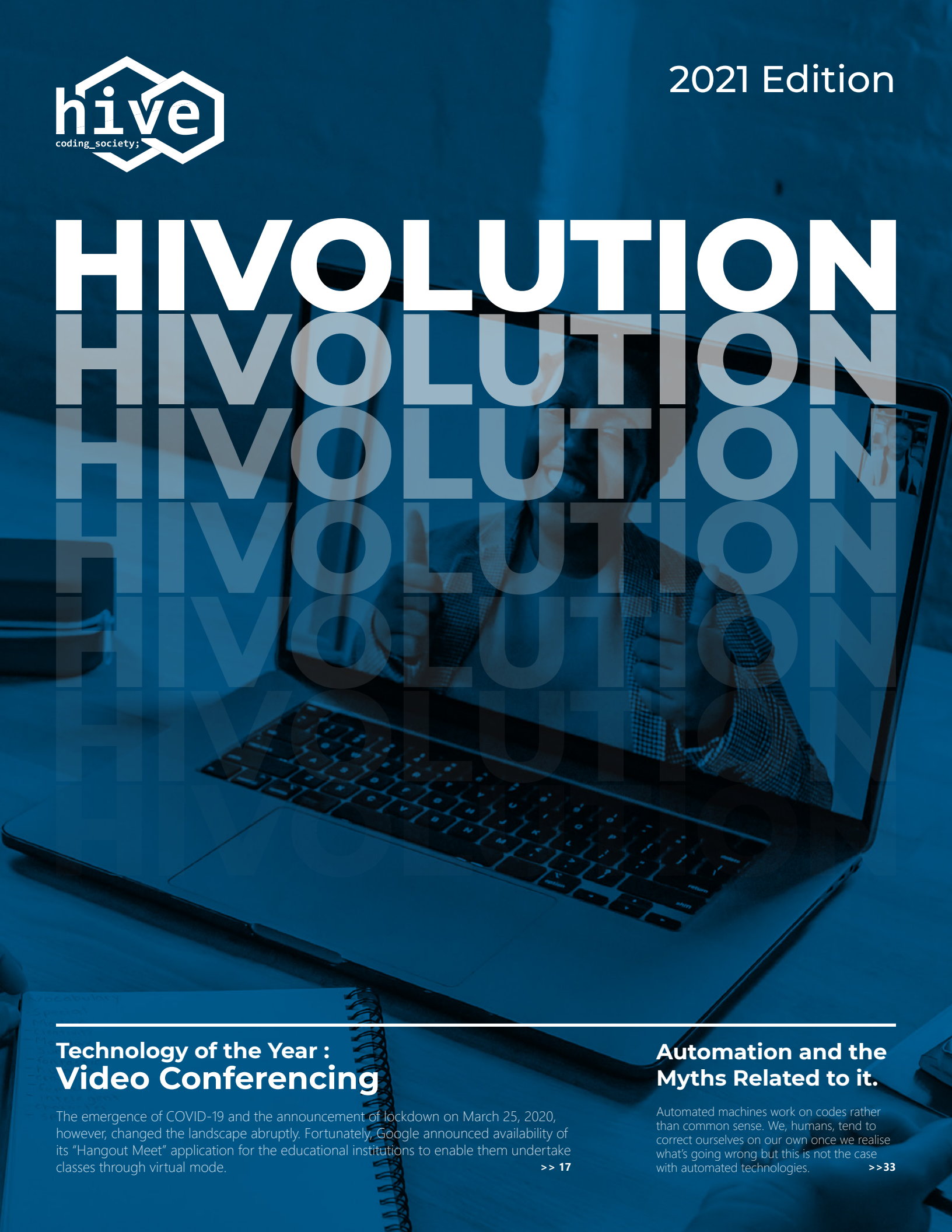
hive
coding_society;

2021 Edition

HIVOLUTION



Technology of the Year : Video Conferencing

The emergence of COVID-19 and the announcement of lockdown on March 25, 2020, however, changed the landscape abruptly. Fortunately, Google announced availability of its "Hangout Meet" application for the educational institutions to enable them undertake classes through virtual mode.

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Automation and the Myths Related to it.

Automated machines work on codes rather than common sense. We, humans, tend to correct ourselves on our own once we realise what's going wrong but this is not the case with automated technologies.

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We dedicate this edition of Hivolution to the courage, determination, and conviction of the founders of Jamia. And also to the teachers and alumni, who have invested their efforts to take Jamia to greater heights of success.
















A Message from the team

Dear Readers,

Hope you all are doing good amidst the current scenario.

We have come out with the first edition of Hivolution with an agenda to propagate our views on recent developments which is 'Endeavours for automation'.

"Automation is solving the problem once and then putting it on autopilot." Thus technology is driving our lives towards comfort.

Through this issue, we intend to enrich you with the latest technological advancements as well as guide you towards future probabilistic enormity.

Background by Jawed Alam

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About Hive

Hive Coding Society is a student-run cooperative society of Jamia Millia Islamia. We aim to encourage innovation and creativity among students. Our coding society majorly involves students to develop real-world projects so that they get industry-ready and can contribute to society as well. The society follows the motto of Jamia Millia Islamia i.e "He taught man what he knew not".

Learning is the best means of self-improvement. We provide ample opportunities to freshmen to learn through projects and various other programs. Also, we have mentors and experienced coders who guide freshmen on how and where to start. We focus on developing motivation among the students for coding and bring like-minded people together to develop critical projects. We believe a developer could apply his theoretical knowledge into practical application to solve real-world problems.

We keep organizing events regularly so that the students remain active and enthusiastic. We try to provide a head start to students to participate in hackathons and various other coding competitions. We conduct frequent meetings for discussions on how to perform better on various coding platforms, the latest technologies being adopted by IT giants, and new project ideas.

Teamwork plays a very essential role in today's multidisciplinary world irrespective of the work domain. We promote teamwork by creating an interactive environment where every society member is free to present his/her perspective and suggestion. Effective teams allow the initiative to innovate, in turn creating a competitive edge to accomplish goals.

About Hive

HoD's Message

Prof. S.M.K. Quadri

First of all, I am rejoiced to see the students of our department taking this step towards peer-to-peer learning.

We are living in the age of information where interdisciplinary fields are converging and it is not practical for an individual to learn everything. But a great team can divide the problem into different fields and individuals can learn to conquer separately. And finally, by their collaborative efforts, they can lead to the final solution of the problem and this is how the IT industry is functioning now.

If we look at our department it only lacks in these coding societies, and other collaborative platforms where students can show their potential apart from the academics. And as the head of the department I feel honoured to be the teacher of the students who are taking this kind of amazing initiative.

So, come and be a part of the society which is working on inculcating the development of industry standard temperament in students.

Founder's Message

Tarun Sharma

It was around 2400 BC when technology came into existence in the form of the abacus. Merely a manual device to perform basic arithmetic operations.

Since then, technology has seen an immense amount of growth. From abacus to Pascaline, and the difference engine to ENIAC, from there to modern-day quantum computers, it has been a long journey for technology to achieve what it is today, and it is still growing. Not just growth in terms of architecture or complexity but also up to the extent that it touches our lives. But what's driving technology to grow so fast? Which organization or person is actually behind this? Who is the backbone of this era of information technology? It's "You". This "You" is not restricted to some researchers, entrepreneurs, students, or engineers but even the person uploading the videos on youtube, someone writing an answer on quora, or someone posting or solving an issue on StackOverflow. It's because of those small contributions a digital democracy has been framed today.

Hivolution is also a contribution to the digital world. It's going to open up unique and extensive knowledge and information about technology in a gist in the next few pages.

Articles


Daily Express Friday September 29 2017
The Doro 8030 – a smartphone
designed with simplicity in mind
make your life easier and better
Buy the amazing Doro 8030 from £89 on Pay as You Go
with no upfront cost at Tesco Mobile, Carphone Wareh
Apple Music and
the data's on us
MUSIC
12 Daily Express Friday September 29 2017
SCOTTISH DAILY EXPRESS
Progress on Brexit talks
We must
defend the

Edu-Informatics on the Move!

By Dr. Khurram Mustafa
Professor, Department of Computer Science
Jamia Millia Islamia

Prologue

Technology, in general, and ICT especially, has advanced more rapidly than almost any institution can keep pace with. It has been truer for education than any other field, perhaps being largely invisible in terms of tangible outcomes and being only longest-term investments. Desktop computers arrived in the 1970s, the Internet in the 1990s, followed up now by intense social media and mobile computing. Change is inevitable and education has been the tool to make it happen. Classrooms are now becoming a network of learners' models of effective instruction to accommodate 21st century education and training. ICT-based educational environments, and solutions, are becoming readily available to the educational system. And these all have not only mooted as inevitable reality but also as a rescue-tool with additional efficiency and effectiveness of the current pedagogical changes to address fundamental educational issues of the future.

The pertinent e-learning solutions are becoming more and more on offer in various forms, keeping pace with the fastest-ever developing technological infrastructure. Such educational technologies include a range with varying potential, utility, and growing maturity. Examples are tagged as Individually Prescribed Instruction, Program for Learning in

Accordance with Needs (PLAN), Design-Based Research, Distance Learning, Collaborative Learning, Intelligent Tutorial Systems, Blended Teaching and Teaching, Project Oriented Learning, Flexible Learning Activities, Individualized Learning, Computer Based Learning, Computer-mediated communication, etc. The tech-savvy people have been benefitted more than ever before, however being largely unaware of inherent side-effects and hidden costs.

Though, with a long history of educational studies, learning theories have been considered mostly inadequate to determine how best is to use technology for learning. Skinner believed that the teacher is the builder and architect of behaviours but also contended that 'a teacher is not as effective as a reinforcing agent'. He appeared to advocate for efficient control of learning. It appears high time to strive for becoming more electric in their philosophies towards learning. That is, ICT potential needs to be recognized but without undermining the critical health-hazards.

