Keshav Mahavidyalaya

NAAC Accredited 'A' Grade Cycle 2

University of Delhi

DIGITALISATION

A Step towards Viksit Bharat

e-BLITZINE 2024

Department of Computer Science

Issue 8

Welcome

e-Blitzine

Department of Computer Science
Keshav Mahavidalaya

Photo: Chetan yadav

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"As technology rapidly advances, it becomes imperative for us to adapt and embrace the new era of information."

From the Principal's Desk

I am pleased to release the 8th edition of e-Blitzine, the annual magazine of the Department of Computer Science of Keshav Mahavidyalaya. e-Blitzine stands as a perfect platform for our students to showcase their knowledge and creative abilities. I am sure that the magazine is an outcome of the creativity, hard work, and enthusiasm of the students under the able guidance of their faculty members. I commend the entire team for their efforts.

I am happy to notice that the theme of the magazine, 'Digitalisation: a step towards Viksit Bharat' highlights digitalisation with a vision of marching towards a developed India by 2047. As technology rapidly advances, it becomes imperative for us to adapt and embrace the new era of information. The articles highlight the digitalisation initiatives taken up by the government of India under Digital India programme. Some articles talk about MOOC platforms like Swayam, repositories like Digilocker, e-commerce site like GeM, an electronic agriculture market e-NAM, unified mobile application UMANG and most importantly Aadhaar under UIDAI. Some articles discuss the technologies developed indigenously like BharOS, a mobile operating system designed by IIT Madras. All in all, the articles are informative and cover a broad spectrum of digital initiatives taken up by the government for social benefit and achieving sustainable goals in the near future.

I congratulate the e-Blitzine team for bringing out the magazine with informative and thought-provoking articles from major domains of computer science and technology. I wish success to all students and staff members of the department for their future endeavors.

I encourage everyone to go through this edition of e-Blitzine. I hope that this magazine will motivate and inspire readers to challenge themselves in understanding the nuances of technology. I wish they follow their pursuits, fulfill their dreams and be responsible tech-savvy citizens of India.

Prof. Madhu Pruthi
Principal
Keshav Mahavidyalaya

"Arise awake and stop not till the goal is reached."

– Swami Vivekananda

From Convenor (e-Blitzine)

Dear Reader,

On behalf of the e-Blitzine Committee of the Department of Computer Science, Keshav Mahavidyalaya, I feel privileged to present the 8th edition of the annual magazine e-Blitzine'24. The theme of this edition is 'Digitalisation: a step towards Viksit Bharat'.

'Viksit Bharat 2047' is a roadmap charted out by the Government of India envisioning India as a completely developed nation by 2047. Digitalisation of core services is one of the key factors in transforming a developing nation into a developed nation. The theme was carefully chosen to highlight the importance of increasing digital footprints in society. The very idea behind bringing out an e-magazine was to go paperless and the electronic edition is a result of digitalisation. As the world becomes more interconnected, digital platforms provide vital channels for communication and knowledge dissemination. Besides, digitalisation has marked its presence in all fields affecting our lives, be it marketing, finance, medicine, sports, agriculture, education, entertainment and beyond.

This edition is unique in multiple ways. To begin with, we invited and accepted articles in both Hindi and English. Secondly, three best articles have been chosen by the editorial team (one each in Hindi and English and one best creative) and special mentions are accredited to the authors. Thirdly, a survey on digital awareness was conducted by the student team and the results are published in the magazine.

I am grateful to all who contributed thoughtful articles, poems, illustrations, technical reports and edutainment content. The articles included in this edition highlight the importance of digitalisation in managing voluminous data and providing the required information at the touch of an icon. Some articles point out that digital technology is a double-edged sword. On one hand, it is immensely beneficial for mankind, but on the other gives us enough reason to be wary of itself. The information helps the readers make informative decisions while dealing with digital resources.

I am glad to acknowledge that this edition is the outcome of great team efforts put in by the dedicated e-Blitzine team with faculty members Ms. Astha Goyal and Dr. Sumit Aggarwal, and the student editorial board comprising Ms. Dhavni (Editor-in-Chief), Mr. Chetan Yadav (Creative Head) and all enthusiastic student members. I wish to convey my sincere thanks to our principal Prof. Madhu Pruthi, the vice principal Prof. Kanupriya Goswami, teacher-in-charge Prof. Priti Sehgal, BLITZ convenor Dr. Roli Bansal, the teaching and non-teaching staff and all students of the department for their wholehearted support in bringing out this magazine.

I sincerely hope that e-Blitzine'24 leaves you with seeds of insights and creative ideas to ponder over and nurture into fruit-bearing trees of knowledge.

Dr. Richa Sharma
Associate Professor
Department of Computer Science

"This theme encapsulates our commitment to embracing digital transformation as a catalyst for the development of a progressive and technologically empowered Bharat."

From Convenor (BLITZ)

On behalf of BLITZ, the computer society of the Department of Computer Science, I once again welcome all our readers to another exciting edition of the society's annual magazine e-Blitzine. I congratulate the entire team of e-Blitzine under the able guidance of Dr. Richa Sharma for working meticulously to bring out this informative magazine. As we embark on this journey into the digital realm, we are thrilled to unveil our theme for this year: 'Digitalisation: a step towards Viksit Bharat'. This theme encapsulates our commitment to embracing digital transformation as a catalyst for the development of a progressive and technologically empowered Bharat.

Since its inception in 1996, BLITZ has been at the forefront of nurturing technological talent and fostering innovation within the Department of Computer Science. Our mission to bridge the gap between academia and industry remains steadfast, as we continue to provide students with the necessary tools and knowledge to thrive in an increasingly digital world.

I am proud to acknowledge the unwavering dedication of the society's faculty members, including Dr. Namita Aggarwal, Dr. Rakesh Kumar and Ms. Nidhi Passi, whose guidance and mentorship have been instrumental in shaping the success of our society. Likewise, I extend my heartfelt gratitude to the students members who have tirelessly contributed to our endeavours, including Ms. Shruti Sharma as President, Mr. Rahul Arora as Secretary, Mr. Shashank Deep as Treasurer, Ms. Simran Dureja, Mr. Jatin Puri, Ms. Nancy Gupta and Ms. Priyanshi Jain as Senior Executives, and Mr. Sourabh Pal, Ms. Aleesha Singh, Mr. Jalaj Kumar and Ms. Kanishka Rai as Executives.

Throughout the year, BLITZ has organized a myriad of activities tailored to the interests and aspirations of our student body. From enlightening seminars to exhilarating coding competitions, our events have served as a platform for students to enhance their skills and expand their horizons. We have been privileged to host distinguished industry professionals who have shared their insights and experiences on topics ranging from cybersecurity to open-source development. As we gear up for our annual extravaganza, 'BLITZKRIEG 2024', we are filled with anticipation for the stimulating challenges and opportunities that lie ahead. This flagship event promises to ignite the imaginations of our participants and equip them with the skills necessary to thrive in an ever-evolving technological landscape.

I would like to express my sincere appreciation to our Principal, Prof. Madhu Pruthi for her steadfast support and encouragement. Additionally, I extend my gratitude to our Teacher-in-Charge Prof. Priti Sehgal and all members of teaching and non-teaching staff for their invaluable contributions to our society's success.

As we continue our journey towards a Viksit Bharat, I am reminded of the pivotal role that each and every student plays in shaping the future of our society and its continued growth and prosperity. Together, let us embrace the power of digitalisation as we strive towards a brighter and more prosperous tomorrow.

Dr. Roli Bansal
Associate Professor
Department of Computer Science

"I dream of a digital India where knowledge is strength - and empowers the people."

– Narendra Modi

From Teacher-In-Charge

Digital India is a flagship programme, an initiative of the Government of India. Its main objective is to transform India into a digitally empowered society and knowledge economy. Viksit Bharat@2047 is a vision under digital India to transform our country into a developed nation by 2047. Technology holds a key to realizing this vision. Our Computer Science students must shoulder this responsibility and help achieve the vision of Viksit Bharat with their innovative ideas. e-Blitzine provides a platform where our young minds can share their technical ideas in the global context. The very theme of our magazine 'Digitalisation: a step towards Viksit Bharat', helps our students to showcase how the rapidly advancing technology can help reshape the physical world. As a teacher-in-charge of the Department of Computer Science, I am proud to serve my nation through this theme of e-Blitzine. I am thankful to our Principal, Prof. Madhu Pruthi, for her continuous support. I congratulate the editorial team of e-Blitzine for the successful launch of yet another issue.

Ms. Priti Sehgal
Professor
Department of Computer Science

About e-Blitzine

The Department of Computer Science at Keshav Mahavidyalaya has consistently strived to be a beacon of knowledge and innovation in the field of computer science. Since 2017, the annual magazine 'e-Blitzine' has been published with the goal of enlightening readers about the most recent advancements in technology through interesting articles, creative sections, activities, and engaging visuals. In 2023, e-Blitzine expanded its presence to social media platforms and introduced a monthly forum. The goal remains to educate and inspire readers to keep up with breakthroughs in the ever-dynamic tech world and embrace new technologies for a better future.

About BLITZ

BLITZ, or the Brilliant Information Technology Zealots, is a vibrant society founded by Keshav Mahavidyalaya's first group of B.Sc. (Hons.) Computer Science students. Committed to promoting creativity and career advancement, BLITZ has emerged as a major player in the campus community, greatly enhancing its lively environment. BLITZ has developed into a proactive organization with the goal of raising academic standards and improving extracurricular activities. It is led by the Principal, the faculty, and peers. In keeping with the motto 'SILICON MINDS, CIRCUITED HEARTS,' technical festivals, seminars, and debates are hosted to educate students on the newest advancements in information technology.

@eblitzine

@blitzkmv

IN THIS EDITION

In this edition, we explore the revolutionary potential of digitalisation in shaping the future of the nation.

As Information Age 2.0 unfolds, digitalisation emerges as a pivotal catalyst in reshaping industries, economies, and societal interactions. We seek to shed light on the many facets of digitalisation, how it affects various sectors and what difficulties it poses. Digitalisation is a cultural movement as much as a technological one. Through recognition of its obstacles and proactive management of its course, we may fully utilise its enormous potential to build a future that is sustainable, just, and affluent for everybody.

Moreover, in this edition, we have included insights from a survey, conducted by our team, regarding the cognizance surrounding digitalisation and cyber safety. This year, the editorial board has also included articles and creative pieces in Hindi and has recognised the best submissions as 'Editor's Choice'.

We are grateful to all the students who contributed their eloquent thoughts, brilliant ideas, and beautiful artwork to e-Blitzine. We also extend warm thanks to the e-Blitzine Committee, Dr. Richa Sharma, Ms. Astha Goyal and Dr. Sumit Aggarwal, for their thoughtful suggestions, diligent guidance and support.

Hope you have a good time reading!

Regards,
Team e-Blitzine

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BLITZ EVENTS

2023-24

Seminar on Career Opportunities in Cybersecurity

Date: 19th October, 2023
Time: 11:00 AM

On October 19, 2023, BLITZ, the Computer Science Society of Keshav Mahavidyalaya, organised a seminar on 'Career Opportunities in Cyber Security,' featuring Mr. Rajiv Khandelwal as the keynote speaker. A former student of Keshav Mahavidyalaya from the batch of 1995-1998, Mr Khandelwal currently holds the position of Global Delivery and Practice Head in the field of Cybersecurity at Tata Advanced Systems. With more than two decades of practical experience, he is a highly accomplished leader in the realm of cybersecurity, possessing a profound technical knowledge that covers the entire spectrum of this field.

Commencing at 11 AM, the seminar was initiated by Professor Priti Sehgal who extended a warm welcome to the speaker by presenting a sapling as a token of appreciation. Shruti Sharma, the President of BLITZ, and Rahul Arora, the Secretary of BLITZ, also extended their greetings to the attendees. Furthermore, Nancy Gupta and Priyanshi Jain, Senior Executives of BLITZ, provided the audience with an overview of the BLITZ society, emphasising the events organised during previous terms. Subsequently, Shruti introduced the speaker and invited him to begin the seminar.

The seminar commenced with the speaker engaging the audience by asking, "How would you define Cybersecurity?" This question kickstarted an interactive conversation. As the seminar progressed, the speaker introduced the integration of Confidentiality, Integrity, and Availability and stressed their significance within the cybersecurity field.

He, further, delved into a comprehensive exploration of the Cybersecurity concept, shedding light on cyber-attacks targeting not just numerous corporate entities worldwide but also governmental organisations.

Mr Khandelwal analysed the distinctions and similarities between cybersecurity and information security to enhance the understanding of the audience. The discussion extended to strategies for safeguarding users against Phishing, SQL injection, and cross-site scripting.

The speaker also addressed the topic of cybersecurity standards and regulations and provided a comprehensive list of various career prospects within the realm of cybersecurity, encompassing data security, application security, network security, system security, and mobile security among many others. Additionally, he offered valuable insights on protecting users from cyber threats on social media platforms and unfamiliar URLs. The speaker actively engaged with the audience through thought-provoking questions, encouraging students to think creatively. The seminar culminated in a productive question-and-answer session.

Concluding the event, Dr. Roli Bansal, the Convenor of BLITZ, expressed her gratitude through a vote of thanks. The seminar proved to be a resounding success, marked by its high level of interaction and the valuable information it provided the students with. The BLITZ team felt encouraged to eagerly organise additional sessions in the future, aiming to assist students in grasping the intricacies of modern technologies and nurturing the essential skills needed to excel in the ever-changing landscape of technology.

Rahul Arora
BSc (H) Computer Science
2nd Year

Code Xcelerator: A Coding Competition

Date: 6th November, 2023
Time: 1:30 PM

On November 6, 2023, BLITZ, the Computer Science Society of Keshav Mahavidyalaya, organised a coding competition "Code Xcelerator" to foster the spirit of innovation and problem-solving among students, encouraging them to apply their coding skills to real-world challenges.

The competition's duration was 1 hour and 30 minutes and it was a team event. BLITZ received participation from 18 teams across all the years as well as departments. The competition was conducted in the Computer Labs of the department of Computer Science. At 1:30 PM, the event officially commenced with Rahul, the Secretary of BLITZ, delivering detailed instructions about the rules and regulations that were to be followed throughout the event.

At 1:45 PM, the competition was hosted on HackerRank and was of 115 points. It consisted of seven questions with varying difficulty levels: easy, medium, and hard, each worth 10, 15, and 25 points respectively. The topics covered in the competition included N-coloring problems, dynamic programming, backtracking, linked lists, greedy approach, optimisation problems, and more.

All participating teams delivered their best performances throughout the event while the BLITZ team diligently observed participants for any indications of cheating or breaches of the competition guidelines.

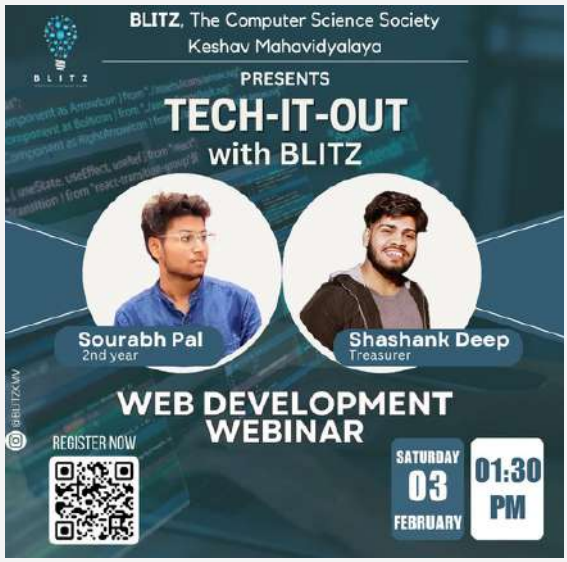
The event concluded around 3:30 PM, Dr. Roli Bansal, Convenor of BLITZ, appreciated all of the participating teams and declared the winners. She also shared tips on how to improve coding skills for better performance in the future. The first position was bagged by Prashant Mishra and Prateek Badola from 3rd Year, B.Sc. (Hons.) Computer Science and the second position was secured by Nitish Thakur and Sachin Sharma from 2nd Year, B.Sc. (Hons.) Computer Science and the third position was secured by Tejas Goel and Vivek Dubey from 1st year, B.Sc. (Hons.) Computer Science. The competition proved to be a resounding success.

Simran Dureja
BSc (H) Computer Science
3rd Year

TECH-IT-OUT with BLITZ

Date: 3rd February 2024 - 15th February 2024

The 'TECH-IT-OUT with BLITZ' series, organised by BLITZ, the Computer Science society of Keshav Mahavidyalaya, aimed to provide students with valuable insights and practical knowledge in various domains of technology. The series comprised two seminars and two webinars, each designed to cater to different aspects of technological learning and skill development for the students.



Episode 1: WebDev Kickstart
Date: 3rd February 2024

The series kicked off on February 3rd, 2024, with the webinar. This session was tailored to introduce participants to the foundational concepts of web development. Shashank Deep, Treasurer of BLITZ, and Sourabh Pal, Executive of BLITZ, started the webinar by highlighting website development as a promising career option within the IT sector. They provided insights into the web development industry, emphasising internships, technologies, job prospects, projects, and opportunities available in the field. They explained the components of web development, namely Frontend, Backend, and Database and elucidated a comprehensive learning roadmap. Additionally, they offered tutorial assistance tailored for beginner developers.

Episode 2: Roadmap to Competitive Coding
Date: 8th February 2024

Following the webinar, BLITZ hosted a seminar on 8th February 2024. Competitive coding has become increasingly popular among students aspiring for careers in software development and computer science. The seminar aimed to equip participants with the necessary skills and strategies to excel in coding competitions. Simran Dureja and Jatin Puri, Senior Executives of BLITZ, shared valuable tips on algorithmic problem-solving, data structures and time management techniques. Through real-world examples and practice problems, attendees learned how to approach coding challenges effectively and enhance their problem-solving abilities.

Episode 3: Streamline Your Research with LaTeX
Date: 10th February 2024

Continuing the series, a webinar was organized on 10th February 2024 by BLITZ. LaTeX has emerged as a preferred typesetting system for academic and scientific documents due to its versatility and professional formatting capabilities. In the session, participants learned how to leverage LaTeX to create high-quality research papers, reports and presentations. Shruti Sharma, President of BLITZ, and Nancy Gupta, Senior Executive of BLITZ, explained topics such as document structure, formatting styles and the importance of research papers. Live demonstrations were also presented, enabling the students to streamline their research workflow and produce polished academic documents.

Episode 4: Artificial Intelligence (AI) and Machine Learning (ML)
Date: 15th February 2024

Wrapping up the series, BLITZ hosted a seminar highlighting Artificial Intelligence (AI) and Machine Learning (ML) on 15th February 2024. With AI and ML revolutionising various industries, the seminar aimed to provide participants with insights into the latest advancements, applications, and career opportunities in these fields. Shruti Sharma, President of BLITZ, Rahul Arora, Secretary of BLITZ, and Priyanshi Jain, Senior Executive of BLITZ, discussed fundamental concepts of AI and ML, including supervised and unsupervised learning, neural networks, and deep learning.

Attendees gained an understanding of how AI and ML technologies are transforming industries such as healthcare, finance, and transportation. The seminar also highlighted the importance of ethical considerations and responsible AI deployment in today's digital age. Speakers also highlighted the available career opportunities in these domains and the ways to acquire necessary skills for the same.

Various fun events were also conducted like typing speed competition and an interesting quiz session which increased the level of engagement of the attendees. Throughout all these seminars and webinars, attendees had the opportunity to be part of interactive discussions, ask questions, and gain practical insights.

Overall, the 'TECH-IT-OUT with BLITZ' series offered a comprehensive learning experience for participants, covering a diverse range of topics in technology and fostering a culture of innovation and skill development within the college community. Through engaging sessions and practical demonstrations, attendees were equipped with the knowledge and tools to thrive in the dynamic field of technology.

Rahul Arora
BSc (H) Computer Science
2nd Year

BLITZKRIEG'23: The Annual Tech Fest

Date: 24th March, 2022
Time : 10:00 AM to 6:00 PM

The annual tech festival, BLITZKRIEG, held at Keshav Mahavidyalaya, University of Delhi, transpired on March 24th, 2023, from 10:00 AM to 6:00 PM, encompassing a wide range of technical and non-technical events. The festival commenced at 10:00 AM with an inauguration ceremony hosted in the college's seminar hall. Simrat Deol, the President of BLITZ, and Diksha Singh, the Secretary of BLITZ, eloquently hosted the entire ceremony.

Esteemed dignitaries graced the event, including the respected Principal Prof. Madhu Pruthi, the senior-most professor of the Department of Computer Science Prof. Priti Sehgal, the Teacher In-Charge of the Computer Science Department Ms. Maulein Pathak, and the Convenor of the BLITZ society Dr. Roli Bansal, along with all the faculty members. Principal Prof. Madhu Pruthi, along with the other dignitaries, commenced the event by lighting the lamp ceremoniously.

Following which she congratulated the entire organising team and shared her valuable insights.

Prof. Priti Sehgal and Ms. Maulein Pathak also shared their kind and motivating thoughts with the audience. Subsequently, Dr. Anjali Thukral, the Convenor of team e-Blitzine, invited the dignitaries for the inauguration of the 7th Issue of the annual magazine of the Computer Science department, e-Blitzine. The theme for the 2023 edition of the magazine was 'Information Age 2.0' which encapsulates the convergence of cutting-edge technologies such as Artificial Intelligence (AI), Internet of Things (IoT), 5G networks, and decentralized technologies like Blockchain.

As the inauguration ceremony concluded, the organising committee commenced the main events of the festival. These events were conducted simultaneously in a three-tiered manner.

The first set of events comprised the coding competition ‘Code Duel’, the AI-based business pitching competition ‘AI Tank’, and the digital art competition ‘Stream Draw’.

Code Duel provided an exhilarating platform for tech enthusiasts to test their coding abilities through a series of challenges. AI Tank fused business with technology, allowing participants to present their AI-driven startup ideas to a panel of judges and an audience of fellow entrepreneurs. The Stream Draw captivated participants who possessed artistic skills, challenging them to design characters from the world of over-the-top (OTT) media using graphic design and illustration techniques.

The second set of events commenced in the afternoon and included the web development event ‘Webopoly Spree’, the Harry Potter-themed debating competition ‘Ministry of Magic’, and the machine learning-based competition ‘Trading Titans’.

Webopoly Spree cleverly merged the board game Monopoly with web development, evoking childhood nostalgia while emphasising innovation and technology. Participants had to build their web development toolkit while playing the game of Monopoly and subsequently employ those tools to construct a website.

The Ministry of Magic, based on the world of Harry Potter, organized a spirited debating competition in the form of a trial, igniting passionate discussions among participants from the wizarding community. The topic for this year's competition was "Is ChatGPT a threat to wizards and technical jobs?". Trading Titans evaluated participants' skills in utilising machine learning algorithms to predict stock prices.

Following these events, the third set consisted of a gaming competition on ‘Valorant’ and an eagerly anticipated treasure hunt called ‘Creepy Crypt Hunt’. The Valorant showdown catered to aspiring gamers who shared a profound passion for gaming and its associated culture.

Participants were tasked with collaborating effectively, leveraging the unique abilities of diverse in-game characters to outmanoeuvre and outsmart the opposing team. The highly anticipated Creepy Crypt Hunt, inspired by the trending Netflix series "Wednesday", the event witnessed an overwhelming participation. To succeed, participants needed to tap into their inner Wednesday Addams, employing their psychic abilities to decipher hints provided through QR codes. The hunt comprised two rounds, with the first round featuring a crossword puzzle for the teams, and the second round culminating in the final treasure hunt where teams had to locate the ultimate treasure known as the "Thing".

After a delightful experience at the events, the organizing team concluded the festival with a prize distribution ceremony. The computer science faculty awarded winners in their respective events with certificates and generous cash prizes.

