically there are three parts in every block of a block chain and those are the data part, hash part and hash of the previous block part. The below shown diagram represents a block.
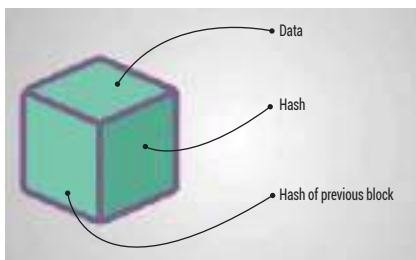

Data stored inside a block has no fixed nature and completely depends upon type of block chain. For example block for bitcoin stores transational data such as sender's information, receiver's information and the amount. An example of bitcoin block is shown below.

Bitcoin block example
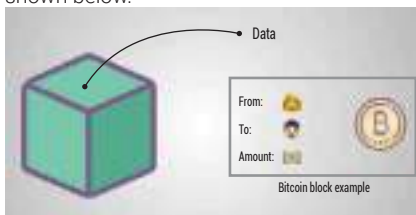
Let's see about *Hash* part. Hash is something you can relate with finger print

which is unique with respect to each block. Every time when the creation of a block takes place its hash is generated using some cryptographic function decided in an earlier stage. If someone tries to change the data of a block its hash also changes and it will not be regarded as the same block and considered as a newly created block. Hashes are most important part of the change detection mechanisum.

Bitcoin block example
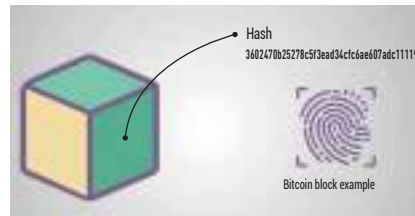
Now the last part and also the connecting part of the block chain which is *"Hash of the previous block"*. It is the glue between the blocks. You can also compare this with a pointer in a linklist data structures. Every block except the first block stores the hash of its previous block.

Creates the chain!
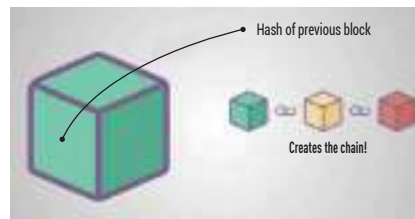
The first block in a block chain called as generic block as there is no block before it so it stores null in place of hash of the previous block. Here a block chain of three blocks is shown in the picture in which the third block is points to second and second points to first just like they do in a block chain.
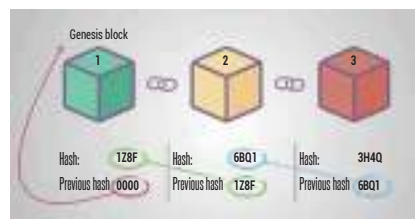
We have seen a block chain of three blocks. Let's say if someone tries to temper with the second block. With the modification in data the hash value of that particular block changes and ultimately results in creation of a new block because hash is generated on the data and it is like the finger print of the block.

The tempered block is now treated as a newly created block and makes all the following corresponding blocks invalid. The only way is to change the hash of previous block value and recalculate the hash of every following block.
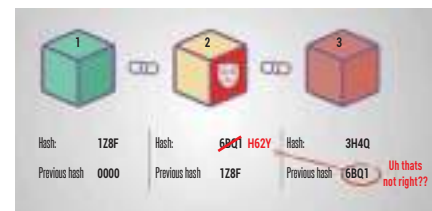
Using Hashing is not sufficient to eradicate the problem of tempering. Modern computers blessed with a very high computation power they can do complex calculation with the blink of an eye. Modern computers have the capability of generating millions of hash in very few seconds. SO it might be possible that a person with bad intentions can temper with the data inside a block and recalculate all the hash values and connect them. This makes the block chain balanced again and difficult to find out the change.

In the solution to this problem a mechanism called as *"PROOF-OF-WORK"* was introduced. This mechanism completely eradicated the problem discussed in the above paragraph. This mechanism do nothing but works as a barrier in fast creation of blocks. This mechanism simply increase the time for creation of a new block. Let's again see the scenario, if someone temper with a block then he has to calculate the new hash and the PROOF OF WORK for the tempered block as well as for all the following blocks.

In case of Bitcoins, time taken for the creation of new blocks is nearly 10 minutes. Now it is not as simple as it was before to temper with a block. So both hashing and proof of work mechanism is responsible for the security of data and permanency of the block chain. Now it is very difficult to modify the data in a block calculate the hash and also recalculate all the hashes which comes in the after path of that block with the proof of

work calculation. All of this is a cumbersome process and consumes a significant amount of time.

Block chain is handled by a group of people which are connected in a network. Everyone on the network has their own complete copy of block chain. Every time a new block is create everyone on the network receive a copy of it. They validate it and if everything seems good then add it to the original block chain. This is how a complete block chain works. They create a consensus about the newly created block and tempered blocks are rejected. So for tempering into a block one has to recalculate the hashes and proof of work for all the following blocks and take control of more than 50% of the block chain network. Impossible is the word you are looking for.

4. Usage of Block Chain

Block chain technology is useful in many areas in which data is very sensitive and should not be tempered such as transactional data in case of bitcoins.

1. **Cryptocurrencies:** Block chain was first used in 2009 for cryptocurrencies bitcoins but after 2016 many people from the industry start taking interest in this technology. Cryptocurrencies grabbing everyone's attention are secured using Block chain technology.
2. **Financial services:** Many banks are interested in implementing the distributed ledger block chain technology due to its ensuring mechanism of maintaining data. According to a 2016 IBM study block chain technology is moving faster than expected.
3. **Video Games:** In November 2017, a game named as "CryptoKitties" launched which was actually based on Block chain technology. This game gained huge popularity a character of this game named "cryptokitty" was sold for 100,000 US dollars.
4. **Land Ownership Information:** Block chain technology can also use to store very sensitive information such as land ownership information. Recently for digitizing land records in some cities of Afghanistan, a block chain technology innovation lab has been set up by United Nations and Government of Haryana in Udyog vihar, Gurugram.

5. Conclusion

Block chain technology was introduced in 1991 and conceptualized in 2008 so the journey is still on. Data tempering is very sensitive issue and deal with such issues takes time and money. People all over the world are working on block chain in many sectors. Recently, a block chain technology innovation lab has been set up by United Nations and Government of Haryana in Udyog vihar, Gurugram for digitizing the land records. Facebook has also introduced his own Cryptocurrency named "Libra". All these things are pointing towards a single aspect that data sensitivity will increase in future and so the need for technologies like block chain. In future, everything will be in digital form and the chances of data tempering will increase. In the interest of mankind industrialists and academician should join hands to set up research labs for further improving block chain technology.

About the Authors

Dr. Priti Sharma MCA, Ph.D. (Computer Science) is working as an Assistant Professor in the Department of Computer Science & Applications, M.D. University, Rohtak. She has published more than 50 publications in various journals/ magazines of national and international repute. She is engaged in teaching and research from the last 12 years. Her area of research includes Data mining, Big data, Software Engineering, Machine Learning.

Deepak Sharma has completed his M.tech from C-DAC: Centre for Development of Advanced Computing, Ministry of Communications and Information Technology, Government of India affiliated from Guru Gobind Singh Indraprastha University, Delhi. He is currently pursuing a Ph.D. in Computer Science at M. D. University, Rohtak. His main research areas include Data mining, Mobile Adhoc Network (MANET), wireless sensor network (WSN) and Internet of things (IoT).

Blockchain : A Revolutionary Technology

▶ Preeti Gulia and Ayushi Chahal
Department of Computer Science & Applications, Maharshi Dayanand University, Rohtak, Haryana (India)
E-mail: preetigulia81@gmail.com, ayushichahal@gmail.com

Blockchain is a technical jargon which is very popular these days. It is a sort of technology which is listened by everybody and some-how one feel like one must know about it like, what it is all about, what it is related to, how it processes. In this article we will get a quick overview on the blockchian.

Blockchain is a technology which is a combination of economic as well as computer science innovations. [1]It is not a technology which one can easily see, hold or touch like other technologies such as smartphones. From the era of internet there is only one question inside the mind of the users that: how can one trust whatever that occurs over the internet?

Answer to this question is "Blockchain". Blockchain is a kind of logs that record every occurred transactions over the internet without letting them altered. These transactions can be of money, data, goods, services of any kind.
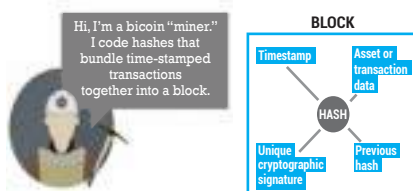
Figure 3: hash of the block

According to Gartner's hype cycle block is being a interested area for researchers from 2015 and still it will take 5 to 10 years to reach the plateau of the gartner's hype cycle, which means that it will take 5 to 10 years from 2018 to completely stabilize this technology. Figure 1 shows the Gartner's hype cycle for 2018 emerging technologies.
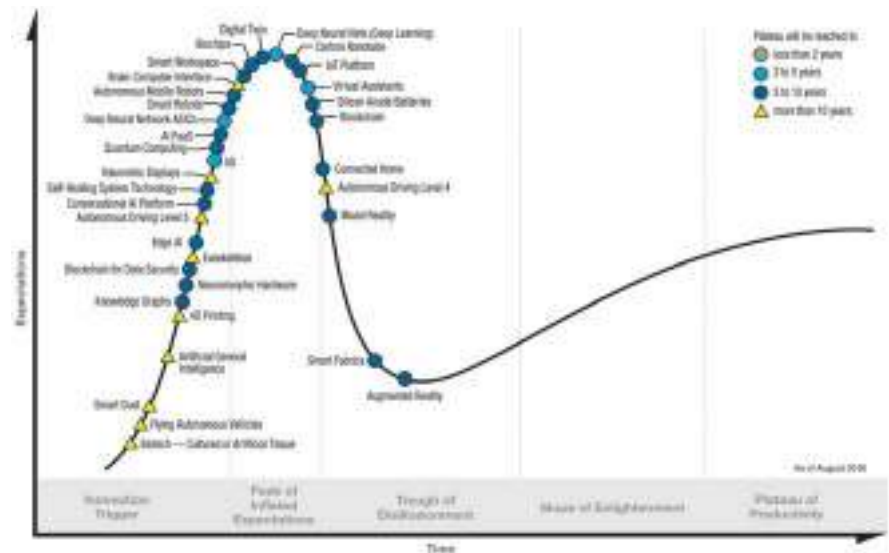
Fig. 1: Gartner's hype cycle 2018
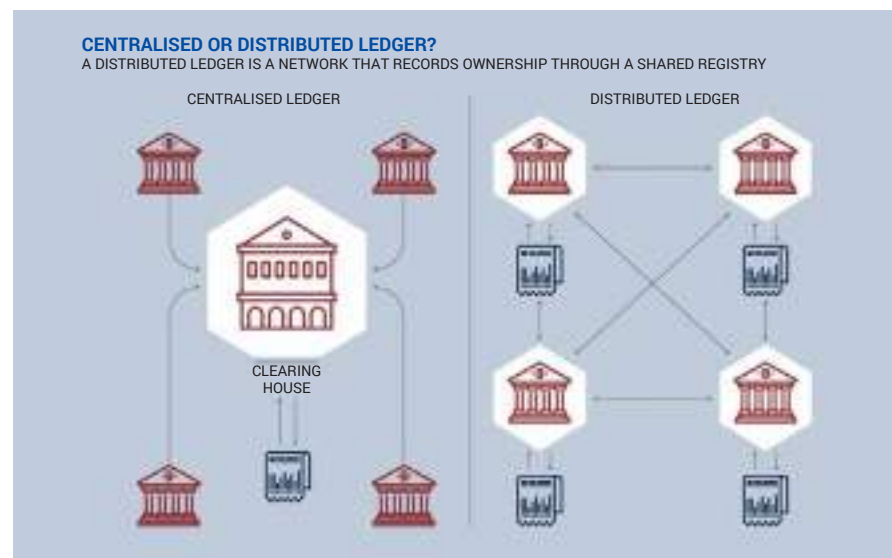
Figure 2: Centralized and Distributed ledger

Definition

Blockchain is basically a giant database which covers multiple networks, different institutions or geographical areas, and records ownership and values of transactions. Whenever a transaction occurs, the blockchain first verifies it, then executes and record the transaction.

Blockchain can be used for any type of transaction like value, data, cryptocurrency, asset, any kind of agreement or any confidential data. Anyone which have access

to it, is allowed to view this database and take partin it.

It helps to create a ledger of data digitally which is Distributed in nature. Distributed ledger means that every party which taking part in blockchain network have their own copy of ledger. If any time, any change is made it will automatically be reflected in every party's copy. Figure 2 gives the difference between distributed and centralized ledger.[2]

History of Blockchain

In 2008, a researcher named Santoshi Nakamoto published his research in the paper entitled "Bitcoin: A Peer-to-Peer Electronic Cash System". This paper describes how electronic cash can be transferred from one party to another party without being monitored by any centralized financial governing body. It introduced the concept of bitcoin first time. Santoshi Nakamoto remained anonymous till now, nobody knows who Santoshi Nakamoto is till date. [3]

Transactions of these bitcoins were made possible by a specially designed data structures without the help of any third party and this technology was named as blockchain. It was introduced in 2008 and was implemented in 2009. In 2014, size of bitcoin blockchain file size was recorded as 20 GB and it reaches to 30 GB till 2016.

Structure of Blockchain

In Blockchain there is no centralized authority which keeps check on the flow of data.Blockchain of one network can be structurally different from other network's blockchain.

Blockchain consists of three elemens[3]:

▪ **Block :**

Blockchain is database in form of distributed ledger which maintain the records of all the transactions. These records are called blocks. Size, data in a block and the time of triggering is different for every different block. Every blockchain records motion of data (cryptocurrencies).

▪ **Chain:**

A chain is created while binding all the blocks together. These chains are made with the help of cryptography, using hash functions. A hash is created by the data of previous block. Figure 3 shows how hash is calculated by miner from a block.

▪ **Network :**

Network is made up of full nodes. The computers running on the network and participating in blockchain are known as full nodes. The data on bitcoin is structured in such a way so that every full node have access to all the records of all transactions. A full node can be present at any geographical location on the earth.
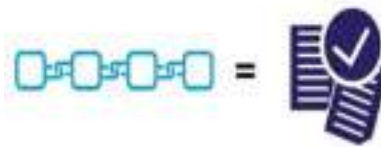
Each block in the chain has data from the previous block. The blockchain is a ledger of transactions that automatically verifies itself.
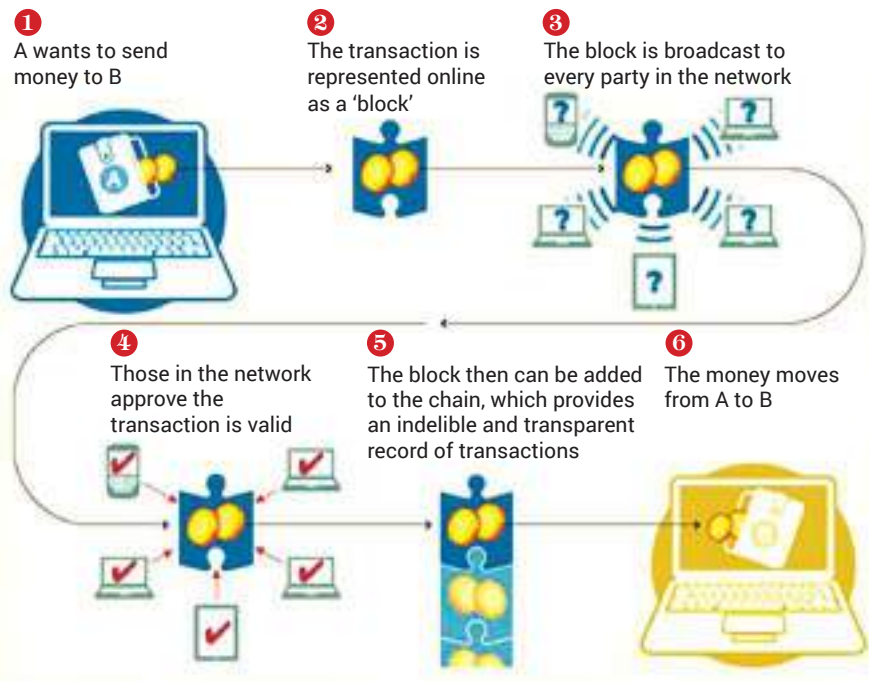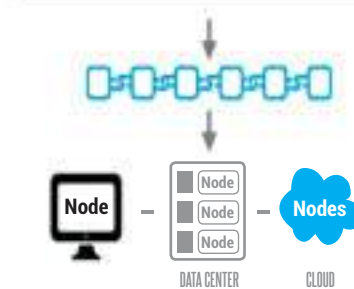
Type of blockchain

There are many types of block chains, which are explained below:

▪ **Public Blockchain:**

Bitcoin is a good example of public blockchain. These are the blockchains which runs between two parties over a large distributed database with the help of cryptocurrencies.