ICT in education was a fast-growing business, and Covid19 has accelerated it further to as a major paradigm shift. The companies, like Pearson, McGraw Hill and Houghton-Mifflin, are currently dominating the market. The field is still under-explored, though being driven by 'ICT modalities, visual appeal and market'. From the Indian perspective of a large population-led-market, we certainly lack at proportionally dedicated efforts. It may be wilfully accomplished by design, rather than compulsions leading to inherent tangible educational losses, delays and waste of time. The suddenly pressed upon requirements to reap and sustain educational practices have met with several challenges such as under-preparedness on physical, pedagogical and technological fronts. The lockdown has pushed the adoption of digital technology by educational institutes. Thus, the prowess of online educational solutions gave way to save quality time to handle such situations and beyond.

It appears high time to experiment, innovate and prepare with e-learning solutions to cope with the future emerging and inevitable requirements. It is appreciable that IT-enabled tools are abundantly available waiting to be enforced effectively, efficiently and skillfully. The needed productivity would highly depend upon the latter, which fraternity is deemed quite short of. Moreover, e-learning systems, in a way, are also compelling the move towards student-centric education and universalization – a largely unfulfilled legitimate dream of educational activists and enthusiasts – apart from managerial support of ICT services.

Top e-Learning Trends

Since the early days of e-learning, its benefits have significantly weighed up to those of the face-to-face approach. The rapid growth of the internet and mobile devices has made e-learning flexible, time-saving, and cost-effective in education. Recent developments in ICT have shown a paradigm shift towards informatic, which is the study of the structure, behaviour, and interactions of natural and artificial systems. Though computation is central as a tool, it deals with the design, application, use, and impact of computational principles and technology in the context of multiple disciplines that encompass a wide range of human activity. A 2020 survey of e-learning industry experts about their outlook identified top 10 e-learning trends driven by educational-informatics as visualized by the infographic as follows[1].

Fig2: Top e-Learning Trends

A top-up to informatics, Edu-informatics leads as the convergence driver. It refers to the integration of education and informatics for meaningfully connecting the education, artistic and scientific fields for desirable e-learning environments. The most generic trends include more of blended learning, tech-teacher and e-content developments marked by MOOCS. However, technology and development perspectives appear to be marked by the ones shown in the infographic. These indications lead to the call for the potential use of technology as informatics to lead context-based modelling of other technologies e.g. audio, video, computation, communication, etc.

Emerging Forecasts

There is no doubt that the developed countries are leading not only on e-learning infrastructure but also on the demand for e-learning solutions. Amongst the worst-hit markets due to coronavirus pandemic, government organizations across these countries are encouraging the use of advanced digital learning content. However, we may appear less prepared with the infrastructure and content but not on the demand side due to the huge population as consumers. Some of the trending forecasts are identified as eye-openers to us and the world at large, as follows[2,3].

a. **Market Forecasts:** According to the analysts at GMI, the virtual classroom technology in the market is expected to grow at a rate of 11% during the forecast timespan (2021-26).
b. **Operating Companies:** Major operating companies in the e-learning landscape as key industry players include: Aptara, Inc., Meridian Knowledge Solutions, Adobe Systems, Inc., Citrix Education, Microsoft Corporation, SAP SE, Cornerstone, Learning Pool, NetDimensions, Oracle Corporation, Apollo Education Group, Cisco Systems, Inc., Allen Interactions, Inc., and CERT-POINT Systems, Inc.
c. **Requirement:** According to the World Economic Forum, around 1.2 billion children are out of classrooms with schools shut down globally due to the COVID-19 pandemic. To combat this situation, large-scale national efforts to leverage technology to the market players in support of distance education, remote and online learning during the COVID-19 pandemic are emerging and evolving rapidly.
d. **Infrastructure:** The physical infrastructure of academic institutions will have less impact on the quality of education and thus directly on the cost of education. Moreover, basic requirements like delivery platforms, IT infrastructure, PC/Desktop/Mobile for end-delivery and assessment tools have been planned and drastic improvement is underway.
e. **Quality:** The use of technology in teaching and recruitment will lead to a new era with the best of faculty available from across the globe to students. Education quality will be gauged not just by the quality of faculty but also digital solutions as important parameters.
f. **Growth Drivers:** Notably, surveys resulted in varying region-wise e-learning growth drivers were identified and visualized in Fig 3(f) as follows.

Fig 3(f): e-Learning Growth Drivers

g. **High Impact Trends:** In the recent past, we have witnessed a dramatic change in the learning models in use worldwide. From self-learning to the flipped classroom approach, we have seen technology make a considerable impact on the learning and teaching methodologies. With numerous benefits to offer, digital learning has become almost an important part of the education system. The most prominent trends are led by the enormous power of digitalization, include the following, as depicted in Fig 3(g) as follows.

Fig 3(g): High Impact Trends

Edu-Informatics

The term Education-Informatics, as a sub-field of informatics, has been in use since at least 1980. With the primary focus on computer applications, systems and networks that support research and delivery of education, it is based upon information science, computer science and education but particularly addresses the intersection of this broad areas. Another term educational informatics has been in use to refer to a new area of research representing the convergence of aspects of information science, computing, education, instructional technology and learning sciences; and integrating them. The scope of studies in 'Education vis-a-vis Educational' Informatics typically encompasses but may not be limited to, the following:

- Logistics and Administration
- Systems Development: Teaching/learning platforms and assessment tools
- Meta-Systems Development: Curriculum maps and outcome frameworks
- Content and Knowledge Management
- Standards Development.

Alike several already emerged fields, such as bio-informatics, chem-informatics, agro-informatics, and social-informatics, Edu-informatics aims to do informatics in education. It is an interdisciplinary field that has several applications having roots in machine learning, data science, HCI, education, etc. It is defined as the development, use, and evaluation of digital systems that use pedagogical knowledge to engage in or facilitate resource discovery to support learning. The said integration is to happen by active-adaptation and reactive-transformation, resulting in adequate Edu-informatics as depicted in Fig 4 as follows.

Fig 4: Technology Integration by Edu-Informatics

For it to be a reality, a drastic change in thought process is required among the policy makers, authorities, students, and specially educationists. We must realize the huge potential of ICT for modeling other technologies, ICT-led convergence of technologies, and the emergence of IoT. All these steps will help strengthen the quality of digital learning infrastructure and hence accelerate the developments/adoption of technologies to deliver education. E-learning solutions, as an affordable alternative and in line with quality content, may prove cost-effective via ever-improving internet infrastructure. Moreover, virtual participation is catching fast due to ease of access that may further lead to lesser crowded transport, housing, etc. A rough estimate, by KPMG Edtech, indicates a $1.96 billion size educational technology market in India by 2021. However, a larger picture of the e-learning market worldwide is visible from the way it is growing.

Epilogue

Though, it is an age-old saying that 'there is nothing new under the sun', the concept of edu-informatics is relatively new. Several efforts on e-learning solutions have been in place but not a dedicated one and enough to cope with the challenges ahead. It is highly imperative to note that ed-tech solutions are

'largely and cost-effectively' feasible now by the ways of ICT. Therefore, such ICT potentials need to be leveraged to the optimal level without compromising the more important aspects of human life such as health. These amount to studies on different aspects such as timely addressing pros and cons related to fast-developing digital culture and educational-inevitable. However, the major takeaway may include 'Research, Design, Development, Evaluation and Standardization', related to edu-informatics process and e-learning solutions. Such efforts are intended to take from the current state 'lean Edu-informatics' to 'intense Edu-informatics' for leveraging ICT's educational potential to cope with emerging challenges.

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AI and IoTs are the Largest Contributors in Industry 4.0

By Prof. S. A. M. Rizvi
Professor, Department of Computer Science
Jamia Millia Islamia

Artificial Intelligence (AI) is one of the important paradigms to solve the real life problems through Computer machine. Impact and potential of AI is much more realized with the advent of faster machines of present times having capabilities to handle large volumes of data or large series of data.

AI is not just a subject rather it is a mother of all subjects, or one can call it Umbrella Discipline / Subject. The techniques or subjects fall under A.I. umbrella are Expert System, Robotics, Genetic Engineering, DM & DW, Pattern Matching, Image Processing, NLP, Voice recognition, Speech recognition, Virtual Reality, Neural network, Deep Learning, Machine Learning, Theorem Proving, etc.. It has gone further steps ahead of data processing what is called as Knowledge Engineering and Knowledge Development through various Learning skills.

IoTs is an attempt to develop manufacturing and Automation hand–to-hand products for the convenience of life of human beings across the globe. Degrees of Automation using AI along with IoTs encourages Industries to handshake Manufacturing and Automation, hand-to-hand, simultaneously to enhance the utility and impact of the use of their products or devices to smoothly sail in the era of Industry 4.0. It leads to come out with SMART products through Smart Com-

puting to improve the highest degree of Quality of Life across the globe without discrimination, which is almost totally based on automation.

IoTs products are an attempt to reach a solution in an Interdisciplinary approach, where on one hand, it uses sensors and cameras to capture the movement at a place on Earth and using Internet and Programming skills to remake it virtually available at another part of Globe. This way one can connect, control, monitor, upgrade and enhance knowledge from the Places of happening to other places around the world, with no impact of barriers or boundaries of the countries slashing out the artificial barriers including the role of middlemen in the process. This phenomenon has led to parallel and fast learning and improvements in all walks of life. Different devices and equipment are needed all over the world to adopt and capture such happenings to improve the quality of Human beings including tribes, which is called the Market of Industry 4.0.

Take for example, just one element of A.I., i.e., The Industrial Robots. Earlier we thought the best use of Robots is in 1. The Warfare, where one can save precious Human lives, and in 2. Automobile Industries, where the critical factors for the performance and productions are based on the accuracies of sizes, shape holes, etc., of equipment used. Robots are far more successful compared with human beings when such degree of accuracy is needed. However, now-a-days, due to substantial reduction in the cost of production of robots, they are now in every aspect of industrial production, even in the Service sector as well. Countries like, Russia, Germany, Japan and China are the top in this race of the use of Robotics. In comparison, India is not in this race so far due to the fact of being largest in population thereby adding more to the already existing unemployment problem.

As per Geography - Global Forecast to 2024, The Industry 4.0 market is estimated to be valued USD 71.7 billion in 2019 and is expected to reach USD 156.6 billion by 2024, at a CAGR of 16.9% from 2019 to 2024. Increasing adoption of the industrial internet worldwide in manufacturing units, growing focus on enhanced efficiency of machinery and systems, and reduced production costs play a significant role in the growth of the market worldwide. Also, the growing demand for industrial robotics is expected to fuel the growth of the Industry 4.0 market.

