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E-COMMERCE

COVER STORY

Top 9 Present and Future Emerging Technology Trends in E-Commerce **06**

The Future of E-Commerce **08**

RESEARCH FRONT

Challenges in fusion of Image Forensics **23**

TECHNICAL TRENDS

Digital Literacy for Financial Operations **25**

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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.

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CONTENTS

Cover Story

Top 9 Present and Future Emerging Technology Trends in E-Commerce 6
S Balakrishnan and J Janet

The Future of E-Commerce 8
Vuppula Sai Sri Mahitha, K. V. Anjani and Sadhula Srilekha

e-Commerce – Ruling the World 13
Aditya Bhatia and Sanjay Bhatia

Realtime Scaling of E-commerce Sites and preparing for the Slashdot effect 15
Sridhar Pandurangiah

Impact of Big Data in e-Commerce 20
M. Senthil Kumar, B. Chidambara Rajan L. and Karthikeyan

Research front

Challenges in fusion of Image Forensics 23
Priya M Shelke and Rajesh S Prasad

Technical Trends

Digital Literacy for Financial Operations 25
G S Rathore and Sunita Yadav

Air Pollution Monitoring System using IOT and Data Analytics 28
B. Hariharan, G. Umaa Mahesswari, V. S. Rohini, Vinitha Shree D. and Ramya D.

Quantum Computing and its Applications 31
Anupama Pankaj and Siddharth Arora

PLUS

About the Guest Editor 19
CSI Foundation Day 24
Call for Paper for CSI Journal of Computing 27
4th Alan Turing CSI National Student Quiz 2019 - A Report 34
Region-VI: Csi State Level Student Convention for Maharashtra - A Report 35
CSI UP State Student Convention 2019 - A Report 36
West Bengal State Student Convention 2019 - A Report 37
Student Convention - Reports 38
Student Branches Inauguration Report 41
From CSI Chapters & Divisions 43
From CSI Student Branches 45

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Editor: S. S. Agrawal

Editorial

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

Dr. Bhagwan Singh
Guest Editor

Dear Fellow CSI Members,

"Communications is at the heart of e-Commerce and community."- *Meg Whitman, President and CEO of Hewlett-Packard*

"In e-Commerce, your prices have to be better because the consumer has to take a leap of faith in your product."- *Ashton Kutcher, Actor, producer, model, investor*

We are now in the era of e-Commerce where making business profitable is effortful venture. This current issue on E-Commerce flags the information about the topic on various contents pertaining to it. The use of social media, online payment, online surfing for travel-tourism and other business affairs the use of e-Commerce is most prudent today.

Cover Story articles *"Top 9 Present and Future Emerging Technology Trends in E-Commerce"* by S. Balakrishan and J Janet, nicely portrays the trends of e-Commerce, AI, Mobile Commerce, Marketing Automation, Augmented and Viral reality, Social Payments, Drones & Droids and the like. *The Future of E-Commerce"* by Vuppula Sai Sri Mahitha K. V. Anjani Sadhula Srilekha reflects the Current Trends and Technologies having an Impact on E-Commerce. *"e-Commerce – Ruling the World"* by Aditya Bhatiya & Sanjay Bhatiya talked about evaluation of e-Commerce and how teenager views about e-Commerce. *"Realtime Scaling of E-commerce Sites and preparing for the Slashdot effect"* by Sridhar Pandurangiah explores the technics involved in scaling e-Commerce sites. And lastly, *"Impact of Big Data in e-Commerce"* by M. Senthil Kumar, B. Chidambara Rajan and L. Karthikeyan discusses about stages of Big Data and impact of Data in e-Commerce.

This issue of Research Front includes *"Challenges in fusion of Image Forensics"* by Priya M Shelke & Rajesh S Prasad, who have explored need of fusion, challenges of fusion, and approaches to fusion to enhance the dimensions for the researchers on Image forensics.

In Technical Trends very nice description by Mrs. Sunita Yadav and Dr. G S Rathore on the topic *"Digital Literacy for Financial Operations"* has emphasised the need of Digital awareness for financial operations. *"Air Pollution Monitoring System using IOT and Data Analytics"* by B. Hariharan et al have proposed a system to monitor Air pollution for IOT. The article *"Quantum Computing and its Applications"* by Anupama Pankaj & Siddharth Arora predicts quantum computer designing and its issues.

I congratulate Prof A. K. Nayak for becoming President of CSI. We wish that in his supervision as President, CSI will shine at its peak.

My special thanks to our Guest Editor Prof. (Dr) Bhagwan Singh, Head of Department (HoD) of Marketing & Supply Chain Management (M&SCM), SBMS, in the Central University of Himachal Pradesh (CUHP), Dharamshala, District Kangra, H.P for being in support in editing and finalizing this issue as this e-Commerce area was entirely pertaining to his discipline and interest.

I also extend my thanks to all authors who have contributed their efforts and knowledge for this issue and expect the same in future. The different events covered in this issue were organized by various chapters of CSI. This issue also promotes the Call for Paper for *CSI Journal of Computing* bearing e-ISSN: 2277-7091.

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

With kind regards,

Prof. (Dr.) S. S. Agrawal
Director General KIIT & Emeritus Scientist (CSIR)

President's Desk

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

It gives me immense pleasure to greet you all and convey my respect & gratitude to all the Fellows as well as my best wishes to Senior Members, Members, Associate Members, Members of the Managing Committee of the Chapters, Corporate Members, Academic Institute Members and young student members of CSI as the President of Computer Society of India.

I am honored to have the opportunity to serve the Members of CSI as President for the year 2019-20. Together with the Executive, NC Members, I would like to say thank you for giving us a chance to bring the Society forward and working with the responsibility to propel the profession to the next level. With your continued support, I am positive that we can achieve our vision to be a globally recognised professional body, bringing values to our members, the profession and the larger community as a whole.

With having the experience of 8 years in Chapter Managing Committee, 11 years of experience as an elected member of National ExecCom & Nomination Committee & several years of experience as Chief Editor of CSIC, CSI Adhyayan, Publisher of CSI Magazines & Journals, Chairman & member of several committees, I got a long experience in CSI for successfully managing all the assignments. With the dynamic leadership of our Office Bearers & active cooperation of our ExecCom members, the CSI has witnessed a significant growth in students membership, professionals & life membership in last year along with the significant financial growth in the year 2017-18 & the growth remains continued for the year 2018-19. I hope by the joint efforts of all the members we will be able to accelerate the rate of growth exponentially in the future days to come.

CSI is having 100,000+ members including student members. It is the main responsibility of Executive Committee of CSI, Managing Committee of Chapters, SIGs and Student Branch Coordinators to serve the members by conducting effective & quality conferences, seminars and workshops to fulfill the objective of the society. I shall try with my level best for promoting the research activities, collaboration with other professional & research bodies along with the efforts for the exponential growth of membership with my best effort for the inclusive growth of the society,

I seek the active & kind support of the Members to make CSI more Dynamic, Vibrant, Productive & Sustainable to achieve the height of excellence.

Expansion of CSI continues all over the country by establishing more & more Chapters & Student Branches. The inauguration & establishment of many new Student Branches in last month as well as the month March has seen more than 60 activities in CSI by many of our Chapters & Student Branches with their dynamic & vibrant efforts and in organizing quality activities from local level, state level, national level to international level seminars/ workshops/conferences. All of them conducted good & quality activities. I congratulate all the respective organisors & members for their tireless effort & significant contribution. The reports & photographs of all of these activities are published in April issue of CSI Communication.

I sincerely request all the Office Bearers, Executive Members, CSI office staffs to kindly work with responsibility for the Society (CSI) to serve honestly for the cause of every Division, Region, Chapter, SIG, Student Branch & every Individual Member including Student Members

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

Top 9 Present and Future Emerging Technology Trends in E-Commerce

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1. Overview

Innovation (Technology) is the foundation of e-commerce. In addition to the fact that it helps interface dealers and client on mobile and web platforms, yet in addition empowers the powerful administration of client orders, conveyances, returns and installments of purchased products. Indeed, innovation assumes a "critical job all through the value chain, in regions, for example, recruitment, marketing, and advertising, among numerous others".

E-commerce (Web based business) is a value-based procedure where parties trade (purchase and sell) merchandise and enterprises or send data with the assistance of an electronic system, the Internet. It is in charge of the business part of e-business. Also, as per the business profile, there are 6 kinds of electronic trade. Consistently, this spreads Business-to-Consumer (B2C) tasks, yet it is additionally engaged with:

- Business-to-Business (B2B)
- Consumer-to-Business (C2B)
- Consumer-to-Consumer (C2C)
- Business-to-Administration (B2A)
- Consumer-to-Administration (C2A)

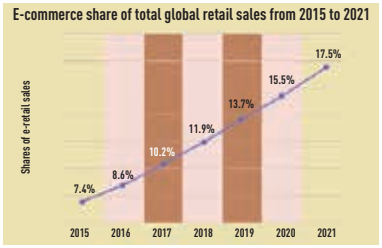

Fig. 1 : E-Commerce Sales from 2015-2021

At an abnormal state, electronic trade depends on innovations occupied with versatile business, online exchange preparing, Electronic Data Interchange (EDI), stock and supply the executives frameworks, computerized information accumulation frameworks, and advanced promoting. It can likewise be joined by more extensive advancements for cell phones, web based life, and email apparatuses.

The Fig. 1 shows how most of our purchases are made online.

2. Ecommerce Craze or Trends

In our internationally associated world, crazes are currently mistaken for "ecommerce trends." You have to comprehend that prevailing fashions begin and end like Twitter patterns. Certifiable patterns for online business remain for a more drawn out time. You can bear to overlook prevailing fashions, yet never the real patterns. Organizations ought to investigate all crazes and patterns cautiously. There is no compelling reason to maintain a strategic distance from the enticement of bouncing the fleeting trend right away.

Trends in e-commerce industry rise up out of different things like: How clients shop, What they purchase and how they react to showcasing strategies utilized by organizations. Inside the most recent decade, a ton of new patterns have developed with a profounding impact. Web based business goliaths like Amazon, Walmart, and Alibaba have been at the bleeding edge of receiving and profiting by such patterns.

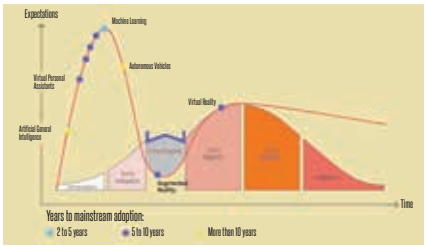

Fig. 2 : E-Commerce Trends

Presently, we will talk about the most recent online business slants that will see an ascent in 2019 and future:

2.1 Artificial Intelligence

In the "present hyper-commoditized showcase, where separating a business from the likes of giants like Amazon, Alibaba, and Flipkart, is getting to be expanding troublesome; online business merchants are concentrating on giving a prevalent client experience". A way to achieve this has been to utilize innovation that drives a high level of personalization, with the end goal that every client is treated as an individual target section, as opposed to a piece of a summed up mass.

Numerous AI organizations are changing internet business by formulating one of a kind answers for web based business organizations. For web based business organizations, AI innovation is "winding up progressively imperative since it holds the potential for dynamic and versatile focusing on, which enables organizations to get the correct pitch, at the ideal time, to the correct client, on the correct stage".

2.2 Mobile Commerce

While mobile commerce will be a prime worry for e-Commerce organizations going ahead, that by itself isn't sufficient any longer. You need coordinated versatile wallet usefulness. Also, you ought to consider propelling a versatile application. An incorporating versatile stage is one of the key e-Commerce innovation inclines in 2018.

2.3 Marketing Automation

For laymen, marketing automation implies computerizing email promoting and booking web based life posts.

Notwithstanding, marketing automation has now turned into the new pattern. It hints at no halting. It covers territories including modified greeting pages and simple to-get to shopping baskets.

In the event that it's executed legitimately, mechanized promoting will let you:

(i) Send out custom-made messages to your clients.
(ii) Display new items and advancements according to the guests' shopping history.
(iii) Retarget clients for essential item deals.

2.4 Augmented and Virtual Reality

Both Augmented Reality and Virtual Reality apply similar technology,

but many confuse the two. Virtual reality builds an entirely new artificial reality while augmented adds only some virtual elements into the real world.

You may think that these things are great now, but the idea of using VR and AR in e-commerce could change the future of online shopping concept. Just imagine if you could virtually interact and touch items before purchasing them. For example, you could virtually try on a dress, feel the fabric, and see how it suits you. Banana Flame, a British clothing e-store, has already incorporated AR, as it allows shoppers to use their web cameras as interactive mirrors.

Augmented & Virtual Reality – Computer vision is used to create digital environments and to amplify our senses. Many systems for educating have started adopting AR and VR to make teaching more productive.

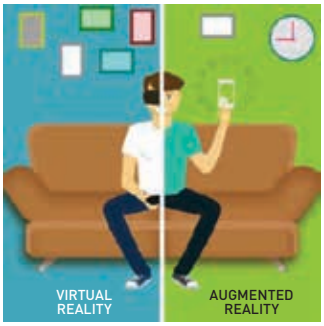

Fig. 3: AR & VR in a nutshell

2.4 Chatbots as Personal Assistants

A chatbot is also known as a conversational agent. Chatbot is "software technology that imitates real human interaction in a written or spoken way". Also It can be called as a "website bot, chatbot app, social media chatbot, as well as a voice assistant".

Fig. 4 : Rise of Chatbot

The benefit of utilizing this innovation is that it spares time and costs via robotizing client support in an internet business space every minute of every day. Another plus is that it generates leads and, thus, revenue by gathering preliminary information about a client. Too, chatbots can divert a forthcoming client to the data they are most inspired by.

2.5 Blockchain

With future of e-commerce growth, some side effects are bound to occur. There are issues with trust, slow transactions, higher fees and policies, and digital data ownership. With its concept of a distributed, genuine ledger of all digital transactions, blockchain helps to build trust in online payments. It also excludes frauds and provides a new payment method with the help of cryptocurrency (Bitcoin, Ethereum, Ripple,etc).

As a real-life example, Amazon has policies for its listed retailers. They reduce contact with their customers, as they can just send one follow-up email. Amazon employs its own customer support that is not acquainted with the merchants` products. As a consequence, this reduces the credibility of the retailers and results in a higher cost to the customer.

At present, experts are working on the future of e-commerce marketplace. It is called ECoinmerce and will be blockchain-driven to solve the aforementioned issues.

2.6 Social Payments

As per Gartner's view, "50% of consumers in mature markets will use smartphones or wearable-tech for making mobile payments by 2018". As per Forrester's mobile payments forecast 2016-2021 view, "mobile payments in the EU-7 are expected to rise at a CAGR of 19% to reach $148 billion by 2021". And as per Forrester's view "in-person mobile payments will become a fast-growing segment, while remote mobile payments will constitute over 65% of mobile payments by 2021".

2.7 Drones & Droids - Next-level Delivery System

The tendency for robots to replace human activity has been observed over the last century. In the past, automated machines started working on car assembly lines and food production. As artificial intelligence and machine learning evolves, it limits people into the process, e.g in a delivery system. Currently, automated vehicles require human operation. However, it is more than possible that drones and droids will eliminate even this participation.

The fate of mechanization lies in automatons grasping the sky and droids on the ground. In spite of numerous hindrances in automaton conveyance, the advantages of its selection are incredible for retailers. This will significantly cut expenses in coordinations tasks. Amazon is in the first line with its testing of a new, fast drone delivery system - Amazon Prime.

2.8 Voice Search

Voice search is widely used in services like Apple's Siri, Google Now, and Cortana from Microsoft, which also embed NLP technology. With regard to virtual e-commerce, like Amazon's Alexa, voice assistants have seen a great increase in popularity. The technology can be used to order goods directly from Amazon by voice command. As well, it quickly finds deals and can even order food deliveries from local restaurants.

2.9 Cognitive Supply Chain Management

Guaranteeing on-time conveyance is a key separating factor for organizations in the internet business space. The effective administration of extraordinary market and spiked-request has, in this manner, turn into the new center zone, streamlining the store network the board procedure for these organizations and assuming a basic job in guaranteeing productive and quicker conveyance models. Mechanical advancements are likewise empowering other basic zones of the production network.

3. The Roadahead

Our reality is evolving. E-commerce will just show signs of improvement in 2019. New advancements will enable it to accomplish that. You, as web based business proprietors, need to grasp the ones that best suit your requirements. Continuously offer some benefit to the clients. The better the client experience, the better your deals.

As indicated by ongoing assessments by eMarketer, overall retail deals are relied upon to reach $4 trillion by 2020. Without innovation, it would be absolutely guileless to try and expect that web based business could accomplish such a noteworthy market estimate. As innovation keeps on developing, winding up increasingly refined and propelled, we expect the web based business industry to achieve unmatched dimensions of development by 2020. Netscribes gives advertise knowledge and substance administrations for organizations in the retail and online business industry.

The Future of E-Commerce

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I. Introduction:

E-commerce (Electronic commerce) can be defined as commercial transactions conducted electronically on the Internet or the buying and selling of goods and services, over an electronic world, primarily the internet. The way business is done in India is transformed as e-commerce came into the market. The E-commerce industry is penetrated the Indian market as a result of increase in the usage of internet and smartphones. As E-commerce is a growing business, there are many investors and as well as businessmen willing to start the E-commerce business. To start an E-commerce one have to know, apart from the general specifications, about:

- How to plan sales in e-commerce?
- Current Trends having impact on e-commerce and performance of e-commerce
- Artificial Intelligence(AI) Devices To Make E-commerce Smarter
- Significance Of E-Commerce In Saving The Environment
- Finding the right E-Commerce
- Future of e-commerce

These 6 does not say how to start E-commerce; they talk about the techniques to improve the business and maintain the business to sustain and gain more profits.