▪ **Private Blockchain:**

The blockchain which uses Distributed Ledger Technology (DLT) with a few trusted members over a small network to transfer very confidential information is called private blockchain.

▪ **Permissioned Blockchain:**

Those blockchains in which role of a particular full node is controlled over the network is called permissioned blockchain. They uses large distributed network. They are less costly as compared with public blockchain.

▪ **Hybrid Blockchain:**

Those blockchains which are combination of above explained three core blockchains are called hybrid blockchain. These combination are made to fulfil the demand of scalability, security, data storage capability and other characteristics of blockchain.

❶ A wants to send money to B

❷ The transaction is represented online as a 'block'

❸ The block is broadcast to every party in the network

❹ Those in the network approve the transaction is valid

❺ The block then can be added to the chain, which provides an indelible and transparent record of transactions

❻ The money moves from A to B

Fig. 4: How a blockchain works

Working of Blockchain

Working of block chain with the help of bitcoin is shown pictorially by figure 4.

Applications of Blockchain

Blockchain is now applicable wide range of areas. These areas are generally divided into two groups i.e. financial and non-financial. [4]

▪ **Cryptocurriencies:**

Cryptocurrencies like Bitcoin are dominating today's digital cash system. They uses Blockchain technology. Blockchain get its popularity through Bitcoin only.

▪ **Smart Contracts:**

These are computer programs that consists of terms and conditions of the contract. If the conditions are met then respective parties involved in the contract are automatically allowed to make payments.

▪ **Private securities:**

These days stock exchange companies are ready to use blockchain technology to distribute shares and clearing in a timely fashion. Like NASDAQ Private Equity, Medici, Blockstream, Bitshares etc.

▪ **Insurance:**

Everledger is a company which uses blockchain technology to provide insurance to diamond. Similarly, blockchain can be used to provide insurance to any kind of property like real estate, diamond, laptops, vehicles etc.

▪ **Anti-counterfeit:**

Counterfeiting is biggest problem in today's commercial sector. BlockVerify uses Blockchain technology to provides anti-counterfeit solutions. It has already entered in the diamond sector, pharmaceutical inductries, luxary items and electronics sector.

▪ **Notary Public:**

Blockchain can be used a verifying body to authenticate legal documents eliminating need of any centralized third party. Stampery, Block Notary, Crypto Public Notary, Proof of Existance, Ascribe are some of the companies which uses blockchain technology to provide notary facilities.

▪ **Music industry:**

Blockchain has helped a lot in fair music transparency and removing payment flows in music industry. It helps in providing them their rights, royalties and transparency in music industry.

▪ **Decentralized documents:**

With the help of blockchain a user can store their legal documents with timestamp and signature. It helps user to maintain their security and privacy by not allowing any third party involved in the process.

▪ **Decentralized IoT:**

Generally in any IoT platform a hub is there which communicates to all the devices i.e. they are centralized IoT scenarios. Block chain helps to make it Decentralized.

Now-a-days blockchain is being used by Department of homeland security in U.S. as a part of software security stack to secure different IoT devices.

Filament, a startup, provides a decentralized IoT.

▪ **Decentralized storage:**

In cloud file storage like dropox, google drive etc. one have to trust a third party for their own confidential files. Using blockchain technology Storj provides a peer-to-peer distributed cloud technology that eliminates the use of third party.

▪ **Internet applications:**

Currently Domain Name Servers(DNS) are being governed by the governments of the country which can be compromised if hijacked or some-one misuses their powers. Blockchain technology called Namecoin can be used for implementation of decentralized vaersion of DNS.

Conclusion

Block chain technology have capability to transform every traditional industry to a new one either it is financial or non-finanacial. Blockchain is very new technology and have vast space for researchers to grow in this field. Blockchain technology will burst in coming years. Early adopters will get truly benefit in future.

References
[1] "It's All About the Blockchain," *Money and State*, 30-Oct-2015.

[2] "The future of blockchain in 8 charts," *Raconteur*, 26-Jun-2016. [Online]. Available: https://www.raconteur.net/business-innovation/the-future-of-blockchain-in-8-charts. [Accessed: 19-Jul-2019].

[3] T. Laurence, *Blockchain For Dummies*. John Wiley & Sons, 2019.

[4] M. Crosby, "BlockChain Technology: Beyond Bitcoin," no. 2, p. 16, 2016.

About the Authors

Dr. Preeti Gulia is currently working as Assistant Professor at Department of Computer Science & Applications, M.D.University, Rohtak, India. She is serving the Department since 2009. She earned her doctoral degree in 2013. She has published more than 65 research papers and articles in journal and conferences of National/ International repute including ACM, Scopus. Her area of research includes Data Mining, Big Data, Machine Learning, Deep Learning, IoT, Software Engineering. She is an active professional member of IAENG, CSI and ACM. She is also serving as Editorial Board Member Active Reviewer of International/ National Journals. She has guided one research scholar as well as guiding four Ph.D. research scholars from various research areas.

Ms. Ayushi Chahal has completed her M.Tech from GJUS&T University. She is currently pursuing Ph.D. in Computer Science at Department of Computer Science & Applications, M.D.University, Rohtak. Her main research area includes network security, Internet of Things (IoT), Data mining.

Blockchain and Cryptocurrency

▶ Mamta Santosh and Avinash Sharma
Department of Computer Science & Engineering, MMEC, Maharishi Markandeshwar(Deemed to be University), Ambala, Haryana(India)
Email: mamta.ahlawat2@gmail.com, asharma@mmumullana.org

1. Introduction

Blockchain has become a buzzword in industry for few years now. Block chain term was first coined in 2009 by Satoshi Nakamoto (still unknown). It was Bitcoin who introduced blockchain technology to the world. It has applications in various industries banking, insurance, asset management, Financial Contracts. Blockchain is a self-validating distributed digital ledger. Blockchain technology allows transaction over the network completely secure. A block is a bundle of records and the chain is formed by adding the blocks one after another as a list. It is consistently growing as new blocks are added to the chain. The blocks are linked to each other using the cryptography.
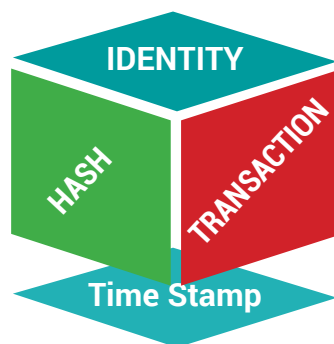

Fig. 1: Blockchain terminology

Each block in the chain consists of transaction data, cryptographic hash of the previous block and a timestamp. Blockchain keeps a track of each transaction of records without the need the need of third party intermediate. It works as peer to peer network so everyone on the network keeps the copy of all the records. Once a transaction has been made it can't be changed in future so it is immutable in a transparent and secure manner. If the user wants to change one block then the whole blockchain needs to be changed which makes it practically impossible for a hacker to hack all the systems of network at once.

Advantages of block chain technology;

Trust: Authentication and authorization in the technology

Transparency: All the transaction done over the network are visible to all the nodes on the network. So any transaction can be verified by any of the chain members.

Autonomy: The blockchain technology doesn't need any trusted third party intermediate to make the transactions secure. It runs automatically with all the predefined cryptographic algorithms.

2. Blockchain categorization:

2.1 Public/Permission less Block chain

With peer to peer connectivity, It allows anyone to join the blockchain and provides all the rights to each member node. Any node can participate in the mining, consensus. Bitcoin, Litecoin, Ethereum follow the principle of public block chains.

Fig. 2: Peer to peer network

2.2 Private/Permissioned Block chain

In private blockchain there is a central in charge who keeps the track of consensus of the nodes. These are built for organizations. MONAX is an example of private blockchain.

2.3 Consortium Blockchain:

It is semi-centralized blockchain where

3. Building blocks of blockchain

The major building blocks of blockchain technology are a database, a block, the hash, miner/nonce, transaction, fork, and incentive.

3.1 Database:

The history of databases goes back to many centuries and blockchain is more or less of a database. Database in the blockchain is basically a ledger of past transactions.

Information about deposits (owners, size, etc.) is stored in Ethereum blockchain on a decentralized and distributed network of computers. Withdraws are determined and correctly executed by some set of rules (smart contract) which are stored in Ethereum blockchain. Each user account is controlled by keys stored in the computer network and the user must install them in order to sign in and make transactions through the smart contract. A blockchain database is immutable-append only: you can only add values to it but cannot change the already stored values.

3.2 A block:

This is a set of transactions that have been added to the blockchain though not straight away. Instead, the transactions are pooled into a candidate block and later added to the blockchain as the target block. Each block has a header that describes other information such as the version, the last block, current time, transaction, and target. Computers use the version data to read each block content correctly. The last block is more or less the identity of the previous block and the target is basically the limbo pole for the block. In order to add the block to the blockchain, the block is first hashed.

3.3 The hash:

Blocks in the blockchain are referenced by the hash. It processes block data into a fixed-length output. The hashing process is algorithmic in nature and increases security by producing an encrypted series of alphabets and numerals that do not resemble the initial data.

3.4 Miner/Nonce:

Miner is a specialized computer that adds transactions to the blockchain. Individuals or companies that participate in processing the hash functions necessary to encrypt data blocks are the miners. Miners use faster computers which have higher electricity usage than the average computers. Miners are compensated as an incentive for a job well done. If two miners find a block at the same time, they will continue working on the blocks until the following block is found.

This situation is called a fork.

3.5 A transaction:

when the value is transferred into blocks and broadcasted to the network it is called a transaction. It is not encrypted thus you have the ability to view and browse any transaction that has ever accumulated into a block. A transaction is considered irreversible if it passes the given sets of confirmations.

3.6 Blockchain safety:

As the name suggests, blockchain is a series of connected digital records of transactions that make it extremely difficult to sabotage a single record. At a glance, this alone may seem major merit, but blockchain has other properties that offer an additional level of security such as the cryptography. Each individual participating in the network has his/her own digital signature. These digital signatures are keys assigned to each transaction the user makes. It is unfortunate for the hackers to try to tamper with the blockchain because it is not centralized but distributed across p2p networks which are timely updated and synced. This would require high-level computing skills and power to access the network without proper authentication.

4. Blockchain and Bitcoin

Bitcoin is an overlay protocol for fast and cheap transactions, consists of payment channels. The payment channels are based on a complex fallback mechanism to keep everything and everyone safe and honest by alerting each user involved in the cycle. Its new phase is under development which will include a new class of extra layers. Which is the future of the lightning fast ways to use the existing services. Bitcoin transactions consists of chunks of information. For example, input (which unlocks the data/coins) and output (locks the coins again with

Fig. 3: Bitcoin Symbol representation
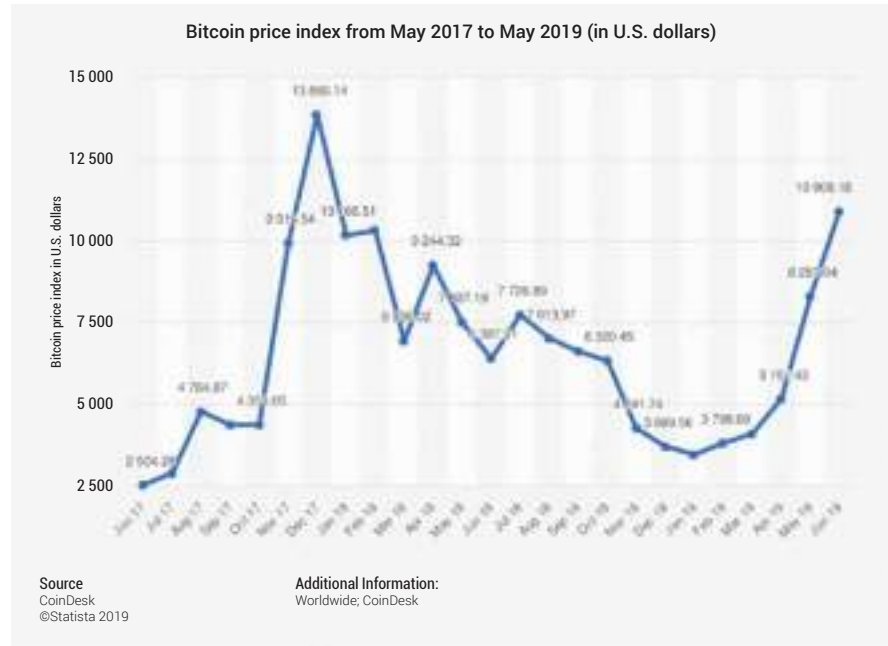
Fig. 4: How a blockchain works

the information which will be required to use them in future). It confirm the signature with the initial user to agree with how the coins are used or spent. That's why we can say, it's the most secure transaction platform currently exists.

There are some emerging similarities like: Ethereum (ETH), Litecoin, Tether, Libra & xpr. But, because of the flexible capabilities, BITCOIN is at the top. Bitcoin is the finest trend. Transactions are bought together into blocks which then add computer nodes to Blockchain.

5. Problems with Blockchain

5.1 Environmental cost:

Blockchain runs complex algorithms to ensure the security of its data. This, in turn, requires a tremendous amount of computing energy. Statistics show that Bitcoin, an example of blockchain, consumes as much energy as 159 of the world's nations.

5.2 Regulatory flaws:

As a decentralized platform, the minimum regulations have led to scams and market manipulation.

5.3 Complexity:

The ledgering process and the principles of encryption behind the blockchain technology are not easy to grasp. This has made it hard for the end-user to actually appreciate the benefits.

5.4 Slow:

On average, a blockchain transaction would require 10 minutes to process. This is very slow compared to its rivals such as Visa and MasterCard which take seconds to process.

6. Discussion/further research

What the future holds for blockchain technology?

While the future of blockchain technology is uncertain, the analyst still predicts big changes. Various entrepreneurs have expressed different opinions on the subject. In the world of Warren Buffet, it is a delusion but to Ellen Musk it is brilliant. Only a test of time will give a verdict on the trajectory of the adoption of this blockchain technology.

Cryptocurrency counterpart is more centralized hence is regulated according to money policies available hence its value can be influenced by the government. For blockchain currency, what matters is the ability and willingness of investors to buy or sell the currency at a particular time.

It is due to decentralization and anonymity during transactions that have made the cryptocurrency a hub for illegal activities. This has indeed attracted the government's watch and scrutiny to ensure customer protection.

Besides, detractors are making it their

business to discredit the blockchain tech and are actually referring it to a bubble about to pop. In spite of all that, the optimists are more positive than ever about technology. Like the internet, the stocks, and the real estates, the technology will show cycles of rising and fall. We are still using the internet, we are still buying stocks and bonds. Aren't we? The technology because it is young and is still finding its shape. Despite its debatable future, blockchain technology has shown tremendous success since its launch.

7. Acknowledgement

We are thankful to University Grand Commission for providing Senior Research Fellowship for supporting writing this article.

8. Conclusion

In this article, we have discussed Blockchain technology. The basic building blocks of blockchain, categories and its most dominant application: Bitcoin is discussed. The technology is in its novice state so it has many problem at present which needs to be addressed. Future research for the blockchain has also been discussed.

References:

[1] https://www.forbes.com/sites/bernardmarr/ 2018/02/19/the-5-big-problems-with-blockchain-everyone-should-be-aware-of/#166a8d021670

[2] https://www.coursehero.com/file/36813464/werkstuk-bruyn-tcm235-862258pdf/.

[3] https://www.investopedia.com/articles/forex/091013/future-cryptocurrency.asp [

[4] https://www.coindesk.com/information/blockchains-issues-limitations

[5] https://hackernoon.com/problems-with-blockchain-technology-d614ea123279

[6] https://cryptomaniaks.com/truth-about-bitcoin-future

■

About the Authors

Ms. Mamta Santosh (CSI Membership No. F8002708) has completed her M. Tech. in Computer Science & Engg. from DCRUSTM Murthal. She has been pursuing PhD as Senior Research Fellow from Maharishi Markandeshwar Engineering College, Mullana, Ambala (Haryana) since 2014.She has qualified various national level exams in the field of Computer Science such as UGC-NET-JRF 2014, GATE 2015, HTET 2014 & 2019. She has published four papers on the topic.