Having conducted the festival online for the past two years, the society expressed gratitude for the successful offline execution of BLITZKRIEG. Tech wizards and enthusiasts from across the University of Delhi flocked to the event, demonstrating their keen interest. The theme-based events provided an enjoyable platform for tech-savvy individuals to showcase their skills, while also introducing non-technical participants to the world of technology in a fun-filled manner.

Simrat Deol
Former President, BLITZ

DIGITALISATION

A Step towards Viksit Bharat

Ideas For The Vision
VIKSIT BHARAT@2047

"Today the goal of the country is
Viksit Bharat, Sashakt Bharat!
We cannot stop until this dream of a
developed India is fulfilled."
-Narendra Modi, Prime Minister

Reference: Viksit Bharat

Vision 2047 : Shaping India's Future Together

Think of a transformed nation, where opportunity thrives, innovation flourishes, and prosperity touches every corner. Imagine India in 2047, a century after independence. This is the vision of Viksit Bharat@2047. As young minds and the future of our nation, we all have the potential to play a vital role in shaping a more developed and prosperous India. The Viksit Bharat Initiative recognises this potential and aims to empower students like us to become active participants in nation-building.

Viksit Bharat@2047 is the vision of the Government of India to transform India into a developed nation by the centenary of its independence in 2047. This ambitious initiative, launched by the Government of India, is not just a dream; it's a call for action. It's a call to us, the youth of this nation, to become architects of a brighter future.

According to Viksit Bharat@2047, modern India would emerge as an innovator in:

- **Economic growth:** Picture a thriving economy in which each person has the opportunity to prosper and make a contribution.
- **Social progress:** Consider a society devoid of inequality, where everyone has equal access to healthcare and education, and every child is given the chance to achieve their full potential.
- **Environmental sustainability:** Now, picture yourself living peacefully with the natural world, making judicious use of resources, in turn, safeguarding the environmental resources for the future generations.
- **Good governance:** Imagine having a transparent and accountable system of governance, where every citizen has a voice and feels empowered enough to participate.

Though it may appear impossible, this vision is attainable. We can make it happen by utilising the strength of our combined potential and directing our ideas, efforts, and dedication.

We, as students, have the key that may unlock this future. The powers of change lay within our creativity, curiosity, and unwavering faith in a better tomorrow.

India stands at a pivotal moment, poised to take off on an incredible growth trajectory. But reaching the destination of Viksit Bharat by 2047 demands more than just potential. It requires strong leadership, unwavering effort, and unwavering faith in ourselves. The government has taken many initiatives to promote awareness and to encourage young minds for the future of the country.

Digital India is also one of the initiatives started by the Govt. of India to promote digital awareness. This includes:

- **Digital India:** By granting access to technology, platforming e-governance services, and digital literacy, this flagship project seeks to make India a society empowered by digital means.
- **BharatNet:** This project intends to provide high-speed internet connectivity to every gram panchayat (village council), so that rural communities can use online opportunities and services.
- **MyGov:** Through this platform, citizens can interact with the government by offering suggestions, taking part in debates, and using a range of e-governance services.
- **Aadhaar:** This exclusive identifying number promotes financial inclusion and transparency through its use in several government programs and services.
- **UMANG:** This smart phone application offers a single platform for accessing more than a thousand government services in different areas.
- **Startup India:** This initiative aims to promote entrepreneurship and innovation by providing funding, mentorship, and other support to startups.
- **Skill India:** The purpose of Skill India is to teach millions of youth about skill development so they can thrive in the digital economy.
- **Digital Literacy Mission:** By providing citizens with essential digital skills and knowledge, this effort seeks to make every citizen digitally literate.
- **Smart India Hackathon:** The annual Smart India Hackathon encourages students to create original solutions to pressing issues faced by the public sector and society.
- **National Educational Technology Forum (NETF):** This forum promotes the use of technology in education and provides resources and training for teachers and students.

Designed by: Lipika

These are just a few of the several government programs encouraging digitalisation and giving students the tools they need to support Viksit Bharat. Through their active participation in these projects and responsible use of technology, students may significantly contribute to the development of a more stable and developed India.

The five main elements of the Viksit Bharat program are essential to constructing a developed and affluent India by 2047. Let's examine each subject and its objectives in more detail:

Designed by: Lipika

- **Empowered Indians:** Picture a society in which every individual has the opportunity to realise their full potential and has access to high-quality healthcare and education. This subject focuses on attaining gender equality, inclusivity for marginalised communities, skill development and training, accessible healthcare and education. Give your thoughts on how to make education systems better, encourage skill development, push for affordable healthcare, and encourage growth inclusive of all.

- **Thriving and sustainable economy:** Imagine a thriving and sustainable economy that conserves environment, generates employment, and grows fairly. This subject delves into the areas of digital transformation, climate change mitigation, infrastructure, renewable energy, sustainable agriculture. digital inclusiveness, foster innovation, assist businesses, promote green energy efforts, and advocate for sustainable behaviour.

- **Innovation, science and technology:** Imagine living in a knowledge-based society that is at the front of scientific and technological developments, where technology serves as a tool for advancement. The research and development in important fields, STEM education, technological startups, digital infrastructure growth, and appropriate use of AI are all covered by this subject.

Discuss ideas for advancing STEM education, funding tech businesses, advocating for the moral use of AI, newer and even more innovative AI-powered sustainable solutions, in order to utilise the means of technology for social good.

- **Good governance and security:** Imagine an effective, accountable, and transparent form of governance and administration that guarantees the protection and safety of every citizen. This subject covers promotion of e-governance, better cybersecurity, guarding national security, combating corruption, and fortifying democratic institutions. Make recommendations on improving governance transparency, attaining stronger grounds of cyber security, enforcing anti-corruption measures, and participating in talks about national security strategies. Technology, if used for interest of nation and its people, can aid a convenient and functional government.

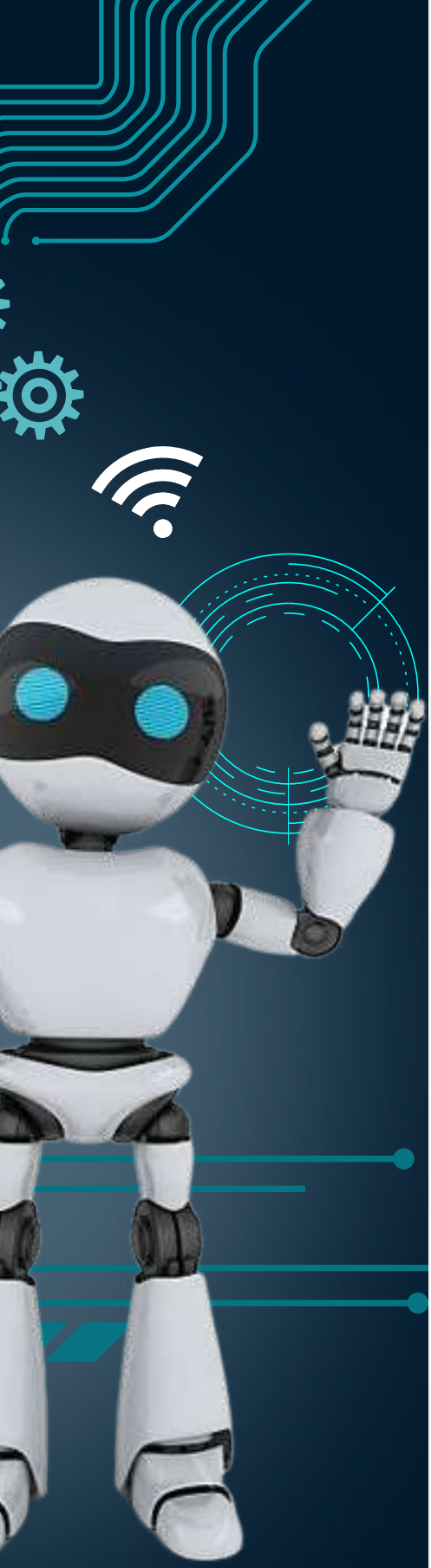
- **India in the world:** Witness India grow into a major force in the world arena, bringing prosperity, peace, and advancement with it. This subject looks at fostering international dialogue, strengthening diplomatic ties, working together to address global issues like climate change, and supporting international peacekeeping missions. Discuss strategies for enhancing India's reputation abroad, supporting initiatives for cultural interchange, coming up with answers to world problems, and arguing for India's active involvement in international opportunities.

Remember, every idea matters!

Every suggestion, and every thought, no matter how big or small, can ignite a spark that leads to positive change.

Share your ideas on specific strategies, initiatives, and partnerships that can propel India on the world stage. By working together, we can ensure that India's rise benefits not only itself but the entire global community. Together, we can build a Viksit Bharat that lives up to its potential and is as ideal as it can get.

Komaldeep
BSc (H) Computer Science
2nd Year



Designed by: Lipika

Editor's Choice

आर्टिफ़िशियल इंटेलिजेंस: डिजिटलीकरण का नया युग

मानव जाति लगातार विकसित और विकसित हो रही है। प्राचीन काल में गुफाओं में रहने से लेकर अब गगनचुंबी इमारतों में रहने तक, हम एक लंबा सफ़र तय कर चुके हैं और अभी भी बहुत कुछ करना बाकी है। शुरुआत में हमने छह सरल मशीनें विकसित कीं, जो थीं- वेज, स्क्रू, लीवर, पुली, इनक्लाइंड प्लेन, व्हील और एक्सल। अब हमने विभिन्न प्रकार की जटिल मशीनें जैसे कि कंप्यूटर, कार, हवाई जहाज़ आदि विकसित की हैं।

जैसे-जैसे हम विकास कर रहे हैं, हम अपने अधिकतम कार्य बिना किसी प्रयास या कम से कम इनपुट के, स्वचलित रूप से करने का प्रयास करते हैं। इससे प्रौद्योगिकी के आधुनिक युग और विभिन्न क्षेत्रों के डिजिटलीकरण का मार्ग प्रशस्त हुआ। आजकल हम आर्टिफ़िशियल इंटेलिजेंस (एआई) को लेकर अधिक उत्सुक हैं। अधिकांश क्षेत्रों में एआई का प्रयोग किया जा रहा है और यह महत्वपूर्ण योगदान दे रहा है। एआई का अनुप्रयोग हमारे दैनिक जीवन के विभिन्न पहलुओं में दिखाई देता है। उदाहरण के लिए, एआई का उपयोग वाणिज्य, सेवा, विनिर्माण, स्वास्थ्य और शिक्षा क्षेत्रों में किया जा रहा है। इससे हमारे काम करने का तरीका भी बदल गया है। वहीं दूसरी ओर देखा जाता है कि कई लोग अपनी नौकरी की सुरक्षा को लेकर चिंतित रहते हैं। ये सभी बिंदु इस लेख की ओर ले जाते हैं।

एआई और डिजिटलीकरण क्या है?

एआई यानी आर्टिफ़िशियल इंटेलिजेंस को हम हिंदी में कृत्रिम बुद्धिमत्ता कहते हैं। एआई एक मशीन की उन संज्ञानात्मक कार्यों को करने की क्षमता है जिन्हें हम मानव दिमाग से जोड़ते हैं, जैसे कि विचार करना, तर्क करना, सीखना, पर्यावरण के साथ बातचीत करना, समस्या को हल करना और यहां तक कि रचनात्मकता का अभ्यास करना। यह कई दृष्टिकोणों, जैसे कि मशीन लर्निंग और गहन शिक्षण में प्रगति के साथ साथ एक अंतःविषय विज्ञान है।

डिजिटलीकरण एक व्यवसाय मॉडल को बदलने और नई राजस्व धाराएँ और मूल्य उत्पादन के अवसर पैदा करने के लिए विभिन्न डिजिटल प्रौद्योगिकियों का लाभ उठाने की प्रक्रिया है। इसमें प्रबंधन और संचार से लेकर उत्पादन और ग्राहक सेवा तक व्यवसाय के संचालन के विभिन्न पहलुओं में डिजिटल टूल और सिस्टम को एकीकृत करना शामिल है। यह भी कहा जा सकता है कि डिजिटलीकरण दैनिक जीवन में कार्यों को सरल और कुशल बनाने के लिए विभिन्न डिजिटल प्रौद्योगिकियों और उपकरणों के एकीकरण की प्रक्रिया है।

एआई डिजिटल युग की आधारशिला के रूप में उभरा है, जिससे प्रौद्योगिकी के साथ जुड़ने और हमारे आसपास की दुनिया के साथ बातचीत करने के तरीके में क्रांतिकारी बदलाव आया है। आभासी सहायकों और अनुशंसा प्रणालियों से लेकर स्वायत्त वाहनों और स्वास्थ्य देखभाल निदान तक, एआई अनुप्रयोग हमारे दैनिक जीवन के हर पहलू में व्याप्त हैं, और मानव-मशीन संपर्क की गतिशीलता को मौलिक रूप से बदल रहे हैं। हमारे डिजिटल जीवन पर एआई का सबसे गहरा प्रभाव व्यक्तिगत उत्पादकता और दक्षता बढ़ाने की इसकी क्षमता है।

एआई के लाभ

हमने देखा है कि अधिकांश ऐप्स और साइटें अपने स्वयं के पूर्व-प्रशिक्षित एआई मॉडल चैटबॉट विकसित कर रहे हैं। उदाहरण के लिए- ChatGPT ओपनएआई (OpenAI) द्वारा विकसित एक जेनरेटिव पूर्व-प्रशिक्षित चैटबॉट है। इसी तरह, गूगल द्वारा विकसित चैटबॉट का नाम गूगल बार्ड है। ये प्लेटफ़ॉर्म ऐसे बॉट क्यों विकसित कर रहे हैं? ऐसा इसलिए है क्योंकि चैटबॉट विकास उनकी व्यावसायिक प्रक्रियाओं को बेहतर बनाने और अपने ग्राहकों को बेहतर उपयोगिता अनुभव प्रदान करने पर केंद्रित है। इससे उपयोगकर्ताओं द्वारा अपने प्लेटफ़ॉर्म पर बिताया गया औसत सक्रिय समय बढ़ जाता है क्योंकि इससे वेबसाइटें अधिक पेशेवर, जानकारीपूर्ण और आसान हो जाती हैं।

क्या एआई केवल इन चैटबॉट्स तक ही सीमित है या अन्य क्षेत्रों में भी उनका कोई अन्य अनुप्रयोग है?

नहीं, एआई डिजिटल युग की आधारशिला के रूप में उभरा है, जिससे प्रौद्योगिकी के साथ जुड़ने और हमारे आसपास की दुनिया के साथ बातचीत करने के तरीके में क्रांतिकारी बदलाव आया है। आभासी सहायकों और अनुशंसा प्रणालियों से लेकर स्वायत्त वाहनों और स्वास्थ्य देखभाल निदान तक, एआई अनुप्रयोग हमारे दैनिक जीवन के हर पहलू में व्याप्त हैं, और मानव-मशीन संपर्क की गतिशीलता को मौलिक रूप से बदल रहा है। हमारे डिजिटल जीवन पर एआई का सबसे गहरा प्रभाव व्यक्तिगत उत्पादकता और दक्षता बढ़ाने की इसकी क्षमता है।

सिरी, गूगल असिस्टेंट, गूगल बार्ड और एमेज़ॉन एलेक्सा जैसे एआई-संचालित वर्चुअल असिस्टेंट दैनिक कार्यों को प्रबंधित करने, शेड्यूल व्यवस्थित करने और मांग पर जानकारी प्राप्त करने के लिए अपरिहार्य उपकरण बन गए हैं।

Designed by: Lipika

एआई के कुछ अनुप्रयोग

- **वित्तीय संस्थान:** वित्तीय संस्थानों में एआई एल्गोरिदम का उपयोग किसी व्यक्ति या कंपनी के वित्तीय डेटा में विसंगतियों और रुझानों की पहचान करने और वर्गीकृत करने के लिए किया जाता है, जिन पर मानव विश्लेषकों का ध्यान नहीं जा सकता है। इससे धोखाधड़ी और महत्वपूर्ण गलतबयानी का जोखिम कम हो जाता है। कॉर्पोरेट बैंकों में एआई के अनुप्रयोग ग्राहक सेवाओं को बढ़ावा देते हैं, निवेश को अनुकूलित करते हैं और बाजार के रुझान की भविष्यवाणी कर सकते हैं।

- **स्वास्थ्य सेवाएँ:** भारत जैसे बड़े देश में, जहाँ जनसंख्या लगातार बढ़ रही है, स्वास्थ्य रिकॉर्ड बनाए रखना एक कठिन कार्य है। एआई का उपयोग मेडिकल रिकॉर्ड और अन्य डेटा के प्रबंधन, दोहराए जाने वाले कार्य, उपचार डिजाइन, स्वास्थ्य निगरानी आदि के लिए किया जा रहा है। मरीज़ों को अब डिजिटल परामर्श की मदद से सीधे उनके घर पर सहायता प्रदान की जा रही है।

एआई मॉडल्स की सीमाएँ

एआई डेटा को प्रोग्रामिंग करने देने के लिए प्रगतिशील शिक्षण एल्गोरिदम के माध्यम से अनुकूलन करती है। उन्हें ठीक से काम करने के लिए पिछले डेटा और इनपुट की आवश्यकता होती है। एआई उसे प्रदान किए गए डेटा में संरचना और नियमितता ढूंढता है ताकि एल्गोरिदम कौशल हासिल कर सके। यानी एआई मॉडल को प्रशिक्षित करने के लिए प्रदान किए गए डेटा का उपयोग करता है। चूंकि एआई मॉडल उन्हें प्रदान किए गए पूर्वनिर्धारित डेटा पर प्रशिक्षित होते हैं, इसलिए उनमें रचनात्मकता की कमी होती है और संदर्भ की समझ सीमित होती है। साथ ही, यह सुनिश्चित करने के लिए निरंतर निगरानी और फ़ाइन ट्यूनिंग की आवश्यकता है कि एआई नैतिक दिशानिर्देशों के साथ संरेखित हो और उद्देश्य के अनुसार कार्य करे।

चिंताएँ और भविष्य की दिशाएँ

जैसे-जैसे प्रौद्योगिकियों और एआई की दुनिया विकसित हो रही है, गोपनीयता और इसके नैतिक उपयोग को लेकर चिंताएँ भी बढ़ रही हैं। विभिन्न ई-कॉमर्स कम्पनियों के रुझानों का विश्लेषण करने और एआई के माध्यम से लक्ष्य विपणन करने के लिए बड़ी मात्रा में उपयोगकर्ता डेटा एकत्र कर रही हैं। इससे डेटा गोपनीयता और सुरक्षा से संबंधित मुद्दे उठते हैं। हैकर्स अधिक उन्नत साइबर हमले विकसित करने, सुरक्षा उपायों को बायपास करने और सिस्टम में कमज़ोरियों का फायदा उठाने के लिए एआई की शक्ति का दुरुपयोग करते हैं। गोपनीयता जोखिमों को कम करने के लिए, हमें सख़्त डेटा सुरक्षा नियमों और सुरक्षित डेटा प्रबंधन प्रथाओं की वकालत करनी चाहिए। इसके अलावा, एआई में पारदर्शिता की कमी है, खासकर गहन शिक्षण मॉडल में। और भी बहुत सी अधिक कानूनी और नियामक चुनौतियाँ हैं।

लेकिन जैसा कि हम जानते हैं, चिंताओं के साथ अवसर भी आते हैं। एआई के क्षेत्र में इंसान के लिए बहुत अधिक अवसर हैं। एआई मॉडलों द्वारा रखे और संग्रहीत किए जा रहे डेटा की मात्रा को नियंत्रित करना और एआई द्वारा पालन किए जा रहे नैतिक मूल्यों और नैतिकता पर ध्यान देना केवल मनुष्य द्वारा ही किया जा सकता है। साथ ही एआई मॉडल का रखरखाव और विकास भी मनुष्यों द्वारा नियंत्रित किया जाता है।

निष्कर्ष

एआई एक विशाल क्षेत्र है जिसमें जीवन के तरीके को बदलने की क्षमता है। लेकिन इसकी आवश्यकता आत्म-निर्भर नहीं है और बेहतर परिणामों के लिए इसे मनुष्यों द्वारा प्रबंधित किया जाना है। यह कहा जा सकता है कि एआई मॉडल्स कुछ स्तर पर इंसानों की जगह ले सकते हैं। लेकिन अंततः चलाने वाली इकाई मानव जाति द्वारा नियंत्रित होने वाली है। इसलिए, अगर एआई कुछ जॉब प्रोफ़ाइल्स में इंसानों की जगह ले रहा है, तो साथ ही यह नौकरी के बहुत अधिक अवसर भी प्रदान कर रहा है। जिसके लिए हमें बस अपने हुनर को निखारना होगा। इसके अलावा, ऐसे कई जॉब प्रोफ़ाइल्स हैं जिनके लिए बहुत सारे रचनात्मक और बड़े निर्णय लेने वाले कार्यों की आवश्यकता होती है जिन्हें एआई द्वारा पूरा नहीं किया जा सकता है।

सुंदरम यादव
बी.एस.सी. (ऑनर्स) कंप्यूटर विज्ञान
द्वितीय वर्ष

Source: Pixabay

Transforming Transactions: Digitalisation of Money in India

In recent years, India has witnessed a profound shift in the way financial transactions are conducted, thanks to the rapid digitalisation of money. This transformative journey has not only altered the financial landscape but has also brought about significant changes in the daily lives of millions.

The rise of digital payment platforms

The advent of digital payment platforms has played a pivotal role in this evolution. Services like UPI (Unified Payments Interface) and mobile wallets have become ubiquitous, offering users a convenient and efficient way to handle financial transactions. Banking services are also easily available online with appropriate safety measures.

The simplicity and ease of these platforms and financial organisation have contributed to their widespread adoption across both urban and rural areas.

Financial inclusion and accessibility

One of the notable outcomes of the digitalisation of money in India is the increased accessibility to financial services. Rural areas, once underserved, are now experiencing a surge in digital transactions, this helps in empowering individuals who previously had limited access to formal banking. Government initiatives like Jan Dhan Yojana have further fueled this inclusivity drive.

Demonetisation as a catalyst

The demonetisation drive in 2016 acted as a catalyst for the acceleration of digital payments. With the sudden withdrawal of high-denomination currency notes, people turned to digital alternatives, accelerating the shift towards a less cash-dependent economy. This event was marked as a turning point as it encouraged both businesses and individuals to embrace digital financial solutions.

Key players in digital payment

In the rapidly evolving landscape of digital payments in India, several key players have emerged, transforming the way financial transactions once occurred. UPI (Unified Payments Interface) has played a pivotal role in the digital payment revolution, allowing interoperability between various banks and payment service providers. Apps like BHIM (Bharat Interface for Money) have utilised UPI to simplify transactions for users across different platforms.

One prominent name is Paytm, which gained prominence for its mobile wallet and has since diversified into various financial services, including payments, banking, and shopping.

PhonePe is another significant player, offering a user-friendly platform for digital transactions. Acquired by Walmart, PhonePe has seen substantial growth, becoming a preferred choice for many users.

Google Pay has made its mark by providing a seamless and secure payment experience. Leveraging the widespread use of smartphones, Google Pay facilitates transactions through a simple interface linked to bank accounts.

Amazon Pay has also entered the fray, leveraging its e-commerce platform to integrate digital payments seamlessly. With a focus on user convenience, Amazon Pay has gained traction in the Indian market.

These key players, among others, continue to innovate, offering a range of services beyond basic transactions, including insurance, investments, and more. As India moves towards a more cashless economy, these digital platforms will play a crucial role in shaping the financial landscape.

Boosting e-commerce and business

The digitalisation of money has also catalysed the growth of e-commerce and digital businesses. Online transactions have become seamless, fostering a thriving digital economy. Small and medium enterprises (SMEs) have particularly benefited, as digital payments offer them a cost-effective and efficient way to conduct business.