II. SALES

Holiday and festive sales are the best way to attract customers. Once the customers are attracted to sales, there can be considerable profits in sales. However, to attract customers, one has to concentrate more on the countries and areas where you targetted. First, one has to study the culture and traditions of the regions and mark out which period will be best to go on a sale. The major drawback, one can say for the sale is if the customers are habituated to discounts, it will be difficult to get the customers to buy on an off-sale day.

III. Current Trends and Technologies having an Impact on E-Commerce

E-commerce strategies are proliferating. In 2017, there were 1.66 billion online buyers. This number is expected to increase to 2.14 billion by 2021.

Nowadays, customers hold the facility within the market, as they need an enormous variety of offers that they tend to select. Thus, it's not alone your product that enables you to square out from competitors; it is customer-centric searching expertise designed around your complete to stay customers. Here, are some trends presently shaping the e-commerce business.

1. Social-Commerce:

Naturally, social commerce is the use of social networks for on-line looking transactions. Social media is essential in our daily activities. The reality that social media is placed in our daily activities effectively changes the buyer-seller landscape. Brands keep connected with their purchasers via social networks to form a private relationship. A lot of advanced technology options were integrated into social media that are directed to shorten the shopping for the cycle. At last, the fact: the social e-commerce rate of growth is on the right track to extend by twenty-five over the subsequent 5 years, to create up over 1/4 of the whole e-commerce market.

2. M-commerce:

Using applications on smartphones and tablets to shop for and sell the product is thought as mobile-commerce or m-commerce. Today, the share of customers victimization mobile devices constitutes a half all web traffic, that means it's of high importance that e-commerce retailers adapt to mobile screens and, in some cases, even build a separate app for the particular purpose of reaching these patrons and following mobile e-commerce trends. Solely the presence of an internet site or mobile app doesn't guarantee tremendous success. It is vital to form positive that you must create the most effective online searching expertise. Mobile shoppers are explicit; thus even the slightest issue will modification their mind and lead them to shop for from a rival. Meanwhile, the additionally advanced practicality embedded into mobile apps sets up some new game rules. There are many such impacts on present e-commerce.

How To Improve E-commerce performance:

Online sales are continued to grow at around twentieth a year, whereas the street declines. Whether or not your business is bricks, clicks or each, there's absolute confidence that future growth can rely additionally on your e-commerce performance than native sound. Moreover, e-commerce performance will change wildly in an ever dynamical atmosphere you wish to stay up-to-date. It has never been easier to line up your online search and begin earning. Also, social media makes spreading the word concerning your business instant and effective, promising higher monetary returns. With numerous folks developing their online businesses, it's vital to square out from the group.

Key areas to improve e-commerce performance:

Beyond the first do's and don'ts of initiating, there are some specific belongings you should do to create positive so that your e-commerce business grows into triumphant. We've summarised the most points here thus you'll begin specializing in raising your web site instantly.

1. Multi-Device Compatible:

The amount of web site traffic from mobile and pill users is growing

perpetually, with additional and more individuals opting to browse and look whereas on the go. Consequently, it's essential that you build your website mobile compatible thus individuals would reach and navigate it from any device. If you take a look at today's templates for making online retailers, you'll realize that many firms can embrace multi-device optimized choices as a part of their hosting services. As an alternative, use a mobile plugin for the platform your website is hosted.

2. Understand the Customers:

Understanding the customer can be achieved through mapping client onsite; therefore, you'll be able to higher meet the requirements of men and women on their purchase journey. Adequate quality product info may be a should for the web shopper nowadays UN agency desires to be informed before creating that everyone urgent call to buy. Since shoppers are browsing on many various devices and across channels, the bulk moving from mobile to desktop to complete the dealings, it's imperative to adopt a multi-screen approach to accommodate these on-line client activity patterns. Ensure you have got Associate in Nursing e-commerce hosting arrange that performs to best standards with websites starting from small enterprises to large company retail and wholesale platforms. Customers currently wish to virtually provide one-click therefore you have got to make sure your web site should reply that demand or risk losing business into the longer term.

3. Curtail the number of HTTP errors internally:

Several things might cause a server to answer missive of invitation with a mistake code. If you recognize the 5x 3 digit codes, you may have some plan from a supervisor perspective. The first digit can like a shot establish the category of a standing code for example 2= Success, 3=Redirection,4= shopper Error, 5= Server Error and purpose directors within the right direction once errors are flagged up. Additional thorough analysis is critical to pinpoint the particular cause and to correct it. Forever begin by checking that your servers are healthy and save yourself time to find error causes, as this is often typically wherever faults occur.

4. Leverage Social Media:

Social media is each a blessing and a curse: use it well, and it'll instantly extend your audience reach by giant proportions, whereas neglecting to stay it updated or material possession your service slide may lead to a torrent of negative reviews. Add social sharing widgets to platforms like Facebook, Instagram, and Twitter in strategic areas across your web site and move along with your customers, encouraging them to share positive experiences regarding your business. It's calculable that eighty-eight of shoppers trust online reviews the maximum amount as an own recommendation, demonstrating the facility that investment this social trust may hold.

5. Make sure your e-commerce is scalable:

Having climbable e-commerce information, your e-commerce web site would evolve and grow to fulfill increasing business demand to expand. Its information can affect its quantifiability directly; thus it's essential that the database accommodates relationships enlargement while not IT intervention to create it happen. Quantifiability might be improved with a cloud-based mostly information because it grows exponentially together with the business. You have got to remember of the most load your information would handle supported your system thus have a look at lockup and input/output speed. Facultative categorization and intelligent caching also can facilitate increase quantifiability particularly in handling everyday transactions. The lesson is – at website construction stage, implement a piece of information that's suited purpose going forward.

6. Do not overload the Network unnecessarily:

Network overload is the next greatest downside once data overload and needs managing. Social networks appear to stay walled gardens with open supply solutions not giving any real integration across social networks. A community dashboard would be convenient across all the social networks; however, it is out of stock at the moment. Some social bookmarking websites like "delicious" produce many connexions through a simple tag. If your network speeds are slow, it affects the event Operations and Business groups the maximum amount because of the network engineering aspect. It's imperative to understand what precisely is retardation the system; therefore corrective action is taken. Some components might presumably be conducive to the matter of network overload. Once self-addressed you'll be able to avert network congestion in the future :

- Associate degree overabundance of hosts within the network structure.
- Too several concurrent requests on the network like on Black weekday resulting in overload.
- Congestion through low information measure, for instance, once Netflix is usurping fortieth of the web or throughout optimum TV streaming hours.
- Hub association purpose may be a location for congestion – A suggestion is to think about however best to integrate the hub into the web to avoid this issue...
- Poor configuration management wherever a network isn't maintained or associate degree engineer introduces a virulent disease into the system once performing on repetitive scripts.

IV. Artificial Intelligence (AI) Devices for E-Commerce Store Smarter

Ultimately, to endorse products uniquely which is well-suited to purchasers and also for authorizing people for exploring products with the help of conversational language or images, as if they are interconnected with a person, AI permits an e-commerce website. Several options transpire by the use of AI to individualize the travel of consumer.

1. Smart automation

Smart automation or smart technology is not just a new way of emerging technology but also has a higher value. The usage of internet has been increasing since the past decade. The Internet is not just used by computers, laptops or any other electronic sources for gathering the bulk information to get useful data. It is used for the various inventions that

happen in technology. For instance, LG Signature OLED TV R9 is that latest sensation that has shown off its latest disappearing OLED TV that has a screen which can extend up to 65 inches (1.65 m) and then rolls into a closely-packed box.

2. Autocomplete Search Plugins

The goal of any e-commerce website is to extend transformation/ conversion by providing a quick, simple and unforgettable e-commerce expertise to the guests. One feature that helps here is that the autocomplete search feature. It helps users notice product concepts that they had not ev0en thought of, resulting in exaggerated average section time, and thus many sales. An individual can build an associate in nursing autocomplete feature themselves or purchase firms that area unit already developing this tool together with Nextopia and Loop54.

3. Chatbots

A chatbot is one type of artificial intelligence (AI) software system which will simulate a language or a chat with a user in language through electronic messaging applications, websites, and mobile apps. A chatbot is usually delineated together of the first advanced and promising expressions of interaction between humans and machines. However, a chatbot solely represents the natural evolution of an issue responsible system investment Natural Language Process (NLP). Formulating responses to queries in linguistic communication is one in all the first typical samples of linguistic communication process applied in numerous enterprises.

4. Customized Recommenders

Numerous web-based business stores besiege all clients with similar item suggestions. In any case, inquire about has discovered that customized experience have a higher shot of creating rehash clients. A few Artificial Intelligence devices endeavor to connect this hole among retailers and buyers by offering customized encounters. A few prominent ones are Personali and Choice.ai that assistance builds individual encounters for the clients of online business stages by gathering and examining client information.

5. Promoting Optimization

One slip-up that numerous new online stores make is that they overcomplicate things and buy into complex administration programming. This outcome in the misuse of membership charges and sat around idly in programming the executives. Artificial intelligence based showcasing streamlining programming are presently helping internet business organizations keep away from these mistakes by rearranging the administration through a straightforward stage. One such device is Intempt, a customized group the executives programming that removes all the messiness from web-based business the board.

6. The Bottom Line

Internet business stores are still a long ways behind in outfitting the genuine Artificial Intelligence instruments. However, one thing is sure; they have computerized most dull undertakings that storekeepers loathed; making it feasible for web-based business retailers to examine a vast number of collaborations consistently and target offers down to a solitary client within a moment.

7. Development in neural systems and human-like innovations

Most of the industries have been utilizing customary Machine Learning (ML) algorithms for very long, and couldn't push ahead. Since the past years, various achievements were found in neural systems/networks. Deep learning is another technique to accomplish nearer to human outcomes. In specific regions like PC vision, it has circumvented the personal effectiveness. Now, everybody is in the time of productization of all these AI advancements. Presently, most A.I devices utilize a blend of conventional ML techniques and deep learning together to accomplish the objectives.

8. Running with quick agents

New intelligent agents/quick agents exchange systems have turned into a standard device utilized in web-based business, following the advancement of artificial intelligence and specialist (agent) innovation. There are 3 fundamental capacities performed by the robotized specialist: coordinating purchasers and merchants; encouraging exchanges, and; giving institutional infrastructure. The agents are computerized and have full command over their activities. They have their correspondence language and respond to their condition, but on the other hand are equipped for utilizing their drive, for example, creating their objectives. It's AI at its most extreme splendor; lastly, they are valuable for e-commerce (web-based business).

V. Significance of e-Commerce in saving the environment

E-commerce is not only a commercial transaction done through internet but also plays a significant role in protecting the environment. The following are a few ways that demonstrate how E-commerce is useful:

1. Industrial Efficiencies

For instance, firms can utilize the Internet, to forecast demand more precisely, along these lines diminishing stock and product waste, as well as the energy and materials required to stockroom and transport items. Utilizing online projects, firms can discover precisely what item a shopper needs before it is delivered, and gratitude to progressively active correspondence by means of email, how it is working and what changes are required after it is acquired. To accomplish these additions, in any case, transportation frameworks must be proficient and the e-commerce framework – from the sourcing of provisions to the end-of-life management of items – must be structured in light of ecological contemplations.

2. Dematerialization

The Internet is starting to uproot a broad scope of written words, from course books and corporate brochures to reference books. The innovation for showing content on a PC screen should improve before electronic books make generous advances into the market for printed content, yet as devoted electronic reading devices are improved and made more comfortable to use, an ever-increasing number of individuals will pick to read electronic adaptations of paper archives. Travel guides, course readings, and guidance manuals are

different archives appropriate for electronic configurations. They require consistent updating, a procedure that can be performed electronically without delivering waste. Custom publishing, one of the quickest developing territories of the college material business, is one of the cases that help in wastage reduction.

3. Smart green products

Forward-thinking organizations are upgrading items with the goal that they can get data from the Internet and be controlled remotely. This innovation can make items unmistakably increasingly powerful, proficient, safe, and enduring, with all the orderly natural and medical advantages. The advancement of inexpensive radio frequency labels to recognize the items to which they are connected may empower us to all the more precisely track their development through business and into definite recycling, reuse, or transfer frameworks, computerizing producer duty programs. The Internet likewise makes it simpler for firms to keep furnishing clients with data and guidance after they make a buy. Providers can give item refreshes, review data, and guidelines on safe item use, legal support for ideal execution and vitality productivity, and alternatives for reusing, revamping, and transfer.

In common, the present organizations should dependably endeavor to make the following best thing that customers will need since customers keep on wanting their items, administrations and so on to persistently be better, quicker, and less expensive. In this universe of innovation, organizations need to oblige to the new sorts of customer needs and patterns since it will turn out to be fundamental to their business prosperity and survival. E-commerce is continually advancing and is ending up increasingly more essential to organizations as innovation keeps on progressing and is something that ought to be exploited and executed. Ending up increasingly more essential to organizations as innovation keeps on progressing and is something that ought to be exploited and executed.

From the initiation of the Internet and web-based business, the likely outcomes have turned out to be huge for both organizations and customers, making more open doors for benefit and advancements for organizations, while making more choices for purchasers. Moreover, much the same as whatever else, e-commerce has its negatives including purchaser vulnerabilities, yet nothing that cannot be settled or maintained a strategic distance from by great primary leadership and business rehearses.

VI. Finding the right e-Commerce Software for Online Business

E-commerce has become one of the primary business in present times. There are many more than the expected number of e-commerce expected. It is easy to get an idea to start the online business, but it is difficult to find the right e-commerce software for the business. The software plays a significant role to maximize the business idea.

One cannot say that this software is wrong or right. It ultimately depends on how you want to have your eCommerce to be. However, still there are some considerations you have to take care of while choosing the right software such as incorporating the website or application with social platforms, the website should be mobile-friendly(if you have not chosen application), an easy way of payment. Once you know, you have gathered all the requirements and factors that are important for the business, search for the platforms which provides you the best tools for building and maintaining the business.

E-commerce platforms can be categorized into two categories. These are self-hosted platforms and hosted platforms. The self-hosted platforms are free and are open source software. The hosted platforms are the ones which you have pay for using the software they provide. Both these have their flexibilities.

Anyway, the platform you choose is one eye of your business and the idea and promotions are another eye for your business. So, integrating the website or application with social media platforms can take your business to another level.

VII. Future of e-Commerce

These are the fashionable processes at this time. However, merchants ought to perceive that as technology progresses, there will be continuous transformations in however we behave a tendency to move with and purchase product.The technical school adoption curve helps to judge the risks of using new technologies employed in e-commerce. It illustrates the first distinguished e-commerce innovations influencing the business and their level of acceptance by the general public. Naturally, it takes your time before being adopted by the bulk within the e-commerce system, however keeping an eye fixed on the technological advancements is over necessary.

1. Voice assistants—modified word of mouth:

Voice search is widely utilized in services like Apple's Siri, Google Now, and Cortana from Microsoft. Voice assistants have seen a good increase in quality. The technology will not take to order product directly from Amazon by voice command. As well, it quickly finds deals and may even order food deliveries from native restaurants.

2. Blockchain technology- new data security & payment method:

E-commerce is one in all the industries being modified by the revolutionary use of blockchain technology. There are problems with trust, slow transactions, higher fees and policies, and digital knowledge possession. With its thought of a distributed, real ledger of all digital transactions, blockchain helps to make trust in online payments. It conjointly excludes frauds and provides a replacement payment methodology with the assistance of cryptocurrency (Bitcoin, Ethereum, Ripple, etc.).

3. Drones & droids – Next-level delivery system:

The future of automation lies in drones grasp the sky and droids on the bottom. Despite several obstacles in drone delivery, the advantages of its adoption are excellent for retailers. This may significantly cut prices in supply operations. The future of the e-commerce delivery system is predicted to be centered not on a selected address, however on a private person and their expected location and time. Pinpoint shipping, as this can be mentioned, would implant refined AI.

The prosperous cases of drones for delivery, voice assistants, and crypto-payments within the e-business

spheres show that our journey of buying product may exceed our imagination. To stay visible, brands ought to discover new school solutions that acquire loyal shoppers and supply unique e-shopping expertise.

VIII. Conclusion

Remember for e-commerce or any other business online there is no best strategy or plan, consider the factors that you feel are most important for your business. One may find that starting the e-commerce easy but maintaining the maturity of the business and expanding the business is a difficult task. For maintaining the maturity and expanding the business, one need to know few things about how to plan sales in e-commerce, future scope, the performance of e-commerce, artificial intelligence(AI) devices to make e-commerce smarter, the significance of e-commerce in saving the environment, finding the right e-commerce.

There are a few elements and factors that should be considered and settled on when beginning an e-commerce business. A portion of these includes kinds of e-commerce business, promoting procedures, and endless more. If the right techniques and practices are pursued, a business will flourish in an e-commerce business setting with much achievement and profitability ending up increasingly more essential to organizations as innovation keeps on progressing and is something that ought to be exploited and executed.

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e-Commerce – Ruling the World

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Evolution of e-Commerce

In the late 90s to early 2000's, after invention and stabilization of Internet, there was a sudden boom of .com companies. The Management Gurus and Corporate Leaders talked about potential revolution in the world using Business Thru Internet. Common People had their doubts if this would really happen or not.

The .com boom busted and hundreds of .com companies vanished overnight, taking billions of dollars of investment in them. The old school thought had won, and the people thought e-Commerce was probably few centuries away. The underlying factor, specially in India was that people will not buy by just seeing pictures on Internet and by just clicking. People need to see, touch and feel before they buy anything, even clothes.