Dr. Avinash Sharma, Presently Principal & Professor, Maharishi Markandeshwar Engineering college,Mullana, Ambala (Haryana) Constituent institution of Maharishi Markandeshwar University, Mullana is NAAC accredited 'A' grade deemed university& the first private engineering college of Haryana established in 1995.Also Dean Faculty of Engineering and Technology & Member of Board of Studies & DRC Committee for Research. Ex-Principal & Professor, Rajasthan College of Engineering for Women (Leading Women's Engineering College in the state of Rajasthan). Publications: International Journals: Published: 45 (Accepted: 61);International Conferences: Published: 90 (Accepted: 102)National Conferences & Workshops: 75 (Accepted: 110 & more)Text Books/EDITED: 06.

He is an active member of advisory/technical program committee of reputed International/National conferences & reviewer of number of reputed Journals e.g. Springer, Elsevier Journal Computers & Electrical Engineering. Approximate 20 years of rich experience in Teaching, research and industry managing technical institution, serving in all capacity including Head of Department, Professor, Controller of Examination, Dean Academics Affairs, Principal etc. Played leading role in accreditation of the institution and ISO 9001:2000 certification. (including05 years of industrial/research experience)

Cryptocurrency and Cryptography

▶ **S. Balakrishnan**
Professor and Head, Department of Computer Science and Business Systems, Sri Krishna College of Engineering and Technology, Coimbatore, Tamilnadu, India

▶ **Manoshree J.**
UG Scholar, Department of Computer Science and Engineering, Sri Krishna College of Engineering and Technology, Coimbatore, Tamilnadu, India

▶ **S. Parvathy Nathan**
UG Scholar, Department of Computer Science and Engineering, Sri Krishna College of Engineering and Technology, Coimbatore, Tamilnadu, India.

Crypto - "**Secret or Concealed**", hence Cryptography is an art of encryption and decryption so as to provide a concealed path for the transmission of data and messages through the network. Cryptography plays a major role in network security and one such application is Cryptocurrency. Cryptocurrency is nothing but a digital currency which traces its origin from cryptography. Cryptographical methods are employed in producing cryptocurrency.

1. Cryptography

Cryptography is a practice and study of techniques for securing communications and data in presence of adversaries. Encryption is the process of securing the messages; it results in converting plain text into cipher text (encoded form of text). Decryption is the process of retrieving the information; it results in converting cipher text to plain text. Both encryption and decryption are done using Keys. A key in cryptography is a parameter which determines the functional output of a cryptographic algorithm; its length determines the complexity of decrypting it.
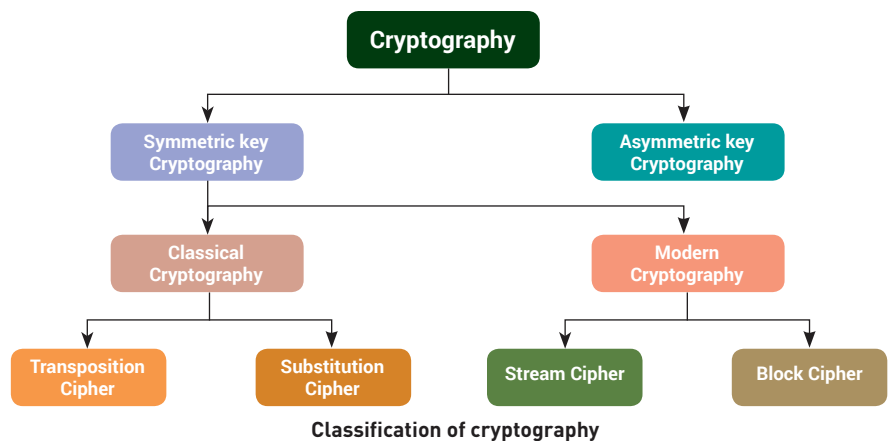
1.1. Symmetric Key Cryptography:

In symmetric key cryptography, the encryption and decryption keys are the same. This is considered as the major disadvantage of symmetric key cryptography.

1.1.1 Transposition Cipher:

Transposition cipher is a technique employed for encryption of messages, the messages are stored in the matrix format and their position is transferred according to the key used to yield the cipher text, which later on decrypting gives the original message.

1.1.2 Substitution Cipher:

Substitution cipher is a technique in which the text in the plain messages is substituted by the texts, based on the key used. This process omits punctuation and symbols and is meant only for digits and alphabets which is considered as a disadvantage.

1.2 Asymmetric Key Cryptography:

Asymmetric Key Cryptography overcomes the disadvantages of symmetric

Classification of cryptography
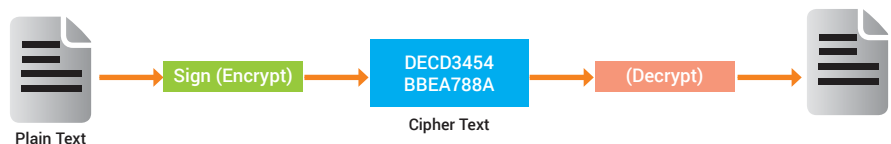
Plain Text

1	2	3	4	5	6
M	E	E	T	M	E
A	F	T	E	R	P
A	R	T	Y		

Plain Text

4	2	1	6	3	5
T	E	M	E	E	M
E	F	A	P	T	R
Y	R	A		T	

Cipher Text

KEY USED: 421635

Plaintext Alphabet:	ABCDEFGHIJKLMNOPQRSTUVWXYZ
Keyword:	Zebras
Ciphertext Alphabet:	ZEBRASCDFGHIJKLMNOPQTUVWXY

Plain Text: FLEE AT ONCE
Cipher Text: SIAA ZQ LKBA

Centralized network   Decentralized network   Distributed network

Nodes in Distributed System

Distributed System
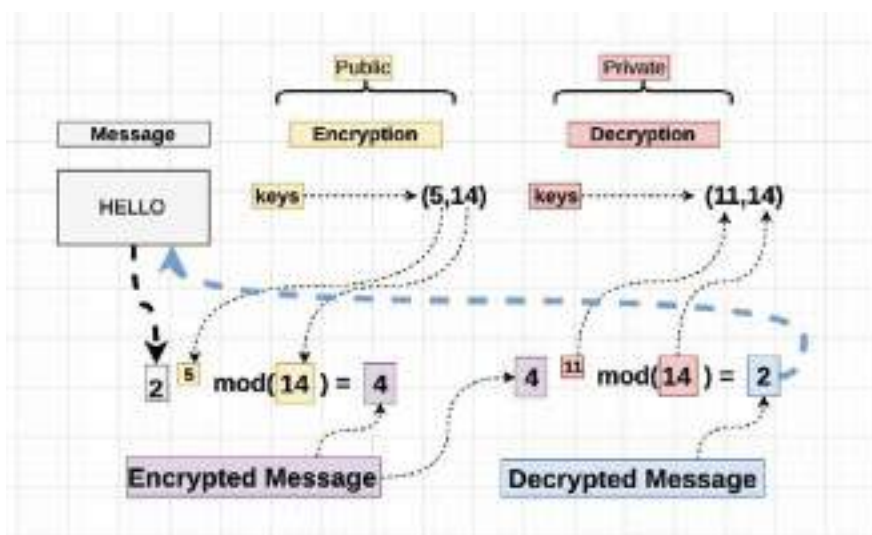
key cryptography as this method consists of separate private and public keys for encryption and decryption. One such method is **RSA**; this method is widely used for internet cryptography. This method is based on the principle of multiplication of 2 prime numbers which is stored in the private key. This method cannot be hacked by brute force method as it can take decades due to the complexity involved. The no of digits in the largest known prime number is 1, 74, 25, 170.

2.   CRYPTOCURRENCY

Cryptocurrency is nothing but a digital currency. One of the most popular brands of such form is bitcoin. Bitcoin is a company founded in 2009; it is a distributed network of transaction technically called as Blockchain. The transactions are stored in the blockchain publicly so that anyone can access the transaction information. But the information is hashed by use of Asymmetric key cryptographic method which consist a private and a public key for encryption and decryption. The transactions are verified by the miners and they are awarded with bitcoins for successful verification. The unconfirmed block once verified is moved to the shared ledger across the network. Thus, the transaction speed is high as the network is a distributed one and there is no duty payment involved (in case of an overseas transaction).

2.1   Blockchain

A Blockchain is nothing but a data structure which is linked with the successive blocks as per the time-stamped chronological order. It is distributed as a digital ledger of immutable public records of all the transactions. The information stored in the blocks is accessible but not editable. The first block of the chain is called as the Genesis Block.

2.1.1 Initiating transactions in Blockchain:

As said earlier, blockchain is a distributed network system and the transaction information is distributed all over through the network ledger very fast. In distributed networks, all the nodes (system connections) work together for a common cause. Technically it is seen as a single logical system consisting of large number of nodes.
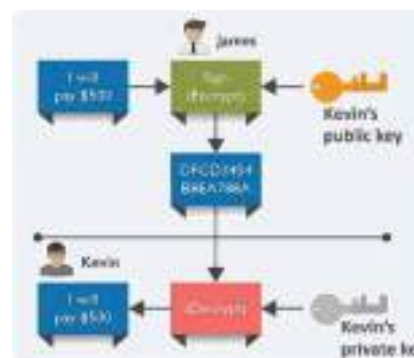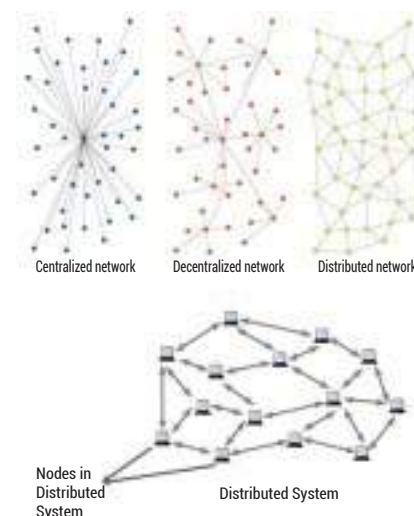
Let us consider a practical example, when James is trying to send 5 bitcoins to Steve.

It is obvious that James must know the public key of Kevin, in order to send the bitcoins to Kevin. There in Kevin's side, he will have his own private key from which the decryption takes place. This method is called as the Asymmetric key cryptography. But in cryptocurrency, there involves a digital signature which acts a physically signed signature except the fact that the digital signature is different for different transactions of the same user. Digital Signature provides the proof of transaction as a genuine one (from the user side).

2.1.2 Transferring of Transaction Information:

Once the initiation of transaction is done, the unconfirmed transactions are transmitted through the nodes in the

First block of the Blockchain is known as the Genesis block.

To access data of the first ever created block, you have to traverse from the last created block to the first block

New Blocks

Digital Signature

Kevin ——→ James   5.0 Bitcoin   043237848843270032843 4ea45de65837abfc452

Digital Message   **Different Every time**
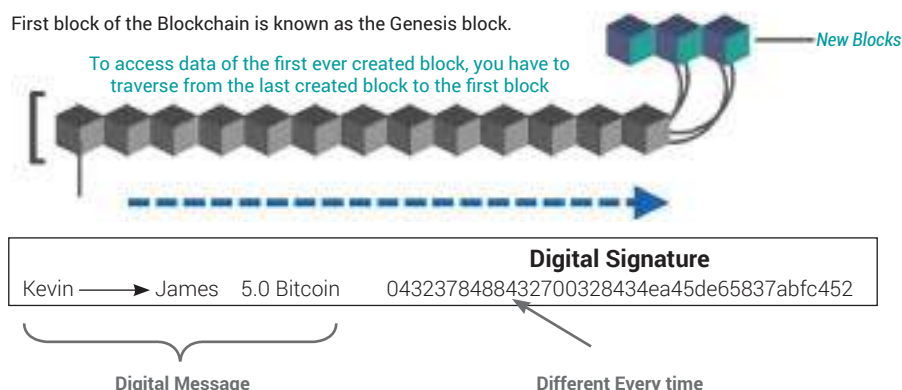
distributed network system. It is a peer to peer method of transmission. The whole transmission happens very fast at the rate of 1-2 seconds.
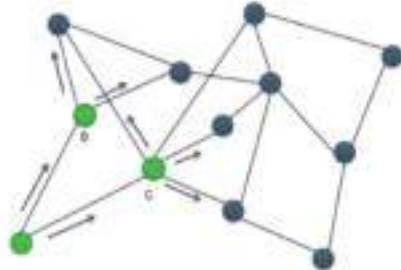
2.1.3 Verifying the Transactions:

There are special nodes in the network to verify the unconfirmed transactions, they are called **miners**. The work of the miners is to verify the transactions happening in the network by using state-of-the-art Cryptographic algorithms. Their job is to confirm the following:

i. The originator of the transaction must possess the amount of fund being transferred

ii. The originator of the transaction has obtained the funds in a valid and verified way.

The problem given to the miners consist of a hashing script of the block and a value of the estimated output. If the value of the estimated output is satisfied by the unknown value (to be found by the miner), then it can be said that the transactions happened in the whole block is verified as a legit one. When the miner successfully found the unknown value which matches the output, the miner gets the reward (bitcoins) depending upon the size of the block.

Consider the above example, the desired output must prefix 42 zeros in order to say the transactions happened through the block is verified as a legit. The miner has to find the unknown value which satisfies the desired output. The difficulty rate depends on the length of the output.

3. Conclusion

Cryptocurrency attained through Cryptography is taking the world economy as major boom! USA has invested 10 million USDs in Cryptocurrency and Blockchain; as a result most of the top shot companies also started transactions with cryptocurrency. The advantage of cryptocurrency transactions is the fact that it is a **decentralized distributed** system of networks involved in transaction. There is no third-party organization involved, except the miners who verifies whether the transaction is legal or not? Apart from that there is no interference in the transaction from their side. Hence, the transaction rate is faster and there is no duty payment involved as it is a decentralized system. Cryptocurrencies can be potentially considered as the future due to the following reasons:

1. **Reduces the Risk of Fraud:** Due to the advancements in technology, online fraud has been growing at an alarming rate. It poses serious threats to businesses. Cryptocurrencies provide the chance to trace the originality of products with the help of the powerful blockchain technology.

2. **Alternative Processing Option of Payment:** Cryptocurrencies ensure that every rightful payment is made and there are no dues. This becomes possible with the help of blockchain as it offers a more open alternative payment system.

3. **Compatible with Commodity Currencies:** Cryptocurrencies are unregulated free market entities. However, they are highly volatile and thus, not favorable as base currency. On the other hand, when it comes to online transactions, cryptocurrencies work faster, better and more efficiently. Therefore, cryptocurrencies can work really great when backed with commodity currencies.

About the Authors

Dr. S. Balakrishnan (CSI Membership No. 2060000034) is a Professor at Sri Krishna College of Engineering and Technology, Coimbatore, Tamilnadu, India. He has 17 years of experience in teaching, research and administration. He has published over 15 books, 3 Book Chapters, 11 Technical articles in CSI Communications Magazine, 1 article in Electronics for You (EFY) magazine, 3 articles in Open Source for You Magazine and over 100 publications in highly cited Journals and Conferences. Some of his professional awards include: 100 Inspiring Authors of India, Deloitte Innovation Award, Cash Prize ₹ 10,000/-, from Deloittee for Smart India Hackathon 2018, Patent Published Award, Impactful Author of the Year 2017-18. His research interests are Artificial Intelligence, Cloud Computing and IoT. He has delivered several guest lectures, seminars and chaired a session for various Conferences. He is serving as a Reviewer and Editorial Board Member of many reputed Journals and acted as Session chair and Technical Program Committee member of National conferences and International Conferences at Vietnam, China, America and Bangkok. He has published more than 6 Patents on IoT Applications.

Mr. S. Parvathy Nathan is pursuing second year Computer Science and Engineering in Sri Krishna College of Engineering and Technology, his area of interests are Machine learning, Cyber Security and Business Systems.

Ms. Manoshree J. is pursuing second year Computer Science and Engineering in Sri Krishna College of Engineering and Technology, her area of interests are Artificial Intelligence, Data Mining and Business Systems.

Decentralised & Distributed Applications: Future Trend in Industries

▶ **Navneet Singh**
M.Tech. degree in Information, Communication and Electronics Engineering with Catholic University of Kore
navneetsinghlovely07@gmail.com

▶ **Navneesh Kaur**
B.Tech. degree in Computer Engineering from Punjab Technical University, Jalandhar

▶ **Akanksha Saini**
B.Tech. degree in Electronics and Communication Engineering from Punjab Technical University

Blockchain Basics

History of Blockchain

Blockchain, buzzword of recent years which took the world by storm. It is technology behind one of the first, famous and most valuable virtual cryptocurrency in the world 'Bitcoin'. Technology which attracts the people to use the virtual digital currencies.