Source: Pixabay

Government initiatives

The Indian government has spearheaded various initiatives to boost digital payments. The introduction of the Unified Payments Interface (UPI) has streamlined transactions, allowing users to link multiple bank accounts to a single mobile app. The Digital India campaign, launched in 2015, promotes digital empowerment, with a focus on enhancing accessibility to electronic financial transactions. The Pradhan Mantri Jan Dhan Yojana (PMJDY) fosters financial inclusion by providing underprivileged sections access to banking services, including digital payments.

Additionally, the implementation of Goods and Services Tax (GST) and the promotion of the Bharat Bill Payment System (BBPS) further underline the government's commitment to creating a cashless, digitally inclusive economy.

Security concerns and regulatory measures

As digital transactions surged, so did concerns about cybersecurity and financial fraud. Recognising the importance of safeguarding digital financial systems, regulatory bodies have implemented stringent measures and guidelines. This ongoing effort aims to ensure the security and integrity of digital transactions, fostering trust among users.

Challenges

- **Digital literacy:** Limited awareness and understanding of digital payment methods among certain demographic segments.
- **Infrastructure:** Inadequate digital infrastructure, especially in rural areas, hinders widespread adoption.
- **Security concerns:** Growing cyber threats and fraud risks associated with digital transactions.
- **Inclusivity:** Ensuring access and usability for all socio-economic groups in the digital financial ecosystem.
- **Cash dependency:** Deep-rooted reliance on cash transactions, slowing the shift to digital alternatives.

Solutions

- **Digital literacy campaigns:** Implement widespread campaigns to educate and empower users on digital payment methods.
- **Infrastructure development:** Invest in expanding digital infrastructure, particularly in rural and remote regions.
- **Cybersecurity measures:** Strengthen cybersecurity protocols, raise awareness, and enforce robust data protection regulations.
- **Inclusive design:** Develop user-friendly interfaces and ensure affordable access to digital services for all.
- **Phased cash reduction:** Implement policies gradually, phasing out cash transactions, incentivising digital payments, and promoting behavioural change.

Future prospects and innovations

Looking ahead, the digitalisation of money in India is poised for further advancements. Emerging technologies like blockchain and artificial intelligence are likely to reshape the financial landscape, introducing innovative solutions and enhancing security measures. The collaboration between fintech companies, traditional banks, and regulatory bodies will play a crucial role in shaping the future of digital finance.

In conclusion, the digitalisation of money in India has ushered in a new era of financial convenience, inclusivity, and efficiency. While challenges exist, the ongoing efforts to address them demonstrate the commitment to building a robust digital financial ecosystem that benefits all strata of society.

Anshika Singh
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Source: Pixabay

Finance and Commerce in the Digitalisation Era

Digitalisation is on its way to revolutionise finance and commerce by leveraging cutting-edge technologies like blockchain, AI-driven analytics, and cloud computing to facilitate the sectors. Fintech innovations help streamline transactions, enhance customer experiences, and mitigate risks. Gamification strategies, further, engage users, promoting financial literacy and incentivising responsible spending. These advancements are redefining traditional banking, fostering a dynamic ecosystem of digital services and disrupting conventional business models.

Open Network for Digital Commerce

Open Network for Digital Commerce (ONDC) is a private non-profit company initiated by the Indian Government. It aims to end the monopoly of the entities in the e-commerce sector empowering the local sellers who have a lot of potential to grow in the future. It also enables the customers to compare the prices of various goods. Also, it ties up with reputed courier delivery partners to safely and timely deliver the commodities.

ONDC allows us to purchase any commodity with different sellers without depending on a specific digital platform. It connects potential buyers with trustworthy sellers in the market. Moreover, it promotes the local businesses that have great potential. Finally, when it comes to delivery of goods, the sellers face little to no issues as ONDC partners with reputed courier brands for delivery. Therefore, regardless of the seller you have chosen, you will get a quick and efficient shipment. This is also because of the in-built algorithm of this open network. It favours local marketplaces instead of entities that have established their monopoly within a certain sector.

To be listed on the ONDC platform, the vendor must pay the fees for listing them on the app and also mention their GSTIN numbers. Most importantly, no middlemen in the supplier-seller chain get the overall commodity shipment cost and it reduces the total time. Since it is backed by the Indian Government, ONDC makes an even playing level for the local sellers with the entities of e-commerce platforms.

Fintech

The fintech industry is undergoing a digital transformation. Digital technology enables fintech companies to grow and expand by improving their operations, services and customer experience. Here are some key areas of digital transformation in the fintech industry:

- **Improved efficiency**

Digital technologies such as automation, machine learning and artificial intelligence enable fintech companies to streamline operations, reduce manual intervention and improve results. This results in faster processing times, lower costs and greater accuracy.

- **Improve customer experience**

The development of digital technology enables financial technology companies to provide customers with convenient and accessible services. This leads to innovation, better service and a better customer experience.

- **Low cost**

New technologies help fintech companies reduce costs through automation, cost reduction and better management.

- **Risk management**

Digital technologies such as predictive analytics and machine learning help fintech companies improve risk management. This improves decision-making and reduces risk for the company and customers. Digitalisation in the financial sector has played an important role in the growth and development of the industry with fewer chances of losses.

- **Big data for driving innovation**

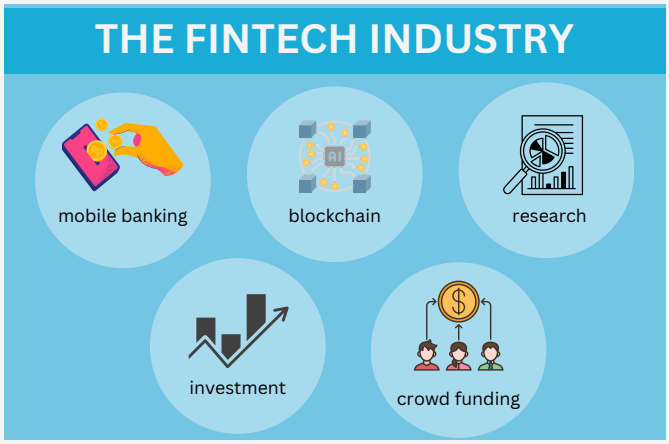
The financial sector has already recognised the potential of big data analytics. Financial institutions and banks are now thinking of new ways of selling their services and using big data to provide more personalised services to their customers.

- **Mobile pay utilities**

There was a time 10 years ago when mobile wallets were a very new concept to people. Mobile wallets have become the payment norm. Merchants, retailers and other consumers prefer to use mobile payments instead of traditional cash and checks.

- **Growing enterprise agility**

After many experiences of the previous financial crisis, the ability of the organisation to expand its skills has become an important trend in the industry. However, to support the kind of continuous development and improvement that is the foundation of agility, financial organisations need fast and reliable access to increasing amounts of information without having to perform tedious manual work processes.



Designed by: Lipika

Indian Stock Market

Source: Pixabay

Digitalisation in the context of the Stock Market means empowering and attracting more investors, which can only happen if the stock market functions are made easier and more transparent.

Digitalisation has drastically increased the trading volume as the online platforms provide easy access for investors to execute the trades efficiently attracting many foreign investors to invest in the Indian Stock Market.

Platforms that assist financial investments and have seen a convincing increase in the user base. Easy user interface and low stock settlement fee are key features of the increasing trend.

A major advantage is the ease of transfer of physical shares into electronic shares. This implies the safety of electronic shares, unlike the physical shares which could be misplaced or can be damaged easily.

Regulatory bodies like the Securities and Exchange Board of India (SEBI) are evolving along with digital trends by working on more efficient rules and regulations. Ultimately, digitalisation in the stock market aims to improve accessibility, transparency and efficiency empowering investors with innovative tools.

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Source: Pixabay

How is Digitalisation Transforming the Indian Stock Market?

As of 2023, 5.18 billion people are connected with the Internet, comprising about two-thirds of the global population. According to data from the National Stock Exchange (NSE), there were 1.2 crore active investors noted in India's FY22.

Across many industries, the growing ease of accessing the Internet has accelerated the process of digitalisation. The stock market has seen similar growth, investors find it easier to join the stock market courtesy of Demat (short for Dematerialisation) accounts. The COVID-19 pandemic contributed largely to the digital platforming of the stock market due to restricted mobility and a surge in the use of technology to adapt to the lockdown. From March 2020, before the COVID-19 pandemic, to August 2022, a 145 percent increase was observed as the number of Demat accounts went from 40.9 million to more than 100 million. The surge has been consistent ever since. During the last fiscal year, FY23, around 25 million Demat accounts were opened.

Opening a Demat account is not a tedious task, anyone can open it in just a few minutes. You can upload documents, and buy and sell shares online with ease. Investors, today, can monitor their portfolios, buy-sell shares, and seek expert help – all on their smartphones. Ultimately, the main goal of digitalisation in the stock market is to improve efficiency, transparency, and accessibility, it empowers investors with innovative tools and opportunities.

Impact of digitalisation on the Stock Market

- **Rise of online trading platforms**

Platforms like Zerodha, Upstox and Groww have seen a massive increase in their users as the integration of research tools and market analytics provides critical insights for decision-making. Traders can now track market conditions at their ease, place orders, and manage their portfolios within a few clicks.

- **Efficency of the market**

The speed and efficiency of buying and selling of shares through automated trading procedures have resulted in higher trading volumes and liquidity. At the very start, the stock exchange was a long, cumbersome, and error-prone process that had to be done physically. NSE brought in much-needed reforms and better regulations but the next-generation online brokers have further enhanced the trading experience by offering features like zero brokerage, biometric logins, charts, reports, and high-speed trading without middlemen. These brokers also comply with SEBI policies and provide a seamless experience while adhering to regulations.

- **Dematerialisation of shares**

The conversion of physical shares into electronic form is known as the dematerialisation of shares. It helps in the smooth transfer of shares. There are no physical documents to be lost or damaged. The risk of fraud is almost eliminated through this process which has boosted the confidence of investors.

- **Improved transparency**

Stock market transparency can be enhanced by digital technologies to allow investors to monitor the market data and trading activity in real-time. This may assist investors to make more sound investment choices.

- **Reduced costs and faster settlement cycle**

Digitalisation can help in reducing the costs of trading stocks. For example, most electronic trading platforms are more cost-effective as compared to traditional brokerage firms. Settlement time is now reduced to T+2 days. This brings a new promised transparency along with better regulatory efforts.

Technologies used for digital transformation of stock market

Several key technologies are driving the digitisation of the stock market, some of which are:

- **Cloud computing**

These include stock exchanges, banks, and other financial institutions, and cloud computing enables them to access and store large volumes of huge data more efficiently and affordably. This is vital as it allows high levels of trade activity in contemporary stock markets.

- **Artificial intelligence (AI)**

New trading tools and investment strategies are being created using AI. Such as AI-enabled algorithms for analysing the market and detecting trading opportunities. Online brokers offer the option of algorithmic trading to reduce human bias and errors. Algorithms for trading follow predefined strategies and this eliminates psychological decision-making. There is also AI which provides customised advice by utilising better-predicting models.

Source: Pixabay

- **Blockchain technology**

The use of blockchain technology for the trade and settlement of stock will definitely lead to a revolution. Blockchain-powered technology that diligently allows tracking and recording transactions in the form of a shared, immutable ledger helps in the settlement of stock trades in the exchange of shares.

- **Robo-advisors**

Robo-advisors are computer-generated financial planning services that utilise algorithms to generate and manage investment portfolios for customers. This makes investing more easily affordable and accessible to individual investors. A common robo-advisory system typically collects information about a client's financial status and future objectives through an online survey. Subsequently, it employs this gathered data to provide recommendations and automatically makes investments on behalf of the client.

Challenges in the process of digitalisation

There are some challenges associated with digitalisation despite its numerous benefits. A big challenge is the requirement to make certain that all investors have the digital tools and resources at their disposal. Another issue is the need to feel the investors safe against fraud and various cyber threats.

This will ensure that stock trading becomes more secure, efficient, and transparent.

Source: Unsplash

Conclusion

India's stock market boom is a cause of digitalisation that opened the door to a new era of investing opportunities. With low brokerage charges, investors can now take the benefits of the growing Indian stock market without any risk of fraud by opening a Demat account. Digitalisation is renewing the stock market and will likely continue changing the way we trade stocks during the coming time.

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Source: Pixabay

डिजिटलीकरण: नए व्यवसाय मॉडल्स का उदय

विश्व अर्थव्यवस्था के लिए, डिजिटलीकरण एक महत्वपूर्ण चरण है जो नए व्यवसाय मॉडल्स के उदय में सहायक है। यह प्रक्रिया न केवल विभिन्न उद्योगों को सुदृढ़ बनाने में मदद कर रही है, बल्कि उन्हें समृद्धि की नई ऊँचाइयों तक ले जा रही है। डिजिटलीकरण के साथ, व्यावसायिक प्रक्रियाओं को सुदृढ़, सुगम और सुरक्षित बनाने का नया मार्ग प्रशस्त हो रहा है।

डिजिटल उत्पादकता और विनिमय

डिजिटलीकरण ने उत्पादकता को नई ऊँचाइयों तक पहुँचाया है। ऑटोमेशन, बिग डेटा एनालिटिक्स, एंटरप्राइज़ रिसोर्स प्लानिंग (ERP) तकनीक और डिजिटल मार्केटिंग के उपयोग से व्यावसायिक प्रक्रियाएँ अब अधिक उत्पादक और दक्ष हो रही हैं। साथ ही, डिजिटल माध्यमों से विनिमय की दृष्टि से भी नए संबंध बनाए जा रहे हैं, जिससे व्यापारिक संचार और विनिमय का तरीका पूरी तरह से परिवर्तित हो रहा है।

डिजिटल प्लेटफ़ॉर्म्स और संचार

डिजिटल प्लेटफ़ॉर्म्स के उपयोग से व्यावसायिक संचार का पूरी तरह से नया आयाम उभर कर आया है। ऑनलाइन मीटिंग्स, वर्चुअल कॉलेबोरेशन टूल्स और सोशल मीडिया के माध्यम से एक नया अनुभव उपलब्ध हो रहा है। कम्पनियाँ अब अपने ग्राहकों और स्टेकहोल्डर्स के साथ संबंध बनाने के लिए डिजिटल प्लेटफ़ॉर्म्स का उपयोग कर रही हैं, जिससे न केवल संचार की गति में वृद्धि हो रही है, बल्कि वास्तविक समय में संचार अधिक सरल भी हो रहा है।

सुरक्षित डिजिटल व्यवसाय

डिजिटल व्यवसाय का सुरक्षित होना भी अति महत्वपूर्ण है, और इसका ध्यान रखना अत्यंत आवश्यक है। विभिन्न साइबर हमलों और ऑनलाइन धोखाधड़ी के ख़िलाफ़ बचाव के लिए उच्च स्तरीय सुरक्षा प्रोटोकॉल्स विकसित किए जा रहे हैं।

सजल अग्रवाल
बी.एस.सी. (प्रोग्राम) भौतिक विज्ञान
द्वितीय वर्ष


Source: Pexels

Driving Forward: The Digital Transformation of the Automobile Industry

The automobile industry is a very vast and rapidly growing industry. It comprises a vast range of companies and organisations that are involved in the design, development, manufacturing, production, selling, repair, and modification of motor vehicles.

The manufacturing revolution

The automobile industry began in the 1860s when hundreds of manufacturers pioneered the horseless carriage. Early automobile manufacturing involved the manual labour of human workers. The process evolved from machines operating on stationary vehicles to a continuous conveyor belt system in which the vehicles travelled through many more specialised machine stations.

Robotics were first introduced in the 1960s, and today most cars and trucks are built by automated machinery. For many decades, the United States dominated the world in overall vehicle production with its Big Three automation companies.

The U.S. Big Three — General Motors, Ford Motor Company, and Chrysler — briefly were the world's three largest automakers, with G.M. and Ford staying the two largest until the mid-2000s.

China set a new record in 2017 with more than 29 million automobiles produced, the greatest margin ever recorded in the United States. The number of automotive models in the United States has increased exponentially from 1970 (140 models) to 1998 (260 models) and 2012 (684 models).

The crucial question of safety

Safety is one of the key, if not the most essential, components of manufacturing in the automotive industry. So, it is imperative that automobiles and other motor vehicles comply with a certain number of regulations, whether local or international, to be accepted in the market. In context to safety issues, the companies have adopted various technologies to resolve the safety issues. ADAS is one of the technologies that are now the most popular as well as compatible in terms of safety.

Advanced Driver Assistance Systems (ADAS) technology has become commonplace, incorporating features such as adaptive cruise control, lane-keeping assist, automatic emergency braking, and parking assistance. These systems leverage sensors, cameras, and radar to enhance safety and improve the driving experience.

Other than safety the consumers are allured to experience digitalisation in their motor vehicles for convenience and ease. They need their vehicles to be digitalised, leading to the development of connected vehicles. Cars now come equipped with advanced sensors, communication modules, and in-car infotainment systems that enable connectivity with other vehicles, infrastructure, and the internet. As well as in terms of manufacturers digitalisation has transformed the manufacturing process with the adoption of digital design tools, simulations, and virtual prototyping. Computer-aided design (CAD), computer-aided engineering (CAE), and computer-aided manufacturing (CAM) technologies have improved efficiency and reduced time-to-market for new vehicles.

Electrification and sustainable mobility

In the late 1820s and 1830s, crude electric carriages were built for the first time. Practical, commercially available electric vehicles appeared during the 1890s and an electric vehicle held the land speed record until around 1900.

In the early 20th century, the high cost, low top speed, and short range of battery electric vehicles led to a decline in the EV sector but in the last decade, the demand for EVs increased rapidly. The rise of electric vehicles is closely linked to digitalisation.

Electric cars heavily rely on sophisticated battery management systems, electric powertrains, and digital controls. The integration of software and digital interfaces has become a crucial aspect of EV development.

Source: Pexels

Predictive maintenance

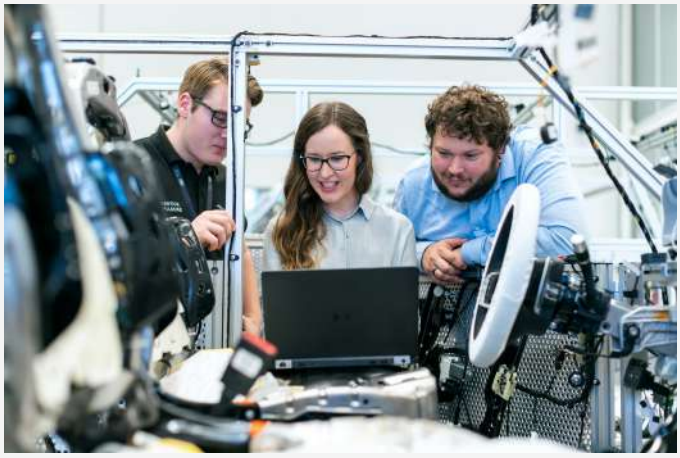
Predictive maintenance is a rapidly growing field that could change how we maintain our vehicles. Modern cars are equipped with sensors that continuously collect data about engine performance, tyre pressure, oil quality, vibration, and more.

In addition, machine learning algorithms analyse this data in real time and identify patterns and anomalies that may indicate imminent problems. Based on analytics, the system predicts when specific components may require attention, often before symptoms appear.

Supply chain management, sales, and marketing

With the advancement of the different sectors, digitalisation also takes place in the supply chain. Digitalisation has improved supply chain management in the automotive industry.

The use of advanced analytics, real-time tracking, and blockchain technology has enhanced transparency, efficiency, and collaboration within the supply chain. By which the sales and marketing team gets a boost to deals with the customers. Online channels play a significant role in reaching consumers. Virtual showrooms, online configurators, and digital marketing strategies have become essential components of the automotive sales process.



Source: Pexels

Cybersecurity concerns

As digitalisation rapidly increases it is also a threat to cybersecurity. The industry needs to protect vehicles from cyber threats and ensuring the security of connected systems has become a critical concern. Hence, Internet of Things (IoT) and telematics technologies are used to gather data from vehicles, enabling real-time monitoring and analysis of the threats, if any. This data is utilised for predictive maintenance, performance optimisation, and improving overall vehicle efficiency.

Conclusion

In the last two decades, massive growth and digitalisation in the automobile industry have brought about transformative changes, impacting everything from vehicle design and manufacturing to how cars are sold, driven, and maintained. As the demand for motor vehicles increases day by day the companies within the industry are likely to get more advancement in their technologies to work more effectively and efficiently.

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Source: Pexels

Healthy Innovations: Digitalisation in Healthcare and Medicine

In the modern world, humans are controlling almost each and every aspect of their lives, including games, accounting, tourism, entertainment, weather forecasting, businesses, and much more. It is made possible with advancing technology and digitalisation. The health care and medicine sector is no exception.

Before the 19th century, we were not capable of garnering medical results in healthcare facilities as accurately, reliably, and conveniently as we can today.

Advantages of digital healthcare system

- Easy access to records of patients
- Digitalised way of health checkup
- Virtual consultation
- Better efficiency
- Cost reduction
- Convenience due to multiple online portals

Digitalisation has made the healthcare system way more efficient and it continues to evolve at an exponential rate. In the news, we often see new trends and technologies evolving in the healthcare field. This is also the reason that the average life expectancy has been doing better year by year.

Latest trends

A few trends in the digitalisation of medicine and healthcare are:

- **Wearable devices**

Using fitness trackers for exercising and tracking body activity, and smartwatches for real-time monitoring of various health aspects such as heart rate, calories intake and blood sugar level. Moreover, some services offer mental health support and regular check-ins about your emotional state.

- **Telemedicine: gateway to remote patient monitoring**

Telemedicine offers remote healthcare services, using electronic communication for non-emergency consultations, providing ease, convenience, cost-effectiveness, and improved access to medical advice, especially for chronic conditions.

- **M-health**

M-health, short for mobile health, allows researchers to leverage mobile devices (smartphones and tablets) to collect real-time health information, conduct surveys, implement interventions, and track participants' progress. This makes research easier and even more dynamic.

- **Genomic medicine**

In this technology, an individual's genes are used for specific healthcare needs. It allows personalised prediction, early diagnosis, and treatment of an individual. In the words of Kemal Malik, a member of the Bayer board of management of the Genomics initiative, "The Holy Grail in health care has long been personalised medicine, or what is now called precision medicine."

- **Internet of Medical Things (IoMT)**

The Internet of Medical Things (IoMT) refers to interconnected medical devices and applications that share health data through the Internet. It is a rapidly growing technology that has the potential to revolutionise health services.

- **AI chatbots**

Nowadays, multiple chatbots are available to assist us in our daily lives; medical-related AI chatbots are also being developed to make the healthcare system more friendly and robust.

Challenges and solutions

We know very well that we can not be completely sure about anything, especially in complex fields like healthcare and medicine. It is a fact that every innovation made by humans has some challenges and we can overcome these challenges with various solutions.

So, the digitalisation of healthcare also has various challenges and the experts are working towards developing various solutions to overcome these challenges.

Let's see some of these challenges along with their potential solutions one by one:

- **Data security and cyber security**

It remains the main concern in every digitalised field. Cyber attacks on even a small hospital can breach the very sensitive information of patients and this data breach can be dangerous for the patients as well as the hospital's reputation.

Solution: Integrating the healthcare system with blockchain.

- **Cost factor**

For high-level digitalisation, we need heavy investment in technology. Also, digitalisation will need coordination with technology firms.

Solution: Agile Software development.

Source: Pixabay

- **Resistance to change**

In a survey, it was found that most health professionals are not able to give time for this digital transformation due to their tight schedules and continuous engagement with patients. But for implementing newer technologies, institutes first need to adapt to them and learn about them.