The future lies with Industry 4.0 where the SMART products that are designed using AI and IoTs will be available across the world to every tribe. The only conditions for smooth functioning will be the availability of Power Generation / Supply with Internet connectivity and its Infrastructure support.

The growth of countries having these - Internet connectivity, supporting IT Infrastructures and Power (Or Digitally enabled) will have exponential growth of positive indicators and parameters of lives of the people else difficult even to survive individual souls with the basic necessities of life.

Different Career Opportunities for MCA Students

By Dr. Suraiya Jabin
Professor, Department of Computer Science
Jamia Millia Islamia

As per their aspirations, our MCA students can join a diverse range of professions and career paths. In this article I would like to explore them one by one.

MCA students can pursue higher studies M.Tech./ Ph.D. in India and abroad. For pursuing Ph.D. in India, they must start appearing for competitive exams such as GATE/NET-JRF etc. during MCA 2nd year as various central universities or IIT/IIIT have these as essential criteria of selection as one of the steps of their Ph.D. program admission process. With JRF, students get funding from UGC to sponsor their own Ph.D. from a central university. Our regularly updated curriculum covers the full NET computer science syllabus. Since 2020, there is one new scheme launched by the government called PM fellowship for Doctoral studies (https://www.primeministerfellowshipscheme.in/) to encourage students to secure first rank in their masters' and pursuing Ph.D. program at various central universities and IITs. There are various other already existing fellowships such as DST inspire (http://www.online-inspire.gov.in/), Maulana Azad National Fellowship for Minority Students (https://www.ugc.ac.in/manf/) etc. For studying abroad, English proficiency (IELTS/TOEFL), GRE, etc. tests must be qualified in advance.

MCA curriculum equipped with semester length courses on AI, Machine Learning, Deep Learning, Cloud computing, Python programming, etc. our students are laced with skills to explore the career path of becoming a Data Scientist in the software industry. All they need to do is a good AI based project; by applying deep learning techniques to solve a real-life problem, for which they can approach different faculty members working in their area of interest. In the recent past, I have noticed our Ph.D. computer science students joining software industries as lead Data scientists. Many of our MCA students have also joined in the same profile at junior level. Most of the AI based software companies give NLP/Image processing related projects to solve as part of their selection process; they basically test how proficient you are in applying deep learning packages to solve a real-life challenge.

Another set of suitable profiles our students can pursue are: Web developer, Cyber Security expert, Mobile app designer, Cloud engineer, etc. When I say students can pursue these dimensions, I mean our MCA curriculum is well equipped with the skills needed for these domains. You need to have keen interest along any of these dimensions and passion to pursue skills needed to attain such a profile.

Sharing some tips given by noted MCA alumni Harshita Jaiswal, MCA 2018 during an event at our department: Generally, placement drives are done in two stages. In the first stage, there will be Aptitude Test and Technical Test. You should be well trained in the aptitude test as it decides whether you are suitable for the position. Technical Test will be mainly based on Programming and Data Structures. So, make sure that when you learn C and Data Structures, learn from the basics. Also, you should try out executing C programs rather than just reading. This helps you to get hands-on experience, as well as help you to answer questions on issues during program execution, and problem-solving skills.

Based on the performance in the first stage, you will be selected to the second stage. In the second stage, there will be Group Discussion (GD) followed by Face to Face Technical, and HR Interview. In the group discussion you should make sure that you are active and crisp in conveying your ideas, but don't enforce your ideas on others. Technical interviews will be based on what you learned in your curriculum. Interviewers look for your knowledge in a topic as well as your level of confidence. HR Interview will be based on your personality and attitude.

I hope my article will help in resolving doubts of various current MCA students of our department.

I wish you good luck with a bright future and long-term association with our department.

Featured on Cover Page

Sustaining University Operations through ICT during COVID-19

By Dr. S. Kazim Naqvi
Offg. Director, FTK-Centre For Information Technology
Jamia Millia Islamia

The FTK-Centre for Information Technology (FTK-CIT), initially setup in the year 1984 as Computer Centre in Jamia Millia Islamia provides ICT services in the university including Network, Internet, MIS, & ICT Helpdesk to faculty members, students and administrative staff of the university. The Centre also offers a Ph.D. program and undertakes academic work such as conducting of ICT training programmes for faculty, staff & students of the university. Due to early adoption and keen interest taken by the university administration, faculty and administrative staff, the ICT has played a vital role in development of the University. Especially, the past two decades have been very eventful during which the university Campus Wide Network grew from few hundred nodes to more than 8000 nodes covering all buildings in the campus and providing WiFi overlays. Jamia also took the pioneer position amongst central universities in successfully implementing a comprehensive 18-module ERP system in the year 2004. It is heartening to note that the ERP is still functional even after almost 17-years of its inception. Due to innovative and effective use of ICT in university operations and management, the university was recognised as the "Best ICT enabled institution of Higher Learning" during the World Education Summit in the year 2011.

Jamia Millia Islamia has been leveraging ICT for more than 25 years for improving university's functioning by adoption of appropriate technologies and setting up of state-of-the art infrastructure. This has helped JMI in improving access, equity, transparency, accountability & efficiency in university operations. While marked improvements have been made using ICT on administrative aspects, the impact of ICT on teaching was not very prominent. The use of technology in academic aspects was limited to support services viz. admissions, fee payment, attendance examination and other related functions. To enhance the use of ICT in teaching, the FTK-Centre for Information Technology made efforts by sensitizing faculty in use of Learning Management Systems through Conferences and Workshop but unfortunately no success could be achieved.

The Government of India while realizing the need to address all the education and learning related needs of students, teachers and lifelong learners also launched a landmark project – "National Mission of Education Through ICT" (NMEICT) in the year 2009. Several projects such as "National Program on Technology Enhanced Learning" (NPTEL), "Study Webs of Active-Learning for Young Aspiring Minds" (SWAYAM), SWAYAM PRABHA, Virtual Labs, National Digital Library (NDL), National Academic Depository (NAD) etc were launched under the aegis of NMEICT. Some of these efforts at national level were inspired by emergence of Massive Open Online Courses (MOOCs) service providers such as Coursera, Edx, Udacity etc. However, despite efforts of the GoI the majority of faculty in Indian universities still considered these developments as upsurge of fancy words coined by the industry and never really attempted adoption of MOOCs and platforms provided by NMEICT mission projects in their own classes.

Emergence of COVID-19 and announcement of lockdown on March 25, 2020 however changed the landscape abruptly. After initial confusion and chaos, the Government and the people started realizing that COVID is not going anywhere for a long time and efforts must be made to continue with the work with whatever resources we have at our disposal. In our case, we wanted to continue with the classes, but this simple objective was riddled with serious challenges. The foremost technical challenge was provisioning of a robust platform to allow online interactions between students and teachers and subsequently dissemination of teaching contents in an organized manner. Fortunately, Google announced availability of its "Hangout Meet" application for the educational institutions to enable them undertake classes through virtual mode. The FTK-Centre for Information Technology quickly adopted the application and configured it for use within the university for teaching purposes.

Prof. Najma Akhtar, hon'ble Vice Chancellor, Jamia Millia Islamia realizing non-preparedness of most of the faculty members in JMI on use of ICT tools for teaching and learning advised the FTK Centre for Information Technology to organise webinars for the entire teaching fraternity in the university. Accordingly, the centre provided online training to ~750 faculty members in four Webinars. The objective of these webinars was to prepare the JMI faculty members on use of online tools for effective teaching. The webinars were delivered through following sessions:

1. Experience Sharing & Best Practices
2. Using Google Hangout and Google Meet for Online Education
3. Using Google Classroom for Online Education
4. Accessing JMI Library resources from remote and Using Open Education Resources
5. Practice Sessions (02)

Prof. Najma Akhtar, Vice Chancellor, JMI inaugurated all the webinars and delivered the valedictory addresses. Prof. Furqan Qamar, Centre for Management Studies moderated all the sessions and shared

his rich experiences with the participants. The four programs were attended by 750 faculty members from various departments/centres.

Similar programs were conducted by FTK-Centre for Information Technology for about 350~ Post-Doctoral Fellows, SRFs & JRFs. As part of the university's outreach efforts, the centre also conducted a 6-day training program for teachers of schools functioning under Delhi Education Society. These programs were attended by ~100 teachers including principals of schools.

These programs have helped teachers immensely in not only carrying out the teaching during last one year but also conduct other important academic activities such as organizing conferences, workshops, departmental meetings etc. The university's Academic Council also approved to allow conduct of online Ph.D./M.Phil. examination w.e.f. June 01, 2020. Since then, 208-Ph.D. examinations and 25-M. Phil. examinations have been conducted online. So far, different departments & centres of the university have organized 144 webinars/conferences etc. using online platforms The tools have been equally effectively used in transacting administrative activities such as conduct of meetings of statutory bodies viz. Executive Council, Academic Council, Finance Committee, Building Committee, Board of Studies etc. The university also successfully conducted online interviews for promotion of teachers.

The above online activities especially have led to many-fold increase in use of computational resources. The major component of these activities is academic. The table below summarizes the increase is usage of some of the resources:

In addition, Jamia Millia Islamia also participated in the global effort of the Coursera Community to help minimize the impact of Corona Virus (COVID-19) outbreak on its students. The Coursera platform provides access to MOOCs from diverse subjects including Technology, Physical Sciences & Engineering, Arts & Humanities, Healthcare etc. Under the initiative more than 3800 courses and 400 specializations from leading universities and companies such as Yale, University of Michigan, University of Chicago, University of Virginia, University of London, Columbia University, IBM, Google etc. has been made available. As per the statistics shown on Coursera portal, till date more than 21,655 enrollments have been made by JMI students and faculty spending 20,465 hours of learning. About 500 of them have earned certificates from respective providers after completing the courses.

In summary, the COVID-19 brought unimaginable miseries to the human lives leading to thousands of deaths per day. The existential crisis created by an invisible tiny virus suddenly showed our vulnerabilities as humans. Billions of people got lock-down, unable to visit their relatives, friends and neighbors. Universities, schools & colleges were closed, workplaces were no exception.