Well that thought did not persist long, and it only took less than 2 decades for e-Commerce to come back with a bang and change the way world worked, shopped and consumed day to day things. Today billions of dollars' worth of goods and Services are being shopped over Internet everyday and some of the e-Commerce companies are the most valuable companies of the world.

Recent Deals in e-Commerce

We hear everyday about big retailers investing heavily into their e-Commence initiatives. There were recent news of deals worth billions of dollars for some e-commerce companies in India. Surprisingly these companies have never made any profit since their inception but still acquired for billions of dollars. Today world's Richest people are having interest in e-Commerce and their net worth was fueled by their e-Commerce companies selling almost everything under the sun.

What makes these deals to happen? Why are the old Retail companies, having been in business for more than 5 decades, paying billions of dollars for these relatively new companies who have never made profit?

The simple answer is "Future". Everybody sees the future in e-Commerce and know that some time down the line, nobody would like to or will have time to go to the mall/shop for buying things but order everything online. With more penetration of Internet, more and more e-Commerce will be promoted and grow exponentially.

In layman's language, e-Commerce is and will rule the world.

e-Commerce thru 16-year old's eyes -

If I ever want a new leather jacket, a new computer mouse, or even a new computer, I no longer need to walk into a store to purchase it.

I can purchase it from anywhere. I could be at home. At office. At a coffee shop.

In a restaurant.

On an aeroplane flying over the Pacific Ocean.

And I could place an order for almost anything I want and have it delivered to my doorstep in a few days

Just like me, everybody who has access to a decent computing device and an Internet Connection, also have this power. It is called e-commerce. And it rules the world.

I live in a rich neighborhood of Katy, 35 miles west of Houston city. I at least see the big e-Commerce retailer truck delivering goods to homes in my neighborhood at least 3 times every day. We, a small family buy almost 2 to 3 items thru e-Commerce every week which are delivered either to our mailbox or to our door within 1-2 days of the order. Our orders are not any luxury or pricey items but simple day to day stuff like books, clothes and electronic items.

My 8-year-old sister now tells us to buy her toys on Internet whenever she needs a toy. I see this as power of e-Commerce and am very bullish about its future.

What is e-Commerce -

What is e-commerce? E-commerce, short for Electronic Commerce, is the sale and exchange of goods and services via electronic means. You now have the capability to purchase anything you want through the 4.5 inch computer in your hand or the larger, 15 inch computer you have at home.

When you watch a film on Netflix, place an order on Amazon, or call a ride on Uber, you are taking part in e-commerce.

I can order the leather jacket or the new computer mouse from Amazon, pay then and there with my credit card. Amazon will receive and confirm the order, and within seconds they will send a purchase order to the seller of the leather jacket and the computer mouse.

The seller will pull the items from their stock and pack it and immediately ship it to my house in Texas. Within 6 hours it is picked up by the postal service and delivered to my house.

My leather jacket and my computer mouse arrive, and I can go the next day wearing a brand-new leather jacket, then come back home later and use my brand-new computer mouse to do more online shopping using my friend, e-commerce.

The best part about this is I saved myself from getting my car keys, getting in the car, driving to the store, looking for the leather jacket aisle, picking out a leather jacket I like, then looking for the computer mouse aisle, picking one out, bringing it to the front, paying for them, bringing them to the car, driving home.

I saved so much time!

Instead, I was able to finish my assignments and work while waiting for my order to be shipped.

Saving Time and Money -

E-commerce rules the world because it saves the world the most important thing: Time

It also saves money. A lot of money.

When you purchase something in a store, let's say a brand-new pair of headphones, a lot of money you pay for those headphones is to cover store rent,

employee wages, shipping to the store, store shelving fees, and presentation fees to display the item.

When you order online, all those costs are gone, meaning the item you want costs far less.

A simple example – at a large electronics store chain in USA, a pair of Bose noise cancelling headphones costs about $270

The exact same headphones on a prominent e-Commerce company portal is available for about $210

A $60 difference! Or a Rs. 4200 difference

Buy the headphones on Portal, have it delivered to your home and treat yourself to a new video game as well for $60. It's a no Brainer where people preference will be.

This is partially the reason we are seeing a decline in shopping malls and upscale stores. There is simply too much of a cost difference in online shopping versus store shopping that most people now would rather make their purchases online.

This is bad news for the stores and malls, but it is better for us as consumers as we get cheaper prices for the same goods we want while also being able to save time.

All thanks to the economics of e-commerce. And Inventors of this Technology. E-Commerce is here to stay and will continue to rule the world.

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Aditya Bhatia is a 16 year old scholar living in Houston, USA and studying in 10th Grade. His passion for Technology has led to few inventions and he has filed 2 software patents and few copyrights. He was founder member for starting Engineering club in his school. He recently qualified for USA National Level championship in Language competition by coming in top 3 at Texas state level. He has topped 2 recent competitions at school level for photography. Aditya has passion for writing and business. Aditya can be reached at adityabhatia78@gmail.com

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Realtime Scaling of E-commerce Sites and preparing for the Slashdot effect

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The costs of doing business on the Internet has been gradually decreasing, hosting costs have come down, several competing ecommerce technologies have surfaced and the costs of services associated with putting together a bespoke solution has decreased. Today a merchant has an option of choosing from one of the following alternatives for his ecommerce needs

1. Create a merchant account on any of the popular marketplaces like Amazon, Ebay or Flipkart
2. Choose a pre-hosted solution from any of the popular vendors like Shopify, Wix etc
3. Deploy a bespoke solution using one of the popular ecommerce platforms like Drupal, Magento, OpenCart, OSCommerce, Prestashop etc.

In the first two options the vendor manages the performance of the ecommerce site, However in the third option the entire technology stack has to be managed at the merchant end. In this article we'll look at the performance challenges that arise when you deploy a bespoke Ecommerce site and the methods to achieve realtime scaling and mitigating the SlashDot effect.

Though the focus of this article is on Ecommerce platforms that are deployed on the LAMP (Linux, Apache, MySQL and PHP) and LEMP (Linux, Nginx, MySQL and PHP) The actionable suggestions in this article can be used on other platforms as well.

Speed and Performance

Last mile connectivity plays an important role in the way the users perceive the speed of an Ecommerce site. If the user accesses the Ecommerce site from a low bandwidth connection even the fastest site would take time to load. This can be resolved by switching over to a higher bandwidth connection. However if the users complain of browsers rendering blank pages or 408 request time out errors then its a sign that your Ecommerce site is unable to keep up with the visitor traffic. This happens when your site gains popularity and a large number of visitors land on your site. The actual nightmare occurs when a popular portal links to your Ecommerce site. This causes a massive spike in visitors, making the site unavailable for new visitors, this moment is called the "Slashdot effect" or "Reddit Hug of Death". The focus of this article is to provide actionable insights for handling the Slashdot effect.

Measuring Performance and Monitoring

The first step is to measure the performance of your Ecommerce site and identify the factors that are inhibiting performance. There are several tools that you can use to measure the performance. These tools should be part of your DevOps arsenal.

Apache Bench

Is a tool that was originally used to measure the performance of the Apache HTTPD Webserver but can also be used to measure the performance of other Webservers. Using Apache Bench you can check the number of requests per second that your webserver is capable of handling. You can use Apache Bench to simulate the concurrent connections and see if your site holds up.

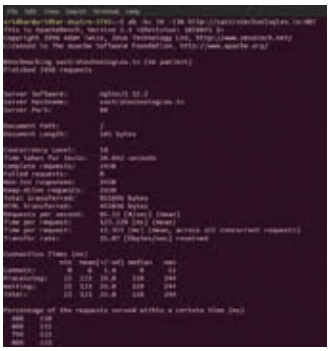

Fig. 1

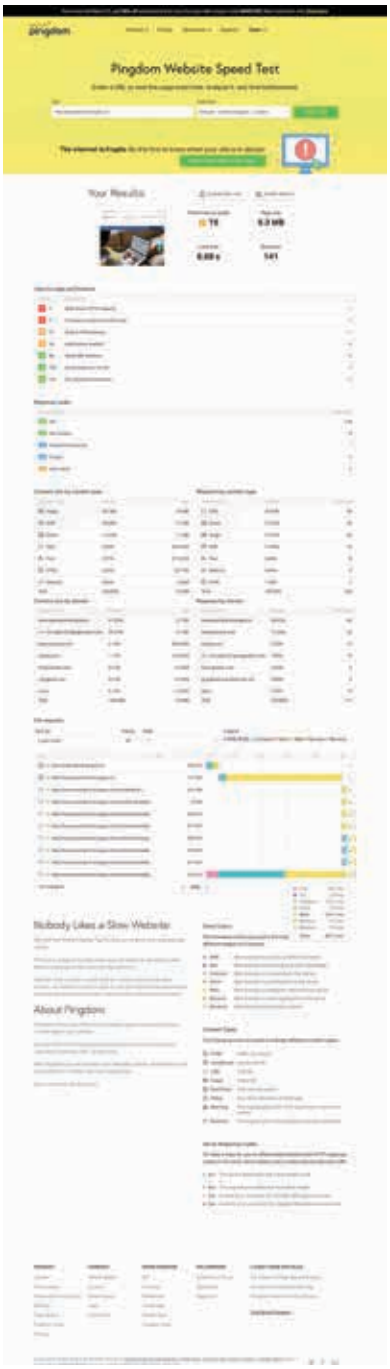

Fig. 2

Fig. 3

The Fig. 1 shows the results of a site using 10,000 connections.

Pingdom

One of the easiest way to measure your site's performance is to use the Pingdom Tools. These tools analyse the performance of the site and indicate the bottlenecks. Figure 2 indicates the results of a Pingdom test performed on our company site. The results give the architects very important clues on potential bottlenecks. In this specific case the page size and number of HTTP requests seem to be dragging down the response times.

Site 24x7

Site 24x7 measures the response time in addition to several other metrics. It continually polls your site to check if its up and measures the response time. Figure 3 shows the dashboard of Site 24x7 with the response from three sites.

Munin / Nagios

To measure the vitals of your Technology stack you should have Munin or Nagios in your arsenal. These tools measure the vitals of your hosting stack and provide a graphical dashboard. You can monitor your CPU, Memory, Hard Disk Space etc. Combined with third party modules you can monitor webservers, databases and other software components of the stack.

In addition to these tools another tool worth mentioning is the Google pagespeed tool that pretty much does the same thing as Pingdom. You could also use the Google Chrome Dev Tools and the Page Load Time Chrome extensions to delve deeper into the page speed metrics.

Identifying Bottlenecks

Once we have the right toolkit we can identify the bottlenecks that inhibit the performance of our Ecommerce site.

One of the biggest inhibitors of website performance is the network latency at the host end (this is not same as the low bandwidth issue that we discussed earlier). Network latency is introduced by Network components like Switches, Routers, Under Sea Cables etc. These contribute significantly to the performance degradation. You can use the "traceroute" utility to identify the components that are hindering performance. Figure 4 shows the latency figures for one of our servers hosted in India. The '*' indicates that the TTL (Time To Live) expired and hence more hops are required to reach the destination.

To resolve Network latency issues host your Ecommerce site with a hosting partner whose datacentres can be reached with fewer network hops.

Bots, Crawlers and DDos

These can creep into your site unnoticed, although not all of them do so with malicious intent. Bots and crawlers aggressively index your site thereby consuming valuable server resouces and making them unavailable for genuine visitors.

On the other hand DDos or Distributed Denial of Service attacks are deliberate attacks initiated on your servers by other servers on the Internet. Usually the servers that participate in these attacks are servers that have been compromised and loaded with toxic payload to initiate attacks by hackers. This can be mitigated by configuring your webserver to handle this kind of traffic.

Technology Stack

An ecommerce stack consists of an Operating System, A Webserver, Database, and a Scripting engine. Orchestrating all of these components to work harmoniously allows you to scale to meet increased user loads while an incorrectly configured technology stack can severly inhibit your performance. Each of these components should be configured to ensure that you scale your stack's performance to levels that can handle the Slashdot effect.

Webserver Configurations

One of the most important components of your Ecommerce site is the Webserver and the configuration parameters determine its behaviour. To ensure that the Webserver responds to the demands that the users place on it without sulking is to ensure that the parameters are set properly. The

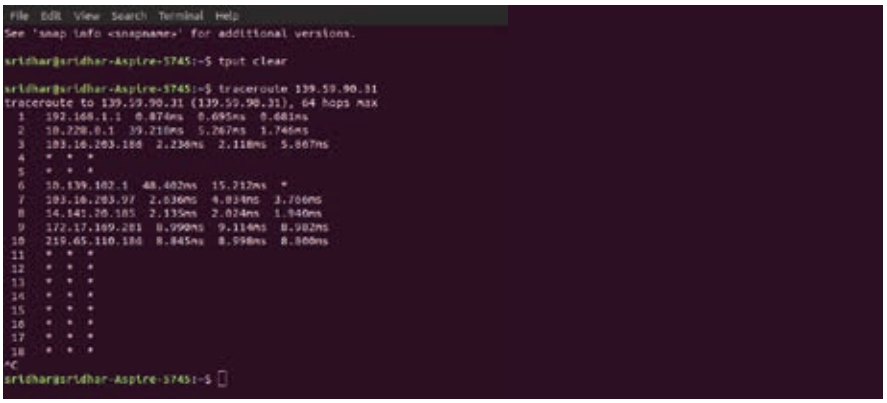

Fig. 4

two most popular webservers are the Apache HTTPD server and Nginx. Configuration settings are provided for both of these servers below.

Limit Crawlers and Bots from using your resources

We have seen how crawlers and bots can severly inhibit your Ecommerce's site to serve genuine visitors. To prevent them from using valuable computing resources you can set the rate at which they crawl the site or prevent them from crawling altogether. Based on your implementation modify the appropriate file and include the entries provided below.

Apache – Robots.txt

```
User-agent: *  /* Or specify crawl agent by name */
crawl-delay: 10 /* Wait 10 seconds after a crawl action*/
Disallow: /  /*Prevent crawling all directories from the root */
```

Nginx – nginx.conf

```
limit_req_zone  $binary_remote_addr zone=one:10m rate=3r/s;
limit_req zone=one burst=5;
location /  /* To prevent crawling */
    deny all;
    return 404;
}
```

Reduce Memory Footprint

A websever shouldn't be swapping to disk. This contributes to the latency. You can optimise memory usage by ensuring that the webserver doesn't load unnecessary modules. If you are using Centos or Ubuntu or any other Linux distribution run the following command to ensure that the webserver doesn't load unnecessary modules.

Apache

```
$ sudo a2dismod authn_alias_module
```

Nginx

```
# ./configure --without-http_autoindex_module
# make
# make install
```

The modules in Nginx are included during compilation. To disable the modules you will have to compile the code by excluding them.

Compress the Payload

Enabling compression on your webserver decreases the size of the payload that is delivered to the browser. To check if compression is enabled on your webserver you could use wget from the Terminal.

```
sridhar@sridhar-Aspire-5745:~$ wget -S www.sastratechnologies.in
--2019-03-20 14:03:56--  http://www.sastratechnologies.in/
Resolving www.sastratechnologies.in (www.sastratechnologies.in)... 139.59.90.31
Connecting to www.sastratechnologies.in (www.sastratechnologies.in)|139.59.90.31|:80... connected.
HTTP request sent, awaiting response...
  HTTP/1.1 200 OK
  Server: nginx/1.12.2
  Content-Type: text/html; charset=UTF-8
  Transfer-Encoding: chunked
  Connection: keep-alive
  Cache-Control: must-revalidate, no-cache, private
  X-Drupal-Dynamic-Cache: MISS
  Link: </home&gt; rel="revision"
  X-UA-Compatible: IE=edge
  Content-language: en
  X-Content-Type-Options: nosniff
  X-Frame-Options: SAMEORIGIN
  Expires: Sun, 19 Nov 1978 05:00:00 GMT
  X-Generator: Drupal 8 (https://www.drupal.org)
  X-Drupal-Cache: MISS
  Date: Wed, 20 Mar 2019 08:34:14 GMT
Length: unspecified [text/html]
Saving to: 'index.html.3'
index.html.3  [  <=>  ]  45.33K  67.8KB/s  in 0.7s
2019-03-20 14:04:14 (67.8 KB/s) - 'index.html.3' saved [46422]
```

The parameter you should look for is the Transfer-Encoding which in the above case is "chunked" meaning that the payload is sent in chunks. To enable compression you should enable the mod-deflate module in Apache while on Nginx it should be compiled. You will also need to place directives in the respective configuration files as follows to ensure that the webserver delivers compressed files.

Apache – httpd.conf

```
SetOutputFilter DEFLATE
```

Nginx – Nginx.conf

```
gzip on;
```

Use fCGI instead of modules

Configure your webserver to use Fast CGI for PHP instead of using mod php. Fast CGI provides performance improvements over the older method.

Changes in the Ecommerce application

Before the Ecommerce site is deployed on a LIVE environment there are a few changes that you you can make on the site that will increase its performance.

Aggregate and minify CSS and JS

Decrease the size of the payload delivered to the browser by aggregating and minifying the CSS and JS components. Most Ecommerce applications have a configuration setting that you can turn-on using the administration dashboard to achieve this.

References to missing assets

During the course of developing your Ecommerce site you would have created blog entries, products and images that might have lost its relevance and could have been removed. However there could be other content that might have links to these. Clicking on these links will trigger a HTTP 404/410 reponse. You should ensure that all links to missing resources are removed.