Solution: Increase staff, and organise webinars for them to learn new technologies.

- **Comply with HIPAA rules**

HIPAA is the Health Insurance Portability and Accountability Act. This act ensures the security of patient's health records and insights. This act was enacted because personal health insights can be misused, which can also be dangerous to the patients themselves.

Solution: Associate only with reliable companies which are experienced in HIPAA-compliant software development.

Government's role

Governments possess a significant responsibility to ensure digitalisation in healthcare in their countries. Governments throughout the world have taken many steps towards this purpose. Government in India is also on the way to form an efficient and convenient environment for digitalised medicine and healthcare sectors.

Now, let's see some recent steps taken by the government in India:

- Ayushman Bharat: Health and Wellness Centers
- Pradhan Mantri Jan Arogya Yojna
- Public-Private Partnership
- National Digital Health Mission
- National Health Program
- Electronic Healthcare Records Standards

Conclusion

Other than these, medical trends are available now in a large number and many trends are in their initial stages. As technology and digitalisation are getting sharper, and medical innovations are touching heights. We, humans, have exponentially grown, with time, in the sector of digitalised healthcare.

In the near future, we might incur more golden achievements in a revolution in the field of healthcare and medicine.

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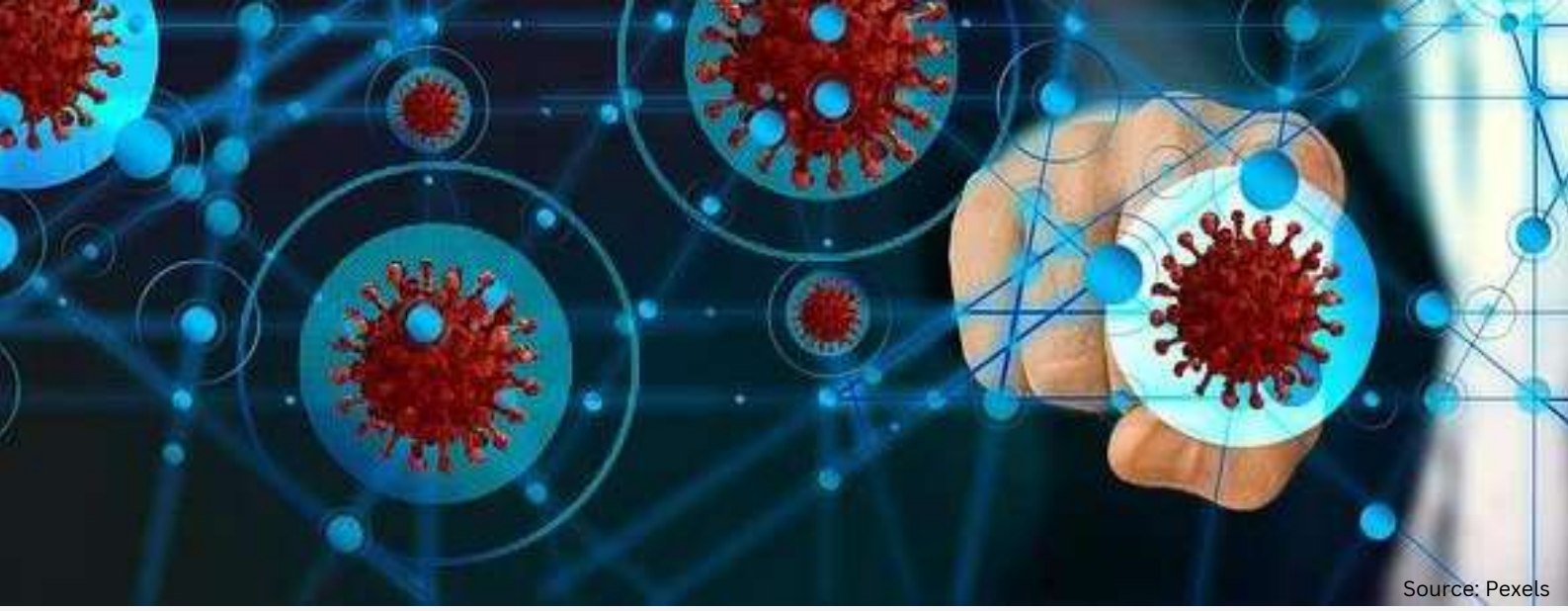

Source: Pexels

Pandemic, Digitalisation and Plaforming Education

Digitalisation is the process of changing analogue to digital form, also known as digital enablement. Said simply, digitalisation is the process of converting a given piece of information from a physical format into a digital one. This digital wave has brought major changes in various sectors and aspects of our lives, one of them is in the education sector. This article talks about how digitalisation exerts an influence on education and how it has transformed the way we learn. With the power of digital technologies and the Internet, education has been made more accessible and convenient and gradually we are transforming traditional learning methods and creating new opportunities for the learners than it was ever before.

Easy accessibility

One of the primary impacts of digitalisation on education is the easy accessibility of instructional materials. Now, students and educators have access to abundant educational content anywhere anytime at their fingertips. This easy accessibility transcends geographical boundaries allowing learners to access materials from anywhere in the world.

This advancement helps bridge the educational gaps and also brings fair opportunities for aspiring students regardless of their socio-economic status and background, as long as they can access the Internet.

New teaching methods

Digitalisation has led to the development of new teaching methods with interactive and engaging learning tools. The advancement of virtual reality applications, simulations, and technologies makes the concept easier to comprehend and understand. This has made learning more engaging and effective for the students as they can learn at their own pace and according to their own understanding.

The best example of such a virtual reality project is the Virtual Labs Project. Launched by MHRD under NMEICT, it provides easily accessible and high-quality education throughout India. Its primary focus is to provide graduate and undergraduate university students with the ability to perform their required laboratory experiments using only the World Wide Web, a computer, and internet connection.

Virtual Labs also allow students to practise and understand the science and engineering behind the experiments that they are required to perform. Virtual Labs also allow the sharing of costly equipment across the country, and in very rural areas, students will be able to perform experiments that they would not otherwise be able to access. Currently, 85 Virtual Labs have been developed comprising 769 experiments. Training and workshops have been held all over India to publicise knowledge of these Virtual Labs.

Online learning platforms

The digitalisation of education has given rise to online learning platforms and Massive Open Online Courses (MOOCs). These platforms provide a massive range of courses, enabling learners to acquire new skills or pursue education. We can understand this process of digitalisation with SWAYAM and NPTEL.

The program Resource Development Ministry spells out as Study Webs of Active-Learning for Young Aspiring Minds (SWAYAM), launched by President Pranab Mukherjee, offers digital classrooms with the help of internet and satellite connectivity even to the most remote corners of the country and courses ranging in hundreds.

All courses are free on SWAYAM and the fee is only for issuing of certificate. The courses are offered by several institutions including IITs Bombay, Madras, Kanpur, Guwahati, Delhi, IGNOU, University of Delhi, Jawaharlal Nehru University, IIM Bangalore, IIM Calcutta, Indian Institute of Science.

National Programme on Technology Enhanced Learning (NPTEL), is a joint venture of the IITs and IISc, funded by the Ministry of Education (MoE) Government of India launched in 2003 is a project to take quality education to all corners of the country.

NPTEL now offers close to 600+ courses for certification every semester in about 22 disciplines. Such flexibility has proven invaluable, especially for individuals with busy schedules or those seeking continuous professional development.

Evolving assessment methods

With such advancements, traditional learning methods have also evolved so it is only imperative that digital assessments also evolve. Several newer digital assessment technologies are evolving to judge the participants' critical skills and knowledge in instances of Open Book Examination (OBE) and such.

Redefining the role of educators

Digitalisation has not only benefited the students and learners but also the educators. Teachers now have access to diverse teaching resources and can also pool and share best practices and learning materials fostering a global community.

Source: Pixabay

How has COVID-19 changed education sector forever?

The global pandemic has left an indelible mark on the educational system. With schools shut all across the world, millions of students have had to adapt to new types of learning which mainly mark the rise of e-learning.

With this significant and unforeseen demand, many online platforms like YouTube, Udemy, and Coursera provide free courses. More than 20 million new learners registered for such online courses. The online learning sector bloomed with the pandemic. According to the Technavio Market Research Report, there was a 400% increase in the market size of online learning in six years by 2019. This online learning came with a bunch of benefits and comforts like skipping schools and college which saved an abundant amount of time which. in turn. resulted in saving time and money. The need to lug all the heavy books and files to school and back was also out of the question. Before the pandemic, traditional learning methods maintained a stronghold in India, the world's second-largest education system.

With this significant shift now, teachers can integrate and combine the best of both worlds of virtual and face-to-face physical classroom teaching. These virtual teaching methods are now here to stay. To conclude, online learning is the life-changing innovation of this century. If education is the asset of our modern era, then online learning is the medium to circulate it to people. It is full of potential, which if used properly will be a big part of development, and will serve as the basic building stone for social, environmental, and most importantly national development and evolution.

Source: Pixabay

Challenges to counter

With greater benefits come greater challenges. One of the main challenges is the digital divide where students from lower socio-economic backgrounds may not have access to reliable and necessary digital technologies and the internet creating a disparity in accessing educational resources and opportunities. Digital distractions also pose a critical threat, where students may be tempted to spend more time on social media platforms diverting from their focus and goal. Another raised challenge is related to the content quality found online. Some stand with the fact that face-to-face interactions between students and educators are essential for effective learning and over-reliance on digital technologies may also obstruct the social skills of the students, a holistic approach should be maintained between the two.

Conclusion

In conclusion, digitalisation has opened a new era in education, transforming the way we can learn and teach. While it offers increased and easy access to information, opportunities for personalised learning, and global cooperation and collaboration challenges like the digital divide, distractions, and quality of online materials are still alarming issues that must be addressed. As with the continuous evolution of digitalisation, it is vital for the students as well as the educators to adapt and welcome the new teaching methods and technologies with open hands. A thoughtful and holistic approach towards digitalisation can lead to a more effective learning environment worldwide.

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Source: Pixabay

Digitalisation in Higher Education for Visually Impaired

Visual Impairment (VI) is a prevalent medical issue that has a substantial impact on a large population worldwide. According to the World Health Organization, it is estimated that over 2.2 billion individuals worldwide have some sort of visual impairment, whether near or far-sighted (WHO, 2023). The COVID-19 pandemic has accelerated online learning, providing flexibility and accessibility for students. However, visually impaired students (VIS) face unique challenges in online learning (Amponsah & Bekele, 2022). Traditionally, In India, the visually challenged are forced to study humanities or arts at the pre-university level and beyond, due to inadequate educational curriculum, campuses with unsupported accessibility, lack of empowering assistive technologies, and ignorance of the needs of visually deprived children (R et al., 2016). Despite the mandate of the Right to Education (RTE) Act, which necessitates the availability of Teaching and Learning Materials (TLM) in formats that may be easily accessed by all pupils, including those with disabilities, the government's emphasis has primarily been on infrastructural accessibility, such as ramps and railings. However, such facilities only enable a child to enter a school, and the lack of accessibility to the subject matter itself is what ultimately results in the exclusion of students with impairments from schooling (Vidhi Centre for Legal Policy, 2021).

The visually impaired community faces challenges in daily activities, income, and personal growth due to cumbersome, expensive, and difficult-to-operate assistance devices like blind sticks or glasses, as well as learning braille and reading and writing (Wang et al., 2023). The experience of visually impaired individuals is not uniform across countries and cultures, and misconceptions about their abilities to use modern technology can hinder their employment opportunities (Betlej et al., 2023).

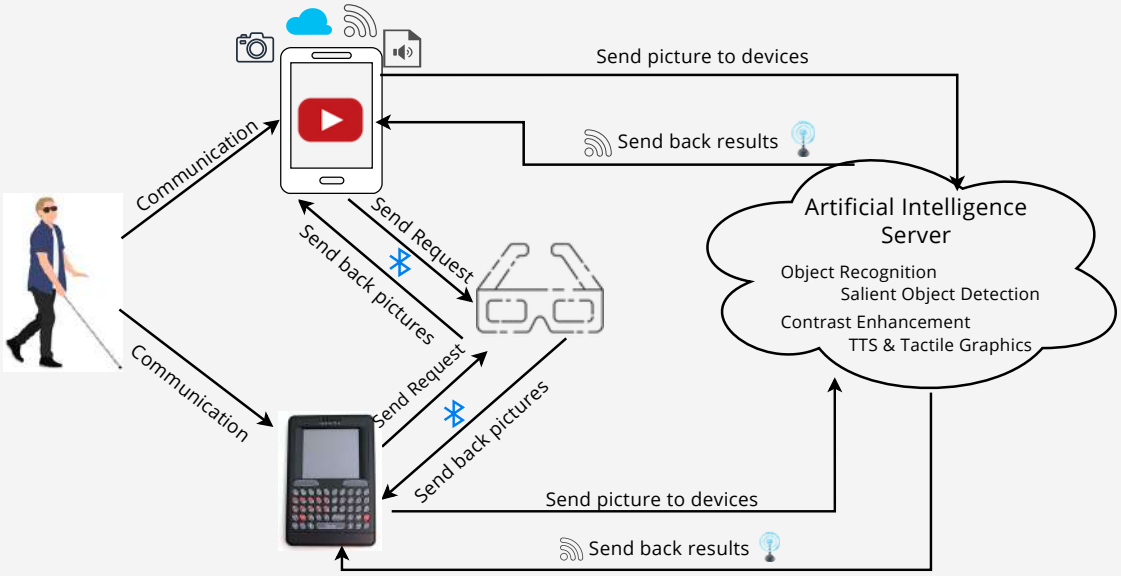

Fig. 1: Overview of the smart glass system from Mukhiddinov and Cho's (2021) study.

The integration of AI-based educational tools that monitor students' learning processes and customise them to their requirements can enhance conventional teaching approaches (Wang et al., 2023). The Assistech Lab at IIT Delhi has introduced innovative solutions for VIS, including Smart Cane, a cost-effective tactile print, and an affordable Braille display. Additionally, the lab has developed Edutactile, a Java-based software that is compatible with multiple platforms and simplifies the process of generating tactile visuals for scientific and mathematical material. This software includes three separate modules: an Image Converter Module, a Chemical Equations Module, and a Mathematical Functions Module. These groundbreaking innovations have the potential to transform the way students with disabilities access and engage with STEM content (R et al., 2016).

Rattanaphinyowanich and Nunta (2021) found that DAISY-WIBORD audiobooks are an effective educational tool for visually impaired students. The audiobooks provided students with a range of voices to choose from, allowing them to select their preferred reader.

Punith et al. (2021) developed a technologically advanced reading aid that uses an integrated camera to capture text images and convert them into audible speech. It also incorporates text recognition technology for clear, natural-sounding reading and ultrasonic sensors to help maintain distance from objects, making it an effective tool for independent reading and mobility.

The Yeo team provided a training session and distributed a smartphone-based low-vision aid that could be used for four weeks. This device has advanced features that improve binocular best-corrected distance, intermediate vision, and near vision and enhance reading precision and facial identification, although reading speed remains a challenge (Yeo et al., 2022). Mukhiddinov and Cho (2021) proposed an innovative use for smart glasses by employing them to recognise text and obstacles during nighttime hours. These smart glasses employ a range of computer vision techniques that analyse graphics and audio for object identification and the device can operate autonomously, even under conditions of limited illumination. Fig. 1 provides an overview of smart glasses.

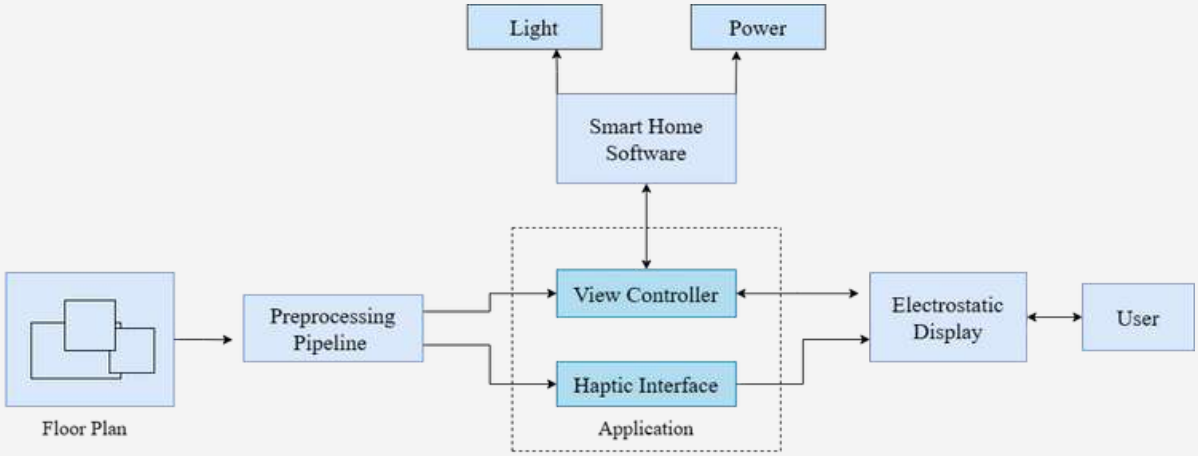

Fig. 2: Setup of the painting navigation system for blind painters in Liu's study.

AI has also been employed in various literary and artistic activities, including calligraphy, painting, music composition, etc. Liu et al. (2022) developed an innovative approach to assist visually impaired individuals in drawing utilising computer technology as a facilitator. The drawing navigation system shown in Fig. 2 is known as "Angles Eyes" employs a range of real-time positioning and navigation algorithms to enhance the drawing experience. This system is effective, practical, and has mobile phone compatibility, making it a promising solution for the future. Adamik, M. et al. (2022) developed a program to generate versatile yet uncomplicated pencil drawings. They tested it on different types of paper and found it effective. The tool can create sketches from high-resolution images and can be used for artistic pursuits.

By 2050, over 1.7 billion people are expected to have some form of vision-related issue. This calls for increased awareness and action to ensure access to proper care and treatment. AI-based educational tools and assistive technologies can enhance the learning experience for visually impaired students. We must prioritise their needs to create an inclusive educational environment that empowers all students.

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Designed by: Lipika

India's Gradual Movement Towards the Centre of a Digital Transformation

India, now, is the world's most populated country. The challenge of an ever-rising population is a difficult one, it not only puts a strain on the country's resources but also on the existing infrastructure, health, education, and other public services. This brings forth the question of growing competition for accessibility and opportunity. Although the Internet cannot replace the need for physical entities to accommodate a larger set of people; it does, to a limit, resolve the question of accessibility. The Internet makes information easily accessible, boosts connectivity, allows transparency to a certain extent, platforms services digitally, and most importantly makes it convenient for citizens to approach the government and avail their rightful needs.

India, in past years, has experienced drastic digital transformation. According to The Hindu, as of May 2023, India has over 759 million 'active' internet users who access the internet at least once a month. Among the numbers, 399 million are from rural India, while 360 million are from urban India. The numbers are estimated only to increase. The change did not occur linearly, several factors and events together have fueled India's vehicle of digitalisation.

Going way back, the National Informatics Centre (NIC), established in 1976 by Narasimhaiah Seshagiri, was the first step towards e-governance and digital initiatives. Information Technology Act of 2000, gave much-needed legal recognition to electronic transactions. The Digital India program in 2015 facilitated broadband connectivity, e-governance, and digital literacy. 2016 was a drastic change in India's digital landscape. Demonetisation of the high-denomination currency notes along with Reliance Jio's affordable data plans gave way for both digital gateways for payment and internet penetration. In the subsequent year, the integration of digitised tax processes for a unified tax system, Goods and Services Tax (GST), also encouraged digitalisation. The COVID-19 pandemic, further, made the Internet a necessity under a complete lockdown where the only way to connect with basic utilities was through the web.

What are all the services that are platformed digitally today with what appears to be the inception of a digital revolution in India? Here's the journey of India's road to digitalisation and a Viksit Bharat.

Digital India Program

Digital India is a flagship program launched by the Government of India on July 1, 2015. The three major objectives of the program are the development of secure and stable digital infrastructure, the delivery of government services digitally, and the promotion of universal digital literacy. The nine pillars of the Digital India Program are believed to be universal access to mobile connectivity, broadband highways, public Internet access, e-Governance, e-Kranti, global information, electronics manufacturing, IT training for jobs, and early harvest programmes

Infrastructure

The Aadhar Project made it possible for every citizen to have a unique identity that helps to deliver public welfare reforms and socially and financially integrate citizens. Aadhar can be easily booked, updated, and ordered online via UIDIA's website, making it convenient to attain. It provides a common ground for Indian citizens to be recognised and connected.
Website: uidai.gov.in

BharatNet or Bharat Broadband Network Limited, set up by the Department of Telecommunications, was a project to connect the 2.5 lakh Gram Panchayats across India by March 2019. It was deemed the world's largest rural broadband project but eventually failed to reach its goal due to the lack of ownership and coordination between BSNL and BBNL. 1,26,318 gram panchayats had optical fibre laid out and about 1,18,104 gram panchayats have fully functional broadband connections.

Common Service Centres (CSC), under the Ministry of Electronics and Information Technology (MeitY), were facilities to provide Government-to-Citizen (G2C) to rural and remote locations where the availability of computers and Internet was negligible or mostly absent.

As of 28 February 2022, there are 4,63,705 functional CSCs across the country, each managed by about four people. Over 15 lakh people are now directly or indirectly working at the CSCs across the country.

Source : Pexels

Digital services

eKranti, approved in 2015, by the Union Cabinet aimed to deliver all government services electronically to citizens through integrated and interoperable systems. The main principles of the plan involved substantial transformation rather than mere translation, integrated services, government process reengineering, on-demand ICT infrastructure, cloud-centric design, a mobile-first approach, fast-tracking approvals, standards compliance, language localisation, GIS utilisation, and adherence to cybersecurity measures.

DigiLocker, released in December 2015, is a digitisation service provided by the Indian Ministry of Electronics and Information Technology. It provides a platform to keep a secure document wallet for citizens, intending to reduce administration expenses and physical documentation while serving as a means to host secure access to government-issued documents.

As of 2022, there are over 237.12 Million users of the platform.
Website: digilocker.gov.in

Launched on April 14, 2016, the National Agriculture Market (NAM) is an electronic trading portal with full funding from the Central Government and implementation by the Small Farmers Agribusiness Consortium (SFAC). It aims to act as a catalyst of development for India's mandi markets through the e-NAM portal by streamlining procedures for transparent online trading, real-time price discovery, and promoting fair prices. The initiative was meant to benefit farmers, traders, buyers, processors, and exporters by reducing transaction costs, providing market accessibility, ensuring quality certification, and facilitating direct online payments to farmers' bank accounts.
Website: enam.gov.in

Government e-Marketplace (GeM), launched in August 2016, facilitates procurement of goods for Ministries and agencies, with over 7,400 products and services available. GeM operates as a paperless, cashless, and system-driven e-marketplace, authorised by General Financial Rules, processing transactions exceeding Rs 140 Crore.

Bharat Interface for Money (BHIM), launched on 30th December 2016, truly revolutionised the scene of digital payments through a Unified Payments Interface (UPI). It enabled users to make direct bank payments through UPI IDs or by scanning QR codes with the BHIM app. Developed by the National Payments Corporation of India (NPCI), BHIM was launched to promote financial inclusion and create a digitally empowered society in India and has fulfilled its purpose since then.

SWAYAM Portal, issued in July 2017, is a portal that allows students and learners to take online educational courses.