The ICT enabled us to fight back and reclaim the lost ground. People who were reluctant to use the technology few months back began reorienting themselves, learning tools and techniques which were already existing for years. Education sector also saw similar pattern, teachers flocked enthusiastically in learning tools such as Google Meet, Zoom, WebEx, Teams to establish the broken link with their students. They started talking about and embracing

Application	April 01, 2020	Feb 28, 2021	Percentage Increase
Drive Storage (TB)	2.63 TB	5.00 TB	90.11%
GMail Storage (TB)	13.96 TB	16.54 TB	18.48%
No of E-Mail accounts	2582	3604	39.58%

LMS, MOOCs and other tools to become better on the new platform. Thus, NMEICT resources – SWAYAM, SWAYA Prabha, NPTEL, Virtual Labs, MOOCs from International providers all gained popularity and momentum & contributed immensely in minimizing the impact of COVID-19 on education.

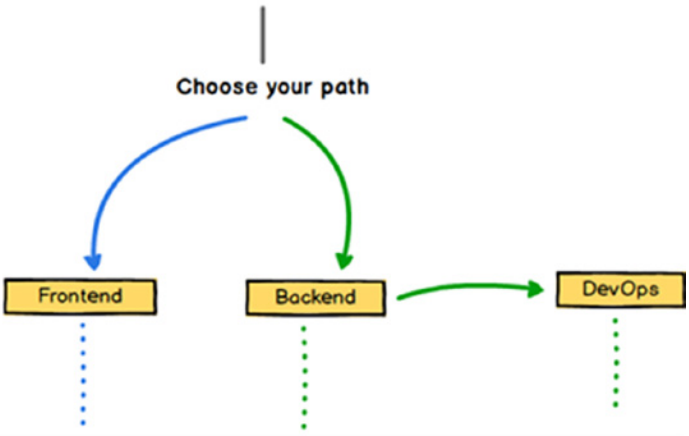
Nevertheless, the ICT intervention in education also exposed the equity & access disproportions across the country. Students belonging to heterogeneous backgrounds faced varying challenges of non-availability of access devices & good internet. We still need to go a long way in bridging the gaps.

Roadmap to Web Development

By Saba Sarwar
MCA (2018-2021)

As per my experience, when you go through the internet, you come across different approaches, tools, and technologies for the entire web development process. When I put my first foot into this field, it entirely baffled me. I always wished if experienced colleagues or seniors could share their experiences and insights on the things that beginners need to take care of. But I couldn't find anyone, worse luck!

Now that I have personal as well as industrial experience in this field, I would like to enlighten you on the topic "How to Start?". In this article, I will share every step that needs to be taken care of- from Beginner to becoming a Developer. First of all, you



have to choose your path; what actually you want to be:

First, I will start with Essential Tools, then cover Programming Languages and finally cover Libraries and Frameworks.
Essential Tools for Beginners are:

- Editor: VS Code, SublimeText, Brackets, etc
- Command Line
- Version Control: Using Git and Github

Technologies to start with are :

- **HTML**
  Used to build the skeleton of any webpage or website. HTML is not that difficult to learn, but one should pay more attention to semantics, forms, tables, and DOM Manipulation.

- **CSS**
  A markup language, a mechanism for adding styles to the webpage. It is also not that difficult to use, but it's also like an ocean that is never going to end, Difficult To Master.

- **JavaScript**
  A popular programming language, widely used for web development. One should learn the basic feature of JavaScript i.e.; data types, loops, conditional, object, primitives, arrays, etc.

Few Topics To Pay More Attention:

1. HTML
   - Semantics
   - Forms and validations
   - Accessibility

2. CSS
   - Box Model
   - Display
   - Flex
   - Float and Clear
   - CSS units (rem, em, px, percentage, vh, vw etc)
   - Positioning
   - Selectors
   - Grid
   - Media query for responsiveness
   - Animation
3. JAVASCRIPT
   - Dom Manipulation
   - Object and Functions
   - Array and Array methods
   - OOJS - Object Oriented Javascript
   - Error Handling
   - UI Events
   - API handling etc

Libraries and Frameworks

FrontEnd Developers

So let's start with Bootstrap. Bootstrap is a free and open-source CSS framework directed at responsive, mobile-first front-end web development.

React is an open-source, front end, JavaScript library for building user interfaces or UI components.

NPM is a package manager for JavaScript which allows you to install different packages on your machine quickly.

SASS is a preprocessor scripting language. It makes the CSS look cleaner and makes it faster to develop.

And there are much more available, but as a beginner, you should start with one of them and deep dive into that. As per my experience, I will suggest React and SASS later on.

Besides all these libraries and frameworks, you should also keep in mind the Content Management System (CMS).

Backend Developers

For Backend, there are different approaches based on the database you are using.

- MySQL database with PHP
- MongoDB database with Node.js
- MySQL database with Java
- Python / Django etc

Website Deployment and DevOps

Once you have your website, you need to put it on the internet, so people can see it. Deployment is the process of deploying your code to a hosting platform. For Deployment, you can use tools like GitHub Pages, Netlify, Heroku, AWS, etc.

And here, comes the concept of DevOps. It's not mandatory for everyone, but yes, if you want to be a Full Stack Developer, you should work around it. Again, it is another wide concept, there are different terminologies ie; Continuous Delivery, Continuous Integration, Continuous Deployment, the entire CI/CD pipeline, and how code or the software comes into production. But as a beginner you don't need to worry about it, all that is needed is a START. As per my experience, I will suggest you follow the principle "GO SMALL", rather than making things complex, go off the track and get disoriented.

Once you've learned some basics, you can solidify your skills by building a bunch of projects ie; Responsive Navigation Bar, Form, Static Webpage, use git to keep track of your project on the remote repository, deploy websites, etc.

I hope you get the idea about the entire Web Development Process. So why wait? Snap it!

Getting Started with Functional Programming

By Arjun Singh
MCA (2018-2021)

Getting started with Functional Programming (FP) is a declarative programming paradigm where software is built by composing pure functions. FP emphasizes using immutable data types and avoiding shared states and side effects. Like every other paradigm, FP is a way of thinking about problem-solving based on some fundamental, defining principles. Functional Programs are inherently more concise, readable, and easy to debug and test. Some of the benefits of using functional styles are:

- Easier to reason with pure functions
- Easier testing and debugging
- Parallel/concurrent programming is inherently easier with immutable data types and a lack of shared states.
- Function Signature conveys a lot more meaning
- Lazy Evaluation

But all those benefits come at a cost, there is a significant learning curve involved with the functional programming paradigm. Associated academic jargon can be very intimidating for beginners. For example, when you google for the “monads” (an FP concept that allows structuring programs generically) you’ll get something like “A monad is a monoid in the category of endofunctors”. Which requires

an understanding of obscure mathematical concepts from category theory. But fear not, if you have been programming in javascript, python, and newer versions of c++ and java chances are you have encountered many Functional Programming concepts like higher-order functions, pure functions, and immutable data types. For example, you may have encountered map, reduce, filter variants in most of the programming languages the concept behind their implementation is similar. If you notice the jargons are what makes learning the FP paradigm a little intimidating. So, let's get familiar with some of the FP vocabulary (this is not an exhaustive list but enough to get started).

Higher-order functions and First-class functions.

- When functions are treated as first-class citizens i.e. functions can be used like any other data, passed as parameters, stored in variables.
- Higher-Order Functions are the functions that can accept other functions as arguments and return functions as an argument.
- Languages like python have higher-order and first-class functions, Similar constructs are now also available in c++11 (lambda expressions & std:function) and java 8(lambda expressions).

Pure Functions

- A pure function does not have any side-effect and returns a value based only on the arguments.
- It's the same as the mathematical function. F(X) -> Y

Immutability and States

- Immutable data and states can't be changed once they are set. This property helps a lot when programming a concurrent and parallel application.

Referential Transparency

- Simply put, to achieve functional transparency you must be able to replace a function call with its resulting value without changing the meaning of the program.
- This is done by creating pure functions avoiding shared states and using immutable data types.
- This facilitates lazy evaluation.

FP programming languages:
Clojure, Haskell, F# are some of the FP languages

Scala supports both OOPs and FP styles. It is a very good choice for beginners who are already familiar with C++/Java and/or Python.

JavaScript, Python, Java, C++: You can also write Functional Code in these languages. They have adequate to somewhat incomplete/limited support for FP style.

Various Methods To Check Whether a Number is Prime or Not in C, C++, Java, Python

By Wasit Shafi
MCA (2018-2021)

A Number is said to be prime no. if it has exactly two factors: 1 & itself. Prime no. has some other properties such as :

- Prime numbers are greater than 1.
- The only even prime no is 2(Why ?).
- All prime no. except 2 & 3 are of the form of 6k±1 where k is a natural number(primes.utm.edu).
- 2 & 3 are the only two consecutive prime numbers.
- All even integer > 2 can be expressed as the sum of two prime numbers.
- All odd integer > 5 can be expressed as the sum of odd prime numbers.

The following code is one of the simplest approaches to find whether a given number is prime or not.

```
def isPrime(num): # Time Complexity O(N)
  i = 2
  if num > 1:
    while num % i != 0:
      i += 1
  return i == num

num = int(input('Enter Value of n... '))
if isPrime(num):
  print(num, 'is a Prime Number.')
else:
  print(num,'is not a Prime Number.')
```

The above code is traversing up to the first divisor & if that divisor is number itself then the given number is a prime number. This approach may seem to perform well for non-prime numbers but for all prime numbers the loop will traverse up to N which we can avoid as discussed below.