PHP Performance Tweaks

One of the methods to improve the performance of your Ecommerce site is to tweak the PHP engine itself. There are several configuration parameters in php.ini that can be tweaked. The file is located in */etc*/php5/apache2 in case of Ubuntu machines.

Increase memory limit

```
memory_limit = 64 ; /* maximum amount of memory a script may consume */
```

Set this figure to -1 which means that unlimited memory is available to the script.

Configure an Opcode Cache like APC

PHP script is interpreted during run time. APC is an opcode cache that compiles PHP code. By compiling ahead you improve response times by not having to compile it every time it is invoked. You can install APC using your distribution's package manager or by using PECL. Once you have installed it

you should add the following lines in the php.ini files.

```
extension=apc.so ;
apc.enabled=1 ;
apc.shm_segments=1 ;
apc.shm_size=64 ;
apc.stat=0 ;
apc.ttl=0 ;
```

You can take this a notch higher by optimising PHP to Apache communication.

Configure the Database for optimum performance

Configure MySQL

The possibilities of configuring a database like MySQL (or its clones like MariaDB and Percona) are endless and there is no magic solution. For the purpose of this article we'll restrict to configuring the cache and buffer parameters. The configuration files are located at */etc*/mysql/my.cnf. Make the following parameter changes to increase the buffer sizes. This will ensure that the frequently used queries are cached in memory.

```
key_buffer = 256M
query_cache_size = 128MB
query_cache_limit = 4MB
table_cache = 512
sort_buffer_size = 32M
myisam_sort_buffer_size = 32M
tmp_table_size = 64MB
delay_key_write = 1
wait_timeout = 60
```

Use Memcached

Memcached is a memory based caching system. You can install the binaries using your distributions package manager or use PECL to install the PHP extension. Then add the following lines to */etc*/php5/conf.d/memcache.ini

```
extension=memcache.so ;
memcache.hash_strategy="consistent";
```

You will then have to make changes to your Ecommerce applicantion's PHP settings for it to use memcached. In magento changes are made to the env.php file while for Drupal changes are made to settings.php

Architecture Considerations

Webserver processes serving a reasonable Ecommerce site are upwards of 40 MB. Their size grows to accomodate the content being served and the size doesn't decrease untill the process dies. Assuming that the browser requests for a single image you would have a process of 40MB being invoked to serve the image file even though this could have been done by a process less than 3MB.

Separate servers for static and Dynamic Content

You can setup a "baby" webserver to serve only static files (images, JS, CSS) and map it to a subdomain. Set the expires header way ahead in the future so that the content never expires on the browser end. This way static content is cached on the browser and is requested sparingly from the subdomain. Thereby decreasing the payload and improving the performance.

Reverse Proxy

One of the greatest performance improvements can be achieved by implementing a Reverse Proxy. Two popular alternatives are Squid or Varinsh. However the newer versions of Apache and Nginx also have reverse proxying capabilities.

Content Delivery Networks

If you have a reasonable amount of traffic then you should consider a CDN like Cloudflare. CDN's work by handling the vistors requests without sending it to the webserver. This is done by changing the DNS servers for the domain to that of the CDN. The CDN holds a copy of your site and in the case of a visitor request will deliver the content without passing it on to the webserver. The CDN will ensure that it polls the webserver and auto-refreshes its copy of the site so that it doesn't serve stale content. This way you could create several edge servers to serve the content thereby relieving your webserver of the heavylifting.

Hosting and Autoscaling

To achieve good scaling capabilities you would need a reliable hosting provider. Vendors like AWS offer autoscaling rules that trigger when a specific threshold is reached while vendors like DigitalOcean offer scaling with minimum downtimes.

In AWS you could setup "Cloudwatch" templates to trigger an alarm which can be picked up by the AutoScaler. Here is a sample autoscaling snippet from AWS

```
"SimpleConfig" : {
 "Type" : "AWS::AutoScaling::LaunchConfiguration",
 "Properties" : {
  "ImageId" : "ami-0ff8a91507f77f867",
  "SecurityGroups" : [ { "Ref": "myEC2SecurityGroup" }, "myExistingEC2SecurityGroup" ],
  "InstanceType" : "m1.small",
  "BlockDeviceMappings" : [ {
     "DeviceName" : "/dev/sdk",
     "Ebs" : {"VolumeSize" : "50"}
  }, {
     "DeviceName" : "/dev/sdc",
     "VirtualName" : "ephemeral0"
  } ]
 }
}
```

Hardware Changes – SSD / baremetal

You could achieve large performance improvements by replacing your Hard Disk Drives (HDD) to Solid State Drives (SSD). The Solid State Drives offer quicker read and write capabilities because there are no moving parts and hence for an Ecommerce site with large volumes of traffic will offer significant improvement in performance times.

Most ecommerce sites start by hosting on a VPS however as traffic grows it would be wise to move to a baremetal server. A baremetal server offers better responses as the OS directly interacts with the underlying hardware without having to talk to the Hypervisor which in turn talks to the Hardware like in the case of a VPS.

Implementing these suggestions on your Technology stack will ensure that your Ecommerce infrastructure is sufficiently prepared for any eventuality, be it a Slashdot effect or a DDos attack. However Performance Tuning is not a one time exercise but a continuous practice. Performance Tuning exercise should be carried out at regular intervals as part of your DevOps health checks.

Resources

Amazon Web Services - https://aws.amazon.com/
DigitalOcean - https://www.digitalocean.com/
Munin - http://munin-monitoring.org/
Nagios - https://www.nagios.org/
PageSpeed by Google - https://

developers.google.com/speed/pagespeed/insights/
Pingdom Website Speed Test - https://tools.pingdom.com/
Site 24x7 - https://www.site24x7.com/
Squid Cache - http://www.squid-cache.org/
Varnish HTTP Cache - https://varnish-cache.org/

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Impact of Big Data in e-Commerce

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Introduction:

As the data management grows rapidly, so also the applications in the entire field that pose lots of challenges to the researchers working in the domain of data management .Hence there is a demand to develop some novel methods to manage the data. Big data is a data set in which traditional methods are inadequate and tedious to deal with them. The main characteristics of big data are Volume, Velocity, Variety, Variability and Veracity. Volume is the quantity of data it holds. Velocity is the speed taken for transmission of data .Variety is type of data stored and processed. Variability is inconsistency in handling or managing data. Veracity is varying/ deviation in the accuracy of result [1]. Big data is a system that stores structured, semi structured and unstructured data which has a wide application in E-commerce Environment. The Figure 1 Shows the Basic structure of Big Data application.

The data that are present in this data set are categories as

- **Black box data** which contains information obtained from helicopter, airplanes and jets, it also helps to capture voice data.
- **Social media data** holds the information and views posted by many users.
- **Stock exchange data** have information about export and import with shares across different companies. Power grid data holds information consumed by a particular node with respect to a base station**.**
- **Transport data** includes model, capacity, distance and availability of a vehicle.
- **Search engines** retrieve lots of data from different databases.

There are two major types of databases. The Fig. 2 shows the types of Big Data structures.

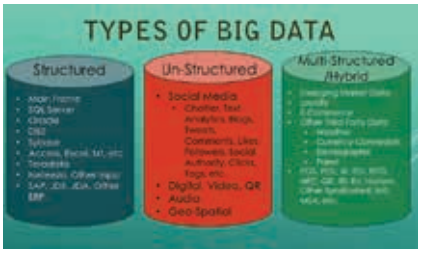

Fig. 2: Types of Big Data

Relational databases stores data in table format. It ensures ACID properties for relational database. Atomicity is all or nothing. If it causes any failure entire transaction has been cancelled. Consistency is Garbage in Garbage out. Isolation means Independent transaction will not affect other transaction. Durability includes long lasting of output after commit process.

Non relational databases is a database used for storing and retrieving of data in other forms such as key value pair other than tabular structure. It must ensure BASE (Basically Available Soft and Eventual Consistency)

Big data Landscape has been categorized into two. They are Operational and Analytics.

Operational which are included in gaining input after processing either real time , transactional etc and stored .It includes systems such as MongoDB where operational capabilities for real time and interactive workloads . NoSQL big data systems are designed to allow massive computation to run efficiently and inexpensive manner. It makes operational workloads to be easier, manage and faster to implement.

Analytics are the process in which data already available are analyzed. It includes massively parallel processing (MPP database) and Map reduce used for retrospective and complex analysis of data

STAGES IN BIG DATA

The stages in big data are as follows. They are

Data Acquisition is the process of gathering the data from various sources. In case of input from black box data set it obtains information in the form signals it needs to be processed and store in an organized way.

Data Extraction removes the unwanted data .If the same data is represented more times we can remove it

Data Collation helps to predict/ analysis of data, it needs to be obtained from various sources since prediction cannot be done with the data obtained from a single source.

Data Structuring is integrating collected data and organizes in a manner for easy retrieval.

Data Visualization performs displaying of data after processing in a structured manner.

Data Interpretation: The information gained is of two types. They are retrospective analysis and

Fig. 1: Basic Structure of Big Data

prospective analysis. The Figure 3 shows the stages of Big Data in E-commerce Environment.

Fig. 3: Stages of Big data in E-Commerce

Technology used in Big data analytics are Map Reduce, Hadoop, YARN, Spark, Hive, NoSQL databases.

Map Reduce

Map Reduce is an implementation for processing and generating large datasets. It is composed of two major functions they are Map () and Reduce (). Map () function process the local data and writes to a temporary storage. The data in temporary storage is analyzed and organized. Reduce () helps to process those data based on key value in parallel manner.

Hadoop

It is an open source framework performs distributed processing in a large datasets. Hadoop architecture consists of four modules they are hadoop Common, Hadoop YARN, Hadoop DFS, Hadoop Mapreduce. Hadoop common contains Java libraries and utilities. A Java library contains filesystem and OS level abstractions. Hadoop YARN has job scheduling and cluster resource management. Hadoop mapreduce is used for parallel processing of large data sets [2].

Applications

The various places where big data are widely used in all E-Commerce applications like Banking and Securities, Communication, media & entertainment, Healthcare providers, Education, manufacturing & natural resources, Government, Insurance, retail & wholesale trade, transportation, energy and utilities etc.

- Banking and securities has Security Exchange Commission (SEC) to monitor the financial market by network analytics and natural language processors. It results when there is a presence of illegal trade.
- In Government sector, Food and Drug Administration (FDA) helps to detect and study patterns of food related illness and diseases, faster response to treatments.

Challenges

The major issues of big data in E-Commerce are as follows [4]. They are

- Distributed System in which distributed parallel processing jobs across many systems are implemented.
- A Non- relational data store includes NoSQL databases that have lack of security.
- Storage – data are stored on multiple tiers based on their business needs.
- End points must ensure the authentication during analysis process.
- Real time Security
- Data Mining Solutions helps to provide security against insiders who abuse the network.
- Access control is the allocation of privileges to the users.
- Granular auditing helps to determine when missed attacks have occurred and future recovery measures.
- Data Provenance has metadata and also define the where data comes from, who can access it or how it can be analyzed. The Figure 4 Clearly shows the challenges faced by E-commerce in real time environment.

Fig. 4: Challenges in E-Commerce

Impact of Big Data in E-Commerce:

The big data is widely applicable for all E-Commerce activities like

- Card fraud detection and audit trails, customer data transformation and analytics in banking sector [5].
- Understanding patterns of real time, media content usage.
- Unavailability / inadequate / unusable data.
- Incorporating data from varied sources and privacy as well as in data protection In Education systems
- Underutilization of data gathered by loss adjusters and hunger for better insight. The Figure 5 shows how the Big Data is very much helpful in E-Commerce Environment by a single click in the computers.

Fig 5. Big Data in E-Commerce

Conclusion

As the technology is improving with leaps and bounds, the type and volume of data is getting larger and versatile. Big data provides an enormous platform to store plenty of data as well as processing to gain required output which is more needed in e-Commerce Environment. If the above mentioned challenges are concentrated much more to have a better facilities so that its work seamlessly, to make human life much better and worth living. Our attempt is to give an overview of various data management problems in E-Commerce Environment and where big data is playing a vital role to solve those addressed problems with the help of various statistical methods.

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Chief Editor

Challenges in fusion of Image Forensics

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Introduction:

Digital image forensics has gained a huge limelight in recent years and has grabbed attention of researchers worldwide for proving the authenticity and integrity of digital images. Now days, because of readily available and easy software tools, without any special skills anybody can alter the digital image. We are witnessing the era where frequency of image tampering is rapidly increasing. In an order to present the digital image as evidence in a court of law, its authenticity needs to be proved. Although many techniques have been developed so far in the literature to identify the history of image, they have a common drawback. Majority of the techniques are based on revealing the traces left during manipulations by single AF tool under specific setting. Hence every forensic detector detects the forgery with respect to particular traces of anti-forensic operation. These traces can be Re-sampling [1], Occurrences of compression [2, 3], copy move or cut paste forgery [4], image splicing etc. However, results produced by these forensic techniques are never impeccable and their outcomes are generally affected by uncertainty, ambiguity or impreciseness. The outcome of forensic detectors can be vague or unreliable as there exists various reasons such as incorrect tool settings, properties of image under consideration, partial presence or absence of particular footprint the detector can detect etc.

Need of Fusion:

Generally, in order to create falsified images anti-forensic adversaries make use of more than one tool and this is another hurdle in detecting the authenticity of the image. Majority of the forensic techniques are passive i.e blind in nature. They do not possess any prior information about image. Hence random selection of any forensic tool will not yield satisfactory result. In such situation the use of more than one tool capable of revealing different types of artifacts becomes necessary. This scenario demands the need of generic forensic framework where output of multiple forensic detectors can be combined before finally claiming for its authenticity.

Challenges in Fusion:

We need certain fusion technique where fusion of decision by different forensic detectors revealing different types of traces is carried out. Even though we fuse outcomes from multiple detectors, we need a single global answer claiming about authenticity of the image. Finding a single final decision, however, is really tedious. It is tricky to use outcomes of several forensic tools as output format of every detector is different. Output obtained from various forensic detectors may be inaccurate as well as heterogeneous. Some tools provide the output in terms of probability value whereas some tools provide a scalar value for authenticity. Outputs generated by certain tools are in terms of binary values as well. Thus integrating such heterogeneous output is a major challenge.

Moreover, forensic tools may have practical restrictions, be prone to errors or may be incompatible with each other depending on the input image. This may introduce another form of vagueness. By using traditional methods such as majority voting or binary OR, we can obtain a single decision; however it will be also prone to errors and will have less confidence in their detection. Therefore, it is essential to develop new efficient methods which will control the uncertainty of different outcomes from several forensic tools and generate single global outcome.

Approaches to Fusion:

As per Kharrazi et al. [5], there are three main approaches to merge the outputs of several forensic tools: feature level fusion, measurement level fusion and abstract level fusion.

- Feature level fusion-Every forensic tool provides certain feature to support their decision. Aggregation of all these features is carried out and based on that final decision about image authenticity is provided by using neural network or SVM.
- Measurement level fusion-In this type, a partial score is generated by each forensic tool based on the features they use. Then by aggregating all such partial scores a final global score is generated to decide image authenticity.
- Abstract level fusion-Separate threshold values are applied to the partial scores obtained from several forensic tools to obtain binary values. Then aggregation of these binary values is carried out into a global value.

Literature Review:

Barni et al [6] used Fuzzy approach to deal with image uncertainty. Proposed method is a type of measurement level fusion based on Fuzzy theory. It can merge the output from five forensic tools which can detect JPEG compression artifact and cut paste forgery traces. Several strengths are claimed by authors such as straightforward integration of new tools, auto generation of fuzzy inference rules etc. for the proposed method. Another Fuzzy logic based technique is proposed by Chetty et al[7].The proposed technique used fuzzy fusion of image residue in order to detect tampering or forgery of video sequences. This technique relies on the Fuzzy integrals. Features are extracted from the forensic methods and fuzzy integrals are applied to that. Significant improvement in tampering detection accuracy is observed by this method compared to its counterparts. Fontani et. al [8] presented a decision fusion strategy of image forensics. This strategy is based on Dempster-Shafer's Theory of Evidence (DST). This

strategy automatically summarizes the output from several forensic tools. It produces a soft interpreted global output by fusing outputs from several forensic tools based on DST. This framework is easily extendable means new forensic tools can be easily added to it. It also considers the reliability of the tool. Authors claimed improved classification accuracy as compared to strategies based on logical disjunction and SVM based fusion methods.

Conclusion:

Although enormous numbers of image forensics schemes are available in literature, due to their technical limitations their practical applications are constrained. Hence fusion of outcomes from several forensic tools has become quiet essential. Very limited numbers of fusion methods are available in the literature. This is a nuance field of forensics and has wide scope of research.

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Chandigarh Chapter Report

CSI Foundation Day

Chandigarh Chapter of Computer Society of India celebrated 54th Foundation Day .Chairman Prof. P Prabhakar while welcoming all, spoke about emerging technologies AI-ML, Big Data, Data Analytics, IOT, EI and Blockchain. Dr. P K Dhawan, ED, CDAC, Mohali was the Chief Guest. He also mentioned our preparation for AI, Telemedicine and Cyber Security, The Expert Lecture on "Blockchain and its Applications: Challenges and Concerns" was delivered by Dr. Avinash Sharma, Prof. M M University, Mullana. His lecture generated lot of interest in the subject. Especially in Cryto Currency. The event ended with vote of thanks by Hon. Secretary.