It facilitates an opportunity to access education for everyone and everywhere.
Website: swayam.gov.in

Designed by: Lipika

Unified Mobile Application for New-age Governance (UMANG), launched by the National e-Governance Division (NeGD) and MeitY in November 2017, is a single-window platform that hosts over 1,836 services and puts together the various schemes in fields of education, law, health and wellness, agriculture, business, employment, banking, transportation, provided by central government and state governments in a single place. It, as of now, has over 5.94 crore registrations across India.
Website: web.umang.gov.in

The Ministry of Panchayati Raj, under the Digital India Programme, is implementing the e-Panchayat Mission Mode Project (MMP) across all States and Union Territories. The objective is to enhance transparency, accountability, and effectiveness of the Panchayats. The ministry introduced eGramSwaraj on 24 April 2020, an accounting application, to streamline Panchayat tasks such as planning, accounting, and budgeting. In addition, it is integrated with the Public Financial Management System (PFMS) which enables real-time payments for Gram Panchayats.

Digital India Portal is a website that organises all the resources which provide online services for different categories to the citizens, namely, banking, recharge, and utility bill payment, registration for government documents, tax filing and business permits, and booking for travel.
Website: digitalindia.gov.in

G2B Portal, hosted by NIC and MeitY, allows the Department for Promotion of Industry and Internal Trade (DPIIT) to provide a single-window platform to apply for industrial licences and industrial entrepreneurs memorandum in an attempt to make Government-to-Business (G2B) services quick and efficient.
Website: services.dpiit.gov.in/lms/

Digital empowerment

MyGov, which began on July 26, 2014, was one of the first initiatives for digital empowerment. It gave citizens a platform to participate in the governance process by providing their ideas, suggestions, and feedback on various government initiatives and policies.
Website: mygov.in

Pradhan Mantri Jan Dhan Yojana (PMJDY), implemented first on August 28, 2014, is a financial inclusion program to provide access to financial services such as banking and deposit accounts, insurance, and pensions to the unbanked population in India. The provision of basic banking services like opening bank accounts, and providing RuPay debit cards allowed people to delve into the realm of electronic financial money/fund transfer.

National Digital Literacy Mission (NDLM) or Digital Saksharta Abhiyan (DISHA), whose first phase was implemented in August 2014, focuses on promoting digital literacy and providing digital education and skills training to citizens across India.

Startup India, initiated on January 16, 2016, promotes entrepreneurship and nurtures startup ecosystems in the country. It includes various schemes and incentives to support startups.

Smart Cities Mission, launched on June 25, 2015, established the goal to develop over 100 smart cities across India by leveraging technology and infrastructure.

Source: MyGov

Its aim is to enhance living standards, improve sustainability, and provide better civic amenities to the citizens.

Pradhan Mantri Gramin Digital Saskshatra Abhiyaan (PMGDISHA), first coming into existence in February 2017, as the name suggests is a digital literacy program that especially targets rural areas, to make at least one person in every rural household digitally literate.

OpenForge, in June 2018, was initiated as a means to use open-source software projects to encourage the development and collaboration for making the existing services better or inventing better solutions for e-Governance.
Website: openforge.gov.in/

National Digital Health Mission, commenced on August 15, 2020, intending to create a digital health ecosystem in India by allowing citizens to have digital health IDs and access to their health records online.

Despite the services provided by the government through online platforms, India is yet to reach the epicentre of a digital revolution. An even more functional digital infrastructure, basic digital literacy among the majority of citizens, and transparency we aim for through digitalisation is still a long way to go to attain the vision of Viksit Bharat.

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Source: Pixabay

BharOS: India's Own Operating System

"If you want a thing done well, do it yourself."
- Napoleon Bonaparte

As we all know our nation is on its way to self-reliance i.e. 'Atmanirbhar Bharat'. The vision of Viksit Bharat also tries to map ideas to an ideal India in hundred years of its independence. Walking in this very direction, we are also heading towards another step in the world of technology in the form of India's operating system, BharOS.

BharOS is a Linux-based operating system for mobiles. It is designed by IIT Madras and JandK Operations Private Limited (JandKops). It is completely indigenous and funded by the Indian government. The main objective of BharOS is to create a free and secure digital environment.

Features of BharOS

Our indigenous BharOS is secure, easy to use and cost-effective. But besides these things, it has many other special features which make it an operating system to look forward to. Some of them are:

- **No pre-installed apps:** Other operating systems come with some pre-installed apps, which are usually not used by some users. But unlike these operating systems, BharOS does not come with pre-installed apps, which gives users the free hand to choose apps.

- **Optimised memory:** Operating systems with pre-installed apps are not optimised for memory space because these apps occupy unnecessary space. But in BharOS, this memory is effectively optimised.

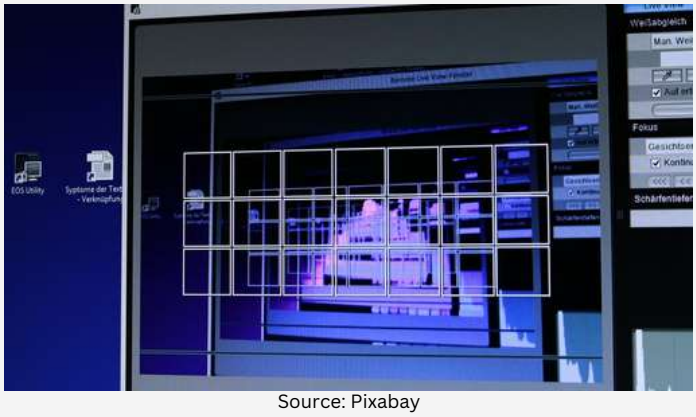
- **Native Over The Air (NOTA):** BharOS provides the NOTA method, which allows it to be updated automatically without manual intervention. This ensures that the latest version is on devices.
- **Private App Store Service (PASS):** BharOS has its own app store. This store contains the registered apps which are verified by BharOS itself. This feature ensures extra security for users.

What is the big deal about India having its own Operating System?

The whole world knows that Indian consumers contribute the most to any product across the world, especially in tech products due to our rapidly emerging digitalisation so why not develop our products like BharOS?

There are multiple benefits of having own OS, to name a few:

- Cost-effectiveness
- Reduced dependency on foreign operating systems
- Cost-effectiveness
- Demand for Indian software
- No international threats
- Boost in the Indian economy



Source: Pixabay

BharOS and digitalisation

Nowadays, every country is exploring more and more opportunities in digitalisation. Everything is digitalised; banking system, application forms, property registration, businesses, government schemes, or examinations. And operating systems have a very important contribution in achieving all these.

BharOS will further consolidate the growing prospect of digitalisation in India.

- BharOS is working with other hardware companies to make the devices which are compatible with BharOS.
- It is working with software companies to make compatible applications with BharOS.
- The Indian government is promoting it to be the default OS for government-generated systems.

Statistics

BharOS was launched in January 2023 and is still under development, so there are not many statistics for this. But still, we have some data, which shows people's reliability on it.

- According to JandK Operation's survey, 60% of current users seek a more secure operating system.
- In India, around 100 government and public sector companies are using BharOS.
- At current, BharOS is available in around 1 lakh devices in India.

- BharOS is available in 10 native languages, which will significantly provide wider accessibility and inclusivity.

Impact on economy

The role of BharOS is expected to prove very significant for the Indian economy as it is fully owned and funded by the Indian government. There are several aspects to this expectation.

- It reduces our dependence on foreign companies in the critical IT industry.

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- It will help boost India's security and sovereignty.
- It will encourage the growth of domestic IT industries which is a positive sign for India's future.
- This milestone would attract foreign investment in the Indian IT sector.

Overall, we can consider the BharOS as an important factor in India's golden future. It is a small spark in a software market heavily monopolised by a handful of tech giants but it certainly is an attempt to set fire to a new effort. It reminds us again that every idea and effort for the nation is a step towards a Viksit Bharat.

Source: Pexels

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Source: Pexels

Comparative Analysis of Digital Landscape in India vs the World: A Focus on Fintech Ecosystem

The rapid evolution of technology has brought about constructive changes in various sectors around the globe, with a major impact on financial domain. With rapidly changing technology countries are trying more and more to be at par with their competitors. This article will dive into a comparative analysis of fintech technologies. We will focus on India's technological landscape vs global trends.

Fintech ecosystem

A Fintech ecosystem is a concept that creates a suitable environment for all types of financial technology services to synergise. They are often formed by the government, financial services companies, and startups, where every partner assists each other.

India's fintech journey has been nothing but remarkable, this sector has witnessed exponential growth and evolution.

India now ranks third across the globe in terms of total fintech companies. PwC reports state India's Fintech development has been remarkable with 87% Fintech adoption compared to the global average of 64%.

For instance, Uber has shaken things up with its cool ideas. They're not just about giving rides; they've got this whole package going on. You know, there's the ride-sharing, bringing food to your doorstep with Uber Eats, and even hooking you up with a rental car when you need one. It's like a whole world of convenience. More than 103 million people use Uber every month! They've taken folks on over 14 billion rides since they started. Now, if you're hungry, Uber Eats has got your back. They've teamed up with over 530,000 restaurants, so you've got choices galore.

There's a little catch if you want to jump on board as a driver or delivery person. You gotta have your insurance policy. Uber is all about keeping things safe for everyone cruising or munching within their big setup. Safety first, you know?

Digital payments

In the digital payment realm of 2022, India took the lead with a whopping 89.5 million transactions, making up 46% of the world's real-time payments. This outpaced the combined numbers of the next four leading nations.

Earlier this year, Prime Minister Narendra Modi said that India is number one in digital payments and that the country's rural economy is transforming.

Brazil secured the second spot with 29.2 million transactions, followed by China at 17.6 million. Thailand and South Korea held the fourth and fifth places.

In Sept 2022 RBI released UPI light, a digital service where we can top-up up to Rs. 2000 in the electric wallet and make offline payments using UPI. Prime Minister Narendra Modi echoed this achievement, focusing on its transformative impact on the rural economy as this enables payments in areas of low connectivity. Apart from this Apple plans to launch Apple Pay and Apple card services in India too.

Source: Pixabay

Regulatory landscape

Ensuring the smooth sailing of fintech technologies requires a keen understanding of regulatory landscape. In India, regulatory bodies have been on their toes, actively crafting policies that focus on encouraging innovation and mitigating risks. RBI understands Regulatory Technology (Regtech) and Supervisory Technology (Suptech) have a significant role in identifying and rectifying risks. In October 2022 RBI launched 'Daksh', an advanced Suptech monitoring system. It establishes a seamless connection between RBI and regulated bodies. RBI further plans to develop Regtech and Suptech tools using artificial intelligence and machine learning.

Some of the regulatory approaches, schemes/acts passed by the government of India, among others, are:

- Payment and Settlement Systems Act, 2007 (PSS Act)
- Master Direction on PPIs, 2021 (PPI Directions)
- Guidelines on Regulations of PAs and Payment Gateways, 2020 (PA Guidelines)
- Master Direction – KYC Direction, 2016

Challenges

India's Fintech scenes are buzzing with energy, showcasing a vibrant atmosphere. However, like any thriving landscape, they are resistant to challenges. Regulatory hurdles and infrastructure limitations stand as roadblocks, hindering the smooth flow of growth. Yet, within these challenges lie golden opportunities for innovation and shaking things up.

Indian fintech market is one of the fastest-growing tech segments across the globe. It is expected to go from 2.30 Trillion INR in 2020 to 8.35 Trillion INR in 2026, with a compounded annual growth rate of ~25%,

However, some factors have hindered its growth:

- **The effect of the Pandemic:** The pandemic led to a severe economic downturn and made the market uncertain.

- **Regulatory challenges:** Fintech companies face heightened regulatory scrutiny as they gain mainstream popularity, challenging their operations to align with laws and regulations amid disruption to traditional financial institutions.

- **Cyber security:** Fintech firms also grapple with cybersecurity and data privacy concerns due to the sensitive financial data they handle, making them susceptible to cyber-attacks and data breaches. While some have thrived by capitalising on the growing demand for digital financial services during the pandemic, others have pivoted towards digital payments and lending. Navigating these challenges is crucial for fintech companies to stay competitive and succeed in the current economic climate.

Conclusion

In summary, India's fintech ecosystem has experienced remarkable growth, ranking third globally with an 87% adoption rate. The country's leadership in real-time payments, exemplified by 89.5 million transactions in 2022, highlights its prowess in the digital payment sector. Regulatory bodies in India are actively addressing challenges through initiatives like Daksh.

Despite thriving growth, the Indian fintech landscape faces challenges such as the pandemic's economic impact, increased regulatory scrutiny, and cybersecurity concerns. However, projected statistics tell us that fintech companies must navigate all the challenges to sustain competitiveness and thrive in the evolving economic climate.

Source: Pexels

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2nd Year

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Source: Pixabay

Digital Frontiers: Global Case Studies in Digitalisation

The world is continuously revolutionising through the trendy buzz of 'digitalisation'. Digitalisation is improving existing processes within multiple sectors by introducing digital technologies to increase efficiency. These rapid advancements in digital technologies have influenced many platforms to reshape society with various trailblazing plans based on innovative digital technologies. This article will share some of the steps taken by various countries to leverage digitalisation in various sectors.

The Role of digitalisation in India-Russia trade

India and Russia have maintained their relations for many years and, thus, in this digital revolutionising era, both countries now found a new way to turn this historic relationship into a modern digital technology collaboration with the help of bilateral trade. This tie will help in better communication and expansion of e-commerce in India-Russia trade. e-Commerce's pivotal role is evident in the record-breaking $45 billion bilateral trade of 2022, with a subsequent 300% increase in the first half of 2023. All businesses of both countries can showcase their services or items on the e-commerce platforms to a wider market which makes it easier to reach desirable targets. Along with cross-border trade, digitalisation eases payments through online transactions which makes it accessible to more stakeholders. Therefore, the integration of digital technology has positive and transformative impacts on proficient trading.

Tokenized Treasury Bonds in the Philippines

Treasury bonds, conventionally, are the debt issued by the government to raise the amount of money and investors after purchasing these bonds will get their respective interest value upon maturity. Now, The Bureau of Treasury (BTr) in the Philippines has taken its step toward digitalisation along with diversifying its debt offering options. BTr has launched Tokenized Treasury Bonds (TTBs) which are digital representations of government bonds in the form of digital tokens with the help of blockchain. BTr has included TTBs in the government securities digitalisation roadmap and appointed the Land Bank of the Philippines and the Development Bank of the Philippines (DBP) as issue managers for TTBs. Eligible investors can borrow a minimum of PHP 10 million in TTBs, with increments of PHP 1 million. In this way, blockchain technology potentially makes the issuance and trading of bonds easier and also reduces costs and administrative burdens. TTBs enhance accessibility to a large market of investors plus increase trust in the system through publicly recorded immutable blockchain as a ledger. Hence, the introduction of this digitalisation step, TTBs, fosters innovation in the financial sector and more economic growth in the country.

UN Development Program's 50 in 5 Initiative

50 in 5 Initiative was launched in November 2023 by The United Nations Development Program (UNDP) in collaboration with the Inter-American Development Bank, GovStack, UNICEF, and 11 “First-Mover” countries (Bangladesh, Brazil, Ethiopia, Estonia, Togo, Norway, Moldova, Senegal, Singapore, Sierra Leone, Sri Lanka, and Guatemala). Along with these various organisations such as the Centre for Digital Public Infrastructure, Co-Develop, and Bill & Melinda Gates Foundation also support and collaborate in this initiative.

This initiative emphasises Digital Public Infrastructure (DPI) like digital payments, ID, and data exchange system networks in 50 countries in the next 5 years and is thus called the 50 in 5 initiative. This will enable many governments to access the digital goods known as Digital Public Goods (DPGs) for their public while also reducing costs for a greater impact on society. This initiative is centred around an interoperable digital system along with a broad government agenda for working in a more connected and seamlessly effective global infrastructure. This digital system will bring development and more economic growth, empowering various governments.

Source: undp.org

European Digital Identity (eID) System

The European government has agreed on a new framework called the European Digital Identity (eID) system which will ensure universal access to secure and trustworthy electronic identification and authentication of all the citizens. eIDAS (Electronic Identification, Authentication and Trust Services) acts as a legal backbone of the eID system, forming a legal framework for data protection, privacy, and an interoperable system.

European digital identity wallet will provide a platform to each user where they can store their credentials such as driving licences, diplomas, medical certificates, bank accounts, or other personal documents. Each member state of the EU with their respective eID scheme will be required to adhere to the standard technical framework of eIDAS rules and regulations. Then they will be able to prove their identity and share relevant documents with just a simple click on their smartphones. It makes the verification process more optimised and thus enhances security and convenience in various sectors like banking, education, and government services. The complete implementation of this eID system is expected to take several years to fully adapt national eID schemes according to the member states. But this eID system signifies a paradigm shift towards digitalisation in Europe which will boost economic growth and security.

The Digital Euro

The digital euro is the digital form of currency issued by the ECB (European Central Bank) to replace the most use of cash in European countries. These digital euros will be stored in the digital wallets linked with your bank accounts. Major big companies like Amazon, EPI, Worldline, Nexi, and CaixaBank have also collaborated with ECB to provide a user-friendly interface to the digital euro and they also added an offline feature, which makes it an easier and potentially effective digital payment system. Digital Euro is made for use in European Union member states but it could be applicable for many non-eurozone areas as well, according to future decisions. This digital system is still in process and aims for a big digital representation in the currency world.

Source: Pixabay

We have discussed how digitalisation is driving innovation globally and useful for inter-countries connections but there is a lot more to study, discuss, and implement in this field which could pave a path to more progressive implementations and transform the whole scenario of today's world.

Simran
BSc (H) Computer Science
2nd Year

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Editor's Choice

Digitalisation: An Opportunity Or A Risk?

As with all the other questions within competition law, the answer is: 'It depends on…'.

First and foremost, from the point of view of a competition enforcer, I see digitalisation as a massive opportunity. In short, digitalisation can lead to new business models, the rise of new competitors, and better, and/or lower-priced products and services. Often the most important role we as competition enforcers must play in this area is that of being an advocate for digitalisation, for example, advocating for the abolishment of unnecessary legislation standing in the way of disruptive competition.

But, certainly, digitalisation and some of its key features such as network effects, big data and algorithms, raise a number of competition related risks.

One such risk is that digitalisation and the use of algorithms, price robots and artificial intelligence may facilitate both explicit and tacit collusion.

The first aspect, facilitating explicit collusion, is, at least from a theoretical point of view, easy to tackle. One example is the renowned Topkins case where the U.S. Department of Justice prosecuted two retailers for aligning their pricing algorithms to increase the price of posters online (United States v. Topkins). This case may involve pricing algorithms, but it is no different from the old world's sharing of information on napkins in smoke-filled hotel bars. At the core of the matter is still people reaching an agreement to fix prices.

However, even if such cases appear relatively straightforward from a theoretical point of view, the existence of algorithms may make such cartels easier to form and maintain. Thus, the detection of such arrangements may require novel investigative approaches, tools, or resources. The scope of this remains to be seen. But as competition enforcers, we should remain vigilant as to whether we and our regulatory framework satisfy such requirements.

The second aspect, that algorithms may facilitate tacit collusion, is not as straightforward, not even from a legal standpoint since, generally, Article 101 TFEU does not cover tacit collusion. However, not every conduct that looks like tacit collusion is tacit collusion. The specific facts of each case should – as always – be analysed closely. The digital context may look different but depending on the facts, the existing case law from the analogue world will be relevant; especially case law concerning concerted practices and hub-and-spoke practices. Also, the analysis should reflect that, ultimately, it is people who design the algorithms and determine for what purpose they are used.

Thus, in some ways, a requirement of compliance by design would appear the obvious – although not necessarily easy – answer. In addition, although tacit collusion may not be illegal, the risk of coordinated effects will be taken into account in our merger analysis.

It has also been argued that some of the features of digitalisation may pull in the opposite direction making markets less prone to tacit collusion, for example, active consumers, increasing product differentiation, an increase in the use of differential pricing tools and reduced barriers to entry (cross border e-commerce).

Thus, within the area of tacit collusion, there appear to be more questions than answers at this point and we should continuously monitor the development.

At this stage, however, there does not seem to be enough evidence to support a change in the core concepts of competition law. Digitalisation may also increase barriers to entry. Barriers to entry are not new but especially two issues appear to be particularly relevant.

One risk is that many digital markets are characterised by network effects such as economies of scale and scope, Network effects are not in themselves bad for consumers to begin with (on the contrary they may create more value and better quality) but they may create substantial barriers to entry. Another risk is data collection and access to valuable data which may also create barriers to entry. From an overall perspective, it may be less important how we categorise data; i.e. whether we see it as a currency, a quality, an input, an output, or, as it has been named: 'the new oil'.

With this in mind, we as competition enforcers have to think closely about how we protect the process of innovation and ensure that incumbents do not foreclose new (disruptive) rivals from the market. In this connection, it is well known that challenges posed by barriers to entry are not easily solved by ex-post antitrust enforcement. However, this does not mean that barriers to entry cannot and should not be tackled.

Source: Pexels

Barriers to entry will always be a significant part of a merger analysis. Thus, digitalisation requires us to continue to be rigorous in our merger control enforcement.

In other cases, (sector) specific regulation may be the better tool to solve issues of barriers to entry. One such example is the new General Data Protection Regulation which introduces the right to data portability. In some markets, this could be an important aspect for potential competition to materialise as data portability may be key to switching suppliers. In addition, customers can become more active if they can access their data.

But ex-ante regulation is a tool which should be used with great care and should always be founded on an evidence-based assessment.

The above is by no means an exhaustive list of the potential opportunities and risks which digitalisation may raise and we, as competition enforcers, need to be able to understand the issues raised by the new technology and business models to be able to perform a correct competition analysis.

However, this does not mean that we need to be digital experts or techies ourselves. This has never been the role of a competition enforcer. Just as competition authorities have never been experts on, for instance, the intricacies of pesticides, cement or interest rate derivatives when handling cases in those areas.

Finally, digitalisation also comes with the opportunity for us as enforcers to detect competition problems, such as to use digital tools and algorithms to screen for bid rigging activities by detecting suspicious bidding patterns.

Khushboo Yadav
BSc (Prog) Mathematical Sciences
1st Year

Source: Pixabay

Cybercrime Incidents: Beware of Falling Victim to the Same!

Shareindia or Shareindiap? A single letter's costly deception

Everyone wants to succeed in the shortest amount of time possible, and social media is one way to do this. However, the stress and avarice of trying to do tasks in the shortest amount of time constantly lead individuals into situations where they become entangled in undesired webs. Shareindia, a leading e-commerce platform, seemed like the perfect launchpad. Unfamiliar with the digital landscape's pitfalls, Tanya eagerly clicked on a sponsored ad promising exclusive discounts on Shareindia's website.

She had heard of the success of ShareIndia, a popular platform connecting individuals and businesses, and decided to create an online presence for her venture. That click from her phone added her to a WhatsApp group having almost 300 people and she started to dream big and the things she would do after her business expanded.

The admin of that group provides them with a link to site (www.shareindiap.com) for the people in the group to register using their credentials, invest in some venture and then they demanded a payment of Rs. 50,000/-. The website looked genuine, mirroring Shareindia's design and logo perfectly. Tanya entered her login credentials, excited about the deals and made the payment but she lost all the money in her account.

A quick Google search revealed the real Share India website and the discrepancies became glaring. Panic surged through her. She contacted Share India's customer support, reported the fraudulent website, and froze her bank account. Share India's cybersecurity team sprang into action. They identified the fake website, alerted authorities, and issued warnings to potential victims.

Remember, the internet is a vast landscape, and it's crucial to be cautious and responsible when engaging online. Always verify the authenticity of websites before entering any sensitive information, and be wary of offers that seem too good to be true. By staying informed and practising safe online habits, you can protect yourself from falling victim to cybercrime.

Cheap deal, steeper loss: Family loses money to online illusion

“In November last year, my neighbour's family decided to book a hotel room in Somnath, Gujarat while they were on a two-day long holiday trip. After detailed research of hotels on Google, they stumbled upon a hotel whose rating was five stars and also had low prices as compared to other hotels available on the list. They preferred it more than others as it was cheap and nice.