We can improve the above code by traversing from 2 to N/2 i.e i <= half because of the fact that the largest factor for any number N must be <= N/2. We should avoid writing i <= n/2 directly in loop condition as we all do, this will lead to the computation of n/2 at each iteration, so it would be better to store the value in a variable.

```
def isPrime(num): # Time Complexity O(N)
  if num < 2:
    return False
  else:
    half = num // 2;
    for i in range(2, half + 1):
      if num % i == 0:
        return False
  return True

num = int(input('Enter Value of n... '))
if isPrime(num):
  print(num, 'is a Prime Number.')
else:
  print(num, 'is not a Prime Number.')
```

The above approach may seem better, but we can still optimize this code; we can do this by just traversing up to the square root of the number.

```
def isPrime(num): # Time Complexity O(sqrt(N))
  if num < 2:
    return False;
  else:
    i = 2
    while (i * i <= num):
      if num % i == 0:
        return False;
      i += 1;
    return True;

num = int(input('Enter Value of n... '))
if isPrime(num):
  print(num, 'is a Prime Number.')
else:
  print(num,'is not a Prime Number.')
```

Now, what's next? Can we still optimize it or Is there any other version? Of course, yes, we can make use of one of the most powerful techniques i.e., Recursion which makes the program precise & the problem can be solved recursively.

```
def isPrime(num, i): # Time Complexity
O(sqrt(N))
  if num < 2:
    return False
  elif num == 2:
    return True
  elif num % i == 0:
    return False
  elif i * i > num:
    return True
  else:
    return isPrime(num, i + 1)

num = int(input('Enter Value of n... '))
if isPrime(num, 2):
  print(num, 'is a Prime Number.')
else:
  print(num,'is not a Prime Number.')
```

Okay, now that recursion is done, do we have any other methods? The answer to that question is yes, we can use Sieve of Eratosthenes, Fermat primality test, AKS primality test, etc. Also, if we recall the property of a prime number that every prime number except 2 & 3 are of the form 6k±1(Primality test), we can write a program based on this property. But I will limit this article to Sieve of Eratosthenes methods because other remaining methods are based on different logic which needs a detailed explanation. Sieve of Eratosthenes is one of my favorite methods, as it doesn't find the prime numbers directly, rather than it computes which number is composite in a given range (1, N) so, the remaining all numbers up to N obviously will be prime numbers. In this method, we create an array of size N+1 & initialize it with 0 or False (Assume), and will assign arr[i] = 1 for all non-prime numbers by simply computing the multiples of number within a range from 1 to N.

```
def isPrime(num): # Time Complexity O(N)
  if num < 2:
    return False
  else:
    half = num // 2;
    for i in range(2, half + 1):
      if num % i == 0:
        return False
  return True

num = int(input('Enter Value of n... '))
if isPrime(num):
  print(num, 'is a Prime Number.')
else:
  print(num, 'is not a Prime Number.')
```

Here the while i * i <= n loop traverse from 2 to Sqrt(n), and in case arr[i] is still 0; this means i is a prime number, so now we have to mark all the multiples of that prime number within a range N, otherwise, we have to continue with the next number. We can notice that the inner loop marks the multiples of the number i from i^2 instead of i * 1, this is because they already would have been marked as multiples of some previous prime numbers less than i so we don't need to mark them again, it's just an optimization technique.

Mistakes Made by Modern Web Developers and How to Avoid Them

By Rahima Khanam & Jaanbaaz Akhtar
MCA (2019-2022)

There exist endless choices to develop a website that works in today's modern web. Web developers have to choose a web hosting platform and underlying data storage, which tools to write HTML, CSS, and JavaScript in, how the design will be implemented, and what potential JavaScript libraries/frameworks to include. Once they finalize everything and start building the website, all developers are prone to mistakes. Although some mistakes might be related to a specific approach, there are challenges shared among all web developers. So, this article covers common mistakes made by web developers and how to avoid them.

Writing Old School HTML

Mistake:
Web developers might still use old habits of writing HTML as if in the 20th century. Examples include, using <table> elements for layout, or elements when other semantic-specific tags would be more appropriate, or using tags that are not supported in current HTML standard such as or <font>, or using too many
 for gap between 2 sections.

Solution: Stop using the <table> element for the layout of content, and limit usage for it to displaying

tabular data. Get acquainted with the current mark-up options of HTML5. Use HTML to describe what the content is, not how it will be displayed. To display your content correctly, use CSS (https://www.w3.org/Style/CSS/).

Bloated Responses

Mistake:

Using high-quality images in the webpages, which increases the loading time of the webpage.

Solution:

Using tools such as Shrink O'Matic or RIOT to compress the size of the image.

Unresponsive Design

Mistake:

New developers make the mistake of not making their web pages responsive that is suitable for all screen sizes. As a result, webpages load differently on different screen sizes, which messes up the look of the complete website thereby destroying the purpose of its presence.

Solution:

Make your front end responsive for all devices. A very popular library ready to serve in this area is Bootstrap.

Styling directly on tag elements

Mistake:

New developers make a mistake of applying style directly on HTML tags like on tag or <section>. By doing this, the same style is applied to every tag element, even though we never mean to do it. This changes the complete look of the website and correcting it is tedious as the developer might not understand the cause of this behavior.

Solution:

Define the id attribute of the tag in case you want to apply styles only to that particular tag element or define the class attribute in case if you want to apply the same styles to several similar tag elements.

Not using comments and proper indentation

Mistake:

Developers never develop complete websites alone; they work as a team. In a team, each developer has their coding style, so when a developer reads another developer's code, it becomes difficult for him to understand thereby consuming a lot of time in understanding it. It often causes problems as other developers might add or remove elements without proper knowledge of the code.

Solution:

Add comments wherever needed and write codes with proper indentation.

So we can conclude that, by identifying common mistakes, web developers can eliminate much frustration that others have already endured. Not only is it important to acknowledge, but when we understand the impact of a mistake and take measures to avoid it, we can create a development process catered to our preferences – and do so with confidence!

Blockchain : The Game Changer

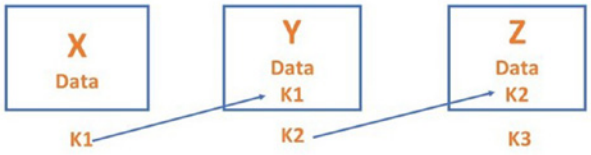
By Zia Haider Naqvi
MCA (2019-2022)

Blockchain is a database or ledger that deals with the maintenance of a continuously growing list of data records or transactions. Blockchain technology works on peer to peer network which enhances its reliability and security. There are several applications of blockchain-like secure sharing of medical data, supply chain, and logistics monitoring, voting mechanism, Real estate processing platform, and many more. However digital cryptocurrency has been emerging as the mainstream application of blockchain.

Blockchain's potential can be estimated by the fact that in the future it can eradicate the traditional centralized banking system. According to a recent report published in CBINSIGHTS, 90% of members of the European payment council believe that blockchain technology will fundamentally change the industry by 2025. Several companies have already adopted Blockchain technology to improve B2B payment models and it has greatly helped in boosting up the economy of few countries, for example, BitPesa providing blockchain-based payments in countries like Kenya, Nigeria & Uganda.

Although digital cryptocurrency transactions sound very convenient but there are some con-

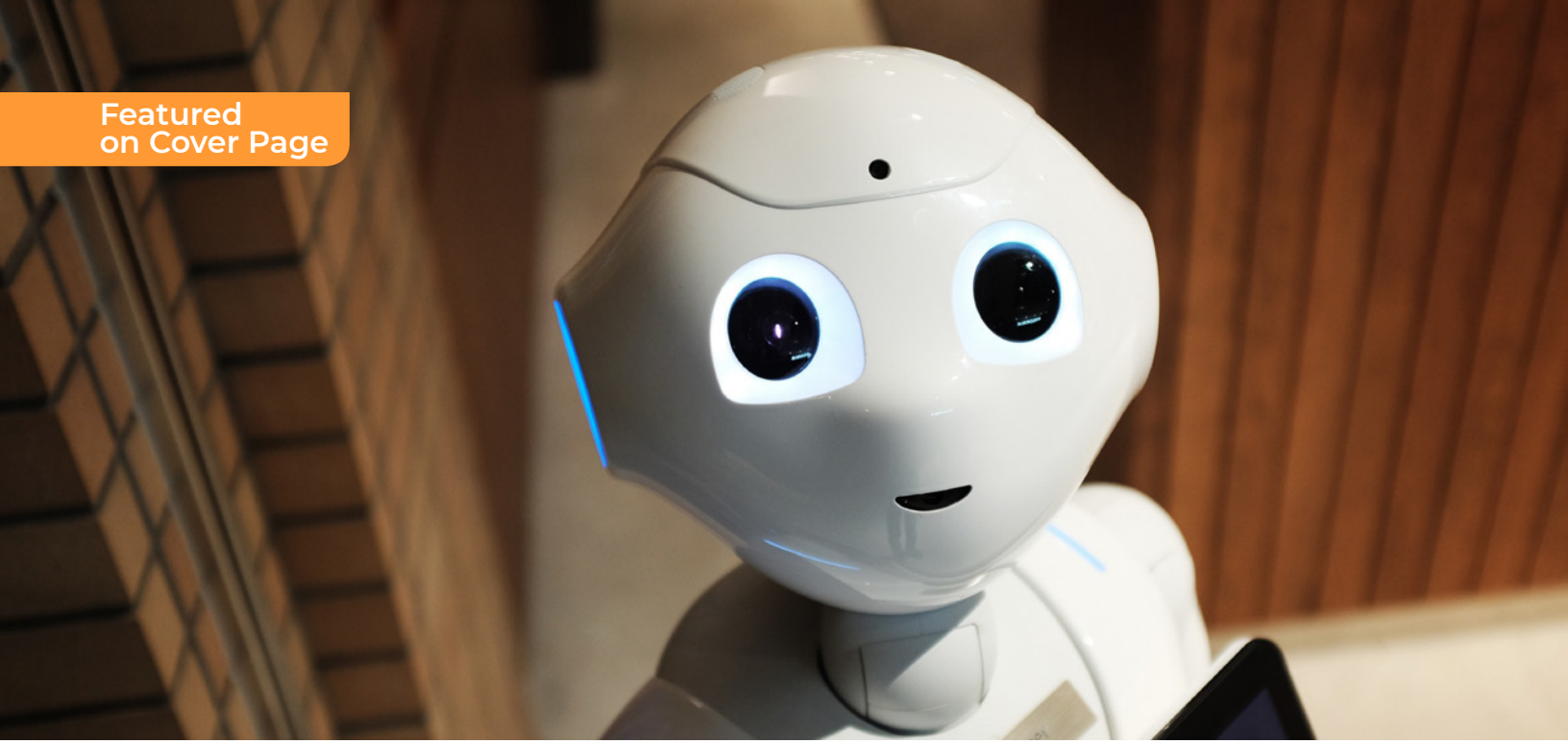
cerns that arise in the mind of the users when it comes to implementation and Trust is the first and foremost issue. How can you rely on blockchain-based transactions? The answer to that is hidden inside the word blockchain itself. In a blockchain, data is stored in form of blocks, and these blocks form a chain with the help of hashed keys generated by implementing certain hashing algorithm on the data of the respective blocks.