Blockchain is basically an immutable decentralised, distributed network database which is often called ledger. This ledger is cryptographically secure. It was first introduced by Stuart Haber and W. Scott Stornetta in 1991, where they show-cased their work on cryptographically secured chain of blocks [1][2]. It took nearly 18 years, when an unidentified person (or persons) known as "Satoshi Nakamoto" came up with the concept of first fully functional Blockchain in year 2008. However, it was first implemented in January, 2009 when Satoshi Nakamoto introduced and mined the first ever "Bitcoin" [3], whose value in exchange market is more than 11,000 USD in July, 2019.

From then new era of blockchain begins, Ethereum [4] in 2014, Hyperledger in 2015[5], and many more.

How it Works?

Blockchain is all about sending and receiving transactions from other user (account address). This process starts when a user launches the transactions using its private key (a number which is picked randomly) also known as Digital signatures. After this user has to find correct solution for mathematical puzzle using his computational power. Then broadcast their transactions to the other members (nodes) of the blockchain. Members start checking and verifying the transactions, if the proper and correct process is followed by the broadcaster to find the solution. Then transactions will be verified and propagated towards the main blockchain. This newly verified transactions will be added to the main blockchain which updates the state of the blockchain and then all the nodes will receive the updated blockchain. This whole process will be repeated every time whenever there is a new incoming unverified transactions is there. This whole process uses a consensus mechanism like Proof- of-work, proof of stake etc. Different consensus mechanism varies from blockchain to blockchain. Consensus mechanism is blockchain protocol that is responsible for making sure that all members (nodes) are on the same state of the blockchain and remain updated and also, agrees on which transactions are legal and which are not. In other words, it is fault-tolerant method used in various blockchain systems.[6]

Types of Blockchain

Basically, blockchain is classified into two types:1) Network type 2) Permission Level. Network type is further divided into three types. First is *'public blockchain'*. Second is *'private blockchain'* and third is *'federated blockchain'* [7]. Permission Level is also divided into two types, first is *Permission blockchain* and other one is *Permission-less blockchain.* These classifications have different benefits and use cases. Public blockchain has truly decentralized structure. It is known for very high transparency. Some of the popular public blockchain are Bitcoin and Ethereum. Private blockchain is used for privacy protection, it is controlled and maintained by organisation (group of organisations). Best example for this is 'Hyperledger' by The Linux Foundation. Federated blockchain is for cost saving and it has less transactions fee. It also known as hybrid blockchain. Permissioned blockchain is best suited for organisations and have less transaction fee. Permission-less blockchain provides free participation in consensus mechanism and have open privacy level.

Applications of Blockchain

Blockchain have very high impact on different industries. Some industries get benefits from this relatively new technology and some have very negative impact on them because it can change the way they work earlier from many years. Blockchain research is very active and going very fast pace. Healthcare, Digital Currencies, Supply Chain, Insurance, Trade Finance, Internet of Things, Real Estate, Government Services, Data Sharing, Social Media, Retail, Oil and

Gas, Film and Music Industries are sectors which are swiftly adopting blockchain. Some applications are discussed below in various industries [8].

In **Healthcare**, blockchain can be used for data sharing among hospitals and patients vice-versa. Blockchain can reduce the fraud and data theft by the hackers and other intruders which cost millions of dollars each year to the healthcare industry. It is also helping the industry in the privacy integrity of patient electronic medical records (EMRs). Prior to blockchain healthcare industry was suffering from data integrity where it was impossible to map the EMRs of patients to their personal information which make data sharing between two or more stakeholders impossible. Now it is possible to track the record and maintain the EMRs securely and efficiently. Patients also able to view whom their EMRs are sharing with by the hospitals and get incentivise for their EMRs. Patients can control access for their EMRs. They can choose whether their data will share with other patients or hospitals for research and diagnoses purposes. Research is being conduct by the universities and companies for finding out new methods to apply blockchain in healthcare sector [9]. We can except new use cases and applications very soon. Research analytics predicts that in 2020, health care industry will totally be transformed by the use of blockchain technology. PokitDok, doc.ai, medicalchain, Gem are some of the start-ups companies which are actively working on solving the problems related to this particular field and some healthcare applications which are using the blockchain for their working are Ethereum Health wallet, Curisium and many more are there.

Digital Currencies are most famous use case of the blockchain, it was the one by which blockchain came into the lime light and shook the world by its transparency and openness. Crypto currencies are attracting many biggest banks and other main stream financial institutes in the world. Every other
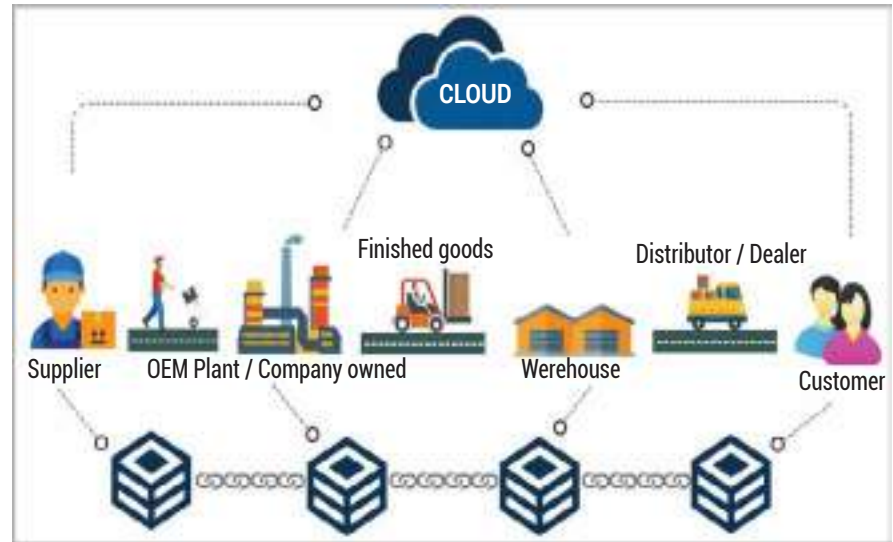
bank now a days coming up with their own crypto currencies. These currencies are not monetized by any government which makes it more versatile and classified as borderless currencies. Many investors are investing millions of dollars in cryptocurrencies. Due to popularity of these digital currencies governments of different countries either making efforts to also launch their own crypto currencies which can co exists with there normal currencies or they are investing in already developed private crypto currencies. Some countries like India still staying away from these cryptos. In India, crypto currencies are not considered as "Legal" tender which means anyone can buy and sell the crypto currencies but government is not liable to any loses to anyone. On other hand countries like UAE and Saudi Arabia are developing their own crypto currencies. Recently group of companies headed by Facebook is also developing their own version of crypto currency called '*Libra*'. Future of these cryptos depends on how governments of different countries sees these currencies and how it will become hackproof so that there will least cases of frauds. There are lots of digital crypto currencies emerging daily and being actively developed but very few become famous and spread worldwide.

Blockchain also changing the **Supply Chain** industry. Problems which were faced by the supply chain industry from decades, now with the use of blockchain those problems are reduced up to some extent. Blockchain researchers and companies are working in collaboration for developing new

applications where they can keep track of their products. Main challenge which is faced by this industry is to prevent piracy and theft of their product while transportation. Innovative solution like labelling the product with specially created QR code using blockchain where regenerating same QR code is practically impossible can prevent the piracy of the products. Although, this solution cannot be applied on every product. Challenges is like finding the solutions for confirming the purity of the products such as coffee, chocolates, other eatables and medicines are yet to be solved.

Internet of Things is already in news from the last 10 years. Many IoT devices are around us now a days such as smart home devices, health trackers, smart wearables and many others. Main features of IoT devices are internet connectivity, small battery and more importantly they have small computational power with dedicated built-in CPU. But this small computational power making it difficult to run blockchain on it. Because blockchain demand high computational power which IoT device unable to provide. Many computer scientists are working on different solutions for running blockchain on IoT devices and possibly developing IoT nodes. IoT can be useful for blockchain like IoT enabled healthcare device which is able to run proper blockchain can deal with data (patient's health parameters) sharing problem between patient and their corresponding hospital efficiently which is not possible with traditional technology. In near future we can see IoT devices which can run blockchain create lots of new use cases and whole new bunch of applications.

Government Services is another area where blockchain is actively spreading its footprints. Government have lots of documents and information which should be either kept secret or should remain immutable throughout its life but many times we heard news that some highly classified documents get leak in the media. Governments face lot of challenges to keep secret files out of reach from public but there is no fool-proof method is there, however blockchain's cryptographic nature can have some positive impact on keeping data secure and making it inaccessible for the outer world. By using Blockchain technology it is possible that we can develop decentralised access control mechanism which is beneficial for government as well as it can reduce illegal selling of documents from a record offices of government. Because of its decentralised nature it will be impossible to gain access by a single person and in blockchain we can track source of the transactions which will help to find by whom and when the files were accessed. This is only one single use case. There are number of use cases where blockchain is helping governments. Elections are the other major area where governments are developing proper mechanism for conducting online elections using blockchain where people can caste their vote and after that it votes become immutable. This is only possible with use of blockchain technology which is immutable in nature. South Korean government collaborating with Samsung for the development of blockchain for themselves aiming to more transparent. In

India some of its states are also transferring their land records to blockchain.

There are endless use cases and applications of blockchain and every day new use cases are coming up which shows what kind of impact this technology have on different areas. In coming years, we will see that many banks, incurrence companies and centralised data storage companies will be closed just because of widespread use of blockchain. People will stop going to banks due to crypto currencies which is fully online. There will be no need to store data on centralised data storage which can be easily hackable compare to decentralised blockchain solutions. With new and creative ideas coupled with blockchain we will see more and more industries moving towards the blockchain in the near future.

Problem with Blockchain Faced by The
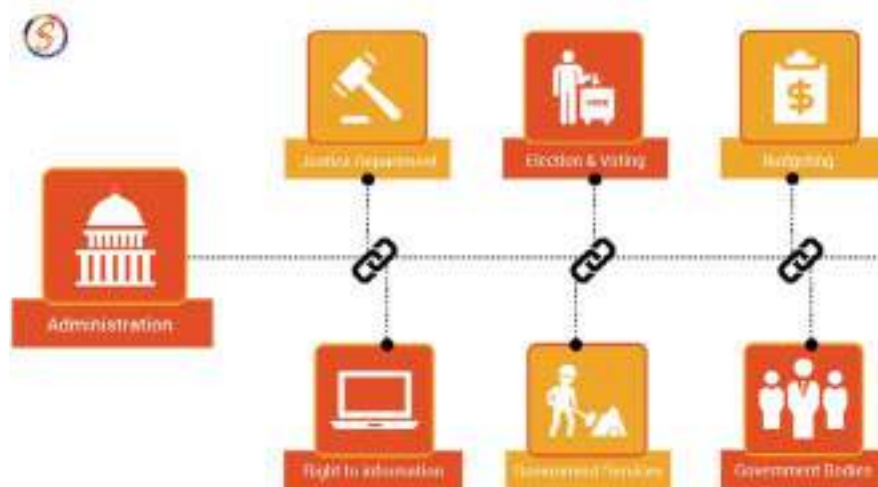
Industries

Every technology which was invented till now came up with benefits and negatives. Blockchain is no exception. Like every coin have two sides. Although, blockchain becoming popular in industries but it has some serious issues with its core structure. Blockchain have three pillars which are Security, Scalability and Decentralisation. All three of them are strongly bonded with each other. If we increase one thing other two will decrease. For say if we want to increase scalability then we have to compromise the other two. And if we increase security then scalability and decentralisation will suffer. Scalability [10] of blockchain is very hot topic among the researchers and industry scientists. Current form of blockchain are less scalable which means it is slower than other technology, it processes a smaller number of transactions per second as compared to their counterpart technology. Some of the idea like sharding [11] are promising to solve the problem of scalability in blockchain. In this, developers are trying to break transaction data into different parts and process them separately and then again join together. It will make transaction processing faster than pervious. Other solution is to increase the size of block so that it can accommodate more number of transactions in it. But it also has its drawbacks, it will slow down the blockchain and decrease the decentralisation and increase the centralisation which is totally against the blockchain concept. This particular topic is open for research to scholars, developers, and scientists. By solving this challenge blockchain can change the life of human beings. Everything becomes secure, faster and transparent.

Blockchain lacks parallel processing. Interoperability [12] is also major challenge for developers. It means that communication between two different blockchains which is impossible till now. There is no mechanism or method by which two different blockchain can interact with each other, share their data or access information between two different blockchain. In future when more and more industries start joining the blockchain bandwagon. It is important to have interoperability among blockchain otherwise it can cost lots of money for the users. Multichain model is possibly the answer for this problem. Only very few startups are coming up with these type innovative ideas.

High electricity consumption, [13] although it is not particular problem or challenge but extremely important from environment prospective. Blockchain uses very high computation power which comes high end, electricity hungry CPU, GPU and dedicated mining rigs used for mining the crypto currencies. It is estimated that by the year 2031, temperature of earth will be increased by 1° Celsius just because of blockchain which not good for our environment. Hardware designers should find new ways to develop dedicated hardware for blockchain which consume less energy and generate high computational power.

Some other bottle necks are integration of blockchain and artificial intelligence, how big data and blockchain work simultaneously and many more.

There are many challenges which should be addressed by the industries before going deep into the blockchain and implemented into their products and organization.

REferences
[1] Blockchain "https://en.wikipedia.org/wiki/Blockchain"
[2] D. Chaum, "Achieving electronic privacy," Scientific american, vol. 267, no. 2, pp. 96-101, 1992
[3] S. Nakamoto et al., "Bitcoin: A peer-to-peer electronic cash system," 2008.
[4] G. Wood, "Ethereum: A secure decentralised generalised transaction ledger," Ethereum project yellow paper, vol. 151, pp. 1–32, 2014.
[5] Hyperledger "https://www.hyperledger.org/"
[6] Andreas Antonopoulos, "Mastering Bitcoin: Programming the Open Blockchain" e2.
[7] Types, "https://en.wikipedia.org/wiki/Blockchain#Types"
[8] Applications of Blockchain "https://www.blockchaintechnologies.com/applications/"
[9] A. Zhang and X. Lin, "Towards secure and privacy-preserving data sharing in e-health systems via consortium blockchain," Journal of medical systems, vol. 42, no. 8, p. 140, 2018.
[10] Eyal, Ittay, et al. "Bitcoin-ng: A scalable blockchain protocol." 13th {USENIX} Symposium on Networked Systems Design and Implementation ({NSDI} 16). 2016.
[11] Al-Bassam, Mustafa, et al. "Chainspace: A sharded smart contracts platform." arXiv preprint arXiv:1708.03778 (2017).
[12] Zhang, Peng, et al. "Applying software patterns to address interoperability in blockchain-based healthcare apps." arXiv preprint arXiv:1706.03700 (2017).
[13] Bernard Marr, "The 5 Big Problems with Blockchain Everyone Should Be Aware Of"

∎

About the Authors

Mr. Navneet Singh received the B.Tech. degree in Computer Engineering from Punjab Technical University, Jalandhar, India, in 2018. He is currently enrolled in M.Tech. degree in Information, Communication and Electronics Engineering with Catholic University of Korea. His research interests include machine learning, AI, internet of things, and blockchain technology.

Ms. Navneesh Kaur received the B.Tech. degree in Computer Engineering from Punjab Technical University, Jalandhar, India, in 2018. Her research interests include robotics, machine learning, AI, internet of things, android and blockchain technology.

Ms. Akanksha Saini received the B.Tech. degree in Electronics and Communication Engineering from Punjab Technical University, in 2015 and M.Tech. degree in Information, Communication and Electronics Engineering from Catholic University of Korea, Seoul, South Korea, in 2018. She is currently pursuing the PhD degree in Information Technology at Deakin University, Melbourne, Australia. Her research interests include identity and privacy protection, network security, cryptography, internet of things, and blockchain technology.