Digital Literacy for Financial Operations

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1. Introduction

Due to the advancement in the technology, there is a direct impact in the social, cultural, technological and economic environment. In 21st century every business is going online, so that they can attract customers via e-commerce and its offers. Bharat i.e. India is a young country where every youth is now having a smart phone, and due to the easy internet availability services, youth use these things to gain knowledge by taking online courses, doing transaction regarding online fees, viewing Web Based Advertisement (WBA), reading e-news and much more. Technology has a direct impact on society as well as life of the individual.

As per the report generated in statista.com the mobile phone internet penetration worldwide during the period of 2014-2019 has risen from 48.8% in 2014 to 63.4% in 2019. Asian and African countries enjoy a higher mobile crowd share i.e. 65.1 % and 59.49% of respectively. The estimate is that the in year 2020, the strength of actual users of smartphone in the world will reach to 2.87 billion, as compared to 2.1 billion in year 2016. In India, the number of smart phone users is increasing day by day. This is the main reason for shift towards digital literacy in modern world.

2. Digital Literacy

Now a day's digital literacy has become very important in this competitive world as companies are hiring professional via internet only which saves their times. So, every individual is somehow forced to gain digital skills so that they can survive in this cut-throat competition. If they are failed to gain digital skills, their chances of growth in job will be lowered. The higher level jobs are dependent on electronic devices like PCs, iPads and the like. Operating these devices require knowledge of digital skills. The employees for such jobs are recruited by taking tests of digital literacy and the promotions are also granted on the basis of tests.

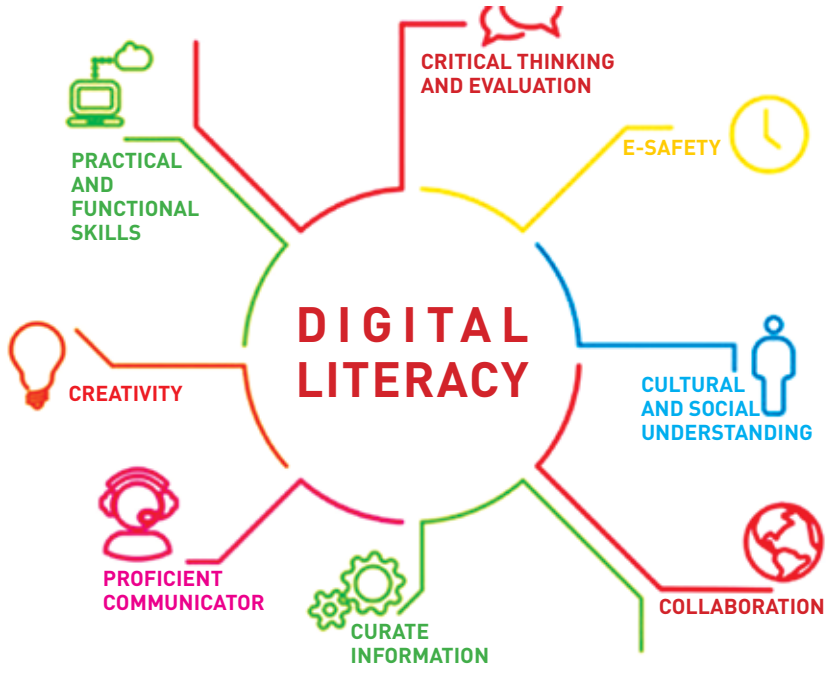
Digital literacy is the human ability to recognize, consume and use the data with the help of computers and other channels of internet (Gilster, 1997). Due to the advent of technology there is advancement in the field of education also. The two words: digital and literacy combines up, and which means the use of digital media to promote the education via use of internet by operating electronic gadgets. It requires many skills namely; cognitive, motor, sociological, and emotional skills. These skills are required for efficient functioning of the digital settings (Eshet, 2004)

In the absence of digital literacy, the people are manipulated by fraud, and many people lose their earned money in one go.

The advantages of digital literacy include:

1. Use of digital literacy in educational curriculum like taking online courses from foreign universities.
2. Digital writing
3. Connecting with friend and society using social networking services.
4. Prevent people from manipulations in photographs, frauds in E-mail etc.
5. Can get you promoted.

In the field of academia, the digital literacy has its own importance in every stream whether it's mathematics, science or humanities. Due to invent of different application now a days, scientist can run simulations on the software that can tell how the rocket can achieve the particular thrust, or to solve any calculations, problems simulation and modelling are done. Digital skills also help learner to learn the difficult



Source: Digital Literacy.

Fig. 1: Digital Literacy Means

concepts through games, exploration, visualization and publish multimedia products.

In humanities digital skills is used to search for the information, exploring the websites, literature, assessing journals, research papers and critical sources which can provide relevant information regarding the topics in the subject. With the help of digital skills, the research work has gained a lot of speed the information can be passed on from one place to another n fraction of minutes.

The Advertisements are also online today. The Web Based Advertisements (WBA) are generating good revenues by using e-commerce platforms. An online advertisement or WBA is an impression which appears as advertisements on web page. (Singh B, 2017). In a nut shell, it can be saying that digital literacy is important for every individual whether it's a person from Rural or Urban, teen or Old, male or female, rich or poor.

3. Financial literacy and operation

Financial literacy can be defined as the knowledge or the set of skills that a person holds which can help him to take the effective decisions on using its financial resources. The person with better understanding of using it's money and resources usually take better investment decisions that also includes savings, investment on different plans.

As per the Investopedia, "Financial literacy is the education and understanding of various financial areas including topics related to managing personal finance, money and investing". Thus it is an ability of individual to manage his/her own money, understanding of selecting suitable choices about their own money in terms of savings, insurance and infrastructure. It also helps the individuals at the time of their job retirement, paying and calculating annual taxes and ultimately organizing home budget (Klinton, 2019)

Digital literacy for Financial operations will be great help in making the investment decisions, choosing profitable savings techniques, managing debt. This all becomes easy if a person is digitally literate for financial operations also. If a person is having financial sound knowledge of e-commerce, he will keep a keen eye on his investment pattern, making budgetary control on the expenditure, investing on real estate, insurance or any other instruments can help him to have a good financial support. The financial e-literacy and operation will enable (s)he to work properly in the era of e-commerce.

Source: (Klinton, 2019),

Fig. 2: Financial Literacy Function

Every business keeps an eye on the money that is coming in and the money that is going out. This Financial operation is now very easy by the click of mouse in the age of e-commerce. If they don't keep an eye on the flow of money, the business may get a bad debt. In Bharat the people are not having a good financial investment knowledge because of which many people get in the debt trap because they are not aware about using of the saved money or how to invest the money to get the profit.

The financial e-literacy and operations help people to get a knowledge regarding various principles of financing like online money transfers, financial planning, planning of interest, handling of dues, techniques of savings and the time value of money. A person is said to be financial literate only if (s)he has learnt the skills of crafting own budget and managed the habits of expenditure efficiently before and after retirement. By this knowledge any person can have a stable financial background.

4. Conclusion

The knowledge makes a person independent to take decisions where as absence of knowledge makes him to depend on others, in absence of financial literacy, the people will make poor financial choices that will have an adverse effect in the financial well being of an individual. Sometime, people face money related frauds which increases the bad debts and bank credits and ultimately leading to insolvency.

In Bharat many businesses, faced losses and run out of business due to inability to control finances. That's why person must have good financial knowledge and Digitally literate to handle e-finance because it is only way they can be able to take better choices regarding finances and that will lead to a stable financial well-being on the platform of e-commerce.

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Dr. Gyad Singh Rathore "Sarswati Samman 2017" holder (Best Teacher Award of U. P. on 5th September 2017 by the hands of Hon. Chief Minister of U. P. Shri Yogi Ji) has more than 65 papers in finance, marketing, commerce and management. His 26 research scholars are posted as Professors, Dean & Heads and are working in various Central, State & Reputed Universities and Colleges. Having all over publications in reputed Journals, Magazines and Books, he has contributed lot to academia in plethora activities.

Mrs. Sunita Yadav is working in an organisation which is giving free computer education to Girls and which focuses mainly on development of weaker section of society, specially women. She has good papers on Women entrepreneurship and online platforms. Being Member of CSI she has also written good book reviews.

Air Pollution Monitoring System using IOT and Data Analytics

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An IoT based monitoring system includes a MQ Series sensors for detecting the amount of industrial effluents in the air, interfaced to an PIC IC equipped with UART adaptor to send the sensor reading to the IOT Module (GPRS)which will in turn send the values to the php server. We will be using an IoT device as a prototype to collect the data, and for expanding our model we used an authorized open source dataset provided by TNPCB. This paper aims at visualizing the results on forecasting the pollution level of air. Specifically ARIMA algorithm was implemented to find out the best predictive model and a forecasting model for calculating AQI of four different gases: Carbon Monoxide (CO), Carbon Dioxide (CO2), Sulphur dioxide (SO2) and Temperature sensor. From this paper, the model can thus be deployed in real-world in areas with high-pollution and corresponding actions can be taken to bring down the pollution levels.

Keywords: IoT, Mq series sensors, PIC IC, Arima, Predictive modeling, Machine learning.

1. Introduction:

With fast development of industrialization and urbanization pollution has become more common. Air pollution is presence of contaminants or pollutant substances that effect human health. Recent researches prove the high correlation between atmospheric pollutants and disease like asthma. The recent advancements in embedded electronics have led to the usage of wireless network technologies in monitoring sensor data and air pollution. The aim in this paper is to come out with prediction and forecasting model for certain air pollutants like CO, CO2, SO2 and temperature which are considered to be quite harmful. Two machine learning algorithm have been implemented which include Arima. These models have very good predictive capacity, generalization power and have a wide range of applications

2. Proposed System:

A. PPM value estimation through Iot Kit:

Since,IoT mainly deals with connecting smart devices (embedded electronics devices) to internet by harnessing the advantage of OSI layered Architecture,in this we propose a cluster of Air Quality Monitoring Sensor motes, which are used to measure the concentration of Air pollutants in the air. All these Air Sensors are interfaced with an embedded platform equipped with mobile's SIM card for network connectivity and are interconnected to internet making it a network of connected things. We have used PIC 16F877A microcontroller which features 256 bytes of EEPROM data memory in addition to the self programming features which make it ideal for more advance level A/D applications in automotive, industrial, appliances and consumer applications. Mq-7(CO), Mq-135(CO2), Mq-136(SO2) and temperature sensors are used to collect the gas concentration measurements. This sensor data would be captured and sent to php server for IoT based data acquisition.

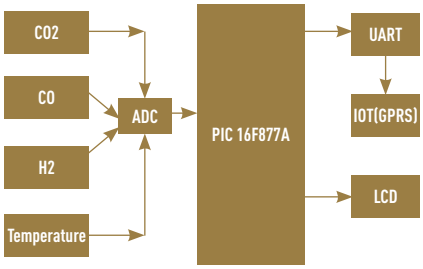

Fig.1: Block Diagram employed in the proposed system

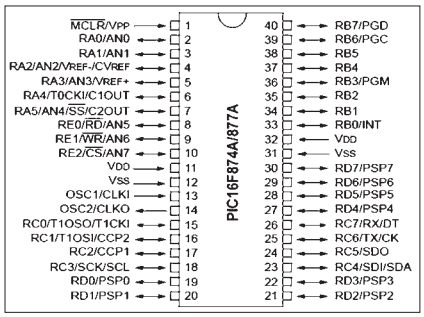

Fig.2: Pin configuration of PIC16F877A

Fig.3: Mq-7 Gas Sensor

Further data processing can be done on the data obtained from the php server rather than on the device to reduce the computational over head of the tiny embedded devices as they are low power devices which is a disadvantageous constraint and mostly powered by battery.

Fig.4: shows the implementation of proposed device to monitor air quality

B. Predictive and forecasting approaches on the data obtained from the sensors:

We aim to accurately predict concentrations of CO2, SO2, CO and temperature. Using the historical data of the gas sensors and their AQI value we try to obtain a predictive model that indicates the graphical representation of the AQI value by one-step ahead forecast and dynamic forecast implemented by ARIMA algorithm. Predictive modeling proposed involves three basic stages which are kept abstract:

1. Pre-processing on Data: The first step of building a prediction model is data pre-processing where data is cleaned, missing values are filled, outliers are removed and also data is arranged in a way to fit for the Machine Learning algorithms.
2. Engineering the Features: Features of predictive models usually increase the prediction accuracy such as day, month, time of the day for instances.
3. Constructing a Forecasting Model: A Suitable model that works on the unseen data which is purely based on the obtained historical data is built for future predictions.

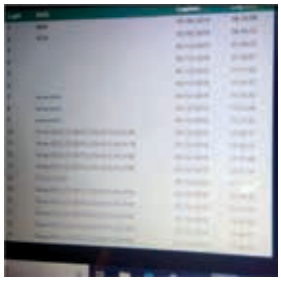

Fig. 6: Predicted data VS Actual data obtained in the php based server

Autoregressive integrated moving normal (ARIMA) is a well known linear model in time arrangement determination. Late research exercises with artificial neural systems (ANNs) recommend that ANNs can be a promising contrasting option to the customary linear methods. ARIMA models and ANNs are regularly contrasted and blended conclusions in forecasting models. The proposed System architecture interprets the training and testing data set.

3. Outlook on forecasted results:

Here are the insights and analytics we got from the data that we generated from the context of our work. The graphical representation is the AQI values predicted for one particular area in Chennai (Anna Nagar).

```
In [42]: y_forecasted = pred.predicted_mean
         print(y_forecasted)
         y_truth = data['2018-10-23':]
         print(y_truth)

Date
2018-10-23    120.858173
2018-10-26    126.556226
2018-11-16    120.279137
2018-11-19    121.331396
2018-11-22    107.507738
2018-11-26    118.753330
2018-11-28    130.979785
2018-11-29    122.336238
2019-02-01    117.026381
2019-01-13    115.190405
2019-01-21    110.621976
2019-01-23    129.627457
2019-01-28    105.187684
2019-01-30    108.815296
dtype: float64
                AQI
```

Fig.6: Predicted data VS Actual data

Autoregressive integrated moving normal (ARIMA) is a well known linear model in time arrangement determination. Late research exercises with artificial neural systems (ANNs) recommend that ANNs can be a promising contrasting option to the customary linear methods. ARIMA models and ANNs are regularly contrasted and blended conclusions in forecasting models. The proposed System architecture interprets the training and testing data set.

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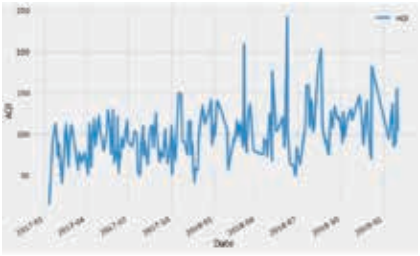

Fig.7(a) Result(Graph) generated by the given data set.

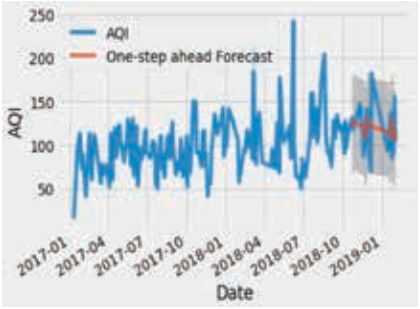

Fig.7(b) Result(Graph) generated by One step ahead forecast method using ARIMA algorithm (prediction).

4. Conclusion:

Air quality is the most serious issue that straightforwardly influences the wellbeing of the human beings and the environment. Air quality information are gathered remotely from checking bits that are outfitted with a variety of vaporous meteorological sensors. This information are investigated and utilized as a part of anticipating fixation

estimations of contaminations in industrialized areas in particular using various stages of Machine learning algorithms. The stage comprises of a ML-based calculations to construct the estimating models by training from the gathered information .ARIMA performs very well as a forecasting model and hence can be used to make a daily forecast just like regular weather forecasting.

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Quantum Computing and its Applications

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Quantum Mechanics is one of the relatively new fields of physics that is yet to be exploited for benefit of human kind. The field of quantum computing being as new as five decades old and is a researcher's playground since then which is finally turning into a piped reality with the efforts made by companies like IBM, Intel and Google who have the investment, brains and the technology to make this new avenue a little less alien. In this article, we will review the basic scientific concepts that forms the basis for quantum computer design, discuss some analogies that can describe the working of QC, how they function and what advancements have been made so far and discuss some newer applications of the technology in optimization and encryption related problems using IBM Q and their probable solutions. And avenues for future research.

Keywords: Quantum Computer Design, Analogies, Applications, IBM-Q

1. Introduction:

The modern-day computers called classical computers and these computational devices work on semiconductors and transistors which uses bits. These computers have become immensely powerful over the course of time and are able to perform tasks that were not possible otherwise and have become aubiquitous part of our lives. Like every technology it has to evolve due to the limitations it may never overcome and one such evolution is the incredibly powerful "Quantum Computer (QC)". The basis of quantum computers lies in the vast and arguable domain of quantum mechanics. QC are not expected to replace the modern-day computer but will assist in solving problems that even a classical supercomputer won't be able to solve it in even millions of years.

Work on Quantum computers is being carried out in research labs for decades and some advancements have already been made as part of the mainstream computing domain. In this paper, we will discuss the basic idea behind quantum mechanics and how QC works, its applications and will focus on one specific problem for future research in this area.

2. Working of Quantum Computer

Classical computers work bits which can be ones and zeroes. In a quantum computer, we have qubits. Qubits can attain any of the two-level quantum system attributes such as a spin and a magnetic field or a single photon. This system can have possible states as 0 or 1. This is like the photons horizontal and vertical polarization in a quantum state. It is not necessary for a qubit to have either 0 or 1 state, it can rather in any proportions of both states at once. This is called Superposition without noise. But as soon as we test the values by sending the photon through a filter it is either horizontally or vertically polarized. So as long as it is unobserved a qubit is in a superposition of probabilities 0 and 1 which can't be predicted what it will be. But as soon it is measured it collapses into one of the definite states.