Here K1, K2 & K3 have hashed keys generated by implementing hashing algorithm on data X, Y & Z respectively. These blocks are forming a chain with the help of these hashed keys.

If we make a little bit of change in the data of block Y then corresponding key K2 will get changed and when we will compare it with K2 inside block Z then we will get to know that both of the keys are different which indicates that someone has tampered with data of block Y and hence any unethical tempering of data can be easily tracked. Hence, this is the process that makes this technology trustworthy. Besides this, the security of the blockchain is managed by asymmetric cryptography. Till now no one has been able to hack the blockchain and it almost seems to be difficult to hack it in the future as well.

In conclusion, it's a decentralized database system in which every process is transparent, and every stakeholder can see the changes inside the system. In the future, we will be using blockchain in every field including banks, hospitals, online rating systems, and Personal Identity.



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Automation and the Myths Related to it

By Baby Muskan
MCA (2019-2022)

According to PC Magazine, Automation, by definition, is replacing manual operations with electronics and computer-controlled devices. Automation is essentially the development and deployment of technology with limited human intervention. So, from the ATM used for withdrawing money to the robots performing manufacturing tasks in organizations, all are the outcomes of automation.

Now, coming to the consequences of automation, there are two groups of people with distinct beliefs. The first one sees the negative aspects of automation pointing to mass poverty, unemployment and social exclusion to be caused if we debate for an entirely automated world. The other group of people is convinced that humans have always found a way of dealing with their issues and we can deal with this one too. They say people performing routine work might tend to lose their jobs but they would find alternatives and hence, this group takes a more positive outlook on this. So, which group has the right outlook in your opinion? Well, it doesn't matter which group has the right outlook on this and neither is there a right answer to this because there is already an inevitable technological revolution going on leading to an automated world no matter whether you patronize it or not. The technologies like ma-

chine learning, blockchain, IoT and data analytics, all aim for automation.

Most of us believe that issues related to bureaucracy, middlemen, legacy systems, human error, corruption, and fraud can be solved using automation which is undoubtedly right. But there are certain misconceptions related to automation that exist as they are either based on information that is obsolete or simply incomplete. Some of the most common myths related to automation are:

- **Automation can be applied to any process**
  Every sector or business has its unique process. Not all processes are suitable to be automated. Automation can be best for the following types of processes :
  - involving repetitive job
  - prone to human error
  - follows a clear set of instructions
  - follows rule-based-logic rather than judgments.

  Here is the utmost probability that there will always be a set of repetitive processes somewhere in the department be it banking, retail, or any other sector, that can be automated but it might not be feasible to automate the entire process.

- **We get accurate results all the time**
  Automated machines run on codes. They don't have common sense. We, humans, tend to correct ourselves on our own once we realize what's going wrong but this is not the case with automated technologies. Rather this is the worst thing about automation. If wrong instructions are fed, automation will only make wrong tasks occur faster and it will not even trigger an indication. This means that they need to be monitored, not all the time, and that too, in this era of emergence and innovation, technologies like process mining and sophisticated process intelligence can be used to keep a check on them if they are giving the expected outputs or not.

- **Automation is going to eat up our jobs**
  This is not entirely true. There has been a buzz that automated robots will replace humans at workplaces but how can this happen! The technologies that we see in movies are still science fiction and are way too far to be turned into reality. Automated machines are not autonomous. People need to know that automated machines are merely running on software that has been programmed on rule-based logic. They are designed to perform iterative jobs which will allow workers to have more time to focus on more meaningful work. They will assist the human workforce in reducing errors and repetition. If we look at Artificial Intelligence, at first glance, only General AI seems to be a threat but it is far from reality. And as with all three revolutions i.e., agriculture, industrial, and information, it will create panic but at the same time, it will also create new job opportunities.
  Well, I think it has already been doing that!!!

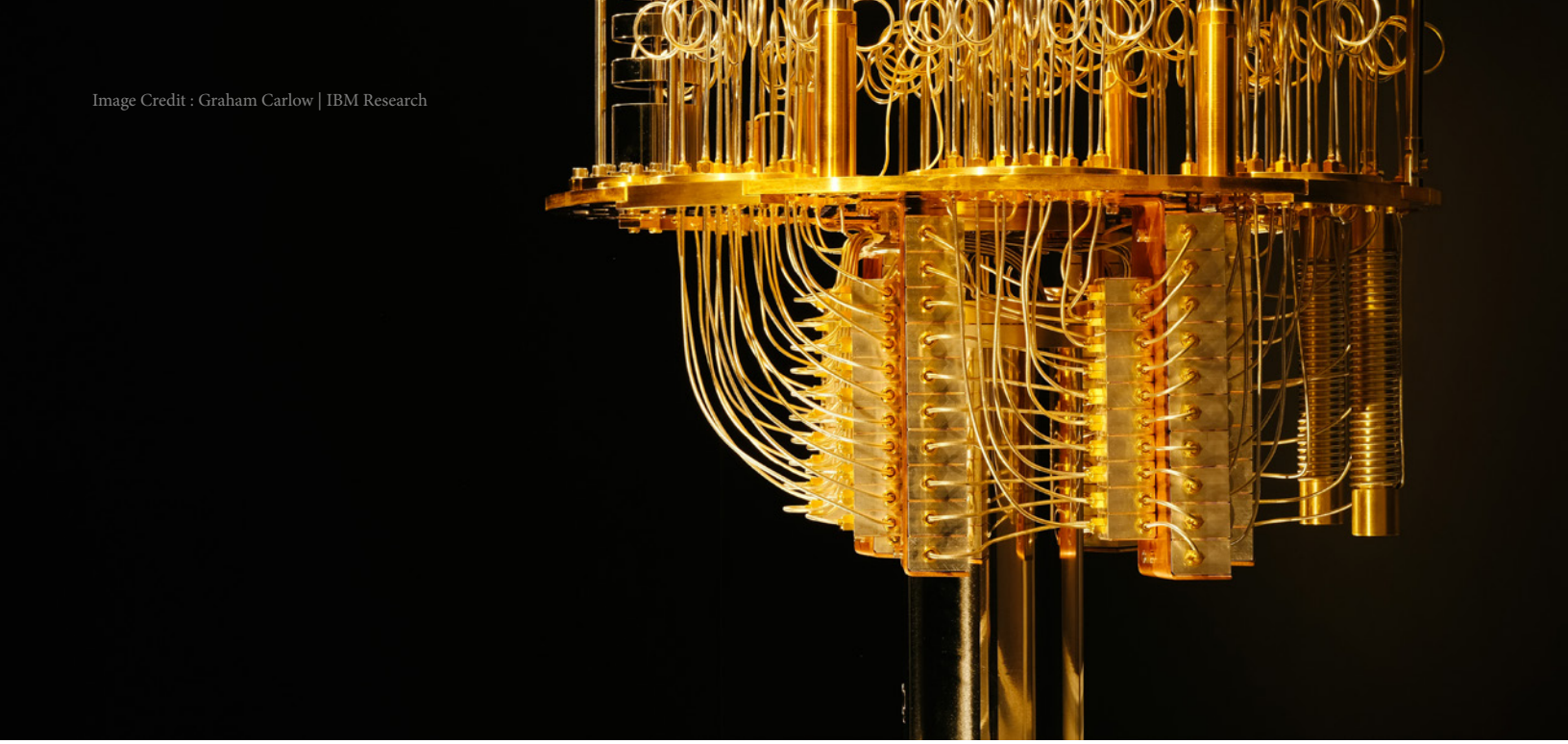

Image Credit : Graham Carlow | IBM Research

Quantum Computers: Can they replace Classical Computers?

By Jawed Alam
MCA (2019-2022)

Quantum Computing:

A quantum computer represents information as a series of bits, called quantum bits, or qubits. Similar to a normal bit, a qubit can have 0 or 1 states apart from an extra state which can have both states at the same time. When extended to systems of many qubits, this ability to be in all possible binary states at the same time increases the computing power exponentially.

Let's use an analogy between classical computers and Quantum computers.

In classical computers, we use the following conventions

1 - a high voltage
0 - a low voltage
In the same manner, we represent quantum states

$|0\rangle$ an up spin
$|1\rangle$ a down spin

$|\psi\rangle = a|1\rangle + b|0\rangle$; a unit vector
$|0\rangle$ and $|1\rangle$ are orthogonal vectors representing the state of a quantum system.
$|\psi\rangle$ represents a qubit which is the smallest unit of quantum information. Based on the values of a and b, the probabilities can be in different states.

Functioning:

It uses the quantum phenomena namely

- Superposition
- Entanglement
- Interference
- Coherence

All of these phenomena are achieved at nearly absolute zero temperature.

Motivation:

Machine learning: Training ML models require huge amounts of data and if it can be processed at a faster rate then that can lead to solutions to more complex problems.

Medicine, Chemistry: Data in these domains are huge therefore even on supercomputers they take a lot more time and in some cases, they can't terminate with an output of any practical application.

Climate change/Earth science: These fields require real-time processing of huge amounts of data and if these problems can be solved then it would be a boon for humanity.

And there are many other domains where we need faster processing speed like Material science, Engineering, Artificial intelligence, Information security, Biometrics, Energy, Photovoltaics, Financial services, Supply chain, and logistics.

Developments:

- Trapped Ion
- Superconductor Quantum Computers
- Photonic Quantum Computation
- Neutral Atom Quantum Computation
- Semiconductor Qubits
- Optically Gated Qubits in Crystals
- Topological Qubits
- Trapped Ion and Superconductor Quantum Computers are the most prominent developments in the field of quantum computing but as the technology is still evolving, research for new ways of generation of qubits has not stopped yet.

Hurdles:

Qubits are superconductors and to properly operate on them for an extended duration, they need near absolute zero temperature. Any increase in temperature will cause errors in superpositions, entanglement, and other phenomena and finally lead to an error in the output.