A great impact of connected cars based on Internet of Things (IoT)

▶ S. Suresh Kumar
Assistant Professor, Department of Computer Science and Engineering
Sri Krishna College of Engineering and Technology, Coimbatore, India
Email: sureshamcetcse@gmail.com

▶ J. Janet
Professor, Department of Computer Science and Engineering
Sri Krishna College of Engineering and Technology, Coimbatore, India

The Internet of Things (IoT) is one of the emerging field in computer science. It take important role in human day to day life. Any kind of device have unique identifier can be connected with one another and finally the information are conveyed to user using smart phone. It can be connected using both wired and wireless medium and used in physical as well as digital world. The Internet of Things (IoT) is connected to various things to make the world smart.There are many application use IoT to make them self-smart are connected cars, smart buildings, smart parking, smart home, smart cities, smart agriculture and so on.The IoT has done many changes in our environment including vehicles. IoT plays major role in cars because each and every car are connected to each other and also with road side infrastructures.It can also be connected to vehicle to vehicle (V2V) and also from vehicle to infrastructure (V2I). It used to reduce the road traffic, prediction of weather condition, occurrence of accidents can be prevented and also other useful information can be conveyed to drivers or owners. This paper explain the development of Internet of Things in connected cars, communication between various cars and also with infrastructure. The various sensors used in cars and various techniques are explained. The information are conveyed to user through smart phone or even using some smart wearable devices.

Keywords: Connected Cars, Infrastructure, Smart phone, Sensor, Wi-Fi.

Introduction

Internet of Things is said to be object inter related with internet connectivity. All kind of objects which has unique identifiers can connect to each other. The object can communicate with each other, take the decision by itselfand finally the information are conveyed to user through Wi-Fi or some internet connectivity. The vehicle can communicate within a range, when the vehicle enter in certain range the start communicating with other. The communication is done within 1 Km with the ratio of 5.9 GHZ.It connect people, auto parts, machines, infrastructure and all other objects. The death rate can be reduced using the IoT in connected cars and there is a traffic in few meters away the information is send to drivers automatically. The smart city include monitor of road traffics, vehicle parking and also connected cars. The connected cars contain internet connectivity and also with wireless local area network, using that internet connectivity it can

communicate with object inside and also outside the car. The main role of connected cars is to reduce the traffic, communicate the weather condition, and inform the road damages occur in road to drivers.

Fig. 1 : Connected Cars

LITERATURE SURVEY

Ruhi Kiran Bajaj, Madhuri Rao, Himanshu Agrawal proposed the paper on Internet of Things (IoT) In the Smart Automotive Sector: A Review

In this paper various features of

connected cars are explained briefly. The driver less car can drive without human input. The car contain network connectivity between the car and environment. When the car reach the destination the information is conveyed toenvironment. It helps the passenger to use the smart phone, laptop, tablet and so on.It makes human to be travel with high freedom and safe. The electric car has electric motor which use electric energy in rechargeable batteries. It is cheaper than regular cars which use petrol/diesel and it is more efficient than usual cars. The user can make it charge easily in home, it use lithium batteries so the car ca travel long distance. Now days most of the devices are plug-in device so this car is useful for upcoming years. In many countries public charging station is provided when the user travel long distance. The wireless charger is introduced for charging the electric cars. It is more helpful for owners to travel long distance without depending on electric charge. To

monitor the drivers the alcohol sensor, eye blink sensor, Gas / Smoke sensor, Impact Sensor are integrated with Microcontroller. The GPS module and GSM Module are also integrated into Microcontroller to find the position of vehicle. The GPS integrate with Google Map to locate the vehicle position. Electronic Smart Toll Collection is implemented in Toll plazas to collect the toll charge without any traffic jams and delay. The Smart Toll Collection should be more convenient to the users. Smart Parking is necessary in smart cities to reduce the traffic in parking area. The parking charge is also done automatically and make them convenient while parking.

Fig. 2 : Vehicle Tracking System

Ankita A. Mahamune, Dr. Salim Y. Amdani, Vaibhav R. Panditproposed the paper on Internet of Things Based Connected Vehicles in Smart Cities: Review and Research Challenges

In this paper the connected car has secure object tracking, traceability of vehicle path and also some of the algorithm to allocate the vehicle service. To track the vehicle along the path Internet of Vehicles (IoV) is based on radio frequency identification system. Social Internet of Things (SIoT) used to select the right the object by communicating from one object to other object. The intra vehicle connectivity is used to communicate within a car like sensor and other devices. The sensors are used to monitor the road condition, to monitor the pressure level of car tire and also the water temperature in cooling system. Inter-Vehicle

Connectivity is based on vehicular ad hoc network (VANET) technology. Inter -vehicle communication (IVC) is processed between two or more vehicles. The vehicle can communicate with infrastructure which has unique identifier.

Fig. 3 : Overview of vehicles-to-x Connectivity

Types of Connectivity

There are five types of connectivity for vehicle to communicate with environment. They are

– Vehicle to Infrastructure (V2I)

– Vehicle to Vehicle (V2V)

– Vehicle to Cloud (V2C)

– Vehicle to pedestrian (V2P)

– Vehicle to Everything (V2X)

▪ **Vehicle To Infrastructure (V2I)**

The vehicle can communicate with outside environment. The vehicle can communicate with infrastructure which has unique identifier. The information are send to driver through smart phone. The algorithm are designed to exchange data between environment and vehicle. It send the information of road traffic, parking, weather condition and so on. Using wireless medium the data are exchanged between environment and vehicle.

Fig. 4 : Vehicle to Infrastructure (V2I)

▪ **Vehicle To Vehicle (V2V)**

The Vehicle to Vehicle (V2V) system use wireless adhoc network on the road to communicate among vehicles. It is also referred as vehicular adhoc network (VAETs). It used to send speed and position of vehicle to driver's mobile. The main goal of V2V is to avoid the accident, to reduce the traffic and to have the positive impact on environment.

Fig. 5 : Vehicle to Vehicle (V2V)

▪ **Vehicle To Cloud (V2C)**

The information of vehicle are stored in cloud, it helps to other vehicle to use the information. The information are used by other vehicle like transportation, smart home, energy. The connected vehicle to cloud should be scalable and more flexible.
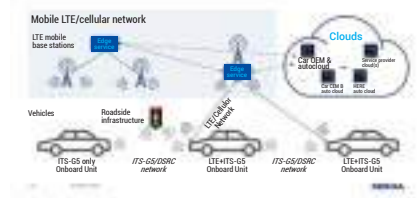

Fig. 6 : Vehicle to Cloud (V2C)

▪ **Vehicle To Pedestrian (V2P)**

The information in the environment are communicated to other vehicle or some other personal mobile phone. The vehicle can communicate with pedestrian and also provide safety to pedestrians. It used to reduce 80% of road accidents.

Fig. 7 : Vehicle to pedestrian (V2P)

§ **Vehicle To Everything (V2X)**

The vehicle can communicate with everything which has unique identifier. It connects highways, trains, airplane and also with ships. It communicate with various sensors to have low latency, high bandwidth, high reliability. It include Vehicle to Infrastructure (V2I) and also Vehicle to Vehicle (V2V) to exchange data between vehicles using wireless technology.

Fig. 8 : Vehicle to Everything (V2X)

Conclusion

The connected cars connect not only with car but also with infrastructure, pedestrian even with everything. It used to reduce the traffic, avoid accidents and helps all kind of user. The vehicle to vehicle communication is possible only through Internet of Things. The car become smarter and it connect various cars and also with smart phones. The connected cars have many benefits like Mobility management, Vehicle management, Entertainment, Safety, Well-being and Home integration.

About the Authors

Mr. S. Sureshkumar is an Assistant Professor in Department of CSE at Sri Krishna College of Engineering and Technology, Coimbatore. Tamilnadu.He has completed his Undergraduate and Post graduate studies in Computer Science and Engineering in Anna University, Chennai. He has 10 years of academic experience in teaching. He has published 5 books and over 20 publications in highly cited Journals and Conferences. He is a professional body member of ISTE and IAENG.

Dr. J. Janet is working as a Principal of Sri Krishna College of Engineering and Technology and active member of CSI. Her specialization is Knowledge Based Systems. She has produced 13 doctorates so far and presently guiding 4 Ph.D. research scholars. She has published over 100 papers in International refereed journals and has 176 Google Scholar citations with h-index 8 and i10-index 7. Dr. J. Janet has executed several research projects to the tune of ₹ 60 Lakhs with funding from various national agencies including DST and AICTE-TAPTEC in the areas of Artificial Intelligence and Cloud Computing. She has mentored several research projects under UGC-MRP and DST-CSRI schemes in her previous tenure. She has conducted several seminars, workshops and conferences with seminar grant from DST, TNSCST, NCSTC and DBT.

Blockchain : Security and Concerns
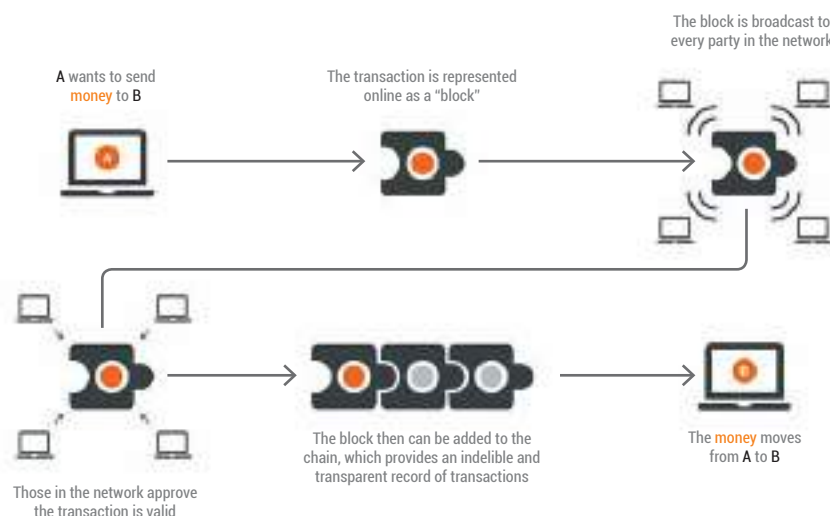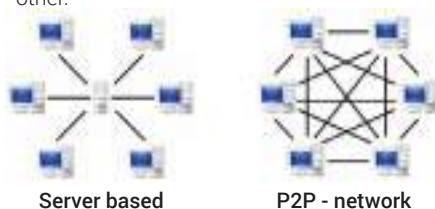
▶ **Avinash Sharma and Jatin Arora**
Department of Computer Science & Engineering, MMEC, Maharishi Markandeshwar (Deemed to be University), Ambala, Haryana (India)
asharma@mmumullana.org; jatinarora28@protonmail.com

A blockchain is a dispersed database of records of exchanges or advanced occasions which are occurring in the middle of two taking an interest parties. The transaction are performed by using public key encryption and are transparent, trustless, publically available and decentralized in nature. A blockchain by default is resistant to changes, the transaction once recorded in the ledger is permanent. By splitting word blockchain into two subparts block and chain, we can easily understand that blockchain is a combination of blocks that are arranged in a sequential order and uses cryptographic methods to create connection between the blocks. Each block here is a collection of data and contains cryptographic hash of the previous block, timestamp, and transaction details. The best benefit of blockchain is removal of infinite reproducibility digital assets, which ensure that a transaction takes place only once.

The very first and the most popular use of blockchain technology is Bitcoin. It enables a global market of transaction without any third party interference, which makes it one of the most controversial as this property of bitcoin has proved out to be a boon for criminals performing illegal transactions. The bitcoin came into existence in 2008 when a paper titled Satoshi Nakamoto was released by an individual or a group of people whose identity is unknown via cryptography mailing list. The reason why the identity of its makers is still unknown is that bitcoin don't need them anymore for its survival and existence.

Advantage over traditional system

Peer to peer- there is no central supervision over the transaction which are being performed all the transactions are end to end connected or directly linked to each other.

Server based　　　**P2P - network**

A wants to send money to B

The transaction is represented online as a "block"

The block is broadcast to every party in the network

Those in the network approve the transaction is valid

The block then can be added to the chain, which provides an indelible and transparent record of transactions

The money moves from A to B

Enhanced security - Blockchain is much more secure than the traditional method of transaction in a number of ways. If we want to create a transaction using blockchain technology an approval is required from both the ends. Ones the transaction has been approved it is encrypted by using cryptographic methods and a connection is generated with the previous transactions. Moreover Unlike the traditional system the financial records here are not stored in a single computer or sever, they are stored over a network which makes the compromising of data a difficult task.

Reduced costs - as we all know that blockchain is decentralized in nature, and needs no third party to keep records of all the transactions and digital activities taking place this feature of blockchain increase the efficiency.

Traceable - we all know how difficult it is to trace a product once it's dispatched. Whereas in blockchain the scenario is not same, whenever any transaction occurs an audit trail of the transactions is generated which contains the complete details of the transaction, thus makes it more secure and helps in preventing frauds.

Increased efficiency and speed - unlike the traditional system blockchain has eliminated the need of heavy paper works, human errors, and third party interference. All the processes performed are automated, time saving and requires no human interference. Which increases the speed of transaction and makes it more efficient.

Trustless - The blockchain innovation gives the upside of discernibility and cost-adequacy for store network the board. With the assistance of Blockchain innovation, it is easy to follow the drive of assets, their source, amount, and so forth. This passes on the data related with every one of the segments which can be conveyed effectively to or from the new proprietor for the specific activity.

Security vulnerabilities in blockchain

The cryptocurrency and blockchain has been the recent trend in the technology and had attracted both the geeks and the critics. But the technology which once hailed unhackable, is now getting hacked as more and more security loopholes are being identified. Some of the major loop holes are

End point vulnerabilities - It is most common vulnerability in the blockchain technology. Named "endpoint vulnerabilities," these issues in any case think about the security of blockchain innovation all in all thus they should be tended to.

Endpoints, are the point where people and blockchains meet. Generally, these are the points where an individual or organizations administrator meets the technology. Regardless if administrations are money related establishments, businesses, or digital currencies, the utilization of a blockchain starts with data being inputted into a PC and finishes with data being yielded from a PC.It is during the way toward getting to the blockchain the information is generally powerless/ most vulnerable.

One of the major reason that comes is the need of certificates required for a mutual disseminated record, and the way these accreditations are used for security shortcomings at endpoints. Moreover when we talk about this limitation of blockchain it is limited to the client side.

Open and Private Key Security

Blockchain technology uses cryptography techniques for its security and needs both public and private key encryption created using a combination of special characters, words, and numerals to make the chances of speculating genuinely cosmic. without the correct combination or what we say blend of open and private key encryption it is basically difficult to obtain the information stored inside the blockchain,, this speaks to quality and shortcoming inblockchain innovation. Without the required combination, hacker probably might never be able get the information ever. Then again, each of the hacker needs is the privilege keys to get to your information and can easily steal your cryptocurrency as once he has privilege key all money is his. In blockchain, ownership ofprivilege keys and responsibility for are absolutely synonymous.

As the hackers already that the unique combination of privilege key set can not be figures out, so in most of the cases they try to hold for ransom or to abduct. For this they try to look up for the weakest places where there is a chance that they might get the key.

These are the similar security loopholes which can make computers, mobile and many other digital devices powerless for malware and attract the hackers to do malware attacks. Whenever blockchain credentials are inserted, shown, put away decoded on affected gadgets, hackers can catch them easily. Shockingly, the majority of us make the programmer's activity far simpler than it should be by neglecting to satisfactorily ensure our gadgets.

The accompanying straightforward advances are exceedingly viable at shielding programmers from taking blockchain credentials:
1. Utilize a decent antivirus for computer and mobile devices,if possible use a paid antivirusand ensure you keep working frameworks refreshed.
2. Run hostile to malware examines normally.
3. The blockchain credentials should never be stored in content record, Document, or in any record as they can be effectively perused by unapproved individual. In the event if anyone wants to store the information on the gadget or digitally, then should use a trusted application for storing passwords which should use guard them in encrypted form.
4. Both the user id and the password should never be shared with anyone. In the event that you should share by means of email, utilize the highlight to change your email of your blockchain wallet.

Similarly for keeping credentials and the data of the blockchain wallet safe from hackers needs a presence of mind and awareness.

Vendor risks- Blockchain is a circular record, which infers that information is constantly moved all through a Blockchain-enabled framework. This contemplates a colossal open entryway for untouchable venders who can make Blockchain-engaged game plans. These courses of action can be made for various ventures including Fintech, Smart contracts, Payment processors, Payment stages, and Wallets.

The issue with that is: the security of a pariah Blockchain framework depends upon the reliability of its trader. Affiliations that send outcast Blockchain applications should realize that weak security on the merchant's side can incite hacking or false activities. Vendor's must be extraordinarily mindful in guaranteeing that the code isn't flawed and all of the vulnerabilities have been perceived before the Blockchain applications are made open to the charmed associations.