They then decided to book the tickets online by directly searching the website of the hotel on Google. After searching, the first search appeared which had the name of the hotel and its pictures. After seeing the pictures, they felt assured that the site was the original site of the hotel and proceeded for further processing. After selecting all the details for their room, they headed for the payment step. The total price for two rooms for two days was two thousand rupees. After making the payment, they waited for the confirmation message to arrive but it didn’t. After waiting for several hours, they decided to call the number provided on the website, but no one answered the phone.

After waiting for several hours, they decided to search for the hotel again on which they found another website having the same name as the hotel with the same pictures.

Designed by: Lipika

They called the helpline numbers to check if the site was the original one, and they got to know that this was the original site. They were told that they had made the payment to a fake site operating from Uttar Pradesh and other people have also made a mistake by mistaking the fake site as the original one and making big payments through it. My family also advised them to get help from a cyber security cell but they refused saying that they already had a loss and didn’t want to waste time by seeking help from cyber security. I think more and more people should be made aware of cybercrimes and all the scams that are happening and how they can be controlled.

The Government should also play a major role in this process by finding such scammers and eradicating them so that innocent people do not lose their hard-earned money,” Priyanshu Pawar, BSc (H) Computer Science, 1st Year, writes to us.

The bank agent's call: friend or foe?

A story of deceit created by the most subtle of cyber crimes was being told in the centre of a busy metropolis where the sounds of daily life could be heard echoing through the streets. It started with just a phone call. Sara, a diligent accountant at a prominent company, got a call one morning from someone identifying himself as Rohan, an agent of her bank's fraud division.

Rohan sympathised with Sara and gently informed her that a recent cyberattack had compromised her account.

As Rohan explained in detail how hackers had targeted Sara's account and threatened to take her hard-earned cash, panic took hold of Sara's heart. He assured her that the bank was moving quickly to protect her money. To win back Sara's trust in the system, Rohan made a goodwill gesture by pledging to pay back the amount that had been compromised and by starting a minor transaction in her account.

The next day, Sara appeared to be receiving a harmless-looking email from her bank with a link to update her security information. She clicked on the link without thinking twice since she trusted Rohan's claims and was not aware of the elaborate trap that had been prepared.

Sara had no idea that the link she had clicked had set off a chain reaction of malicious software that would steal her whole savings and deposit it into the eager hands of cybercriminals. Sara was left spinning in shock and sorrow when years of careful saving vanished into the digital abyss with a few keystrokes.

Source: Pixabay

Jamtara: From digital darkness to a brighter tomorrow

Jamtara has become known for being a hub for online scams and fraud. This segment explores the socioeconomic issues—such as unemployment, poverty, and a lack of education—that fuel the growth of cybercrime in the region.

An incident draws attention to the tactics used by cybercriminals in Jamtara, who usually use phishing emails, phoney calls, and other fraudulent schemes to prey on innocent people.

These thieves frequently pose as bank employees, government agents, or representatives of well-known businesses to trick their victims into sending money or disclosing private information.

The difficulties law enforcement organisations encounter in battling cybercrime in Jamtara are a lack of resources, shoddy infrastructure, and the quick development of cyber threats. The issue is made worse by the lack of strict legislation and a lack of awareness among the local populace, even with efforts to combat cybercrime being made.

To effectively address the issue of cybercrime, we conclude by highlighting the necessity of cooperative efforts between government authorities, law enforcement agencies, and the community. To stop the growing threat of cybercrime in Jamtara and other susceptible areas, it advocates for actions focused on increasing awareness, enhancing digital literacy, and enacting stronger rules.

Komaldeep
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2nd Year


Source: miramuseai

Digital Awareness: The Need of the Hour

The world of artificial intelligence is rapidly evolving and it seems that we can't keep up. The vast Internet can be extremely beneficial but we fail to use it to its best potential either due to ignorance or unawareness. Moreover, the Internet is a precarious slope to walk over, if you walk into it with little to no information it might make you susceptible to crime. Thus, one must be aware of the digital landscape before heading head-first into it. To take the nation towards the idea of a Viksit Bharat through digitalisation, we need to ensure digital knowledge and encourage digital solutions to practical problems. The government of India has tried to platform services online for the ease of citizens and promote digital empowerment. Let us dive into some of the efforts.

Digital India Programme

The Government of India's flagship initiative, Digital India, aims to make India a knowledge economy and a society led by technology. In the middle of the 1990s, e-governance projects in India expanded to include more sectoral applications and a focus on citizen-centric services.

The government's key Information, Communication, and Technology initiatives included among other things, certain large-scale programs that primarily concentrated on the construction of information systems like land record computerisation and railway computerisation. Subsequently, a large number of states launched ambitious pilot programs for e-governance with the goal of offering residents electronic services and railway computerisation.

e-Kranti: National e-Governance Plan 2.0

The National e-Governance Plan (NeGP) is a national-level e-governance plan that began in 2006. There were 31 Mission Mode Projects under the National e-Governance Plan, which included a wide range of domains such as agriculture, land records, health, education, passports, police, courts, municipalities, commercial taxes, and treasuries, among others. 24 Mission Mode Projects have been implemented and are now delivering either the full or partial range of expected services.

India is transforming into the digital era but the programs regarding digital awareness in India are as important as the advent of technology.

Source: digitalindia.gov.in

Digital Advertisement Policy, 2023

Recently, The Ministry of Information and Broadcasting of India launched a new digital advertisement policy to tap digital media for awareness campaigns. "This policy marks a pivotal moment in the CBC's mission to disseminate information and create awareness regarding various schemes, programs, and policies of the Government of India in response to the evolving media landscape and the increased digitalisation of media consumption," the ministry said in a statement. The policy will allow the Central Bureau of Communication (CBC) to appoint agencies and organisations in the OTT and Video on Demand space. Through their empanelment, the CBC will be able to capitalise on the expanding number of podcast and digital audio listeners. Aside from streamlining its website empanelling procedure, the CBC will now be able to route public service campaign messaging through mobile applications for the first time.

Digital Empowerment Initiatives

- **AADHAAR Enabled Payment System (AEPS)**

AEPS is a bank-led concept that enables online interoperable financial inclusion transactions at the point of sale (MicroATM) via any bank's business correspondent utilising Aadhaar verification.

It is a payment service that allows a bank customer to use Aadhaar as his or her identification to access his or her Aadhaar-enabled bank account and conduct basic banking operations such as balance inquiry, cash deposit, cash withdrawal, and remittances through a Business Correspondent.

Website: https://www.npci.org.in/home.aspx

- **MyGov**

Shri Narendra Modi, India's Hon'ble Prime Minister, unveiled the MyGov platform, a one-of-a-kind, game-changing project. It is a groundbreaking participatory governance program involving ordinary citizens. MyGov's concept brings the government closer to the average man by utilising an online platform to provide an interface for the healthy exchange of ideas and perspectives between ordinary citizens and specialists, with the ultimate goal of contributing to India's social and economic development.

Website: http://mygov.in

- **OpenForge**

These are just a few of the several government programs encouraging digitalisation and giving students the tools they need to support Viksit Bharat. Through their active participation in these projects and responsible use of technology, students may significantly contribute to the development of a more wealthy and developed India.

OpenForge is the Government of India's platform for open, collaborative development of e-governance applications. The government intends to use this platform to promote the usage of open-source software, as well as the sharing and reuse of e-governance-related programming.

OpenForge's objectives are as follows:

- To offer a platform for managing code repositories and version control for government source code.
- To foster a culture of open collaborative application development among public and private organisations, citizens, and institutions.
- To minimise development cycles and accelerate the adoption of e-governance apps across the country.
- To provide e-governance services and solutions of greater quality and security through increased transparency and mass peer review.
- To reduce e-governance project costs and lower the total cost of ownership through a system of reuse, remixing, and sharing.

Website: https://openforge.gov.in

Reference: OpenForge

- **Value Addition Course (VAC) for digital empowerment**

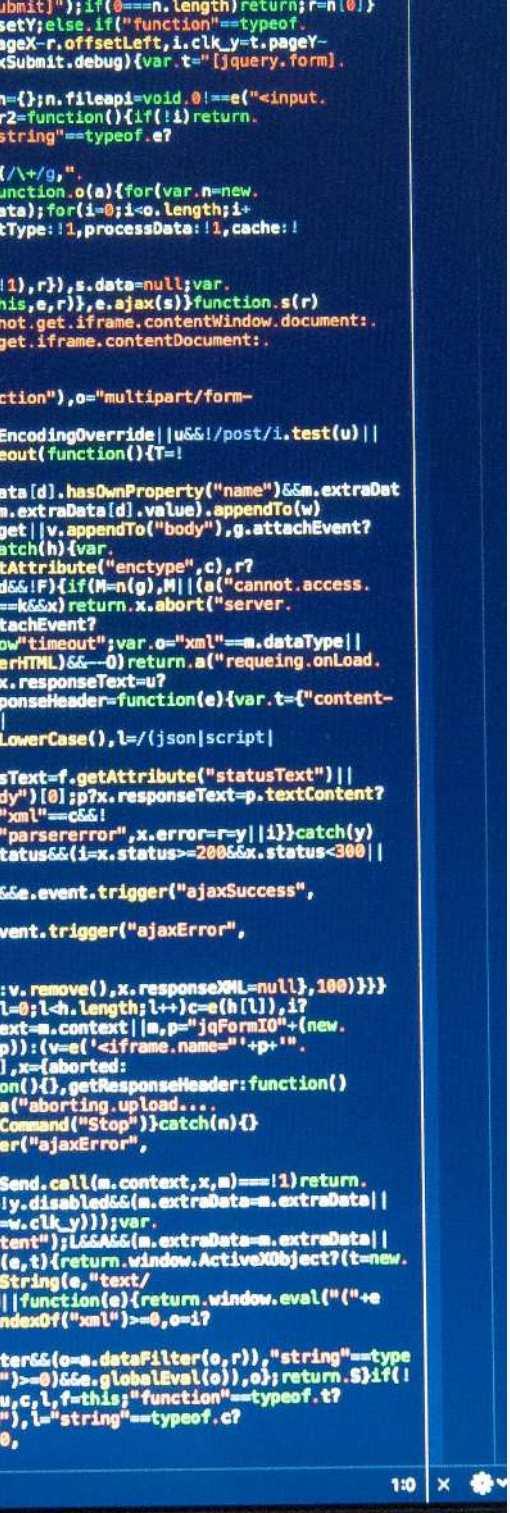
The University of Delhi has introduced a Value Addition Course (VAC) for digital empowerment in the curriculum. Students can opt for this subject for VAC if they are interested.

The learning objectives for digital empowerment include understanding the digital world and the need for digital empowerment, creating awareness about Digital India, exploring, communicating and collaborating in cyberspaces, building awareness of cyber safety and security and establishing ethical dilemmas of digitalisation. Students are being taught using workshops about e-services, and demonstrations using interactive mode and vulnerable sections of society are being encouraged to be involved in the initiative.

Conclusion

Digital awareness is not only an individual obligation but also a critical and societal imperative. It allows people to make more informed decisions, protects against cyber dangers, and contributes to the overall health of our networked society. It is recommended that one cultivates a culture of digital awareness before organising digital services so that the benefits of technology are maximised and the harmful consequences of unawareness can be curbed. We must prioritise education, open communication, and ongoing learning about the digital realm. Through these initiatives, we can create a more secure, informed, and digitally empowered global community.

Ankit Negi
BSc (H) Computer Science
1st Year

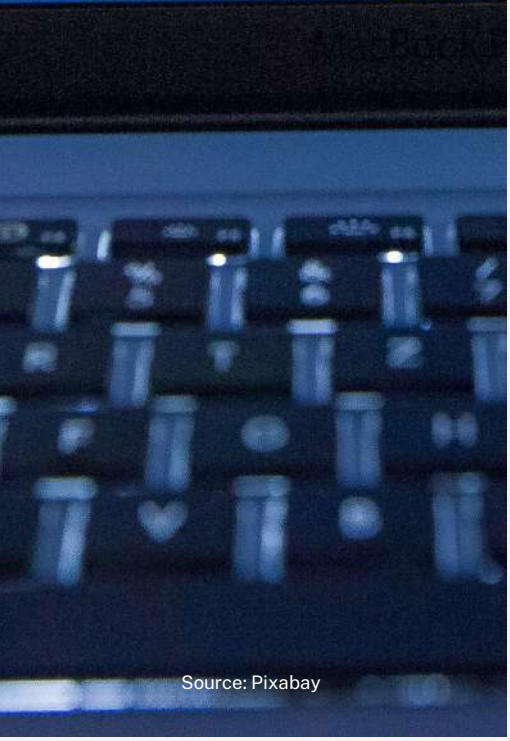


Source: Pexels

Free and Open Source Software: A Gateway to Eternal Freedom

When a computer program respects users' freedom and community, we call it “free software.” We also sometimes call it “libre software” to stress that we're talking about liberty, not the price. In other words, roughly, it means that users have the freedom to run, copy, distribute, study, change and improve the software. We know that freedom means having control over your own life. If we use a program to carry out activities in our life, our freedom depends on us having control over the program. And we deserve to have control over the programs we use, and all the more so when we use them for something important in our life.

Even if proprietary software isn't downright malicious, its developers have an incentive to make it addictive, controlling and manipulative. If the users don't control the program, the program controls the users. With proprietary software, there is always some hidden entity, the developer or “owner” of the program, that controls the program and exercises power over its users through it. A paid program is a yoke, an instrument of unjust power. In outrageous cases (though this outrage has become quite usual), these proprietary programs are designed to spy on the users, restrict them, censor them, and abuse them, all for just using the software. Windows, mobile phone firmware, and Google Chrome for Windows include a universal back door that allows some person or company to change the program remotely without asking permission. The Amazon Kindle has a back door that can erase books. The use of non-free software in the “Internet of Things” would turn it into the “Internet of telemarketers” as well as the “Internet of snoopers.”



Source: Pixabay

Schools and universities (and this includes all educational activities) influence the future of society through what they teach. They should teach exclusively using free software, to use their influence for the good. To teach a proprietary program is to implant dependence, which goes against the mission of education. Training using free software makes schools equipped to direct society's future towards freedom, and help talented programmers master the craft. They will also teach students the habit of collaborating and helping other people.

Each class should have this rule: “Students, this class is a place where we share our knowledge. If you bring software to class, don't just keep it for yourself. Rather, you must share copies with the rest of the class — including the program's source code, in case someone else wants to learn. Therefore, bringing proprietary software to class is not permitted except to reverse engineer it.”

Proprietary developers would make us punish students who are good enough at heart to share software and thwart those curious enough to want to change it.

Many of us, young students, have a programming talent; we are fascinated with computers and eager to learn how our systems work. With proprietary software, this information is a secret so teachers have no way of making it available to us. But if it is free software, the teacher can explain the fundamentals and then hand out the source code for us to read and learn.

Stable, secure and easily installed Free Software solutions are already available for education. No matter how we use it, excellence of performance is a secondary benefit; the ultimate goal is freedom for its users.

It is a very common myth that people who don't work on proprietary software make less than the people who do since big tech companies often have fancy salaries advertised on their job application portals.

But I would argue that this is not the case because people who work on open source software often have very robust proofs of their contributions to complex real-world problems and the particular way in which open source projects are managed and especially how contributions are attributed to individual agents allows the best programmers to create a signal that more mediocre programmers cannot achieve and turn this signal into monetary rewards that correspond to their superior capabilities. Thus, more chances of getting oneself hired. This argument stems from a study by two economists in which they mathematically model the process by which successful participation in an open-source project turns into a higher salary for programmers.

I'd end by quoting an intellectual giant in computer science who has been awarded the Turing Prize. Prof. Donald Knuth: “The success of open-source code is perhaps the only thing in the computer field that hasn’t surprised me during the past several decades. But it still hasn’t reached its full potential; I believe that open-source programs will begin to be completely dominant as the economy moves more and more from products towards services, and as more and more volunteers arise to improve the code. For example, open-source code can produce thousands of binaries, tuned perfectly to the configurations of individual users, whereas commercial software usually exists in only a few versions. A generic binary executable file must include things like inefficient 'sync' instructions that are completely inappropriate for many installations; such wastage goes away when the source code is highly configurable. This should be a huge win for open source.”

Source: Pexels

Using free and open source software, we will not only learn how our systems work under the hood if go and read the source code but we're also serving the community at large by contributing bug fixes and new features, the community whose great engineers made the very software and had the audacity to make it free and open source so that people like us can use the software and make our lives better. This road leads to free information, to a society in which big companies no longer have a monopoly over the people. Deep within we all know that nobody likes to be controlled but we cannot directly compete with the state we can certainly make things better than them, things that are based on pure technicality, and through this, I believe we can experience eternal freedom.

Manmohan Shukla
BSc (Prog) Physical Sciences
2nd Year

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Source : Pexels

Ethical AI: Ensuring Fair and Responsible Machine Learning

“Success in creating AI would be the biggest event in human history. Unfortunately, it might also be the last, unless we learn how to avoid the risks.”

– Stephen Hawking

The rise of artificial intelligence and machine learning has definitely revolutionised the world of technology. Just a few years ago, one could have only imagined that their tasks would get completed in just a matter of a few seconds, but that's what technology has been over the years, turning imagination into reality.

Artificial intelligence and machine learning have increased their presence in various domains and the demand is only increasing day by day.

We know that every coin has two sides and so does artificial intelligence. With the plethora of benefits it offers to humans, it also brings the need for caution and ethical use.

It is a developing technology and it certainly has various loopholes that are constantly being exploited by computer scientists worldwide. As this technology is becoming more prevalent, its ethical use and deployment become more and more important. Artificial intelligence and machine learning have not inherited data genetically, instead, they have learnt certain patterns from training datasets which leave space for certain biases in outputs.

Therefore, one should acknowledge the sensitivity of a topic and should not completely rely on whatever result is generated by these AI software and machine learning algorithms. One can also see the disclaimer provided by such AI software. They also mention that the user should verify the information provided by the software. It does not mean to stop using them. Instead, one should adopt a cautious approach while accepting the results generated by such algorithms. One can do this by verifying the results with various sources. This task might feel like an extra burden initially but it will save the user from several unwanted consequences.

One should also consider the aspect of lack of accountability in the usage of AI software. As of now, there is no concrete reasoning for the accountability of wrongdoing using artificial intelligence.

That's why one should not blindly trust every result generated by such algorithms. These software were created for human help and to make the tasks easier. Hence, the primary aim is to increase efficiency. But, many times, users take this for granted and indulge in some sort of wrongdoing.

The machine learning algorithms and artificial intelligence aimed to provide convenience to the user and to make the tasks efficient. The responsibility for ethical use lies in the user's hands. The best one can do is to provide the services as per the user's demands. Then the moral responsibility for ethical use lies towards users.

For example, in the educational sector, students have started copying the homework from such AI software and that certainly diminishes the scope for creativity in the minds of the students.

In such a scenario, it is the role of teachers and parents to teach the students about ethically using the AI software because in the short term scenario, it might seem to be a beneficial, time saving means but in the long term, it might affect their holistic growth. One should definitely take help from such software to make progress rapidly but overuse should be prevented.

Talking about commercial sectors, artificial intelligence and machine learning have proven to be a boon for many domains. They have facilitated ease of business and user interaction. They have helped in solving users' requests in no time. But one can also hear about certain fraudulent activities done by hackers using such algorithms to obtain user's data without permission.

Artificial intelligence and machine learning have played a huge role in the healthcare sector by detecting the trends in the spread of diseases and the possible areas for improvement in the medical field. This being a very sensitive field requires utmost caution while using such software because one small step can lead to huge consequences either way.

One major hurdle in maintaining the control mechanism is the ambiguity in the digital protection frameworks in various parts of the world. These AI software are available worldwide. So, there is a need for a common basic framework that should be implemented all over the world so that there is very little scope for conflict in the guidelines.

Today, in the absence of stringent control mechanisms, regulatory bodies all over the world should work as soon as possible to create a framework to make users aware of the ethical use of artificial Intelligence and machine learning algorithms. Still, it is the beginning only and much more can be improved.

Ultimately the purpose of technology is social good and the main aim should not be diverted in any scenario. The short-term rapid goals should not affect the long-term possibilities in a negative sense.

These software have an incredible potential to take the world to new heights. Now the users have the responsibility to use these facilities ethically and facilitate mutual growth.

"Technology is of the human, by the human, for the human!"

Rahul Arora
BSc (H) Computer Science
2nd Year

Source: Pexels

Laws that Protect Your Digital Space & Empower You

Right to Information Act

The Right to Information (RTI) Act is a law, passed by the Indian Parliament on October 12, 2005, that grants citizens the right to request government information from public authorities. The Department of Personnel and Training, Ministry of Personnel, and Pensions have initiated an RTI Portal Gateway for citizens to quickly search for details on first appellate authorities and PIOs. Public Authorities will need to disclose their organisation, structure, functioning, powers, financial information, and duties. These rules apply to ministries, public sector initiatives, non-governmental organisations, and regulators that are supported by public funds and are self-governing entities established by the Constitution, laws, or official notifications.

RTI has established Information Commissions at both central and state levels to address appeals and complaints regarding the implementation of the Act.

Any citizen of India can file an application seeking information from a public authority by submitting a written request, which should specify the details of the information sought. Public authorities are required to respond to RTI requests within 30 days, and this period may be extended to 45 days with a valid reason. If an applicant is not satisfied with the response or if their request is denied, they can file an appeal with the first appellate authority within the public authority. If one is unsatisfied with the appellate authority's decision, a second appeal can be filed with the government.

This act promotes accountability and makes citizens more equipped to participate in governance. The RTI Act is still a potent tool that encourages transparent government procedures and helps create a more informed and engaged democracy despite obstacles.

Digital India Act 2023

The DIA is a response to the limitations of the 2000 IT Act, which didn't quite keep up with the rapid changes in technology. The DIA aims to regulate the digital environment of India, it mainly focuses on the aspects of safety, security, trust, and adaptability while also promising to not hinder innovation that drives digital transformation. The Digital India Act is not just another set of rules; it's a blueprint for India's digital future. It was first introduced on March 9, 2023, by the Minister of State for Electronics and Information Technology (MeiTY), Rajeev Chandrasekhar.

“The law will be principle-based but the rules will be prescriptive. For example, if there are 10 types of platforms, and we classify them into 10 categories, for each category, there will be a set of law rules that will be very clear and precise and prescriptive: thou shalt not do this, thou shalt do this,” informed Chandrasekhar.

He further explains, in an interview with Moneycontrol that there would be different sets of rules for different spaces online. The fintech platforms will have rules made mostly under the Reserve Bank of India (RBI) and the Ministry of Electronics and Information Technology (MeitY) to ensure that cybersecurity breaches are dealt with strictly.

Social media would not have as rigid rules but the exhaustiveness of rules will still be relative according to the social media platform.

"We are not going to regulate AI but we will create guardrails. There will be no separate legislation but a part of DIA will address threats related to high-risk AI,” he said.

He also states there would be nine categories of content that will be dealt with no tolerance. Through DIA, the government plans to work together with digital platforms to tackle disinformation and misinformation that are “looming threats”. Among other categories are child sexual abuse material (CSAM) and any content that causes psychological harm or addiction. Psychological harm caused due to gaslighting or doxxing on the internet will not be taken lightly and the law would clearly define the crime and its consequences.

Chandrashekar promises that the act would not be a threat to the right of free speech but is a way to curate safe and trusted spaces online.

Source: Pexels

The Digital Personal Data Protection Act (DPDPA) 2023

The Digital Personal Data Protection Act (DPDPA) is a significant legislation enacted by Parliament in India's Seventy-fourth Year and introduced in the Lok Sabha on August 3, 2023.