Because a qubit can be any combination of 1 and 0, qubits and quantum gates cannot easily reject small errors that occur in physical circuits. As a result, noise in creating the desired quantum operations, or any unintended signals that couple into the physical system can easily lead to wrong outputs appearing in the computation, and for their redressal, quantum error correlation algorithms are required.

Conclusion/inference.

Prominent concepts for the quantum computation were proposed in 1980. And the developments in this domain are continued but because it requires quite a low temperature for effective use, it is physically not feasible to accommodate it on small computers.

Apart from that, it has a disadvantage, the quantum world is not deterministic. The correct result can achieve a higher probability of measurement than the others, but their probabilities can't be dropped to zero. The measured result can therefore be wrong, so the process must be repeated until you are sure you have the correct result.

Therefore considering all these developments and complexities I can say that Quantum Computers are not replacing classical computers very soon.

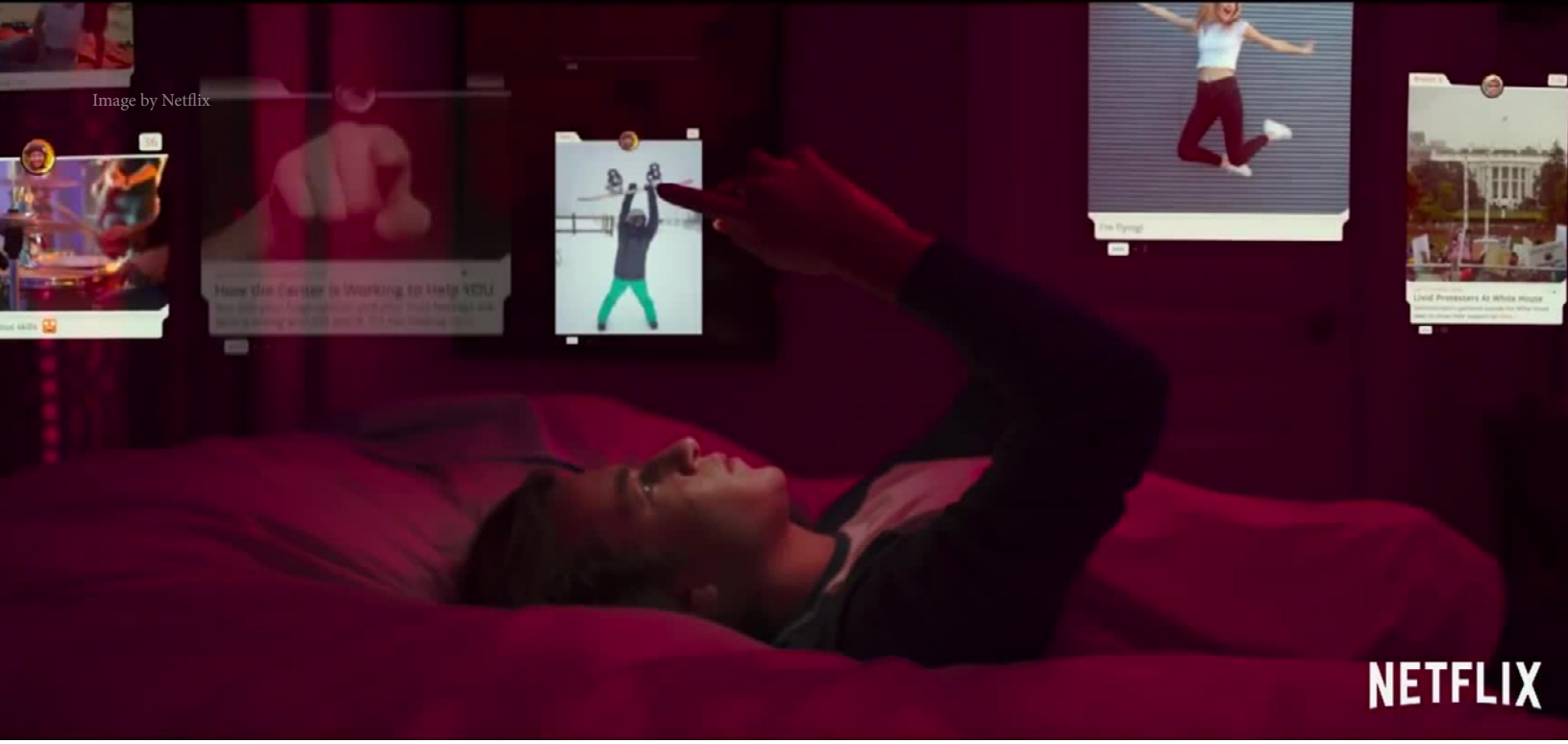

Image by Netflix

Percept on The Social Dilemma

By Sana Eram
MCA (2019-2022)

"The water, which is the reason for existence can turn into a curse when in excess", similarly the technological advancements along with all the benefits comes with a price tag which can pose threat to humanity.

The Netflix featured documentary 'The Social Dilemma' starts with a quote from Sophocles 'Nothing vast enters the life of mortal's without a curse' fits like a glove to the theme.

It unwinds the story of a teenage sibling showcasing the adversities they face as the consequence of the artificial intelligence annotating their physiological behaviour. It also unveils the point of views of eminent figures who were a part of the tech-giants and are well aware of their mechanism being employed. They enlighten us how it sets back a negative impression on humanity.

Artificial Intelligence is termed as 'the technological mogul' at present. With its presence in the society, benefiting it at large it is leaving behind negative footprints with time which are negligible. But with the effervescence of time will have a large impact on the community.

Tristan Harris an ex-design ethistics at Google revealed, "Never in history, more than 50 designers had the power to impact 2 billion people." But with this lies the moral responsibility which is generally being overlooked as their focus orbits around capturing our attention and increasing the screen engagement time.

"If you are not paying for the product, you are the product". They provide us with an abundance of free services, rather sell our data to advertisers therein to brew profit. With this approach they target our perception thereby completely changing our mindset with advit to a particular product.

With the advancement of technology, AI systems are improving thereby making better decisions with time. This is achieved by using the data captured from the users end and then thereby using the output to build prediction models.

'Growth Hacking' is entirely a discipline with the usage of persuasive technology which involves hacking human physcology to increase engagement time. These persuasive techniques lead to polarisation, addiction , outrage-ification, and ramification. With downright indulgence, short time appreciation with conflicting values leads to depression, anxiety as well as forges void for social approval.

According to a survey, fake news spreading on twitter is six times faster than a real one. This itself portrays how massively it impacts the society thereby creating rifts and deteriorating values.

With humans being used as lab rats, it leads towards an existential crisis. And it can be overcomed only by talking about it openly rather than keeping mum. With an initiative to raise this issue globally Tristian Harris started the 'Center for Humane Technology' which focuses on taking up the responsibility towards change which outlays the products as 'ethical designs' keeping up with the morale welfare for the customers.

Image by Netflix

Internet of Things

By Azim Ahmad
MCA (2020-2022)

Suppose you are going to a meeting in a nearby town. While traveling, a message popped up on your device screen informing you that the volume of petrol is going low. You were confused about what's happening when another message sharing the details of a nearby petrol station popped up on your smartphone device.

Wondering how is that possible? Well, it's nothing but a real-life example of IoT.

Confused about what is the Internet of Things (IoT)? How does it work?

IoT also referred to as the Internet of Things (IoT), is a technology of interrelated computing devices, digital machines, and objects that can transfer data to each other in real-time, with minimum human intervention.

Working of IoT

When talking about how IoT works, the process begins with devices that have built-in sensors. These devices are connected to IoT platforms that store data from all the connected devices. The important data is then used to perform tasks that fulfill the needs of people.

In this way, IoT applications work with smart systems that automate tasks to address specific needs.

4 Major Components of IoT Ecosystem

1. **Sensors/ Devices**
   The foremost component to consider in the Internet of Things technology sensors/devices. A sensor picks up all the minute details from the environment. The environment can have many complexities. What makes IoT security so great is these sensors that pick up even the most sensitive changes. These sensors are built into the devices which collect all the data to be used later. For instance, our phone is a device with built-in sensors like GPS, camera, etc.

2. **Connectivity**
   Once the data is collected it is transferred to the cloud infrastructure (also known as IoT platforms). But to transfer the data, the devices will need a medium. That's when connections like Bluetooth, Wi-Fi, WAN, cellular networks, etc come into play. These mediums are all different and must be chosen wisely for the best results. The effectiveness of IoT security highly depends on the speed and availability of these mediums.

3. **Data Processing**
   After reaching the cloud infrastructure the data has to be analyzed so that the right action can be taken. This process is however considered one of the most crucial obstacles in front of IoT app development. The analysis can be as simple as checking the temperature of the AC or a complex one such as a situation where an intruder comes in and the device has to identify it through cameras. The IoT application is made such that it can process all the data at a fast rate to take immediate action.

4. **User Interface**
   The last step is when the user is notified about the action with the help of a notification or an alert sound sent to the IoT mobile apps. This way the user will know that his command has been run through the systems.

However, this isn't as easy as it seems. It all depends on what is an IoT platform and how the technology has been developed.

Successful IoT projects first understand the day-to-day problems the customers and the business have, and then imagine a connected product that can help solve those problems. After you figure this out, you can start to develop a feasible implementation strategy, set realistic goals and expectations, and streamline the deployment process. Like every other major business undertaking, this requires thorough planning and testing.

Cyber Security :
The People of India and the Idea of Privacy

By Shahid-ul-Islam
MCA (2020-2022)

On the 8th of November 2016, taking the nation by surprise the government of India announced the demonetization of Rs 1000 and Rs 500 currency notes. On one end, the government claimed the move to be a masterstroke against black money, fake currency, and corruption. The opposition on the other side claimed it was a mighty mistake in India's economy and made the common man's life a mess. This was India's first step towards digitization and making a cashless economy. While on one side discussions were being held about the effectiveness of this move by the government, cybersecurity, and technology experts were also divided into two sides. Some of them claimed that this move will benefit people and make their life easy while others believed it will pose a huge risk for common people and will pave the way for scammers, fraudsters, hackers, and other evil people out there.

Demonetization compelled people to use e-sources for transactions like credit cards, debit cards, USSDS/ UPI, and Internet banking. India is home to one in every three illiterate persons in the world. According to the Education For All Global Monitoring Report(GMR), India currently has the largest population of illiterate adults in the world with 287 million. It was very difficult for such a large population of illiterate people to use these e-sources in their day to day simple transactions. From large businessmen to local street vendors everyone was forced to change and while some eventually learned there are still people out there who find it difficult.