A classical computer has bits which are logical representations of electricity being turned on and off but in quantum world it is described as the internal angular momentum called spin of the electron or small particles like photons in general. The spin up state of the electron can be analogous to the on state of a transistor. This is only point of similarity between the classical bits and qubits.

Now a look at a property that distinguishes bits and qubits

2.1 Superposition and Entanglement

In a QC, qubits can exist in superposition of 0s and 1s. So if 1 qubit can be in superposition of 2 states, 2 qubits can be in 4 states, 8 qubits can be in a superposition of 64 states. Entanglement is another property which gives information about other states when measuring one. Both these factors promote the building up of a QC.

There are certain properties which only a QC exhibit as described in section 3.

3. Properties of Quantum Computer

3.1 Quantum Computers are Exponential

Four classical bits can be in one of the two to the power of four different configurations at a time. Out of 16 possible combinations, one can be chosen. But four qubits with their superposition property, can attain those 16 combinations at once. As we add one qubit, this number grows exponentially. Twenty qubits can store a million values in parallel. So the capability of performance increases exponentially for a quantum computer.

If the electron is spinning in many different directions at the same time similarly if we do not measure it, a qubit may be doing different calculations at the same time only making a measurement at the end of the computation. It works on the state of calculation if we exploit this power of the particles we can build a quantum computer.

3.2 Entanglement

A phenomenon called quantum spookiness which find its application in the form of entanglement of particles in QC. It states when quantum particles like photons are not measured they exist in both of the randomized positions but when state of one particle is measured the other particle automatically achieves the opposite stateon its own no matter how far they are apart. This coherent state is necessary for storing and manipulating information. The values obtained on finding the states on both on the IBM Q and the earlier experiments like bell test matches out.

3.3 Fast Computation

A 2 bit classical system can only have 4 possible combinations but at the most a 2 bit classical computer can perform only one of those four possible functions and in order to check all of them the computer will have to repeat each operation separately. While a single qubit can be in a superposition of two states at once and is able to analyse all of these states at once. But 2 bits contains information about 2 states while 2 qubits have information about 4 states. And as the power of superposition and the number of states qubits can handle grows exponentially.

For comparison a 4 bit classical computer which can possibly have 16 states is able to analyse only one state at a time and have to perform computational operations 16 times to analyse each one of it but a 4 qubit system can analyse those 16 states simultaneously because of superposition. The capacity of quantum computer increases with the increase in data.

The day we are able to build a practical QC with 500 qubits we would be able to do computations on data as huge as the numbers of atoms in the observable universe.

Another property of qubits that we might want to exploit **quantum tunnelling**. Let's put it this way suppose if you move at a really high speed towards a wall and bang your head on it you will probably get a headache because we are colossal when compared to an electron but a electron may disappear at one end of it and re appear at the other end across the wall. This phenomenon is called quantum tunnelling and we exploit this property of quantum particles to our benefit by building a Quantum gate for carrying out search algorithms in a database.

In order to get a state to distinctly utilize this property we need to isolate the system very carefully from the environment just enough to maintain its quantum coherence. Problems with achieving that are huge but the potential is immense that we would be able to perform computations in a finite time which would otherwise take us longer than age of the universe to solve.

4. Constraints of Classical Computers

4.1 Optimization

There is n! ways of arranging n objects linearly and (n-1)! Ways when needed to be arranged in a circular shape. In a network, routers can be arranged in topology and the number of total ways to route traffic in real world scenario depends on it. The routing algorithms are just not capable enough to formulate a way to find the optimal path for traffic. They are basically approximations. All that redundancy is good but when it comes to finding the best path for routing the traffic the router makes some calculation and finds the best probable path but in a cloud network where the data and transmission is key finding the best possible route to enhance safety and reduce latency optimization becomes necessary. So imagine a quantum computing enable router that can actually check the vulnerabilities and the possible measures before actually releasing sensitive data over the web. This may be a bizarre idea but if implemented correctly then it could help us in numerous ways.

4.2 Searching

No, a QC will practically never replace classical computers but has varied number of applications i.e. to find something in a database, a normal computer may have to test every single one of its entries whereas quantum computer algorithms will need only the square root of that time which desired for searching through large databases makes a huge difference.

5. Quantum Computer Challenges

5.1 Building a QC

Building a QC itself is a really difficult task. Firstly, we need qubits that work in such a way that we can harness quantum mechanics so for that we need isolated atoms. Secondly, the atoms used are of phosphorus which behaves quantum mechanically in a superconducting Josephson junction coupled to a microwave resonator at absolute zero Kelvin temperature. (0.015K) achieved in a dilution refrigerator. The communication is done with the help of microwave and to set this apparatus utmost precision and money is needed.

5.2 High Error rates

It's obvious why the number of qubits matter. More the number of qubits, the more the number of superposition states which is necessary to get high computational power. But with increase in the number of qubits the error rate also increases. We need to be able to control what's going on the qubits because having high error rate and all the operations we perform don't work as we expect them to then that's not going to really work. To control this there's a metric called quantum volume where if we increase the number of qubits you can get to higher computational power but not if you have really high error rates. So, we have to move toward lower error rates and higher cubic counts.

6. Applications of QC

We don't really know the practical uses and the limits of quantum computing in human revolution and there's only one way to find out i.e. experimenting.

6.1 IT security

Now a days Quantum computers are breachng IT security. Our emails and banking data is secured by an encryption system. In this encryption system everyone is provided with a public key to encode messages and these messages can be decoded only by the holder of the key. This encryption can be broken by calculating the private key using the public key. If normal

computer is used to guess the private key, it would take years.. But a quantum computer could do it in a matter of few minutes.

6.2 Data Processing and Simulations

QC can find its wide applications in effective data processing of a database and much more. Quantum simulations can be used to have insights in proteins structures that can do wonders in medicine field.

6.3 Chemistry and Drug Research

Drug development requires chemical molecular interactions for drug development and this often requires testing endless combinations of molecule to find the right solutions and that could be done quickly using a QC.Let us take nitrogenase enzyme for example. Nitrogenase is an important catalyst for the creation of ammonia which is an important component of fertilizer, food production, pharmaceuticals etc. Nitrogenase is made up of many clusters of molecules and most efficient and fastest supercomputers we have today are only capable of simulating iron sulphide having 4 iron and 4 sulphide molecules clusters and this is the biggest molecular structure that can be depicted. Despite being so small relative to any other object naked eye can see we are only able to simulate the biggest of the smallest structure because there are various factors that needs to be accounted for like the electron-electron repulsion and attraction of nuclei and that number grows exponentially with the how big the molecules get. Electrostatic force is exerted by every electron on every other electron and when another electron is added we need to recalculate these electron energies for simulations.

6.4 Other Applications

QC finds its applications in areas such as the improvement of voice activation device technology, in medicine field to develop new drugs, traffic control, robotics, machine navigation, recognition of shapes and many more. Shor's algorithm and its potential use to break RSA. Grover's algorithm was devised to sort through information in an unordered database.But it is only a probable solution and needs to repeatedly done to verify the result. Other applications include Neuromorphic computing(AI), Prime factorization of really large numbers and eventually breaking RSA encryption, Data crawling, Data sorting, Path optimization(Dijkstra, bubble sort, shear sort, etc are all different and asynchronous yet serial in operation and a QC can help reach the best optimal solution simultaneously, Circuit design, Shape of vehicles for optimal drag performance, Google maps , Protein folding, Simulating chemical reactions, Cracking Cryptography

7. Future scope of QC

IBM Q is a project which makes a 5qubit quantum computer to be available online for free where anyone can experience and experiment the potential of a quantum computer. Many Universities are doing projects exploring and teaching Quantum Computer.There's already a community for supporting noobs in this domain and discussion. Recently a 16-qubit computer was also released for beta testing.

8. Conclusion

From the above discussion, it can be conclude that a quantum computer is far superior than any modern-day supercomputer. It uses Qubits instead bits and is capable of carrying multiples computations on various states of a qubit at the same time. It significantly reduces the time taken to perform computation to O(sqrt(n)). It takes advantage of superposition of small particles to its benefit. The results are probabilistic and not fixed thus only arriving at a particular state at the time of measurement. Quantum computers are being developed in research of a lot of big organizations like google, IBM and NASA for decades and finally we have some versions of it available in the market. Like the IBM's 5 qubit and NASA Dwave and many other attempts by big corporations like Intel are no far behind. Quantum computers can solve problems like optimization, Simulations and many other problems which for even the fastest supercomputer could take millions of years to solve. The day is here when we can perform experiments and test algorithms on an actual QC to solve problems in a fraction of time. Some areas where it can help tremendously is the development of AI software and Machine Learning as it can speed up the process of learning to a breeze. It's time to dig right in and make things happen. It could even break the RSA encryption techniques but efforts made by IBM can help tackle that situation as they have proposed a post quantum, unbreakable security and encryption mechanism using Quantum computers to save the day. This article provides a basic insight to the vast domain and can act as introduction to newbies for future research. ■

About the Authors

Dr. Anupama Pankaj is working as Associate Professor in the Department of Computer Applications, MRIIRS, Faridabad, India. She has experience in Research, Academics and Software development. She has many publications in International, National Journals and Conferences. She has authored chapters for various books. Also she has authored one book in the field of data mining. Her area of interest include data mining, big data and software engineering.

Mr. Siddharth Arora is a student of MCA final year in the Department of Computer Applications. Currently, he is on his industrial training as a part of MCA programme.

4TH Alan Turing CSI National Student Quiz 2019

Reported by Dr. Ranga Rajagopal
National Convener, CSI ICT Quiz

Organized by CSI Coimbatore Chapter

Office bearers of CSI Coimbatore Chapter, Staff of SRKCAS with all finalists

Alan Turing was highly influential in the development of Computer Science giving a formalization of the concepts of "**Algorithm**" and "**Computation**" with the Turing machine, which can be considered a model of a general purpose computer. Turing is widely considered to be the father of Theoretical Computer Science and Artificial Intelligence. To commemorate his contribution to Computer Science, CSI has initiated a Quiz competition in his name which is in its fourth edition this year.

This is a team event consisting of two CSI student members per team. There were a record number of over 1150 teams (2300 students) who registered online for the quiz. The first two rounds of the quiz were held Online and had a range of questions of various levels of difficulty covering Programming languages, Data Structures, Architecture, Networking and recent developments in Computer Science. Reliscore, Pune as the Technology Partner provided support for conducting the Online rounds. 109 teams based on their performance in the first round were shortlisted for the second round from which the best SIX teams were chosen to attend the National Finals hosted by CSI Coimbatore Chapter. The finals were held jointly with the CSI Student branch of Sri Ramakrishna College of Arts and Science (SRKCAS) who extended excellent support in all aspects relating to the event.

The 2019 finalists are very providential to have participated in this wonderful Quiz. The finals were conducted by noted Quiz master, Dr. M. Rangarajan who has conducted over 1000 quiz shows till date. He conducted the quiz in an innovative way and kept the audience as well as the participants at the edge of their seats. He conducted several rounds including Infinite Bounce, Theme Game, Visual Treat, Talking Straight and the final round of Rapid fire questions. All along the event, the audience was kept in high spirits through several audience questions and freebies. At the end of well fought out rounds, three teams emerged victorious as given below. Cash prize of ₹ 15,000/- as First Prize, ₹ 10,000/- as Second Prize and ₹5,000/- as the Third Prize apart from Trophies and Certificates were presented by Dr. K. Karunakaran, Principal, SRKCAS. Prof. A Sivabalan, Chairman, CSI Coimbatore chapter proposed the vote of thanks. Dr. Vijaya Kumar, Controller of Examinations, SRKCAS was a great source of support for the finals while Mr. Gnanasekaran, Manager, Administration, CSI Education Headquarters was the coordinator for the entire event and provided excellent support. Prezantim Events were the creative partner while ABT Info, Applied Controls and V-Link Systems were the event sponsors. The Cash prizes and travel support for outstation participants were provided by CSI Headquarters.

Team Members	Institution	Position
Prasanna J S Rakshith Holla	Srinivas Inst. of Tech., Mangalore	Winner
Nirzari Gupta Shailly Rajput	BVM Engg. College, Vallabh Vidyanagar	1st Runner up
Sri TejaVure Pruthvi Belide	Vasavi College of Engineering, Hyderabad	2nd Runner up
Vishal Balaji S Krishnakumar C	National Engineering College, Kovilpatti	Finalist
Atharva Thorat Ankita Sahane	K K Wagh Institute of Engg. Education & Research, Nashik	Finalist
Pradeep K Vignesh S	Karpagam College of Engg., Coimbatore	Finalist

The National Finals in Progress

Winners of 1st Prize

Winners, 1st & 2nd Runners Up

A section of the audience

CSI Maharashtra State Student Convention 2019

Organized by Vishwakarma Inst. of Information Technology, Pune

Reported by **Mrs. Snehal R. Rathi**
SBC & Event Chair CSI State Convention, Assistant Professor, Computer Department VIIT, Pune

The "CSI VIIT Student Branch" of Vishwakarma Institute of Information Technology, Pune had conducted CSI State Level Student Convention, "Techno Vishwa" on 17th and 18th March 2019.

This was the annual state level student convention for Maharashtra state. The aim of the Convention was to bring all technical minds together and give them a platform to showcase their talents.

The opening ceremony saw a large and eager crowd waiting to know about CSI and its evolution. Imminent guests included Dr. Sukant Bhatt, Head of University / Clinical Program, Philips Healthcare Innovation Centre and Mr. Sangram Kadam, Vice Chairman and Chairman Elect for 2017-2019, Computer Society of India, Pune.

Different events conducted during convention were as follows.

I. Bug Off:

A fun game to check your understanding of language and its syntax. Debugging is an art and we invite you to be an artist. The code provided will have logical and syntactical errors and contestants will have to debug the code.

II. Reverse Coding

It is a C/C++ coding event. You will be provided with input and its respective output, you have to code for it.

III. Earn Code

Buy Questions with virtual wallet money, Solve & earn more. There are 2 rounds in this event.

1) MCQs Round C/C++
2) Coding Round (C/C++)

IV. Artificial Intelligence & Machine Learning Workshop

An intensive, Hands-On, Live In-Class training in Artificial Intelligence starting from the basics of Python, Data Science, Machine Learning, Applications, Deep Learning.

All the events received overwhelming responses and more than 200 students had participated in various events. All the events were very successful and received positive feedback from the students. By conducting the above convention, the CSI VIIT Committee was able to achieve its main objective to provide opportunities and platform to show technical talent and providing the knowledge of current ideas in technical education and role of student in IT sector.

It helped students to improve team spirit, interact with industry experts and to enhance and enrich updated technical knowledge demanded by industry. ■

Inaugural Function CSI State Convention VIIT, Pune

Mr. Sangram Kadam, Vice Chairman and Chairman Elect, CSI Pune

Dr. Sukant Bhatt, Head of University / Clinical Program, Philips Healthcare Innovation Centre

Earn Code Event

CSI UP State Student Convention 2019

Organized by Amity University CSI Student Branch

UP State Student Convention 2019 was organized by the Amity CSI Student branch on 28th & 29th March, 2019 at Amity University Uttar Pradesh, Noida campus. It was a two day event that witnessed enthusiastic participation in various technical competitions of the convention from reputed institutions of the State. The event commenced by taking the blessings of Almighty and lighting the lamp on the chants of Saraswati Vandana. During the inaugural ceremony, Dr. K. M. Soni, Dy. Dean of Engineering & Technology at Amity University, Noida welcomed all the participants to the convention and motivated the young minds to develop a healthy competitive spirit. Prof. (Dr.) Balvinder Shukla, Vice Chancellor, Amity University Uttar Pradesh encouraged the participants and emphasized on the relevance of technical competitions for holistic development of the students. Also present during the ceremony were Dr. M. K. Pandey, Dr. Abhay Bansal, Joint Heads of the School of Engineering & Technology and Dr. Nitasha Hasteer, Dy. Director Academics of the Institution. More than sixty students from Computer Science & Information Technology branches from different reputed institutes from all over north India registered and showed keen participation during the event. During the convention Quiz-o-Mania 3.0, Weaving the Web, Decrypton 5.0 and Code Hunt 3.0, technical coding competitions were conducted. The rules of the event were briefed to all the participants before the start of the event. Quiz-O-Mania, was a technical quiz game show, that was enjoyed by all participants to the fullest. The first iteration of website designing competition with the name weaving the web was conducted where the topic was given to the contestants on the spot and participants were judged on interactivity and user friendly interface of the website. Decrypton 5.0 was a combination of a treasure hunt and also tested technical know-how of the participants. The participants were presented with an encrypted text using some ciphers which they had to solve to find the enclosed message which contained the venue for the next round. In Code Hunt 3.0 the participants had to solve a crossword puzzle and prove their coding skills.