It aims to establish a comprehensive framework for how personal data is collected, processed, and stored. It helps individuals by providing clear rules on how businesses collect, store, and use their personal information, which means that Internet users could have means to control their digital footprint, request removal of unwanted tracking, and enable data portability.

The DPDPA also creates a framework for responsible data practices, benefiting businesses, society, and innovation.

MeitY states that the objectives of the DPDPA are that the Act provides for the processing of digital personal data in a manner that recognises both the rights of individuals to protect their data and the need to process such personal data for lawful purposes and matters connected therewith or incidental thereto.

Government representatives have emphasised the importance of the DPDPA, balancing interests, strengthening trust, and recognising the need for ongoing dialogue and potential amendments. Although the DPDPA has not been fully implemented yet, potential benefits include increased awareness, improved data security, empowered users, and responsible data-driven innovation.

Lovely Mahour
BSc (H) Computer Science
2nd Year

References:

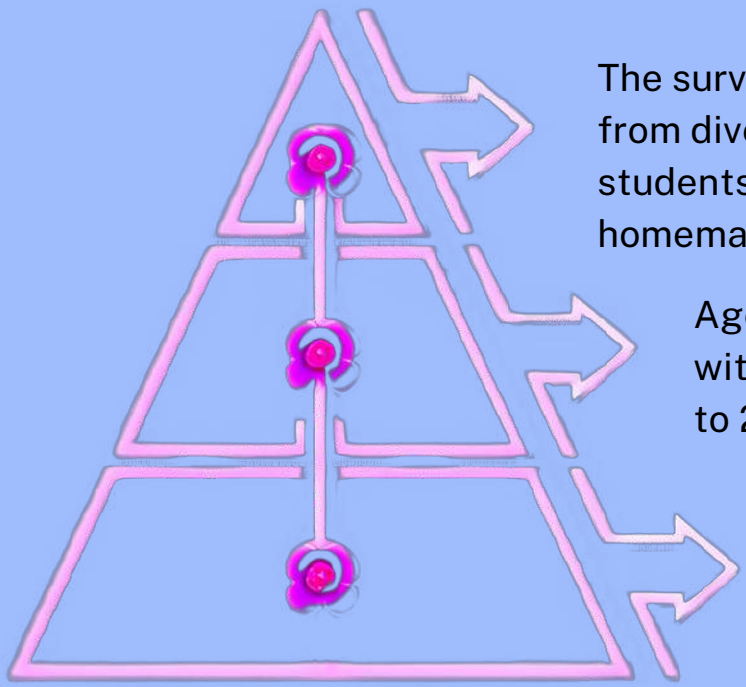
RTI - Right to Information Act, 2005, Wikipedia [*https://en.wikipedia.org/wiki/Right_to_Information_Act,_2005*]

Explainer: The Right to Information (Amendment) Bill, 2019 [*https://prsindia.org/theprsblog/explainer-the-right-to-information-amendment-bill-2019*]

DPDPA - India’s Digital Personal Data Protection (DPDP) Act, 2023 [*https://www.india-briefing.com/news/indias-digital-personal-data-protection-act-2023-key-provisions-29021.html/*]

Introduction

e-Blitzine conducted a survey on 'Digitalisation and Cybersecurity Awareness' with the objective of acquiring valuable insights into digital awareness among the citizens of the country. The initial section of the survey is based on digitalisation, with questions aimed at analysing the knowledge of participants about digital services and their utilisation in their daily lives. Subsequently, the survey focused on cybersecurity consciousness among the surveyed population.



The survey received 102 responses from diverse participants, including students, professionals, and homemakers.

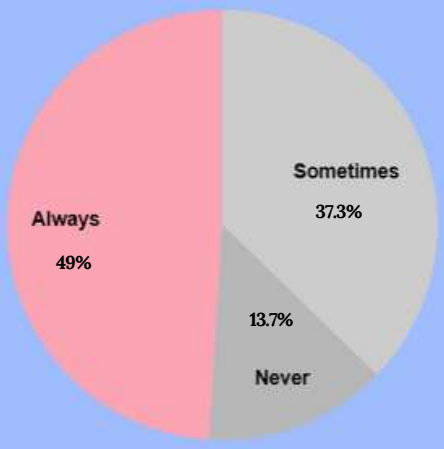
Age distribution varied from 14 to 52, with the majority falling between 18 to 29 years of age.

Predominantly, participants were from urban areas (74.5%) and it also reflected a wide variety of professional and educational backgrounds.

Digital Awareness Insights

In this era of rapid technological advancement, our lives are increasingly intertwined with digital solutions, influencing how we conduct transactions, handle documents, and engage with governmental services. This segment of the survey studied participants' engagement with digital services and displayed noteworthy trends that highlight the pervasive impact of technology across diverse domains.

Use of UPI as payment method

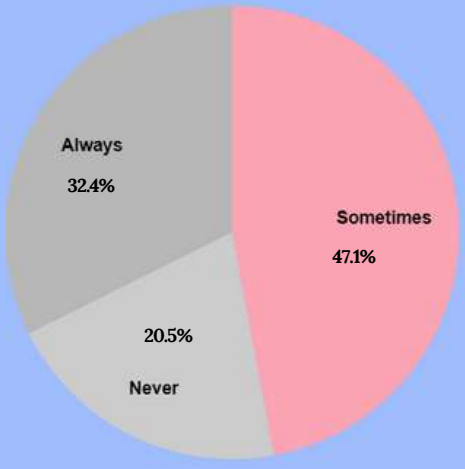


Nearly half of the respondents

49%

always use the UPI as payment method, showing a big leap towards digital or cashless transactions.

Use of DigiLocker

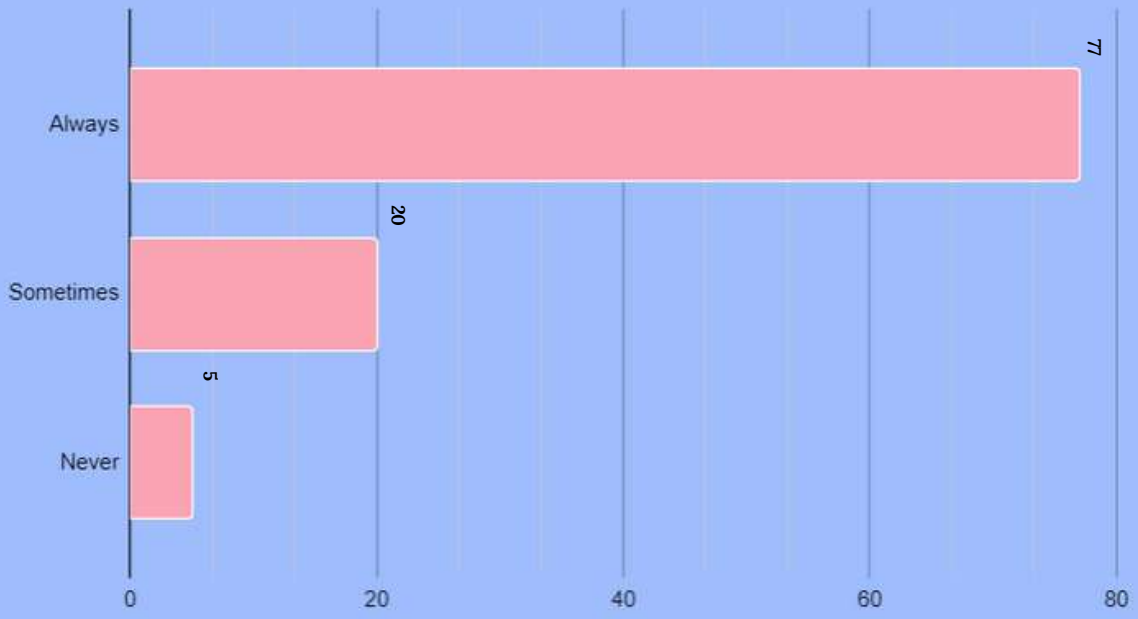


Nearly half of the respondents

47.1%

sometimes use DigiLocker to store documents, indicating some challenges in regular adoption of digital government services.

Frequency of online bill payments



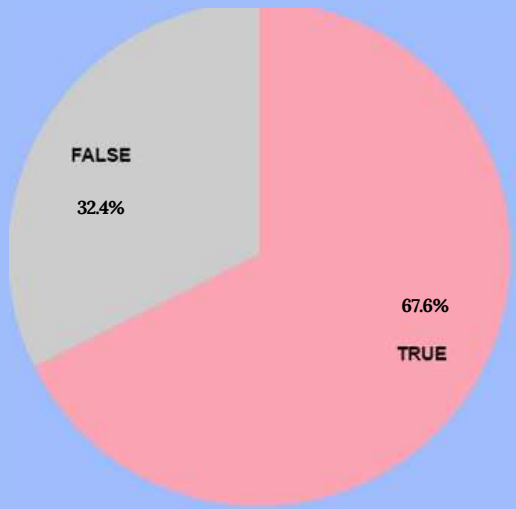
A significant majority of respondents consistently use online platforms for recharge and bill payments, demonstrating a strong inclination towards cashless transactions.

75.5%

Awareness about Digital India initiatives

Majority of respondents stated that it was true that they are aware of Digital India initiatives, illustrating the growing awareness of government-led digital initiatives among the citizens.

67.6%

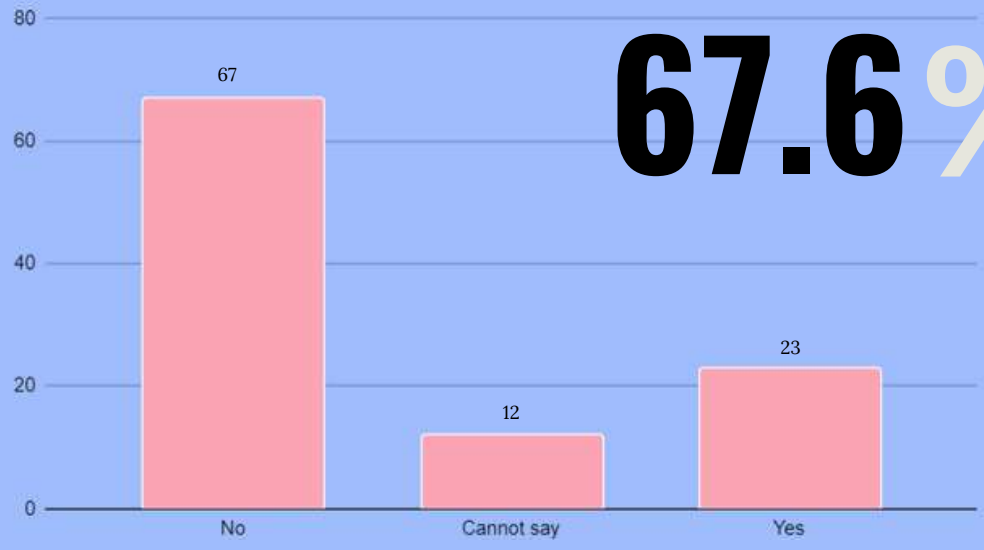


Cyber Awareness Insights

This section delves into participants' experiences and perceptions regarding cyber-attacks and frauds. The questionnaire revealed instances of victimhood, financial losses, and security breaches, providing insight into the evolving challenges faced by digitalisation.

Have you been a prey to cybercrimes?

Majority of respondents have never fallen victim to cyberattacks, indicating that the majority have been spared from the detrimental effects of cyber threats or fraud.

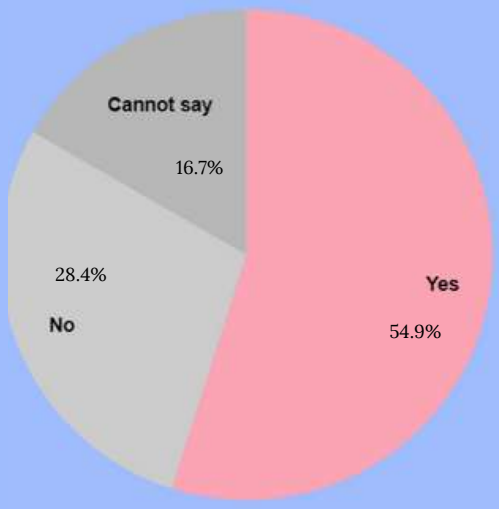


67.6%

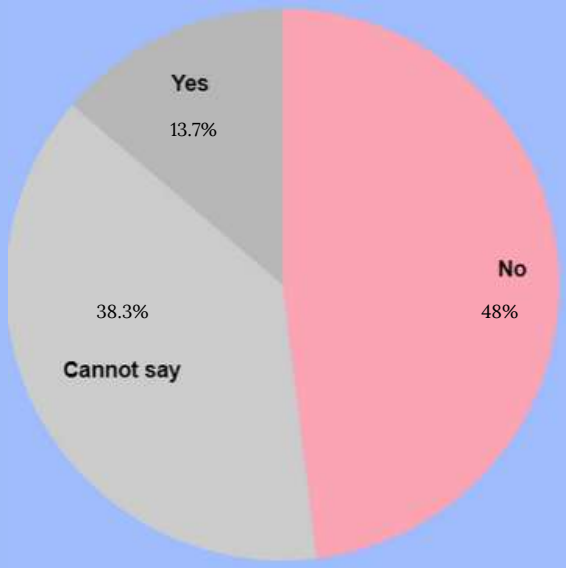
Can you report a cybercrime?

More than half of respondents are familiar with the procedures to report cybercrimes, showcasing awareness among more than half of the respondents.

54.9%



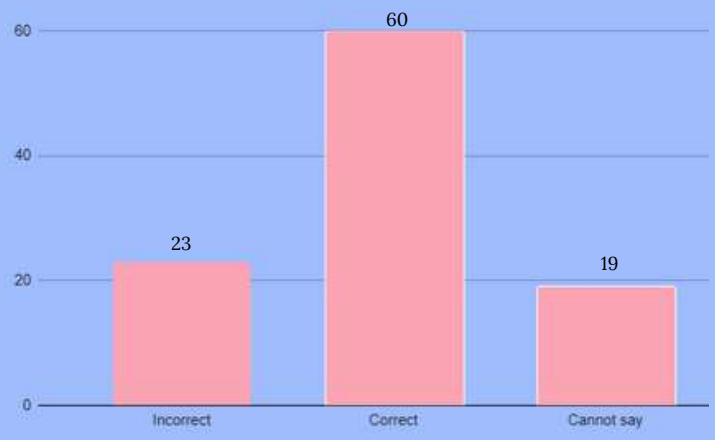
Are regulations for cybercrimes efficient enough?



48% of respondents believe that current regulations for cybercrime are not efficient enough and require more strictness. At the same time, 38.3% of respondents could potentially lack awareness or clarity regarding existing cybercrime rules and regulations.

Identifying a phishing e-mail

A phishing e-mail is any malicious email message meant to trick users into divulging private information. More than half of respondents could identify a legitimate Microsoft email from a phishing attempt, **58.8%** while 18.6% could not differentiate between a phishing email and an authentic one.



The survey findings reveal a growing awareness and preference for digital services across various sectors, driven by their convenience. However, the need to address some sections of the population to encourage widespread awareness of all available digital services remains. While a considerable portion of respondents has never experienced cyberattacks or frauds, there persists doubt regarding cybersecurity and privacy concerns which are escalated by phishing attacks. These insights highlight both the strengths and areas for improvement in our digitally evolving world. Comprehensive awareness programs and digital literacy initiatives should be extended to all citizens to build confidence and secure the adoption of digitalisation.

Imagination Unleashed

CREATIVE CORNER

Digital India

In this 21st century's embrace,
Recollection in my memory's space
Is India's journey, a vibrant trace.
A digital empire, an empowered grace.

From '*bhaiya khulle nah hai*' to UPI's leap,
From '*license ghar par reh gya*' to Digilocker's keep,
We all witnessed change in every stage.
Now, India aims to shatter every cage.

Bridging the digital divide,
No one is left aside.
From urban centres to villages wide.
In this digital era, united we stride.

Many challenges were faced, and the path was unclear,
But speed breakers were conquered without fear.
To illuminate every eye with glitter,
India is soon going to top the global digital metre.

Raghav Sanduja
BSc (Prog) Mathematical Sciences
1st Year

वाह रे! डिजिटल इंडिया

वर्तमान भिन्नता से भरा है,
कहीं उड़ रहे हैं पँछी,
कहीं बज रहें हैं पटाख़े

कहीं कोई जानवर कर रहा है शिकार
अपनी ही प्रजाति का

कहीं डर रहे हैं बच्चे बम के विस्फोटों से,
रो रहीं हैं माँएँ,
ढह रहे हैं मकान,
उखड़ रही हैं साँसें,
कहीं लोग चिल्ला चिल्ला कर मार रहे हैं लोगो को
कहीं पर लोग सोए के सोए रह गए हैं

ये सब जानकर,
कहीं पर लोग कर रहें हैं टिप्पणियाँ
कहीं पर लोग चुपचाप सहन कर रहे हैं
कहीं पर लोगों को फ़र्क नहीं पड़ रहा
ये सब मशीने हैं अलग अलग कम्पनियों की,

कहीं पर कोई बाप ख़ुश है,
बेटे ने कर दिए बीस हज़ार रुपए पे टी एम
कहीं पर कोई माँ खुश हैं बेटे की शक़्ल देख कर
उसकी आवाज़ सुनकर
तो कहीं पे ज़ाहिर हो रही है चहरे की उदासी

वाक़ई, डिजिटलाइज़ेशन ग़ज़ब चीज़ है।

मंदीप सिंह
बी.एस.सी. (प्रोग्राम) गणितीय विज्ञान
तृतीय वर्ष

The Digital Realm

In this digital realm, where wonders unfold,
Bits and bytes dance, stories are yet untold.
With a click and a swipe, the world at our fingertips,
Connecting hearts and minds, through digital trips.

From social media feeds to online stores,
Digitalisation opens infinite doors.
Information flows freely, knowledge abounds,
In this digital age, exploration knows no bounds.

But amidst the advancements, let's not forget,
To cherish human connection, with no regret.
For in this digital world, we must always strive,
To keep our hearts open, and our relationships alive.

So let's embrace technology, hand in hand,
But never lose sight of what makes us truly grand.
Digitalisation, a tool to enhance our lives,
But let's remember, it's the human touch that truly thrives.

Kanishka Gupta
BSc (H) Computer Science
1st Year

Editor's Choice

एक मानव निहित डिजिटल जुगलबंदी

मशीनों की झुनझुनाती गड़गड़ाहट, कीबोर्ड की लयबद्ध "खट-खट", और पायजामे की ज़ेब में सिसकियों की तरह गूँजती फ़ोन की कंपन - यह डिजिटल युग की सिम्फ़नी थी। और फिर, एक स्वर, स्पष्ट और तीखा, परिचित धुन में सुनाई पड़ता है - एक डिजिटल "बीप", इलेक्ट्रॉनिक हवा में एक फुसफुसाहट, अतीत से एक संदेश,

"दोस्त, तुम कैसे हो?"

यह सिर्फ़ एक संदेश नहीं था, यह समय का ताना-बाना था। कई वर्षों में, महाद्वीपों के पार, उस जीवन की खाइयों के पार बनाया गया एक पुल जो हमारे स्कूल के दिनों के बाद भटक गया था। किशोरावस्था की भूलभुलैया में खोए हम समय के विशाल सागर में दो जहाज़ों की तरह बह गए थे।

लेकिन डिजिटल युग ने, अपने अलौकिक जादू से, हमें फिर से जोड़ दिया है। यहाँ हम दिल्ली में बैठे सात समंदर पार उठी एक आवाज़ की गूँज सुन रहे थे। एक आवाज़ जिसमें साझा की गई यादें, फुसफुसाए रहस्य और अधूरे वादों का खट्टा-मीठा दर्द शामिल था।

डिजिटलीकरण ने, अपनी त्वरित-गति और असीमित पहुँच के साथ, दुनिया को एक गाँव के चौराहे तक सीमित कर दिया है। हम अब अपने आप में द्वीप नहीं हैं, बल्कि एक वैश्विक गाँव के नागरिक हैं, जो डेटा और सूचना के अदृश्य धागों से जुड़े हुए हैं। हम कहानियाँ साझा कर सकते हैं, जीवन को प्रभावित कर सकते हैं और संस्कृतियों के बीच की खाई को पाट सकते हैं, यह सब एक उँगली या माउस के एक क्लिक से।

यह लगभग वैसा ही संसार है जैसा कि शंकराचार्य ने इसे देखा था, परमात्मा का एक मात्र भ्रम, जो अब आत्म-जागरूक हो गया है। ब्रह्म का स्वप्न स्वयं की चर्चा कर रहा है, उसके पात्र अपने विशाल कैनवास में नई कथाएँ बुन रहे हैं। हम, डिजिटल अवतार, इस भव्य प्रवचन की आवाज़ हैं, जो पूरे वेब पर गूँज रही है, समय की रेत पर अपने पदचिह्न छोड़ रही है।

दूर के तटों से जुड़ने के लिए पुराने, साहसी तूफ़ानों और विश्वासघाती पानी के नाविकों के बारे में सोचें। आज, एक साधारण बीप हमारी आवाज़ को महासागरों, महाद्वीपों और समय क्षेत्रों से दूर पहुँचा देती है। यह प्रौद्योगिकी की शक्ति का एक प्रमाण है, एक ऐसी शक्ति जो संचरण के धागे बुन सकती है, तब भी जब भौतिक दुनिया हमें अलग कर रही हो।

परंतु डिजिटल युग की सहजता और गति का आनंद लेते वक्त, हमें मानव हृदय की गूँज को नहीं भूलना चाहिए। आइए हम इस डिजिटल पुल का उपयोग केवल सूचनाओं के आदान-प्रदान के लिए नहीं, बल्कि सहानुभूति, समझ और प्रेम के पुल बनाने के लिए करें।

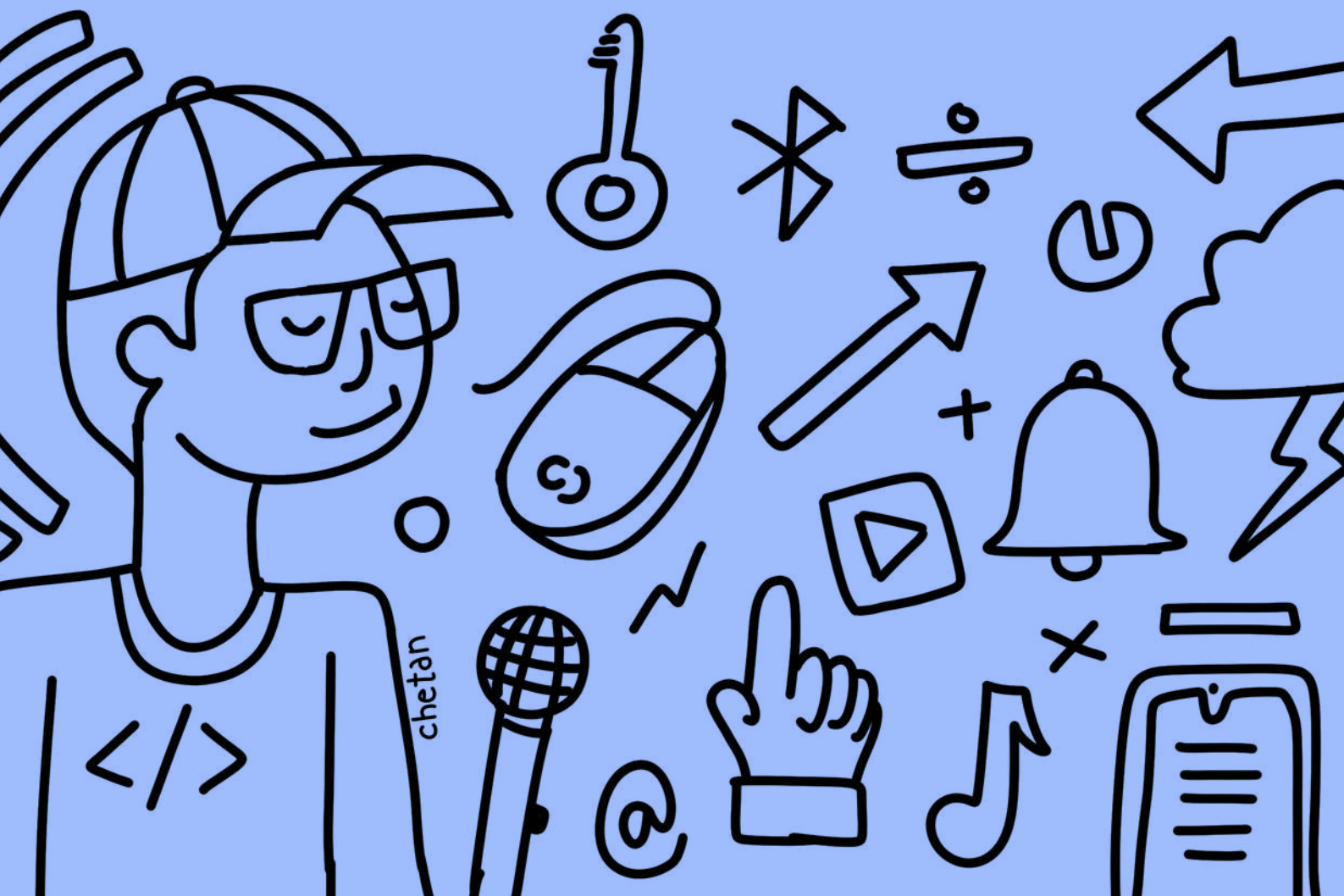
अंततः, डिजिटलीकरण का असली जादू मशीनों में नहीं, बल्कि इसके द्वारा बढ़ावा दिए जाने वाले मानवीय संबंधों में निहित है। वह उस बिछड़े यार से मिलने का अनुभव है, साझा किए गए सपने और प्यार की गूँज है जो विशाल डिजिटल परिदृश्य में गूँजती है। तो आइए हम सुनें, केवल बीप को नहीं, बल्कि मानवता की उस सिम्फ़नी को जो पूरे ब्रह्मांड को अपनी छोटी सी प्रतिध्वनि में समाहित कर सकती है।

यह डिजिटल युग है, न केवल मशीनों का, बल्कि दिलों का, कहानियों का, संबंधों का जो समय और स्थान की सीमाओं से परे है। यह डिजिटल इको का युग है, और यह सुनने में एक बेहद खूबसूरत नमूना है।

गोविंद सिंह राठौर
बी.एम.एस.
तृतीय वर्ष

VISUAL VISIONS

Transforming Ideas into Art



Bhoomika Singh
BSc (H) Computer Science
3rd Year

Saloni
BSc (H) Computer Science
3rd Year

Anubhav Bharti
BSc (H) Computer Science
2nd Year

Chetan Yadav
BSc (H) Computer Science
3rd Year

Achievements and Placements

Keshav Mahavidyalaya is one of the leading colleges for Computer Science at the University of Delhi. The department and faculty continuously put a mammoth effort into providing the students the best with different pedagogies and practical approaches to help them understand the core of the field. The students are always encouraged to embrace new technological trends and expertise for personal growth and development. The healthy competitions and events held by the department enhance the students to nurture their skills effectively for future progress.