Not fully tested - The major security concern with blockchain is numerous organisations in blockchain business have never considered: what occurs at full scale?

Distributed Ledger Technology models are naturally scalable. Actually, whenever a change at all occurs to the blockchain,

it is scaled. After specific ammount of changes, it automatically scales up by one information square. Until this point in time, the natural extension feature of blockchain have not caused any major security damage. Nonetheless, the Financial Stability Oversight Council (FSOC), a government association of USA, have expressed concern over this issue and has doubt that this might cause a big security damage in future.

As indicated by the FCOS, development of blockchains presents in any event two dangers that are related legitimately to blockchain:
1. Blockchains nowadays are huge and have never been like this before, we are moving toward an obscure area with each gigabyte of extension. The constrained understanding of the DLT business means restricted experience distinguishing and reacting to issues. Likewise with each innovation, from planes to self-governing autos, experience includes some significant downfalls. The cost ofblockchain security disappointment is not yet so sufficiently high that major changes are required in the security framework, which is both incredible and horrendous.
2. The FCOS is additionally worried that blockchains can be powerless for extortion, if a critical amount of members plan against the remainder of the members. Calleda larger part assault, or as 51% issue, this hypothetical risk may emerge, taking into account that an enormous number of people who are mining homesteads are worked in countries where electrical price is not so expensive, and oversight faulty.

The blockchain security difficulties uncovered by the FCOS are legitimate. With respect to the risk of the obscure, the main arrangement is for each member in blockchain's biological system to perform best in all ways when creating or utilizing conveyed record innovation. Slip-ups are unavoidable, and for the individuals making them the cost may be high. In any case, the best method to pick up involvement with Distributed ledger technology is continuing onward, yet as shrewdly as would be prudent.

Shielding the agreement design from being ruined is presumably not as hard as it may appear. Well-planned brilliant contracts are more than equipped for keeping such

intrigues from happening.

Lack of standards and regulations- As indicated by Forbes, among numerous others, the major securities issues in blockchain technology is the absence of guideline and norms.

The straightforward notice of either rules or standards makes blockchain dreamers on high alert. Isn't blockchain without a doubt something contrary to organization and consistence?

Depends on the circumstances.

On the off chance that you are discussing Bitcoin and digital forms of money, a substantial contention can be made that they should keep on getting a charge out of the secrecy that filled the very development of blockchain. While a few — particularly government controllers and inheritance monetary foundations — will contend that even digital currencies should

be directed, a number of members will definitely contradict these thoughts.

Notwithstanding, the counter dictator path has no spot in a large portion of the parts where blockchain development is best.

On the off chance that we allude back to the subsequent defenselessness examined in this post, Vendor Risks, it winds up difficult to see how any of the 6 applications referenced couldn't benefit by some level of organization, if not guideline.

Moreover the absence of the rules and regulations makes it difficult for the developers of the blockchain to easily earn profit from the mistakes committed by others. With every association, each consortium, and each thing working by a substitute course of action of standards, the threats that begin from nonstandard development of any sort are accessible.

Further, sooner or later, chains may

should be incorporated. Absence of institutionalization can mean new security hazards as assorted innovations are combined.

The answer for the subject of guidelines and rules is more bewildering than that of a huge part of the specific issues.. Be that as it may, these questions will at the end settle themselves. Like number of different innovations, advancement will at last achieve a fully accepted plan:

1. Constrained guideline and models where it bodes well.
2. Deliberate guideline and institutionalization among consortiums in territories where advancement is essential.
3. No guideline or institutionalization for blockchains worked in-house and just utilized inside the association.

∎

About the Authors

Dr. Avinash Sharma, Presently Principal & Professor, Maharishi Markandeshwar Engineering college,Mullana, Ambala (Haryana) Constituent institution of Maharishi Markandeshwar University, Mullana is NAAC accredited 'A' grade deemed university& the first private engineering college of Haryana established in 1995.Also Dean Faculty of Engineering and Technology & Member of Board of Studies & DRC Committee for Research. Ex-Principal & Professor, Rajasthan College of Engineering for Women (Leading Women's Engineering College in the state of Rajasthan). Publications: International Journals: Published: 45 (Accepted: 61);International Conferences: Published: 90 (Accepted: 102)National Conferences & Workshops: 75 (Accepted: 110 & more)Text Books/EDITED: 06.

He is an active member of advisory/technical program committee of reputed International/National conferences & reviewer of number of reputed Journals e.g. Springer, Elsevier Journal Computers & Electrical Engineering. Approximate 20 years of rich experience in Teaching, research and industry managing technical institution, serving in all capacity including Head of Department, Professor, Controller of Examination, Dean Academics Affairs, Principal etc. Played leading role in accreditation of the institution and ISO 9001:2000 certification. (including05 years of industrial/research experience)

Mr. Jatin Arora is a 20 year old tech geek , info sec lover and a B.tech Computer science final year student from maharishi markandeshwar deemed university mullana. He has been in digital security and forensics for one and half year. He has done his internship in cyber security in gurugram police. He can be reached at — mobile- 8168747616 email- jatinarora28@protonmail.com.

1 Day hands on Workshop on AI Reinforcement
held on 31st August, 2019 at CSI-Bangalore Chapter Premises, Bengaluru

Reported by **Dr. Anbunathan R.**, Chairman, CSI Bangalore Chapter & Senior, Project Manager, LG Soft India Pvt. Ltd., Bengaluru

Reinforcement learning (RL) is part of Artificial Intelligence and is more about how humans learn in reality. RL along with deep neural network enables automated decision-making. The application of RL includes robotics, drones, autonomous car, industrial automation, games, Advertising etc. This course covers both theory and practical usage of RL.

Speaker(s) at the Event
Dr Anbunathan R, Chairman, CSI-BC & Senior, Project Manager, LG Soft India Pvt Ltd, Bengaluru

Gist of the Event
Delivered one day hands-on workshop on 'AI Reinforcements'

organized by Computer Society of India, Bangalore chapter, Attendees are Research Scientists, IT Engineers, Academic Experts, and Entrepreneurs from Bangalore and Hyderabad.

Topics covered:

Forenoon
• Introduction • Markov Decision Process (MDP) • Dynamic Programming (DP) • Monte Carlo Methods (MC) • Temporal Difference (TD) • SARSA • Q-Learning • Genetic Algorithms (GA)

Afternoon
Hands on session
• Open AI Gym • Dynamic Programming • Monte Carlo Prediction • SARSA • Q-Learning with TaxiV2 • DQN for Robot Traversal

KIND ATTENTION !
Prospective Contributors of CSI Communications

Fourth Coming Issues : October 2019 : CLOUD COMPUTING

Please note that Cover Theme for **October 2019 issue is Cloud Computing**. Articles may be submitted in the categories such as: Cover Story, Research Front, Technical Trends, Security Corner and Article. Please send your contributions by 20th September, 2019.

The articles should be authored in as original text. Plagiarism is strictly prohibited.

Please note that CSI Communications is a magazine for members at large and not a research journal for publishing full-fledged research papers. Therefore, we expect articles written at the level of general audience of varied member categories. Equations and mathematical expressions within articles are not recommended and, if absolutely necessary, should be minimum. Include a brief biography of four to six lines, indicating CSI Membership no., for each author with high resolution author photograph.

Please send your article in MS-Word format to Chief Editor, **Prof. (Dr.) S. S. Agrawal** in the email ids **csic@csi-india.org** with copies to the Publisher **Prof. A. K. Nayak**, in the email id : aknayak@iibm.in and Editor **Ritika Wasan,** Associate Professor Bharati Vidyapeeth's Inst. of Computer Applications and Management (BVICAM) in the email id : rit_2282@yahoo.co.in Issued on the behalf of Editorial Board, CSI Communications.

Prof. (Dr.) S S Agrawal
Chief Editor

Global Digisports Conference 2019
International Association of Sports and ICT

2-3 August 2019, Hotel Seaview, Kanyakuamri, Republic of India

Reported by **Prof. Ripu Ranjan Sinha**, Ph.D(CS)

Prof. Nayak is lighting the lamp in the Inaugural function of Global Digi Sports Conference 2019.

Left to Right : Prof. D. Shunmugnathan, Prof. R.R Sinha, Prof. A.K Nayak, Prof. K. Pitchumani, Mr. Praveen Abhinapu, Dr. R. Perumalsamy, Prof. A. C. Swami, Mr. Saju Joseph

On 2-3 August 2019, Kanyakumari, India, Computer Society of India Conducted Global Digisports Conference in association with Council for Sustainable Peace and Development, Innovation Society and World Academy of Informatics and Management Sciences under the Dynamic Leadership of Prof. Dr. A.K Nayak-President- Computer Society of India and Prof. Dr. Ripu Ranjan Sinha-Director General, Council for Sustainable Peace and Development and President-International Association of Sports and ICT. Global Digisports Conference 2019 planned and Executed in Vision with amalgamation and promotion of United Nation Sustainable Agenda 2030 and Digital India Initiative in Sports Domain. With Motivation and Vision of Our Visionary Prime Minister Shree Narendra Modi Ji towards promotion of Bi-lateral Relationships Globally and Promotion of United Nation Sustainable Development Agenda 2030. Event organized on the theme of Role of Technology in Sports and Sports Education first ever in the mankind of Sports and ICT Domain Globally. For the promotion of United Nations sustainable development agenda 2030, Goal No. 3 "Good Health and Well Being", Council for Sustainable Peace and Development initiated an International Association of Sports and ICT (IASI) to support the Digital India and standup India initiative of Government of India by amalgamation of ICT with Sports and sports education.'

Prof. Ripu Ranjan Sinha – President-IASI during his speech in inaugural session at Global Digi Sports Conference 2019

Theme of Conference "Role of Technology in Sports and Sports Education" described about the gap of ICT implementation in sports domain in India and provided a roadmap for standup of India in Olympic by 2030 towards Achievement of Desired Goals and Objective as per the IASI Constitution and Requirement of Digi Sports Academy, Center of Excellence in Respective Domain with Sports Specialization and Technological Sports. The Theme Meant for the Support of Make-In-India, Standup-India and Startup India and for all Stakeholder of Sports Domian. IASI Shall Guide and Assist in the Promotion of Physical Fitness through ICT and Sports Education.

During Inauguration Prof. Dr. D. Shunmuganathan, Organizing Secretary and General Secretary of IASI welcomed Chief Guest of the function Mr. Praveen Kumar Abhinapu, IPS, Dy. Inspector General of Police, Tirunelveli Range, Dr. K. Pitchumani, Vice Chancellor, M.S. University, Tirunelveli, Key Note Speaker Prof. Dr. A. K. Naik, President Computer Society of India, Guest of Honor, Prof. R. R. Sinha, President – IASI, Dr. Ashish C Swami, Vice President IASI, Dr. R. Perumalsamy, Pro Chancellor, Noorul Islamic Centre for Higher Education and other dignitaries on the Dice. Event started with tamil prayer song sung by local children and lamp lightening by invited guests of Conference. He also Delivered Welcome speech of Event and described agenda of United Nation Sustainable Development Goal.

Prof. Dr. A. K. Nayak, President - Computer Society of India conferred Life Time achievement award During the Event from Council for Sustainable Peace and Development for his contribution and Promotion of ICT and ICT Education in India. Prof. Nayak received Certificate and Medal as a token of appreciation from the council in the presence of DIG, Triunveli Range and VC of MS University, Tirunveli.

Prof. R.R Sinha , Prof. A.K Nayak , Prof. Ashish C Swami

Prof. A. K. Nayak, during His Key note address described Requirement of Digital India initiative in Sports Domain along with measures of amalgamation of ICT in sports to mark strong presence of India in Olympics game. He also focused on the importance of DigiSports academy to be opened in all the states of India to promote scientific training for athletes. DigiSports Academy Shall Support Sports Education and Research for Global People for the active Involvement in Olympic Games through Scientific and Technical Assistance. He also Emphasize action and activities of CSI across the India through its chapters and student branches. He told that CSI is the professional body having largest member base not only in India but also in South East Asia and Shortly Going to enable the CSI Global and CSI Local Initiative in line with CSI SIG (Special Interest Groups-Corporate) and agreed to put forward the establishment of SIG CSI Corporate in the next execom. He committed the all necessary technical support for working of Council and IASI in achieving its objectives through associations at various levels in Digi Sports Academy. Prof. R. R. Sinha, President and Founder of Council form the Sustainable Peace and Development and President- International Association of Sports and ICT on behalf of organizers thanks Prof. Nayak for enlightening the audience with his deep sense of knowledge, words of motivation for young atheletes and ICT experts for making IASI DigiSports academy one of the leading institutions for providing ICT and sports skills together.

Prof. R. R. Sinha, President-IASI in his speech described about the theme of Conference and statically described about the gap of ICT implementation in sports domain in India and provided a roadmap for standup of India in Olympic by 2030 towards Achievement of Desired Goals and Objective as per the IASI Constitution and Requirement of Digi Sports Academy and Center of Excellence in Respective Domain leads to University of Importance with Technological Sports Specialization and the requirement of Technological Sports. The Theme of Digisports 2019 "Role of ICT in Sports and Sports Education" Meant for the Support of Make-In-India, Standup-India and Startup India and all Stakeholder of Sports Domian. IASI Shall Guide and Assist in the Promotion of Physical Fitness through ICT and Sports Education.   Prof. Sinha told as per the Report of Ministry of Youth Affairs and Sports, Department of Sports, Govt of India and List of Recognized National Sports Federation for the Year 2019. 56 Enlisted Sports Federation and 08 National Sports Promotion Organization, 02 regional Sports Federation. Surprisingly, We are Unable to find out agency who is working in the objective for the

Performance improvement of athlete's through Scientific Research Using ICT Effectively.

Dr. K. Pitchumani, Vice Chancellor, M.S. University, Tirunelveli, in his inaugural speech focused on the importance of sports education and research through ICT and committed the necessary support towards achieving objectives of IASI.

In Presidential address Mr. Praveen Kumar Abhinapu, IPS, Dy. Inspector General of Police, Tirunelveli Range thrown light on importance of fitness and Sports in our daily life by linking this with Information Communication Technology, He also described about various digital gadgets being used in sports arena and advocated the utilization of ICT in sports domain.

Prof. A. C. Swami, Vice President of IASI briefly described   the Importance of Event for the Betterment of Global Human ManKind in line with UNSDG -2030 Goal 03 with various Action and Activities. During his Presentation and Goodwill Message he emphasize on Digi Sports Academy and Digi Sports University at sports park in near future. He also Enlighted on International Center of Sports Excellence and there requirement at IASI Headquarter and Shortly Management of IASI shall going to Submit requirement for the same to Government authorities.

Prof. R. Rajkumar, Vice President of IASI gave the vote of Thanks with Future Hope and Wellbeing. In this Global Digi Sports conference more than 200 participants from across the globe registered and participated in the conference came from Spain, Malysiya, United Kingdom, Dubai, Australia and Across the India.

Flag-off and Logo Unveiling Ceremony :During inaugural ceremony official logo of International Association of Sports and ICT Logo Unveiling & Flag off ceremony was done by all guests present on the dice and off the dice.

Prof. A.K Nayak during Flag Off Signing Ceremony

Conference Souvenir was also launched that included more than 100 papers contributed by participants. Asia Africa Development council™, Award of Excellence for the Contribution in respective domain like Life Time achievement award conferred to 5 eminent persons including Prof. A. K. Naik, President of CSI. Other ADCO Award of Excellence was also presented to award winners in the Sports Domain for their significant contribution in the field of Sports Education, Sports Journalism, Sports and ICT implementation. (Table-I) Enlisted Awardees.

Data Visualization using Tableau Software and PowerBI

Organised by CSI Chennai Chapter

Computer Society of India, Chennai Chapter in association with CSI – Student Branch, SSS Shasun Jain College, T.Nagar, Chennai organized a presentation on "Data Visualization using Tableau Software and PowerBI " on   Saturday 31st August 2019. Prof. J. Jerald Inico, Hony. Secretary of CSI Chennai Chapter welcomed the Chief Guest and Chairman Dr. E. Iniya Nehru addressed the gathering by giving a glimpse on how data is getting exploded and gave a brief introduction to Tableau. Vice President Prof. P. V. Subramanian Introduced the Resource Person Mr. R.Vivekanand, Consultant, Visual Business Analytics and was honoured by past chairmen Mr. Vasudeva Rao. Dr. S. T Deepa, Associate Professor and Dr. S. Sridevi, CSI Student Branch Councillor (SBC) from SSSS Jain college were honoured by past chairperson Dr. S. Poonguzhali, past vice-president Mr. S. Ramasamy for their support to conduct the event.