On the second day of the convention, Dr. Nitasha Hasteer, Student Branch Counsellor welcomed Sh. R. K. Vyas the Vice President (Elect), Computer Society of India to the valedictory session of the convention. Sh. R. K. Vyas delivered a motivating talk which enlightened the participants. The winners of various competitions were applauded and awarded during the prize distribution ceremony by all the dignitaries present. The student branch members presented a report of the two day convention and proposed a vote of thanks to Sh. A.K. Nayak, Vice President & President Elect, Sh. Arvind Sharma, Regional Vice President (Region-I) and all other advisory committee members of Computer Society of India for the opportunity to organize the convention. ■

Prof.(Dr.) Balvinder Shukla, Vice Chancellor, AUUP addressing the participants of the convention

Sh. R. K. Vyas addressing the gathering

Participants during the state convention

Winners receiving the award from dignitaries during the convention

CSI Student Branch Members

CSI West Bengal State Student Convention 2019

Organized by Techno International Batanagar CSI Student Branch

Reported by **Diganta Sengupta, PhD**
MIEEE, MACM, LMCSI, MIE (India)
Organizing Chair, CSI - West Bengal State Student Convention 2019,

Techno International Batanagar, Kolkata hosted the CSI – West Bengal State Student Convention 2019 organized by Techno International Batanagar CSI Student Branch on 31st March 2019 at the institute premises. It was a single day event witnessing a galaxy of invited dignitaries and participation of students and delegates from different institutions across the state.

The inaugural session of the event was attended by Prof. A. K. Nayak (Vice-President cum President Elect – Computer Society of India), Mr. R. N. Lahiri (Fellow CSI & Vice Chairman, Techno International Batanagar), Prof. (Dr.) Sukumar Raychaudhuri (Director, Techno International Batanagar), Prof. (Dr.) Ankur Ganguly (Principal, Techno International Batanagar), Mr. Indranil Sengupta (HoD, Dept. of CSE, Techno International Batanagar), Padma Shri Prof. Ajoy Kumar Ray (Ex-VC BESU & Ex-Director IIEST), Prof. Atal Chaudhuri (Vice-Chancellor VSSUT (Burla University) Odisha), Mr. Ajoyendra Mukherjee (EVP & Global HR Head TCS), Mr. Gautam Hajra (Vice-Chairman cum Chairman Elect CSI Kolkata), Prof. (Dr.) Radha Tamal Goswami (Director, Techno International New Town), Dr. Phalguni Mukherjee (Fellow – CSI), Prof. (Dr.) Tirthankar Datta (Principal, Netaji Subhash Engineering College), Prof. D. P. Sinha (Past RVP, CSI R-II), Mr. Sourav Chakraborty (Secretary, CSI Kolkata), Dr. Anupam Ghosh (Professor, Dept. of CSE, Techno India Group) and Dr. Diganta Sengupta (Organizing Chair & Student Branch Counsellor, Techno International Batanagar CSI Student Branch). The inauguration session was followed by welcome and keynote addresses by the dignitaries. The Organizing Chair detailed the day's event after the inaugural addresses followed by a session talk on Intellectual Property Rights (IPR) delivered by Ms. Prama Mukhopadhyay, Kolkata Police Institute of Law. The inaugural session was concluded with Vote of Thanks offered by Vice-Chairman cum Chairman Elect, CSI Kolkata, Mr. Gautam Hajra followed by lunch.

The post lunch session witnessed the Thematic Talk on Security delivered by Prof. Atal Chaudhuri, Vice-Chancellor, VSSUT (Burla University), Odisha. This was followed by three concurrent student activity tracks – Student Paper Presentation, Student Poster Presentation and Expert Panel on Internet Protocol Standards (IICB Program). All these activities attracted participation from all participating student members. Session chairs in the Student Paper Presentation activity shortlisted three papers for publication in CSI Communications. The winner and the First Runner-Up in the Student Poster Competition were felicitated by Certificates and Cash prizes. The Expert Panel track witnessed massive interaction among students and the speakers from TCS Standards Lab.

The CSI – West Bengal State Student Convention 2019 concluded with valediction post completion of the three concurrent student activity tracks.

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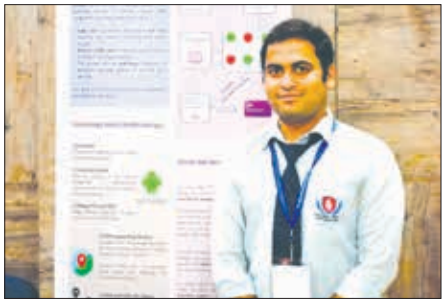

STUDENT CONVENTION

REPORTS

CSI Regional Student Convention 2019 at Kongu Engineering College, Perundurai (Region-VII)

CSI Student Branch of Kongu Engineering College, Perundurai has organized the Regional Student Convention during 11th March 2019 and 12th March 2019. The convention comprised various technical events and workshops which gave exposure to the students in this competitive world and emerging trends in IT World. Enthusiastic students and learners participated in this meet to excel in their field. Around 200 students from various parts of Tamil Nadu actively participated in the event. The chief guest Dr. M Sundaresan, Regional Vice President, Region VII graced the occasion of Inaugural ceremony with his presence. On the first day more than 100 students from more than 15 colleges actively participated in different events. Technical Quiz Competition, Paper Presentation, Project Presentation, Code debugging, etc., were conducted and many students actively participated and won prizes. Two workshops were organized on the second day (12th March 2019). The workshops were "Internet of Things" and "Django Frame work".

More than 90 students attended the IOT workshop and more than 50 students attended the Django workshop and got benefited. The workshop on Django Framework was co-taught by industry expert Mr. R Venkata subramaniam, COO, VAGMAWARE Tech. PVT. Limited, Karur, and the internal experts Dr. S Malliga, Ms. S.P. Sri Sindhu, Ms. M K Dharani, Department of CSE and Mr. A Jeevanantham department of IT organized the IoT workshop. The sessions were highly interactive; students queried keenly and advised on choosing career according to the capabilities, considering Key Factors aligned to industry requirement touching sensitive issues and the entire event was coordinated by Dr. K Kousalya, Dr. Jayanthy, Ms. R Shanthakumari and Mr. B Krishna Kumar.

CSI Haryana State Student Convention 2019 at Jai Parkash Mukand Lal Innovative Engineering & Technology Institute (JMIETI), Radaur

Jai Parkash Mukand Lal Innovative Engineering & Technology Institute (JMIETI), Radaur has organized one day State Level Students Convention in collaboration with Computer Society of India on 8th Feb. 2019. Mr. Chaman Nasa, Manager Gray Oragne robotics, Gurugram was Chief guest for the inaugural function. Prof. R S Chauhan, Director, JMIETI, Radaur presided over the function elaborated the highlights & achievements of the institute. Mr. Chaman Nasa discussed about "Scope of Artificial Intelligence" and how to orient our workforce in a direction to achieve our individual goals. He explained his vision about the artificial intelligence and indulging into its future scope and possibilities to create new intelligent machines. He motivated students to think out of the box, he also added another perspective to our thought regarding artificial intelligence that it is a boon to humanity as it can widely create more opportunities. This convention has provided a platform to learn as well as to show skills in events like Technical Talk, Poster Designing using Photoshop and CorelDraw, Technical Quiz competition, Programming and Debugging contest and Group discussion between students of various institutions in the state. The convention was attended by 303 students from 16 institutes. Mr. Vishal Garg, Convener, paid thanks to the Guests and speakers of the convention and congratulated the team of convention for the success of state level function. Mr. Ronak Sethi from HEC secured 1st Position, Ms. Kashish from HEC Jagadhri secured 2nd position, Mr. Rahul Singh from HEC secured 3rd position, in the event of Bug Killer

(Code Debuging). Mr. Jatin Dhingra from JMIETI secured 1st Position, Mr. Paras Dhingra from JMIETI, secured 2nd Position and Mr. Amandeep from JMIT secured 3rd position in the event of Quizzard. Mr. Sarthak from JMIETI, secured 1st Position, Ms. Akshma from JMIT secured 2nd Position and Ms. Divija from JMIETI secured 3rd position in the event of Iconic Mind. During convention, Dr. S. K. Garg, Mr. Vikram Verma, Mr. Vivek Sharma, Dr. Sanjeev Garg, Ms. Upasana Sood, Mr. Vishal Garg, Ms. Ruchi Gupta, Ms. Priyanka Kamboj and Mr. Rohit Bathla Mr. Rajiv Bansal were present.

CSI Andhra Pradesh State Student Convention 2019 at VR Siddhartha Engineering College, Kanuru, Vijayawada

The Branch of VR Siddhartha Engineering College had organized a Two-day CSI State Level Student Convention "Evolution 2019" on 1st and 2nd March 2019. The Main theme of the fest was "The 4th Transformation". The Guest of honors were Dr. Kurra Rajasekhara Rao, Chairman, CSI Vijayawada Chapter and Prof. Venkata Praveen krishna Anne, Past AP State Student Coordinator. The Dignitaries had graced the occasion with their valuable words about 4th Transformation technologies like Machine Learning, Artificial Intelligence, Internet of Things, Block Chain, AR/VR. While addressing the students, Dr. Kurra Rajasekhara Rao had shared the importance of CSI. The program was initiated under the guidance of Dr. A V Ratna Prasad, Principal, VRSEC and Dr. M Suneetha, HOD-IT. Apart from student coordinators, the faculty coordinators Mr. Y Kalyan Chakravarti, Assistant Professor and Mrs P Ramya, Assistant Professor had took a step to encourage the students to participate in all the events.

The students had organized technical events like Paper Presentation, Tech Quiz, Ideathon, Controvert, Ignite Jam, and Tech Blind. In addition to the events, two Technical workshops were conducted on AR/VR and Amazon Web Services. All the events are open to all Engineering domain students. A total of 174 students registered for the student convention from various institutions from Andhra Pradesh. In a nutshell, we trust that this event had given a chance to the students to share their knowledge and pitch new innovative ideas. The participants where with self-motivation, commitment and support and made this occasion a grand success.

CSI Karnataka State Student Convention 2019 at Cambridge, Institute Technology, Bengaluru

The 32nd CSI Karnataka student convention with the Theme "**Convergent Innovative Technologies for the Mankind (IoT and Machine Learning)**" was conducted by Cambridge Institute Technology, Bengaluru on 1st & 2nd March 2019 in association with CSI Bangalore Chapter. The convention inauguration was started with an invocation by students on Friday, 1-3-2019. Dr. Suresh, Principal welcomed the dignitaries. The chief guests & other dignitaries joined to light the lamp to mark as a good beginning. Dr. Shantharam Nayak briefed about the student convention and its importance. Mr. Satish, Chairman, CSI Bangalore Chapter speak about CSI & academia association. Dr. R Srinivasan, Past president CSI, briefed about the beginning of CSI student convention and expressed that up-skilling is required for the students. Dr. K N Balasubramanya Murthy, Vice Chancellor of PES University was the chief guest. He advised the participants to equip with boon of technology to compete with rest of the world in this era of convergent technologies. Mr. D K Mohan, Chairman, CITech addressed the gathering and advised the young engineers are required to set the goal and work sincerely with quality principles. Mr. Radhakrishna, Principal Engineer, CISCO gave keynote address. He requested the young minds to use available data and learn from that to take proper timely decision. Dr. Anantha Padmanabha, HOD-ISE, CITech proposed vote of thanks. From CSI-BC Mr. H C Sridhar, Mr. T N Seetaramu, & Dr. Shantharam Nayak have participated in the inauguration and also coordinated the events. Mr. Vishwas Bopanna & Mr. Suresh Thaigarajan helped in evaluation

of paper presentation. The invited talk was: i) "Reasoning Explainability, and Bias in AI" by Dr. Mandar Mutalikdesai – Scientist IBM R&D, talked on how reasoning helps in providing solution. ii) Ms. Sheetal Srivastava – Data Scientist (IBM) talked on use of AI & machine learning with a demo. A meaningful Panel Discussion was conducted focusing on the theme. The panel comprising Mr. Sabapathy (VP Ninestars-Retd), Dr. Mandar Mutalikdesai (Scientist IBM), Dr. L Suresh (Principal CITech), Dr. D H Rao (Director, CITech) and Dr. Shantharam Nayak (Professor, RVCE) as moderator. The convention was meaningful. Total 833 (547 host college + 286 other institution) delegates from 16 different engineering colleges have participated and drawn the benefit. Mr. Anbhunathan R was present during valedictory and briefed about the benefits of CSI association. The curtain was drawn to the convention by honouring the Winners of all the competitions during valedictory. Prizes were distributed in the valedictory programme. Prof. Janardhan Singh along with their team from CITech, Bangalore have coordinated for the success.

CSI Tamil Nadu State Student Convention 2019 at Sri Sai Ram Institute of Technology, Chennai

CSI Student Branch of Sri Sai Ram Institute of Technology, Chennai organized the State Level Student Convention for Tamil Nadu State on 13th March 2019. Dr. S Poonkuzhali, Chairperson, CSI Chennai Chapter inaugurated the convention and Mr. Devanathan Sundaramurthy, Associate Director, Supply Chain SAP Architect, Cognizant technology Solution acted as the Guest of honour. More than 200 students participated in the convention. More than 20 batches presented their papers in the paper presentation event and best three batches are awarded with case prizes. In the Project and Poster presentation, more than 10 batches presented their project and best three batches awarded with cash prizes. More than 170 students participated in Web designing Contest, Mobile Application Development &Code Debugging events. The prize winners and participants were honoured in the valedictory function.

CSI Kerala State Student Convention 2019 at Viswajyothi College of Engineering and Technology, Ernakulam

CSI Student Branch of Viswajyothi College of Engineering and Technology, Ernakulam, has organized the state level student convention for Kerala State at its campus on 12th March 2019. The Convention was aimed at bringing together the students from various colleges of Kerala and to provide a platform to broaden their horizons. The inauguration ceremony was graced by the eminent personalities and office bearers of the Computer Society of India, Prof. B Kannan, Chairman, CSI Cochin Chapter was the chief guest for the occasion. The function was started by lighting of the lamp by the dignitaries present. Mr. Koshy Sabu, Secretary, CSI student branch, VJCET introduced the Chief guest. He also outlined the brief history and achievements of the CSI Student Chapter of VJCET.

The guests were welcomed by Mr. Koshy Sabu. Presidential address was given by the Manager Rev Msgr Dr. Cheriyan Kanjirakombil. Directors Message was given by Rev Dr. George Thanathuparambil. Our beloved Principal Dr. Josephkunju Paul C delivers his thoughts and messages to the participants. Chief Guest gives a talk about the convention theme on Security in Digital world. Prof. Somy P Mathew, Vice Principal, Prof. Amel Austine, HOD-CSE and Prof. Anju Susan George, HOD-IT gives felicitation for the event. The chief guest was presented a memento. Around 300 participants from various institutions all over Kerala were registered and participated. Various student activities as inter college competitions were organized in this convention such as code hunt, blind coding, gaming contest and workshops. Workshops topics are Bug Boundy and about drones. These workshops are carried out by different resource persons with high experience in each area. At the end of the convention Winners of competition were awarded by cash prizes and certificates by CSI Student Branch Counsellor of VJCET Mrs. Arsha J K.

STUDENT BRANCHES INAUGURATION

REPORTS

U V Patel College of Engineering, Ganpat University, Kherva , Gujarat (Reegion-III)

The CSI Student Branch at U. V. Patel College of Engineering, Ganpat University, Kherva, Gujarat was inaugurated on 11th March 2019. The aim of the function was to provide awareness for the students regarding the benefits provided to CSI-Members by Computer Society of India. The chief Guest of the function was Dr Kiran Amin, Principal and Dean, Department of Engineering UVPCE. Dr. and addressed the CSI student members and explained how it is important for students to connect, collaborate and create using such a large platform which will be provided by UVPCE-CSI Student Branch. He also marked the importance of CSI as it plays a major role in IT Policy framework and encouraging the professionals by way of organizing conventions and various events. Dr Paresh Solanki, HOD- CE and Dr. Rakesh Vanzara, HOD-IT along with senior Faculty members Prof. Ketan Sarvarkar, Prof. Hitesh Rajput and Prof Ravindra Modi also graced the occasion. The event was witnessed by around 65 participants including CSI members, student members, other faculty members and students. He also congratulated both the Heads of Computer Engineering and Information Technology and Ms. Sweta Dargad, Assistant Professor Computer Engineering Department, Student Branch Counsellor The Student committee members of CSI student branch, were felicitated by handing over them their I-CARDS along with a flower by the hands of the distinguished guests. A seminar on Intellectual Property Rights was delivered by Ms. Sweta Dargad to increase awareness among students about Copyright, Patents and Trademarks. The seminar intended to make more students get attracted towards research opportunities and patent Filing activities and getting the most benefit of policies and rewards offered by CSI. The branch will play a foremost role in achieving the objective of the CSI. Branch will provide connectivity between members so as to enhance the knowledge of members. The branch will organize various workshops and conferences, Guest lectures, technical meetings, poster presentation / exhibitions, seminars to promote the knowledge to students. The branch will also host regional, divisional, national and international events along with the various reputed sponsoring agencies.

Narasaraopeta Engineering College, Narasaraopet, Andhra Pradesh (Region-V)

The CSI Student Branch Inaugural function was held on 27th February 2019 at Narasaraopeta Engineering College. The program started with lighting the lamp and continued with the welcome address, activities of CSI- NEC Student Branch and future plan by Dr. B. Jhansi Vazaram, CSI – Student Branch Coordinator. The presidential address was given by honorable Chairman, Mr. M. V. Koteswara Rao. He motivated the students to set positive goals, highlighting short term goals as well as long term goals. The Principal Dr.M.Sreenivasa Kumar addressed the students about the role of professional society in IT Industry. The Chief Guest of the function Dr. K Rajasekara Rao, Chairman, Vijayawada Chapter briefed about the recent Technologies in IT Industry. He included the History, benefits of CSI and the programs conducted for the students under CSI student chapter. The guest of honor, Prof. A. V. Praveen Krishna, Past AP State Student Coordinator, also graced the occasion. He gave suggestions and guidelines to run the student branch. He explained clearly how exactly to go about this program. Dr. S. N. Tirumala Rao, Head, Dept. of Computer Science and Engineering motivated with the phrase, "plan, execute and bring a positive change". The guests were felicitated by the dignitaries on the dais. The Department of CSE conducted various workshops and Hackhathons for the students under CSI banner. Prizes were distributed to the winners and Participation certificates to Contestants. Prize Distribution

session was taken care by Mr. T. Subba Reddy, Faculty Nominee and Mr. S K Shabbir Hussain, faculty Nominee, CSI – NEC Student Branch proposed vote of thanks.