With pride and pleasure, we present a comprehensive collection of impressive headways of the 2023 batch students in their respective careers.

Name of students	Exam Cleared	Course and College
Adeeb Ahmed	NIMCET	MCA at USCIT
Agam Gupta	CUET	M.Sc. Computer Science at the Department of Computer Science, University of Delhi
Deepak	CUET	M.Sc. Computer Science at the Department of Computer Science, University of Delhi
Harsh Yadav	CUET	M.Sc. Computer Science at the Department of Computer Science, University of Delhi
Nachiket Nasa	CUET	M.Sc. Computer Science at the Department of Computer Science, University of Delhi
Prachi Goel	CUET	M.Sc. Computer Science at the Department of Computer Science, University of Delhi
Prakhar Pandey	NIMCET	MCA at University School of information, communication and technology, Indraprastha University

Name of students	Exam Cleared	Course and College
Sagar Rathore	CUET	M.Sc. Computer Science at the Department of Computer Science, University of Delhi
Shruti Ray	IGDTUW CET MCA (AIR 50)	MCA at IGDTUW
Suhail	JMI Entrance Exam	MCA at Jamia Millia Islamia
Tanya Bharti	NIMCET	MCA at NIT Warangal
Udit Kaushish	NIMCET	MCA at University School of information, communication and technology, Indraprastha University
Vaibhav Dubey	NIMCET	MCA at University School of information, communication and technology, Indraprastha University
Vinay Dagar	CUET	M.Sc. Computer Science at the Department of Computer Science, University of Delhi
Vishal Maurya	NIMCET	MCA at NIT Jamshedpur

Name of Students	Company	Role at Company
Aditi Budhiraja	TravClan	Automation test Engineer
Anjali Kumari	Accenture	Database Programmer
Ishita Rai	Inventrik	Full Stack Engineer
Ishita Rai	Wipro	Graduate trainee Engineer
Mohit Aggarwal	Ditto	Advisor

Name of Students	Company	Role at Company
Saurav Rawat	SHL	Implementation Analyst
Shivam Jha	S&P Global	Associate salesforce application specialist
Shivanshi Gupta	BPB online	Content Development Editor
Shreyashi Dabral	Edoflip	Junior Software Developer

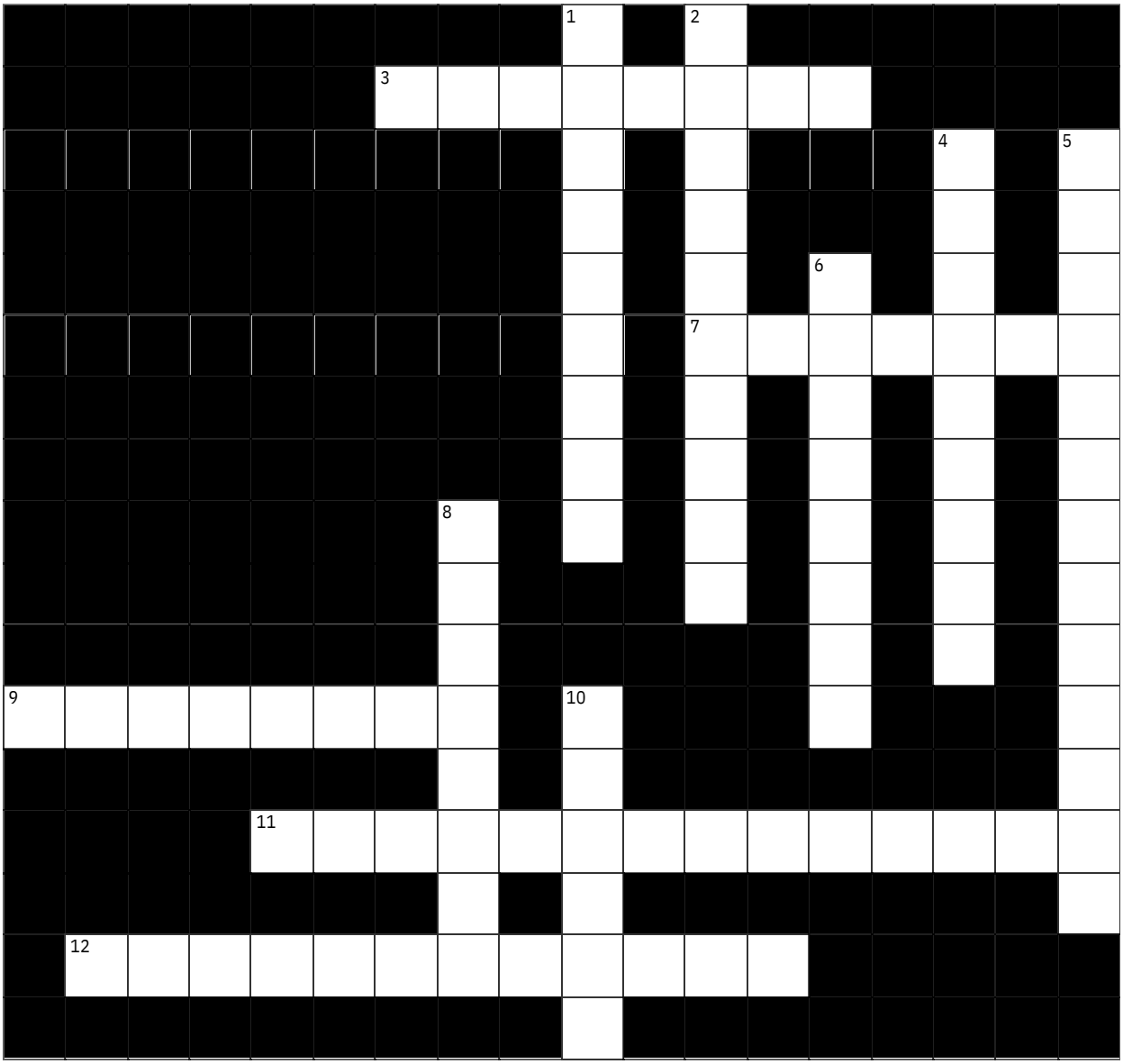
In today's competitive job market, college education is integral in moulding student career path opportunities. Colleges not only provide students with academic knowledge but also offer various opportunities for skill development and professional growth. Thus, the faculty of Keshav Mahavidyalaya always looks forward to fostering the students with trending technical skills, critical thinking, and global perspective so that they can witness remarkable success of the graduates.

Competition Wins 2022-23

Welcome to this section dedicated to the diligent coders and tech enthusiasts who have triumphed in various computer science competitions by showcasing exceptional talent, problem-solving skills, and innovation. Their achievements not only bring pride to our institution but also inspiring for passionate and young individuals. Join us as we highlight the winners of these prestigious competitions and delve into their remarkable journeys.

- Ashutosh Prajapati and Krishna Kumar secured first positions in *Blind Coding*, a coding competition at Sankalan'23, the annual fest of DUCS.
- Konicaa Sharma secured the second position in *Web Hive*, a web development competition, at TECHELONS'23 organised by Shivaji College, Delhi University.
- Riddhima Pant was placed first in the *Debate On AI and Unemployment* at Lakshmibai College, DU, and secured third place in the *Ministry Of Magic*, the debating event, at BLITZKRIEG'23, the annual tech fest of Keshav Mahavidyalaya.
- Tanuj Kumar secured first position in *Webopoly Spree*, a website development competition, at BLITZKRIEG'23, the annual tech fest of Keshav Mahavidyalaya.
- Sourabh Pal secured second position in *Webopoly Spree*, a website development competition, at BLITZKRIEG'23, the annual tech fest of Keshav Mahavidyalaya.
- Chetan Yadav secured third position in *Stream Draw*, a digital art competition at BLITZKRIEG'23, the annual tech fest of Keshav Mahavidyalaya.

GEEK TIME



Across

3. A network security system that monitors and controls incoming and outgoing network traffic based on predetermined security rules.

7. Software that is specifically designed to disrupt, damage, or gain unauthorised access to a computer system.

9. A branch of engineering and computer science that involves the design, construction, operation, and use of robots.

11. The process of businesses and society transitioning to the digital world.

12. The process of hiding or coding information so that only the intended recipient can read it.

Down

1. The technology that allows people to interact and communicate across long distances through the electronic transmission of voice, fax or other information.

2. A type of malicious software designed to block access to a computer system until a sum of money is paid.

4. Transmission of wide bandwidth data over a high-speed internet connection.

5. The use of technology to harass, threaten, embarrass, or target another person.

6. Malicious hackers who break into computer systems with malicious intent.

8. Practice of steal sensitive information, such as usernames, passwords, and credit card numbers.

10. A government initiative that provides free and high-quality e-learning education to students from Class 9th to post-graduation.

Answers

Down

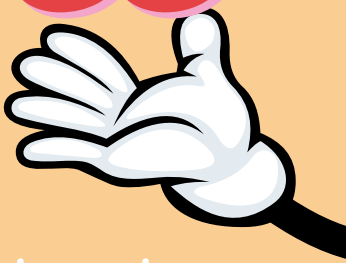
1. Telephony
2. Ransomware
4. Broadband
5. Cyberbullying
6. Blackhat
8. Phishing
10. SWAYAM

Across

3. Firewall
7. Malware
9. Robotics
11. Digitalisation
12. Cryptography

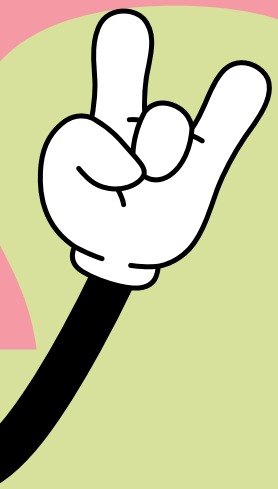
Riddles

PUT YOUR THINKING CAPS ON!



I'm the conductor
of the digital choir.
Arranging data.
layer by wire. What
am I. in the world
of code?

Answer:
Programmer

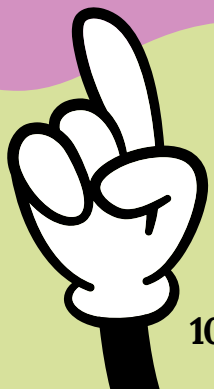


I'm the architect
of the digital land.
Commands I follow.
at your hand. What
am I. in the binary
node?

Answer: Algorithm

I'm the guardian
of digital gates.
Screening data.
my duty awaits.
What am I?
in the realm
of defense?

Answer: Firewall



I'm a revolution in the digital age.
Transforming industries.
turning the page.
I connect devices.
make networks thrive.
With speed and efficiency.
I help them all thrive.
What am I?

From: Kanishka Gupta
BSc (H) Computer Science
1st Year

Team
e-Blitzine

First Row (Left-to-Right): Kavita Mishra (Design Executive), Mannat Pathak (Content Curator), Nikhil Sahni (Design Curator), Dr. Sumit Aggarwal, Dr. Richa Sharma (Convenor), Ms. Astha Goyal, Komaldeep (Content Executive), Siddhi (Design Executive), Dhavni (Editor-in-Chief), Lipika (PR Head)

Second Row (Left-to-Right): Rushank Garg (Design Curator), Simran (Content Executive), Ankit Negi (Content Curator), Shubham (Design Curator), Chetan Yadav (Creative Head), Deependra Kumar Singh (Design Executive), Abhishek Kumar (Design Lead), Eshaan R James (PR Head)

Not in Picture: Lovely Mahour (Design Executive)

Team
BLITZ

1st Row (Left-to-Right): Dr. Rakesh Kumar, Dr. Namita Aggarwal, Dr. Roli Bansal (Convenor), Ms. Nidhi Passi

2nd Row (Left-to-Right): Rahul Arora (Secretary), Sourabh Pal (Executive), Shruti Sharma (President), Nancy Gupta (Senior Executive), Priyanshi Jain (Senior Executive), Jalaj Kumar (Executive)

3rd Row (Left-to-Right): Aleesha Singh (Executive), Kanishka Rai (Executive), Simran Dureja (Senior Executive), Shashank Deep (Treasurer), Jatin Puri (Senior Executive)

Faculty Members

First Row (Left-to-Right): Ms. Nidhi Passi, Dr. Richa Sharma, Prof. Priti Sehgal, Prof. Madhu Pruthi, Dr. Anjali Thukral, Dr. Roli Bansal, Ms. Jyoti Kumari

Second Row (Left-to-Right): Ms. Astha Goyal, Mr. Anand, Mr. Sumit Baberwal, Dr. Rakesh Kumar, Dr. Sumit Aggarwal, Mr. Pradeep Kumar, Dr. Namita Aggarwal

Non-Teaching
Members

Left-to-Right: Ms. Pooja Batra, Mr. Rajesh Wadhwa, Ms. Anuradha Chadha, Mr. Lovkesh Jairath, Mr. Ritesh Gupta. Mr. Akhilesh Kumar

B.Sc. (H) Computer Science

1st Year Students

1st Row (Left-to-Right): Goldi, Simran Aggarwal, Mannat Pathak, Kanishka Gupta, Kritika Anand, Deepti, Anushka Aggarwal, Muskan Rana, Riya Bharti, Muskan Kashyap, Diksha Nagpal

2nd Row (Left-to-Right): Jhalak Arora, Nomin, Anjali, Anamika, Kanishka Rai, Medha, Kanika, Snehal, Bhavika, Bhumika Singh, Dhriti

3rd Row (Left-to-Right): Nikhil Sahani, Aryan Huria, Vishnu Rajpoot, Tarun Jaiswal, Pawan Yadav, Vijay Kumar Sahani, Himanshu, Prince Raj Meena, Anand Raj, Kartikey, Manan, Moksh, Akarsh Jain, Ayser, Anoop, Arjun, Dev, Himalaya

4th Row (Left-to-Right): Tushar, Kushagra, Krish Rajaura, Kaushal, Priyanshu Pawar, Yash Rohilla, Mohit Kumar, Yash, Amritesh, Mohit Kumar, Aman, Madhav, Harshul, Abhishek, Anish, Anmol

5th Row (Left-to-Right): Nitesh, Akshat Choudary, Vedant Goel, Kunal, Shivam Choudhary, Manish Dimri, Prince Kumar, Judson

B.Sc. (H) Computer Science

2nd Year Students

1st Row (Left-to-Right): Sourabh Pal, Priyanshi Jain, Tamanna Ahuja, Simran Pahwa, Komaldeep, Nancy Gupta, Lovely Mahour, Diksha Saluja, Anusha Garg, Siddhi, Kanishka Kukrej

2nd Row (Left-to-Right): Pawan Kumar, Vishal, Priyanshu Arya, Ananya Jain, Simran, Meghanshi, Anshika Singh, Lakshita Rawat, Lipika, Anubhav Bharati, Gopal Arya, Viranchal Kumar Uraon, Anmol Arora

3rd Row (Left-to-Right): Sachin Sharma, Nitish Thakur, Rishabh, Rahul Arora, Sayyam Bansal, Daksh Sahni, Mayank, Vinay Ruhil, Satyam Yadav, Vishal, Bratadipta Mondal, Dhuruv Giri, Aman Raj, Vimal Kumar, Hiten Singla

4th Row (Left-to-Right): Shivam, Sujal Kumar, Gitesh Bisht, Divyanshu, Sarthak Chaturvedi, Dhirendra Kumar Patel, Jigmet Namgail, Kanishk Chauhan, Ayush, Ansh Juneja, Chandan Kumar, Bhaskar Malik

5th Row (Left-to-Right): Aman Ranjan, Sachin Kumar, M Devanandan, Arun Kumar, Aryansh Sahu, Deependra Kumar Singh, Eshaan James, Ajit Singh, Akshay Goswami, Ankush Kumar, Ashutosh Papnoi, Aman Kumar Sparsh

B.Sc. (H) Computer Science

3rd Year Students

1st Row (Left-to-Right): Priyanshi Kaushik, Riddhima Pant, Shruti Sharma, Poonam Kushwaha, Saloni, Amisha Rathi, Khushi, Dhavni

2nd Row (Left-to-Right): Sudhashnu Prusty, Vishav Kumar, Sonu Kumar, Ayush Ranjan, Chandan Patel, Ryan Jose, Yash Chaudhary, Abhishek Yadav, Manjit Singh, Dev Gupta, Nishant, Chetan Yadav, Ashutosh Prajapati, Abhay Veer Yadav, Abhayjeet Kumar, Mandeep Negi, Abhishek Kumar

3rd Row (Left-to-Right): Shekhar Mishra, Krishna Kumar, Pranay Kumar, Pardeep, Sahil Kshirsagar, Sparsh Verma, Rohit Meena, Akash Nishad, Anurag Rana, Abhishek Maurya

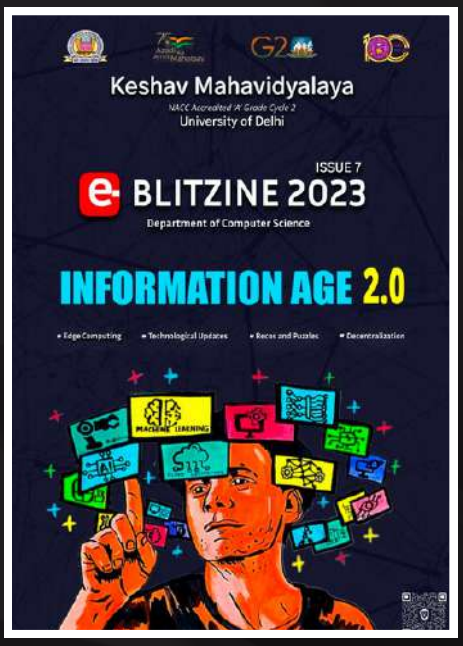
Thanks for reading!

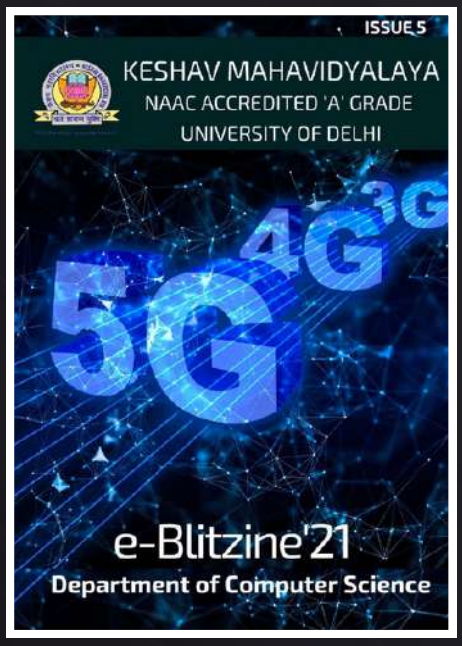
e-Blitzine

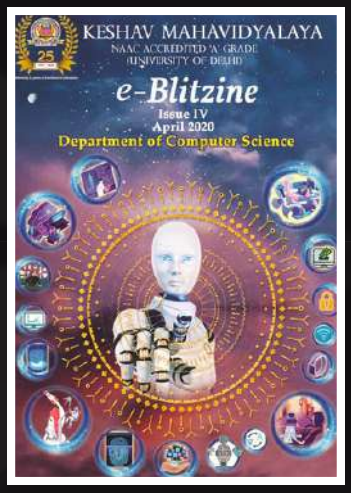
Department of Computer Science
Keshav Mahavidalaya

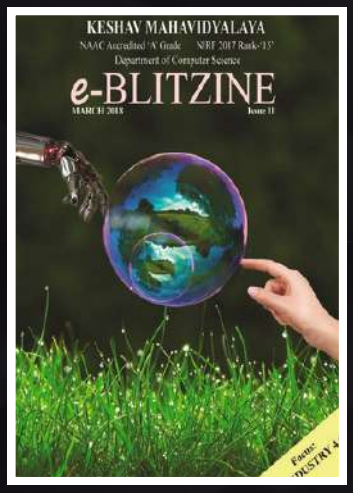
Photo: Chetan yadav

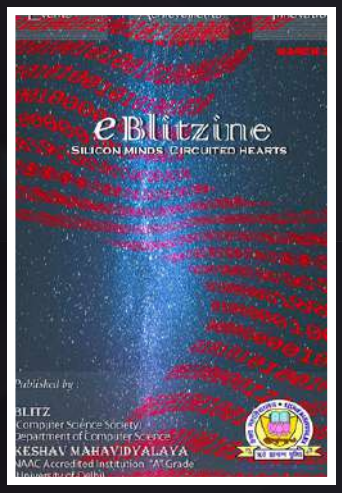
PREVIOUS ISSUES











e-BLITZINE

Department of Computer Science

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