The session started with an appreciation from the speaker for the early attendance of all the 110 participants and went on with briefing the visualization of data science. He also gave a glimpse of how data repository has increased to 90% within 2 years in 2013.He gave a demo of anatomical test of brain compared with neurons for data repository analysis. The various steps involved in visual analytics were discussed with interactive exchange of question and answers from the audience.

Best practices of Tableau were illustrated with colours and shapes. Choosing an appropriate method to measure sales and dimensions to design a pattern was explained with bar diagrams. Dashboard design was taught to the participants and how to do sales on dashboard was also explained well. Idea of replacing numbers with patterns for better understanding of techniques was discussed. Finally a video by Hans Roslings was played to explain the concept of patterns. The speaker also stressed on "how to convert boring information in to interesting one using Tableau software and Power BI.

110 Acdemicians, students and industrial persons attended the program. Lucky draw was conducted and prizes sponsored by Mr. T. Jagannathan, Author of the book - Management Immemorial and Founder of Future Calls were distributed. Dr. A. Prema Kirubakaran, MC member CSI Chennai Chapter briefed the entire summary and Dr. S. Sridevi, Assistant professor proposed the vote of thanks and the programme was appreciated by everyone attended and was really a fruitful session.

Visit to Chapter's of Gujarat by Shri Jayant Bhide, RVP-III

Reported by **Mr. Jayant S. Bhide**, Regional Vice President Region-III

CSI Surat chapter general body meeting was organized, where gathering of 150 + people attended the program. A portal of CSI Surat chapter was inaugurated by Mr. Jayant S. Bhide, Reg. Vice President Reg.3 and then addressed the audience. Many industrial groups attended it. Major group was L & T. Interesting to note that eight of Larsen & Tubro officials witnessed the program. They expressed their willingness to support CSI Surat chapter. It was most vibrant event as deputy Comm. Of Surat municipal corporations extended their full support to CSI Surat chapter. Regional Vice President Reg 3 felicitated chairman CSI Surat Mr. Tejash and Mr. Shah with CSI lapel pins. Mr. Jayant S. Bhide Reg. V.P. inaugurated the portal of the Surat Chapter and then addressed the audience.

Regional Vice President Reg. 3, Mr. Jayant S. Bhide planned the Gujarat tour to promote CSI activities, to Solve the problems every chapter facing, to provide guidance on Election, Accounts and Bank Resolution along with start new activities in the chapters .

Mr. Jayant S. Bhide Reg.V.P. 3 further visited CSI Baroda Chapter and had a meeting with all the office bearers of the chapter and discussed about their problems. Reg. V.P. also addressed the CSI Baroda chapter Members . More then 25 members attended the meeting. Reg. V.P. Jayant S. Bhide felicited the Chapter Chairman and Secretary with the lapel pins. One new member joined the CSI Surat Chapter.

Reg. V.P. 3 Jayant S. Bhide visited CSI Vallabh Vidhya Nagar,Chairman organized a CSI Chapter meeting at a short notice. Very few members were able to attend the meeting due to admission in the college and examinations. Mr. Jayant s. Bhide Reg. Vice President had discussion on the problems and activities with the members present in the meeting.

Mr. Jayant S. Bhide Reg. Vice President Reg. 3 visited CSI Rajkot chapter officials. CSI Rajkot Chapter Chairman called all the members in the office where a meeting was organized. About 20 members attended the meeting Mr. Jayant S. Bhide expressed his intention to promote the chapter activities in the surrounding area. @ New members joined the CSI Rajkot Chapter.

CSI Regional Vice President Mr. Jayant S. Bhide had a nice meeting with office bearers of CSI Ahmedabad Chapter and discussed about problems of the chapter. It was raining heavily so very few members were able to attend the meeting. It was quite a fruitful meeting with the CSI Ahmedabad chapter members. Mr. Jayant S. Bhide Reg. Vice President assured them to solve their problems soon.

Mr. Jayant S. Bhide Reg.V.P.3 had a short visit to Bhavnagar and discussed to open a new CSI Chapter along with Student Chapter in the University. He also had a telephonic talk in Jamnagar where they have agreed to open CSI Chapter soon.

Results of the visit

1   Made one new Life member to Surat Chapter

2   Made Two new Life Members to Rajkot Chapter

3   Explored to start new CSI Chapters in Bhavnagar and Jamnagar

4   Two new CSI Student chapters will be opening in Bhavnagar and Jamnagar

A report on 7th International Conference on Innovations in Computer Science & Engineering - ICICSE-2019

Department of CSE & IT, Guru Nanak Institutions

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

Dr. H. S. Saini M.D, GNI while felicitating Prof. A. K. Nayak, President, CSI

The Department of Computer Science and Engineering and Information Technology, Guru Nanak Institutions, Ibrahimpatnam, Hyderabad hosted the 7th International Conference on Innovations in Computer Science and Engineering (ICICSE-2018) on 16th & 17th August 2019 in collaboration with Computer Society of India, CSIR, Microsoft and Springer LNNS series publication.

Prof. A. K. Nayak, President, CSI while delivering the inaugural address at ICICSE-2019

The inaugural function took place on 16th August, 2019 in the Auditorium of GNITC. Prof. A. K. Nayak, President CSI was the Chief Guest. Among others, Mr. G. S. Kohli, Vice-Chairman, GNI, Dr. H. S. Saini, Fellow, MD GNI, Prof A Govardhan, Rector, JNTUH, Dr D. D. Sarma, Fellow, Recipient LTA Awardee, CSI, Dr M Ramalimga Reddy, Principal, GNITC and Dr. S. Srinatha Reddy, Principal, GNIT, Dr. Vijanth Sagayan Asirvadam, Director of Institute of Autonomous System University Technology, PETRONAS, Perak, Malaysia. Mr. Meka Venkata Chalapathy, Senior Director & Talent Management Head, Virtusa, India, Mr. Dhrumil Sorathia, COO, Multiplier Solutions Mr. G. Rama

Seshagiri, Head - IT Group, CSIR - NGRI, Hyderabad, Mr. K.Mohan Raidu, Chairman Region-VIII. CSI and Dr. Rishi Syal, Conference Co-Chairman graced the occasion.

Dr. Rishi Syal welcomed the dignitaries. He gave a brief report on the Conference and said that the aim of this conference was to provide an international forum that hubs together the researchers, scientists, academicians, corporate professionals and students from all over the world under one roof to make it as a phenomenal, informative and interactive session which is acutely needed to pave the way to promote research advancements in the field of Computer Science and Engineering.

Prof. A. K. Nayak congratulated Guru Nanak Institutions (GNI) for organizing an international conference and said that the Society needs to build an innovative ecosystem by combining the use of advanced technologies with the best minds across academia, business industry and government for the overall benefits of the common man. He mentioned about various cutting edge technologies such as big data, grid computing, cloud computing, block chain, artificial intelligence and IoT and its importance in digitizing the world.

Dr. D D Sarma addressing the gathering

Dr. H. S. Saini said that the scientific research community is transforming into becoming an extremely interactive global community with collaboration and exchange of ideas on an international scale. Dr. D. D. Sarma said innovations are the corner stones of sustained economic growth and development and they were needed to face development. Branches of knowledge such as AI, Data Science, Machine Learning etc., are the ones which create a world better than the one what we have today. Mr. G. S. Kohli and other dignitaries wished the Conference a great success. Dr. M. Ramalinga Reddy, Principal, GNITC, Dr. S. Sreenatha Reddy, Principal, GNIT, have also addressed the gathering at the inaugural ceremony of the conference. Dr Sreenatha Reddy proposed a Vote of Thanks.

ICICSE-2019 has attained a notable achievement that it invited papers from 500 authors around the globe and 200 participants for oral and Skype presentation. ICICSE continues to be a convention in Guru Nanak Institutions which ensures an upward surge of quality

publications and presentations. Council of Scientific & Industrial Research (CSIR) has granted an amount of Rs. one lakh for launching this conference.

The selected and presented papers of this conference are published in Scopus indexed LNNS Springer Series, Journal of Innovation in Computer Science & Engineering (JICSE), Journal of Innovation in Information Technology (JIIT) or Book proceeding with valid ISBN.

The statistics of paper contributions to ICICSE-2019 are as follows:

No. of papers received	502
No. of papers accepted im SPRINGER LNNS series.	86
No. of papers accepted in JICSE journal	20
No. of papers published in JIIT journal	20
No. of papers published in ISBN indexed Proceedings	54

Each submitted paper was meticulously reviewed by a review committee consists of senior academicians, industry professionals and professors from premier institutions and Universities and paramount publisher who has given a Valid ISBN number to the proceeding.

As a curtain raiser of this conference, pre-conference tutorial was organized for two days during 9th & 10th August 2019, to provide participants with an opportunity to extend their knowledge and strengthen their skills in the cutting-edge technologies of computer science and engineering.

The conference was having 3 technical sessions on both days, Springer Special Sessions and Skype respectively. All the technical sessions were Chaired by eminent professors, Dr. P.Swetha, Department of Computer Science and Engineering, JNTUH College of Engineering Jagtial, Telangana, Dr. T. Arumuga Maria Devi, Centre for Information Technology and Engineering, Manonmaniam Sundaranar University, Tamilnadu, Dr. C.N.S. Vinoth Kumar, School of Computing, SRM Institute of Science & Technology, Kattankulathur, Chennai.

An overwhelming response has been received for the pre-conference tutorials with about 800 students, faculty members from various institutions of A.P and Telangana. The following tutorials were organized:

Date: 03/08/2018

Tutorial 1: Social Network Analysis: Speaker: Dr.Parthiban Natarajan, Prof, Dept of CSE, SRM Institute of Science & Technology, Chennai, India

Tutorial 2: Knowledge Representation & Expert Systems Speaker: Dr. Srinivas Padmanabhuni, Co- Founder Tarah Technologies, Associate Vice President Research at Infosis, India.

Date: 04/08/2018:

Tutorial 3: Development of Smart Grid towards Smart City Perspective Dr. Albert Alexander, Dept. of EEE, Kongu.

Tutorial 4: Augmented Reality Dr.Vigneshwaran.T, Founder & CEO, Nanda Infotech, Coimbatore, India. SRM Institute of Science & Technology, Kattankulathur, Chennai.

The conference was having 3 technical sessions on both days, Springer, Special sessions and Skype respectively. The sessions were Chaired and Co-chaired by Dr. P. Swetha, JNTUH College of Engineering Jagtial, Telangana, Dr.T. Arumuga Maria Devi, Centre for Information Technology and Engineering, Mainoth Humar, Tamil Nadu, Dr C N S Vinoth Kumar. Department of Computer SRM Institute of Science & Technology, Kattankulathur, Chennai.

In fact, the journey of this conference have been triggered and properly channelized from November 2018 under the advise, guidance, and suggestions of our National and International advisory board members who have always been there for directing a right path for this mega event ICICSE-2019.

The proceedings released during the conference are as under

1. Release of Souvenir Springer by Chief Guest Dr. A. K. Nayak
2. Release of Journal JICSE Volume - 8 Issue-2 by Guest of Honor, Dr. A. Govardhan
3. Release of Journal JICSE Volume- 9 Issue-1 by Guest of Honor., Dr. Vijanth Sagayan Asirvadam
4. Release of proceedings by Guest of Honor ,Dr D D Sarma
5. Release of Journal JIIT Volume 3- Issue - 1 by Guest of Honor. Mr. Meka Venkata Chalapathy
6. Release of Journal JIIT Volume 3- Issue - 2 by Guest of Honor Mr. Dhrumil Sorathia

High profile scholars, scientists, technocrats, academicians and research scholars from various organizations, such as, Centre for AI & Robotics(DRDO), Osmania University, JNTU Hyderabad, IIT(Kharagpur), NIT(Hamirpur, Kerala), Cognizant Technology Solutions India Pvt. Ltd(CTS), Tata Consultancy Services (TCS), Vellore Institute of Technology (Tamilnadu), Amity University, (Dubai, Haryana, Noida) JJTU(Rajasthan), BITS Pilani (Ranchi, Hyderabad), Banasthali University(Rajasthan), SASTRA University, Christ University, PES university (Karnataka), Motilal Nehru National Institute of Technology (Allahabad), Inderprastha Engineering College(Uttar Pradesh), Jaypee University of Information Technology (Himachal Pradesh), Myanmar Institute of Information Technology(Myanmar), University of Missouri-Kansas City, Tokyo City University, Tamazutsumi, Setagaya-ku, Tokyo(Japan), University of Texas at Dallas, Daffodil International University(Bangladesh) and many other organizations from within India and across the globe have showed up for presentation in-person or via Skype.

Outstanding groundbreaking research works presented by authors were selected for best paper award in each technical session. The papers have been published in GNI's JICSE (Journal of Innovations in Computer Science & Engineering) volume 8 issue 2; volume 9 issue 1; JIIT (Journal of Innovations in Information Technology) volume 3 issue 1 participants and JIIT volume issue 2.

On 17th August 2019 i.e., Day-2 Around 90 participants presented their papers in the forenoon Technical Session.

A Research Scholar of Linyi Top Network Company, Shandong, China, presented his paper in this conference. The most notable outcome of this was that Guru Nanak Institutions have signed a MOU with Mr. Suresh Babu, Vice President Information Techno-logy and International Cooperation, and Mr. Huang Liming, Manager and Co-Interpreter, of International Cooperation of Linyi Top Network Company, for International Students Internship Programme. .

Dignitaries at the Inaugural Function

A Report on the Joint Meeting of Region V & VII of CSI

Reported by
Dr. M. Sundaresan and **Dr. M. S. Prasad Babu,** Regional Vice Presidents of Rgion-VII & V

As per the decision made in the Second ExecCom Meeting held in Hyderabad during 13th and 14th of July 2019, the Joint Meet of Region V & VII was organized and held at Mysore on 24th August 2019. It was jointly organized by Prof. M. Surendra Prasad Babu, RVP5 and Prof. M. Sundaresan, RVP7. Office Bearers of CSI Chapters from Bangalore, Mysore of Region 5 participated. Region VII was represented by Office Bearers from Chennai, Coimbatore, Kancheepuram, Kochi and Salem. Regional and State Student Coordinators from both the Regions were full present for the meet. The Meeting was chaired by both the RVPs. Prof. R. K. Vyas, National Vice President, CSI addressed the gathering and requested all the Chapters to comply with GST, Income Tax Issues and also to conduct the Election Meetings on time and do the Accounting as per procedure. Dr. P. Kumar, National Student Coordinator motivated all the OBs and Student Coordinators do more student oriented activities like Convention and Conferences. Both the RVPs along with Prof. Vyas clarified the points raised by the Participants. Prof. A. K. Nayak, President of CSI addressed the meeting by Audio Conferencing and it was highly motivating for the attendees. The entire arrangements for the meeting was supported and coordinated by Ms. Anitha Venkatesh, Karnataka State Student Coordinator. In total, the Meet was a very successful, well coordinated, useful and informative one to take CSI to further height.

STUDENT BRANCHES INAUGURATION
REPORTS

DR. K V SUBBA REDDY INST. OF TECH., KURNOOL (REGION-V)

CSI Student Branch have been inaugurated at Dr. K V Subba Reddy Institute of Technology, Kurnool campus on 6th August 2019. The main idea behind establishing this new chapter is to make all the Computer Science students abreast of technology and maintain and edge over others. Chairman of the college Dr. K V Subba Reddy has graced the occasion as the Chief Guest while Dr. L Timmaiah, Principal of the college, Prof. Dr. C Dhanraj, Prof. Dr. C Gulzar, HOD of CSE Department, Smt Bushra Tahseen, Student Branch Co-ordinator has presided over the function. HOD of all the Departments and faculty members of Computer Science have been invited for the function. The Institution released the CSI certificate. Dr. K V Subba Reddy, Chairman inaugurated the CSI Student Branch. The function followed by a National Level Workshop by Mr. Md Fayaz, UI developer of Red optics, who gave seminar on Web designing by using BootStrap4 and he focused on how the industry is making a drift towards Web designing and the need for us to think about it. The session was very informative to the students.