PACE Institute of Technology & Sciences, Vallur, Ongole (Region-V)

The CSI Student Branch at PACE Institute of Technology & Sciences, Vallur, Ongole was inaugurated on 19th March 2019. The program initiated by welcoming the dignitaries, lighting the lamp followed by the prayer. Mr. P Lokaiah, Student Branch Coordinator outlined the agenda of the CSI student branch and advantage of being a member. Dr. T R Chaitanya, HOD-CSE, motivated the students by stressing the importance of working models, conferences, workshops, certification courses, and National level symposium. Dr. Raj Anand, Dean, Academics has thrown light on software engineering, objective of education, expectation of industry, professionalism & skill set. Dr. M Sreenivasan, Principal explained how competitive the industry in the outside world and how CSI provides a platform to nurture the skills of students for a better career. Prof. Anne Venkata Praveen Krishna, Past CSI state student coordinator, congratulated PACEITS for creating the right platform which enhances the employability of the students also Computer Society activities in India and in SEARCC countries. The Chief Guest K. Raja Sekhara Rao, Chairman, CSI Vijayawada chapter shared his experiences in CSI and explored to the students, the benefits of being a CSI member. He congratulated the management for encouraging CSI and the students for active participation in CSI. Students expressed gratitude for talk. Chief Guest was felicitated by Principal, Dean, and Coordinator of CSI. The program concluded with vote of thanks.

K Ramakrishnan College of Engineering, Samayapuram, Trichy (Region-VII)

CSI student branch was inaugurated on 6th March 2019 at K Ramakrishnan College of Engineering, Samayapuram, Trichy. Starting with the lighting lamp and devotional song. Mr R Selvaraj, Sr Deputy General Manager (Rtd.), BHEL, Tiruchirapalli was the Chief Guest. The guest was welcomed by Dr. D Srinivasan, Principal, K Ramakrishnan College of Engineering. The chief guest presented the cash prize to the winners of various events organized by the student branch followed by the inauguration. The CSI id cards were also distributed to the student members. The event was witnessed by around 400 student members, CSE faculty and students. 306 students were become a member of CSI. Mr. R. Selvaraj gave the inaugural keynote and mentioned the importance of CSI is playing a major role in IT policy framework. He has also encouraged the professionals by way of organizing major events. The vote of thanks was offered by the CSI student coordinator of the department.

AHMEDABAD CHAPTER

Ahmedabad Chapter in collaboration with Indus University has organized a workshop on Python Programming on 8th and 9th March 2019. The key speaker were Dr Samir B Patel, Chairman, CSI Ahmedabad Chapter and Mr Santosh Kumar Bharti, Lecturer, PDPU. The session was started with Introduction to Python language and reasons of Python language's popularity followed by various hands-on in Python. Students explored useful Python Libraries including Numpy with Arrays operations, File handing, and object oriented Concepts in Python. The workshop has explored power and simplicity of Python language for the students.

CHENNAI CHAPTER

Chapter organized a technical talk on "Digital Marketing and Website Design using WordPress" by Mr. Barath Surendran, Director - Techemate Leadership Academy on 10th December 2018

Chapter organized a function to release of the book title "The 99 Day Diversity Challenge – Creating an Inclusive Workplace" written by Dr Saundarya Rajesh, Social Entrepreneur, Founder & President, AVTAR Group, followed by a presentation on "Inclusion begins at home" on 22nd Feb. 2019. Mr Umasanker Kandaswamy, COO & Joint Director, Bruhat Insights Global released the book.

The Chapter organized two day workshop on "Python Programming" for School teachers on 25th and 26th February 2019. SMTJV Hr Sec School, Chennai has offered their Lab to conduct the workshop. MC members Ms Priya Vijay and Mr. R Babu were the Resource Persons. Mr. Ananthapadmanabhan, MC Member and Ms. Mythili Prakash, Past Secretary coordinated the programme. Dr S Poonkuzhali, Chairperson handed over the Participation certificate to the participants. The feedback was excellent and the participants are requested to conduct the same kind of workshop on regular intervals.

KANCHEEPURAM CHAPTER

Kancheepuram Chapter organized a one day state level Student convention 2k19 at SRM Valliammai Engineering College on 5th March 2019. The Event was inaugurated by Dr B Chidambara Rajan, Chairman, CSI Kancheepuram Chapter. During the inauguration, Dr Chidambara Rajan delivered an extraordinary speech explaining about various job opportunities and the concept of data analytics and its importance. He insisted that the students must not limit themselves to just securing a pass mark, but must try to go beyond that and learn what is the recent trend going around, so the students must try to obtain more insight on how to learn any subject and were motivated to indulge themselves in extracurricular activities. Dr M Murugan, Vice Principal of SRM Valliammai Engineering College felicitated the chief guest. Around 250 students were participated with various events like Code Vaganza, Quiz-O-Phile, Network Gaming and show cased their talents and utilized this opportunity for their betterment. The students felt grateful for the glorious opportunity for testing their talent. The event was coordinated by Dr M Senthil Kumar, Dr S Ravikumar and Mr V Santhana Marichamy.

LAKSHMANGARH CHAPTER

Lakshmangarh Chapter in association with Mody University of Science and Technology has organized a two days technical fest Droid 2.0 on 22nd February 2019. The dignitaries present were Dr. V K Jain (Dean-SET), Prof Venu Gopala Rao (Director Academics, MUST), Ms. Sunayna (Admin and Communications Manager, SWE, India), Shri. B. M. Bhamu (Guest of Honor, OSD, Energy Dept., Govt. of Rajasthan), Prof. H. D. Charan (Chief Guest of the event, Vice Chancellor, Bikaner Technical University, Bikaner), Dr. A. Senthil (HoD-CSE) and Dr. Anand Sharma (Coordinator-Droid 2.0). They inspired the students with their influential presence and advised them for achieving their aim without losing moral values. Dr. V. K. Jain, Dean-SET welcomed the students and dignitaries with his motivating words and showed his gratitude towards the technical society. The chief guest Prof. H.D. enlightened the students on importance of self-evaluation and how it helps one to achieve heights of success in life. Guest of honor, Mr. B. M. Bhamu gave a mesmerizing oration implying the importance of education and its essence, reflecting on not only individual personality but on whole society. The events conducted during the fest were Poster presentation, Hardware Project Presentation, Coding Competition and Mobile App Development Workshop. More than 220 students participated in various events. Droid 2.0 was successfully concluded with prize distribution and valedictory ceremony with Prof. Anriban Sengupta, Dean SMS, Prof. N. K. Joshi, HoD-NST, Dr. Anand Sharma, Secretary CSI Lakshmangarh Chapter, Ms. Samridhi Mehta, Convener, Utkarsh and Ms. Navya Mathur, Co-Convener, Utkarsh. The winners were awarded with certificates and cash prizes worth ₹ 19,500/- and all the participants were felicitated with certificate of participation.

UDAIPUR CHAPTER

A Two Day National Workshop on IOT-IGNITE held on 22nd and 23rd February in Department of Computer Science at Sophia Girls' College Ajmer (Autonomous), in collaboration with Computer Society of India, Udaipur Chapter. The workshop was inaugurated in a prayerful manner with the lighting of the lamp by Chief Guests Prof. Kumkum Garg Dean, Department of Informatics and Automation, Bhartiya Skill Development University, Jaipur the Guest of Honor Prof. N. N. Jani, Director SKPIMCS Kadi Sarva Vishwavidyalaya, Dr. Sister Pearl, Principal Sophia Girls'College Ajmer (Autonomous), Mr. Gautam Chaturvedi Convener of the workshop and Dr. Ritu Bhargava , Organizing Secretary of the workshop. Speaking on the occasion, Prof. Kumkum Garg enlightened the budding minds about IOT and skill based education. She focused on IOT as a major component of Digital India Program.

Prof. N. N. Jani introduced the "IOT Domain Ignite". He changed the phrase "Teach me and I will learn." to "Involve me and I will learn". The crux of the session was Innovation and RFID. To broaden our horizons, he demonstrated RFID system. Helpful innovations like Dash Button for physically handicapped has inspired our students to learn more about IOT. Dr. Richa Mehta, Assistant Professor SKPIMCS Kadi Sarva Vishwavidyalaya took the charge of sharing information on: "Face Recognition availing Python platform." Dr. Mehta mainly emphasized on imparting knowledge about the applicability of face recognition technology by sharing the existing mobile and web platforms. A free and open source (FOSS) environment was introduced using PYTHON. She discussed about the implementation of face recognition technique by sharing the pre-requisites of hardware and software, installation of Python Environment, open library, database browser and execution. Prof. Madhukant bhai Patel, M D Reve Automation LLP and Ex ISRO Scientist delivered a lecture on "IOT Motherboard and Building Application". The session brimmed with information on IOT and how IOT devices make decisions using smart data. He enlightened the participants over the need to learn about IOT. He gave a live demo of machine learning and sensors working on REVE Automation IOT motherboard. He also gave a demo of Actuators working on REVE IOT motherboard. He further interacted with the participants by challenging their knowledge on reliability sciences by a triangle based quiz. He shared very stimulating and instructive exchange of ideas with the participants to enhance their knowledge. Prof. Madhukant bhai Patel, made the participants familiar with Sensors, its Interface, Protocol and Actuators. He also discussed about the Basics of Embedded, including access point, gateway, and cloud. At the valedictory function, the Principal Dr. Sr. Pearl welcomes and addresses Prof. Arun K. Pujari, Vice Chancellor of Central University of Rajasthan. Prof.Pujari emphasized that technological advancement is inevitable because it is the need of the time and has numerous advantages in our daily life along with a dark side of negative social impact which we have to manage at every level of life. Dr. Ritu Bhargava, convened the Workshop, the vote of Thanks was given by Mrs. Neha Sharma.

FROM CSI STUDENT BRANCHES

REGION-II

JIS College of Engineering, Kalyani

2-2-2019 - A passion for Lesson – Techtalks – Quiz

Supreme Knowledge Foundation Group of Inst., Hooghly

23-2-2019 - Recent Trends and Advances in Artificial Intelligence and Machine Learning

REGION-II

Techno International, Batanagar

8-3-2019 - Seminar on BlockChain and Recent Trends in Computing

REGION-III

Sarvajanik College of Engineering & Technology, Surat

4-2-2019 & 5-2-2019 - Workshop on Cyber Security Recent Attacks and Countermeasures

REGION-III

Devang Patel Institute of Advance Technology and Research (DEPSTAR) Anand

9-2-2019 - Adobe Package Hands-on

15-2-2019 - Expert Talk Graph Database

Manipal University, Jaipur

6-3-2019 - CSI foundation Day celebration followed by Seminar on Cache Efficient Computing

G H Patel College of Engg. & Technology, Vallabh Vidyanagar

2-3-2019 – CSI Day Celebrations with Web-Page Designing Competition

REGION-III

B V M Engineering College, Vallabh Vidyanagar

9-3-2019 - Workshop on Arduino And Raspberry PI

Pandit Deendayal Petroleum University - School of Technology, Gandhinagar

22-2-2019 & 23-2-2019 - Workshop on Multisim-Logisim

REGION-IV

Shri Shankaracharya Inst. of Professional Mgmt. and Tech., Raipur

4-3-2019 - CodeRex : Coding Competition

REGION-V

SRK Institute of Technology, Vijayawada

6-3-2019 - CSI Day Celebrations with Technical Events

REGION-V

G Pullaiah College of Engineering & Technology, Kurnool

18-2-2019 to 20-2-2019 - Workshop on Amazon Web Services

Vallurupalli Nageshwara Rao Vignan Jyothi Institute of Engineering and Technology, Hyderabad

17-2-2019 & 23-2-2019 - Two Day National Level Technical Symposium on CLAMARITE

Srinivas Institute of Technology, Mangalore

2-2-2019 - Technical Talk on SAP

16-3-2019 – Mr Rakshith Holla and Mr Prasanna : winner of Alan Turing CSI National Student Quiz at Coimbatore

REGION-V

Kallam Haranadha Reddy Institute of Technology, Guntur

9-3-2019 – Envisage : Poster & Project Expo Contest on Emerging Trends

16-3-2019 – Quizitech : Technical Quiz Contest in Programming

CMR Technical Campus, Hyderabad

25-2-2019 to 1-3-2019 - FDP on Data Science & Big Data Analytics

7-3-2019 - Guest Lecture on Importance of Data Science and Overview of R, Python

BVRIT Hyderabad College of Engg. for Women, Hyderabad

8-3-2019 to 10-3-2019 - Boot Camp & 24 Hr Hackathon

Chalapathi Institute of Engineering and Technology, Guntur

11-3-2019 to 13-3-2019 - Workshop on Rapid Mobile Application Development

Anurag Group of Institutions, Hyderabad

6-3-2019 - Project Expo

8-3-2019 – Event on Business Analyst certification using qlik sense

REGION-V

K S Institute of Technology, Bangalore

20-2-2019 - Seminar on City Surveillance and Nayagaadi

22-2-2019 - Technical Talk on Mobile App Development

New Horizon College of Engineering, Bangalore

1-3-2019 - Motivational Talk

8-3-2019 – FDP on Hadoop-Apache Spark

JSS Academy of Technical Education, Bangalore

5-3-2019 & 6-3-2019 - Workshop on Requirement Elicitation and Design Architecture

GSSS Institute of Engg. & Technology for Women, Mysore

7-3-2019 to 9-3-2019 – Hands-on workshop on Computer Network Security : Issues & Challenges

Alva's Institute of Engineering and Technology, Moodbidri

18-2-2019 to 25-2-2019 - Certification Course on Cyber Security

Santhiram Engineering College, Nandyal

11-3-2019 to 13-3-2019 - Workshop on Cyber Security

REGION-V

Maharaja Institute of Technology, Mandya

23-2-2019 - Workshop on Web Application Security

S G Balekundri Institute of Technology, Belagavi

18-3-2019 - Workshop on Digital Marketing and SEO Tools

REGION-V

Bharat Institute of Engineering and Technology, Hyderabad

7-3-2019 - Workshop on Cyber Security, Forensics & Python Programming

REGION-VI

Sipna College of Engineering and Technology, Amravati

6-3-2019 – CSI Foundation Day Celebration followed by Seminar on Cloud Technology & Information Security

REGION-VI

College of Engineering, Pune

3-3-2019 - Workshop on Python Programming

P.E.S. College of Engineering, Aurangabad

7-3-2019 - Academic Visit to Computer Forensic Science

REGION-VII

Sathyabama Institute of Science & Technology, Chennai

21-2-2019 & 22-2-2019 - National Conference on Advances In Big data and Cloud Computing (NCABC-2019)

Syed Ammal Engineering College, Ramanathapuram

18-1-2019 to 20-1-2019 - Workshop on Mobile App Development

REGION-VII

SRM Valliammai Engineering College, Kattankulathur

16-2-2019 - National Seminar on Recent trends in Internet of Things (NSRTIOT- 2K19)

4-3-2019 - Intra College Technical Contest

National Engineering College, Kovilpatti

28-2-2019 - Technical Workshop on Blockchain Technology

S A Engineering College, Chennai

15-2-2019 - Workshop on Block Chain and Cyber Security

Kongu Engineering College, Perundurai

16-3-2019 - National Conference on Networking, Intelligence and Computing

JCT College of Engineering and Technology, Coimbatore

15-3-2019 - JFinagles- National Level Technical Symposium Tarang-2K19

Francis Xavier Engineering College, Thirunelvel

13-3-2019 - Workshop on Angular JS

Dr. M.G.R. Educational and Research Inst. Univ., Chennai

18-2-2019 & 19-2-2019 - Boot Camp on - Artificial Intelligence with IBM WATSON

FROM CSI STUDENT BRANCHES

REGION-VII

Er Perumal Manimekalai College of Engineering, Hosur

1-3-2019 - National Conference on Emerging Trends in Information & Communication Technology

Sri Venkateswara College of Engineering, Sriperumbudur

12-3-2019 – Event on HackUrSelf : Online Coding Competition

SVS College of Engineering, Coimbatore

20-2-2019 - Workshop on Python with MongoDB

23-2-2019 – Workshop on Mobile Apps Development using Android Studio

Manakula Vinayagar Institute of Technology, Puducherry

8-2-2019 - Workshop on Hadoop

15-2-2019 - Guest lecture on Bigdata in Deep Learning

Viswajyothi College of Engg. and Technology, Ernakulam

20-2-2019 – Winner at National Level Intercollegiate Quiz Competition Prayudh '19

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

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

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

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Important Moments in CSI

The Executive members of CSI on the occasion of Executive Committee meeting on 17th March 2019 at India International Centre, New Delhi

Members on the occasion of National Council meeting on 17th March 2019 at India International Centre, New Delhi

Immd. Past President of CSI, while welcoming the new President on the occasion of taking over the charge on 1st April, 2019 at CSI HQ

Prof. A K Nayak, President of CSI with the OB Members

Staff members of CSI HQ while welcoming the new President of CSI at CSI HQ on 1st April 2019

Partial view of 53rd Annual General Body Meeting in progress on 17th March, 2019 at India International Centre, New Delhi