NEW HORIZON COLLEGE OF ENGINEERING, BANGALORE (REGION-V)

The CSI student branch of New Horizon College of Engineering, Bangalore was inaugurated for the academic year 2019-2020 on 23rd August 2019. The esteemed guest for the inauguration was Mr Ritwik, Head, Nextgen Business Product Company, Wipro, Bangalore. The blessing of Lord Almighty was invoked through a melodious song sung by the college coir. Dr. B Rajalakshmi, Prof.

and Head-CSE and the Student Branch Counselor (SBC) delivered the welcome address. To remove the darkness and mark the beginning of the new academic year, the dignitaries lighted the holy lamp. The managing committee consisting of the President, Vice President, Secretary, Joint secretary, Treasurer, Joint treasurer for the academic year 2019-2020 was introduced the august gathering. Dr. CSR Prashanth, the Dean of Academics in New Horizon highlighted the importance of computing and the activities of the student branch. Dr. Manjunatha, the Principal of the college delivered the presidential address. In his address, he expressed the importance of projects, mini projects and students involving in co-curricular and extra-curricular activities. Mr Ritwik formally inaugurated the student branch and delivered the keynote address. During the keynote, Mr Ritwik highlighted some of the hard earned learning's he acquired. He was narrating all the lessons learnt with supportive case studies. The first thing is to play from our strengths. The second thing is that a rupee earned is of far more value than five found. The third point is that no one bats a hundred every time. The fourth point is the importance of humility. Students have to strive for excellence. Never give up in the face of adversity. Adversity can come suddenly without warning. Deal the situation with courage and dignity. We must be in control of our actions. Last he referred to a statement, Steve Jobs made in commencement speech at Stanford – "Stay Hungry, Stay Foolish".

The Vice President of the student branch Mr Rahul Dinesh from the CSE department proposed the vote of thanks. The wonderful session ended with the salute to the nation by singing the National Anthem.

SRI KANYAKA PARAMESWARI ARTS AND SCIENCE COLLEGE FOR WOMEN, CHENNAI (REGION-VII)

The inauguration of CSI Student Branch was held on 26th July 2019 at Sri Kanyaka Parameswari Arts and Science college for Women, Chennai. The Chief Guest of the day was Mrs Mythili Prakash, Past Hon Secretary of CSI Chennai Chapter and Prof G

Rajesh Kannan, Asst Professor, Rajalakshmi Engineering College. Mrs Mythili Prakash addressed the students with an elaborate note on CSI Student Branch and its benefits. This event was followed by honoring the student office bearers with the badge and the event followed with the Guest Lecture on Recent Trends on IT which was presented by Prof Rajesh Kannan. Finally, the session end up with the vote of thanks.

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

CSI Primary Membership Termination of Gautam Mahapatra, Membership No. I0175895

Date 15/7/2019

Dear Members of CSI,

Sub.: **CSI Primary Membership Termination of Gautam Mahapatra, Membership No.I0175895**

Greetings from Computer Society of India !!

This is to notify that, CSI ExecCom for the year 2019-20/21 had resolved to Terminate Primary Membership of Sri Gautam Mahapatra, Membership No.I0175895 and abstract of ExecCom's resolution is stated below :

Note : Agenda Item (Any other matter on 14th July 2019, Hyderabad ExecCom)

Resolved that, the final report of Investigation Committee is already submitted and placed before CSI ExecCom via email circulation and once again placed hard copies in it's Second Execom meeting on 13-14 July 2019 at Hyderabad and ExecCom unanimously resolved to terminate CSI Primary Membership (with immediate effect) of Sri Gautam Mahapatra, Membership No.I0175895, E-4, A D R I N, Housing Complex, 203 Akbar Road, Monovikash, Nagar P O, Hyderabad Andhra Pradesh 500009 , email : gautam@rcilab.in / gautam.mahapatra@gmail.com for fabricating accounts of CSI at Hyderabad Chapter from 2014-2018, tampering document's at Hyderabad Chapter of CSI, misappropriation of fund of CSI and tried to evade service tax of CSI Annual Convention 2014 approx. Rs.7,54,265.00 and not remitted service tax amount (12.36% of ₹ 61,02,467.00 approx. ₹ 7,54,265.00) in FY 2014-15 before govt. statutory bodies.

Hence, Sri Gautam Mahapatra's primary membership termination notice may publish in CSI Portal, CSIC and leading news papers and Hony Secretary, CSI is authorised to make all these publication's , immediately.

IT IS FURTHER INFORMED TO MEMBER'S OF CSI THAT, ANY ONE DOING ANY BUSINESS IN ANY FORM UNDER THE AEGIS OF COMPUTER SOCIETY OF INDIA WITH SH. GAUTAM MAHAPATRA WILL DO AT HIS OR HER RISK. NO LEGAL CASES WILL BE ENTERTAINED BY CSI IN THIS REGARD.

Thanking you.

Yours faithfully,

Sd/-

Prof. S K Yadav
Hon Secretary, CSI
Cell : 09810888853
E: secretary@csi-india.org

Enclo. Show Cause Notice & Final Investigation Report in the matter of Sri Gautam Mahaptra.

Copy : CSI Hqrts / ED / Society Registration office @ Hyderabad / CSI Notice Board / CSI official portal for necessary publication of this information and office record.

HARIDWAR CHAPTER

A one-day workshop on Digital Payment Awareness and Cyber Security was organized by CSI Haridwar Chapter in Collaboration with Department of Computer Science, Faculty of Technology, Gurukula Kangri Vishwavidyalaya, Haridwar on August 17, 2019. The invited Guest was Mr. Anurag Kumar, Director, NIELIT and Mr. Sayam Rathore, Joint Director NIELIT. The workshop began with welcoming of the guest and dignitaries. Dr. Vivek Kumar, Chairman CSI Haridwar Chapter presented bouquet to Mr. Anurag Kumar. Dr. M S Aswal, Past Chairman welcomed Mr. Sayam Rathore by presenting bouquet. Dr. Suyash Bhardwaj, Secretary CSI Haridwar Chapter introduced the speakers of the workshop Mr. Nikhil Ranjan, Senior Faculty at NIELIT and Mr. Sushil Kumar, IT Support from NIELIT. Mr. Nikhil Ranjan introduced the need of the digital payment systems and also aware the students and faculty members about the security measures that are required to undertake during any type of digital payment. He also told the students about the different types of digital payment modes and the initiatives of the government of India for promoting digital payment. Dr. M S Aswal Presented vote of thanks and Dr. Suyash Bhardwaj convened the workshop. The certificates for the C Programming quiz were also distributed during this workshop. The winner students and invited guests were felicitated with a plant as a memento from CSI Haridwar Chapter.

JABALPUR CHAPTER

A one day Seminar has been organised by Jabalpur Chapter of Computer Society of India on "Cyber Threats & Preventions". There are 120 students from various Engineering Colleges in and around Jabalpur, most of them from three Student Chapters participated.

Two eminent guest speakers Dr Anup Girdhar from Delhi and Dr Harold D'Costa from Pune made nice presentations for the participants.

Chief Guest - Prof Kapil Deo Mishra, Vice Chanceller, RDVV, Jabalpur and Guest of Honour - Shri Ashish Kumar, IAS, CEO - Smart City Project& Commissioner - Nagar Nigam Jabalpur addressed the inaugural Session. Shri Arvind Mohan Nayak, National Chairman - NC, CSI also graced the occasion.

KANCHEEPURAM CHAPTER

CSI Kancheepuram Chapter in association with CSI Student Branch of KCG College of Technology organized a contest on Machine Learning Application Development (ML-APPS2K19) on 12th July

2019. A total of 18 teams (48 participants) from various colleges participated in the event solving some real problems. The event started with an Icebreaking session. The Inauguration session started with the felicitation of Dr. G Prabhakaran, Principal, KCG College of Technology, Dr. P Deiva Sundari, Associate Dean followed by the key note address of guest speakers Mr. J S Jayaram, System Engineer, Infosys. and Ms. V Priyanka, Senior System Engineer, Infosys. Dr. J Frank Vijay, Hon. Treasurer of CSI Kancheepuram Chapter presided over the Function. The Chief Guest pointed out the current trends and prospectus in IT industry. All the teams performed well in the contest and the participants illustrated their talents. Based on their performance, the teams were rated. The teams with highest score bagged the prizes. First prize was bagged by RECHNOVATORS team, Second Prize was bagged by ICONIC Team and the third prize was bagged by CODE_BOTS. In the valedictory ceremony, Ms. R Adline Freeda, Assistant Professor, Dept. of IT delivered the welcome address, Mr. Ganesh Parameswaran, Senior Technical Manager, Flex Limited gave his views on R & D projects and Mr. Jayaram discussed about the types of scientific researches, Ms. Priyanka, Senior System Engineer, Infosys enlightened the audience with the role of application developments. Ms. Shiny, Programming Club In-charge, addressed the gathering. The prizes for first 3 teams were distributed. The programme ended with the vote of thanks by Mrs. Krithikaa Venket, Assistant Professor, Dept of IT.

CSI Kancheepuram Chapter in association with SRM VEC CSI Student Branch has organized a Training Programme on IoT for the school students on 27th July 2019 at IoT-Centre of Excellence Lab, SRM Valliammai Engineering College. XI standard Computer Science students from Neelan Matriculation Hr Sec School had participated along with 3 of these school teachers. The programme was inaugurated with a motivational talk by Dr B Vanathi, Head,

Dept of CSE by delivering the importance of learning technologies as a computer science student and briefed about the various emerging technologies in the field of computer science. The second session of the technical talk was handled by Dr M Senthil Kumar, Hon Secretary of CSI Kancheepurm Chapter with the presentation about IoT. The Introduction to IoT along with its impact in the modern world was narrated. Further the presentation was discussed among the students with the applications, benefits and challenges of IoT. The students found the session was informative and had a discussion about their interests and the scope of IoT. After the technical session, technical quiz and connections from the subjects Physics, Chemistry, Computer Science and General Knowledge was conducted by Ms S Shanthi, A.P-CSE and Ms S Sandhya, A.P-IT for the students to make them more interactive. The hands-on session was initiated with a presentation about the tools and working environment required to develop IoT products by Dr D Kavitha, A.P-CSE. The students were demonstrated with the projects by CSI Volunteer Students coordinated by Ms S Shenbagavadivu, AP-IT. The overall event was coordinated by Mr Santhana Marichamy, AP, GE, Dr V Ravi Kumar, AP-IT, Mr K Elaiyaraja, AP-IT, S Suma, AP-CSE and Ms K Devi, AP-CSE. The valedictory part was given by Dr B Vanathi, Head, Dept of CSE by felicitating the School Management with a memento and the participation certificates to the students. The Event was organized under the Guidance of Dr B Chidambararajan, Chairman, CSI, Kancheepuram Chapter.

KOLKATA CHAPTER

The Memorandum of Understanding (MoU) has been signed on 20th July 2019 between CSI Kolkata Chapter and Maulana Abul Kalam Azad University of Technology, Kolkata to conduct joint Certificate Programs with six months duration

FROM CSI STUDENT BRANCHES

REGION-I	REGION-II
Maharishi Markandeshwar (Deemed to be University), Ambala	**Techno International Batanagar, Kolkata**
26-8-2019 & 27-8-2019 - Hands on workshop on Micro Controller Programming & Simulation Software	9-8-2019 - Seminar on Importance of Internships by Dr Diganta Sengupta, SSC, West Bengal

REGION-III	
Devang Patel Institute of Advance Technology and Research, Anand	**U V Patel College of Engineering, Ganpat University, Mehsana**
6-7-2019 - Workshop on Creating and Deploying IBM Watson Assistant	5-8-2019 to 9-8-2019 - STTP on Blockchain Tech. and Crypto-Currency

REGION-III	REGION-IV
B V M Engineering College, Vallabh Vidyanagar	**Shri Shankaracharya Inst. of Professional Mgmt. & Tech., Raipur**
20-7-2019 - Competition on Code Crunch	5-8-2019 to 12-8-2019 - SDP on Internet of Things

REGION-V	
CMR Technical Campus, Hyderabad	
1-8-2019 - Seminar on Path to Employability Awareness Programme	8-8-2019 - Seminar on Cyber Security

FROM CSI STUDENT BRANCHES

REGION-V	
Santhiram Engineering College, Nandyal	**Chalapathi Institute of Engineering and Technology, Guntur**
 29-7-2019 to 3-8-2019 - Workshop on Front-End Development using HTML & CSS	 29-7-2019 to 3-8-2019 - Cloud Computing with AMAZON ALEXA
NBKR Institute of Science and Technology, Nellore	
 31-7-2019 - Technical Quiz for CSI Student Members	 7-8-2019 - Logo Mania Event
Narasaraopeta Engineering College (Autonomous), Narasaraopet	
 28-6-2019 & 29-6-2019 - Statistical Programming with R	 11-7-2019 – Winner of the Technical Quiz on C, JAVA, DATA STRUCTURES & General IT
GSSS Institute of Engineering & Technology for Women, Mysore	**K S Institute of Technology, Bangalore**
 25-7-2019 to 27-7-2019 - FDP on Machine Learning with Python	 17-7-2019 to 19-7-2019 - Faculty Development Programme on Outcome Based Education-NBA

REGION-V	
Vasavi College of Engineering, Hyderabad	**Anurag College of Engineering, Ghatkesar**

7-8-2019 - Guest Lecture on Importance and Evolution of Computer Science Engineering by Mr Badrinath

1-8-2019 & 2-8-2019 - Workshop on Android App Development

Sai Vidya Institute of Technology, Bangalore

2-8-2019 - Technical Talk on Software Engineering

14-8-2019 - Awareness Program on Sales Force Trailhead Technology

Rajeev Gandhi Memorial College of Engg. and Technology, Nandyal	**G Narayanamma Institute of Technology and Science, Hyderabad**

22-7-2019to23-7-2019-WorkshoponCyberSecurityandEthicalHacking

18-8-2019 to 20-8-2019 - Boot Camp on Data Engineering and AI

Kallam Haranath Reddy Institute of Technology, Chowdavaram	**Dr. K V Subba Reddy Institute of Technology, Kurnool**

5-8-2019 to 8-8-2019 - FDP on Internet of Things (IoT) Applications

22-8-2019 - Technical Quiz competition

REGION-VI

SNJB's Late Sau Kantabai Bhavarlalji Jain, College of Engineering, Chandwad

13-7-2019 – Event on Project Idea Elicitation by Mr. Husain Dahodwala

27-7-2019 - Session on Carrier Guidance by Mr. S B Karkhanis, Past Chairman, CSI Nashik Chapter

Sipna College of Engineering and Technology, Amravati

18-7-2019 - Seminar on Higher Studies Abroad

7-8-2019 - Seminar on Effective Communication and Hacks in Interview

REGION-VII

SRM Valliammai Engineering College, Kattankulathur

11-6-2019 - Antivirus Server installation and Client installation for Non-Teaching Staff Members

30-7-2019 - Qiuzzards : a Technical Contest for the academic year 2019-2020

Shri Krishnaswamy College for Women, Chennai

2-8-2019 – Guest Lecture on Machine Learning and Deep Learning by Prof M Sindhuja

17-8-2019 - Technical Club on BITS & BYTES by Mr Kannan Swaminathan

REGION-VII

Jeppiaar Institute of Technology, Sriperumpudur	Panimalar Institute of Technology, Chennai
16-7-2019 - Event on Research-paper writing	27-7-2019 - Workshop on Virtual Reality

Er Perumal Manimekalai College of Engineering, Hosur	
2-7-2019 - Workshop on Network Simulation & Analysis and GloMo SIM	6-7-2019 - Workshop on Basic Hardware Components and Assemblies Introduction to IOT

National Engineering College, Kovilpatti	
2-7-2019 to 5-7-2019 – Workshop on PHOTO-O-Magic (photoshop for beginners)	6-7-2019 – Gaming Contest on Play Mode

IFET College of Engineering, Villupuram	
4-6-2019 – Workshop on Hands on SCI Lab	10-6-2019 - Workshop on Tableau - Data Visualization Tool

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	Digital Communication	Digital Analytics	Digital Security
• E-Democracy	• Distributed Computing	• Web Analytics	• Digital Forensics
• E-Governance	• Internet of Things	• Data Analytics	• Information Security
• E-Judiciary	• Cloud Computing	• Big Data Analytics	• Network Security
• E-Learning	• Mobile Communication	• Business Analytics	• Blockchain Technology
• E-Commerce	• Edge Computing	• Software Analytics	• Social Network Security
• E-Participation	• Fog Computing	• Medical Informatics	• Cyber Security
• Crowd Sourcing	• Wireless Sensor Network	• Deep Learning	• Intrusion Detection System
• Social Network		• Machine Learning	

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
Programme Chair
Computer Science Dept.
Utkal University, Bhubaneswar, Odisha, India.
Email-id: pkbehera.cs@utkaluniversity.ac.in

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