The positive side of it however was discovered by the people during the covid-19 pandemic lockdown when most of the business and companies shifted online and food medicines and other commodities were delivered online as people were sort of already prepared for it.

But the statistics about the other side of the story are far more terrifying. According to Mumbai based cybersecurity firm Sequretek, in covid-hit 2020, India has seen a 4000% spike in phishing emails and 400% uptake in the number of policy violations that have grown over 400% as per the latest statistics.

The Internet crime report for 2019, released by the USA's Internet Crime Complaint Centre of the Federal Bureau of Investigation(FBI), has revealed that India stands 3rd in the world among the top 20 countries that are victims of internet crimes.

Another major event concerned with the idea of privacy of the Indian citizens was the aadhaar. Created in 2009, aadhaar is a 12 digit unique identity number that is issued to all Indian residents, and obtaining an aadhaar card involves the collection of fingerprints, retina scans as well as face photos of all the citizens. It is one of the biggest biometric databases on the planet with around 1.2 billion enrollments, covering around 89% of India's population. Although its importance cannot be underestimated, aadhaar has faced a lot of criticism and controversies. One of the major criticisms of aadhaar has been the numerous major security lapses that have been found in the working of aadhaar.In 2018 around 200 official government websites accidentally made personal Aadhaar data public. A series of such events questioned the credibility of Aadhaar and citizens were worried that their private data was vulnerable. The concerns were such that the case reached the Supreme Court of India. Security experts like former CIA official and whistleblower Edward Snowden said via a video conference at a Talk Journalism event in Jaipur that Aadhaar is a mass surveillance system and if not fixed now then it will lead to the death of all civil rights of Indians.

Rachna Khaira, the reporter of The Tribune newspaper, conducted a sting and uncovered that there is a security breach in an Indian government database that contains a billion people's details. According to the report, it just took Rs 500 and 10 minutes to access the details of any aadhaar number. Even the aadhaar card of other people can also be printed and misused. In the response, the UIDAI files a case against the same journalist and maintained the same claim that biometric data was safe. Forget Aadhaar, even your voter details are vulnerable to abuse, because they are kept public by the government. The right to privacy is a fundamental right. Despite all the events and facts stated above a user needs to be heavily cautious regarding his privacy and cybersecurity. Cyber attacks in India are becoming common and deadlier with companies like Paytm, Truecaller, Dunzo, Bharat Earth Movers Limited, White Hat Jr getting attacked. Hacker 'John Wick ', hasn't even spared India's PM.

It's no wonder online security breaches are becoming so prolific becausdigitall is pervading in every corner of our lives, yet most people are terrible about their security.

Some of the simplest preventions and tips for the users so that they can be protected from attacks and can protect their security and privacy are stated below:

- Install, use, and regularly update your antivirus, anti-spyware software on your personal computers and mobile phones.
- Use firewall protection.
- Install apps from Trusted Sources
- Download and install software updates for your mobile and PC operating systems and applications as they become available.
- Use unique and strong passwords for social media and internet banking accounts.
- Use Two-Factor or Multi-Factor Authentication.
- Learn about Phishing Scams –be very suspicious of emails, phone calls, and fliers.
- Protect your Sensitive Personal Identifiable Information.
- Use your Mobile devices securely.
- Backup your Data Regularly.
- Don't use public Wi-Fi.
- Review Your Online Accounts & Credit Reports Regularly for changes.

Past Events

Event	Date
Roadmap to Data Science	Feb 26, 2021
A Session on Branch Handling in Git	Feb 25, 2021
A Session on Basic HTML & CSS	Feb 13, 2021
A Session on Version Control System Git/GitHub	Feb 12, 2021
Orientation (MCA 2020-2022)	Jan 16, 2021
Webinar on Emerging Technologies	Jan 3, 2021
Open Web Development Session	July 19, 2020
All About Data Science	July 7, 2020
A Session on HTML, CSS & Bootstrap	Mar 14, 2020
Orientation of the Club	Jan 22, 2020


Coding Club
HTML5 & CSS


COMPETITIVE PROGRAMMING
FROM SPORTS TO JOB


Hive presents
OPEN WEB DEVELOPMENT SESSION
2:00 PM
19 JULY 2020
VENUE: VIRTUAL MEETUP


Roadmap to
DATA SCIENCE


JOIN THE ORIENTATION OF THE VERY FISRT
CODING CLUB
OF DEPARTMENT OF COMPUTER SCIENCE, JAMIA MILLIA ISLAMIA
JANUARY 22, 2020
11AM TO 12NOON
COMPUTER LAB, DEPARTMENT OF COMPUTER SCIENCE


hive
Hive Coding Club
Department of Computer Science, JMI
Presents
A Webinar on
Emerging Trends in Industrial and Academic Research in Computer Science
Technologies Driving the Future of Mankind
Scope of Research in Computer Science
Industrial and Academic Research
SUNDAY, JANUARY 3, 2021
ENTRY CLOSES AT 1:30 PM
QUIZZES AND EXCITING PRIZES TOO


Competitive coding society presents
What do you mean by 100?
The "100"
Is it about 100 ways of doing something?
Find out on August 22, 2020


A session on
Basic HTML & CSS
HTML
CSS
February 13, 2021
3:00 pm


Orientation
Hive Coding Club
Department of Computer Science, Jamia Millia Islamia
January 16, 2021
from 12:00 pm onwards


A session on
Version control System
Git/GitHub
February 12, 2021
3:00 pm

Up for Laughs ?

Memes

Jokes
Riddles

hive_jamia
Jamia Millia Islamia, New Delhi

131 likes
hive_jamia #fun #memes #entertainment

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Jamia Millia Islamia, New Delhi

94 likes
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Jamia Millia Islamia, New Delhi

131 likes
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Me to client : you have to pay extra amount for additional features you have suggested for webpage

Client :

126 likes
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Students enjoying OBE :

Subject knowledge :

227 likes
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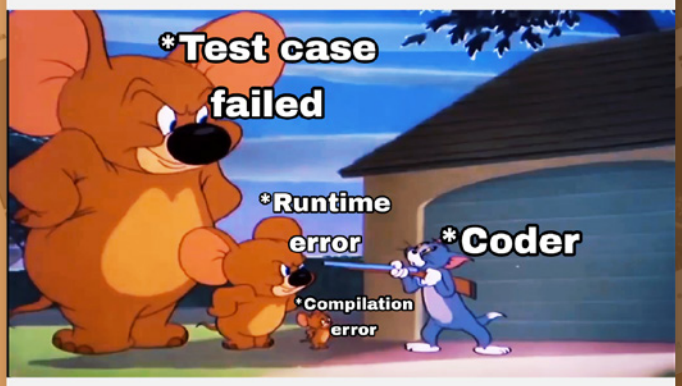

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ye hum hain

ye hamara project hai

ye hamari progress horri hai

219 likes
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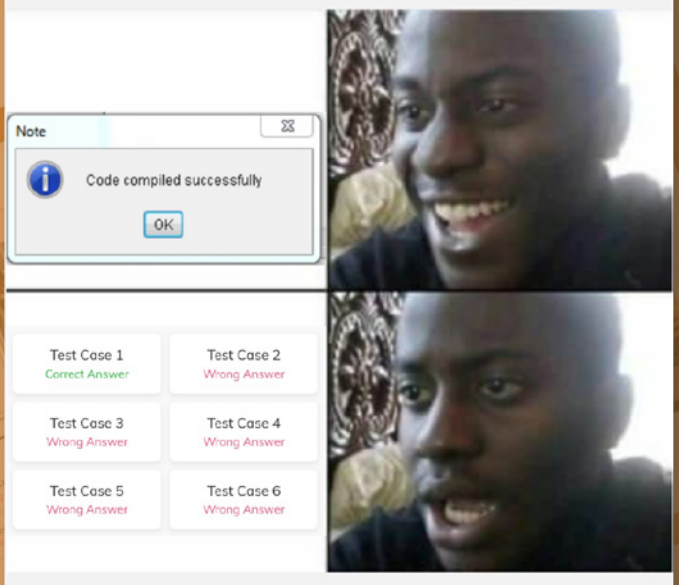

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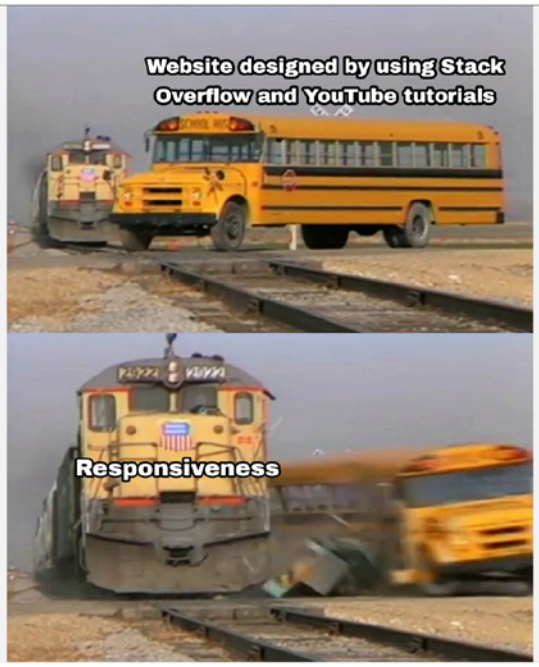

137 likes
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Jokes

People who say, ignore little things can never understand the sufferings of programmers. Because we know missing a tiny dot in `System.out.println("World is Beautiful");` inverts our thinking.

Computers are efficient because they are controlled by their motherboard.

A physicist, a mathematician, and a statistician go hunting. They spot a deer. The physicist shoots and misses 10 metres right. The mathematician shoots next and misses 10 metres left. The statistician throws his gun and proclaims "we got it!".

From a statistician's perspective Old age is good because very few people die past the age of 100.

Student: Will I pass this examination?
Teacher: Yes, I'm absolutely sure.
Student: How can you be so sure?
Teacher: 9 out of 10 students fail every semester and yesterday I failed the ninth student.

"Debugging" is like being the detective in a crime drama where you are also the murderer.

I wanted to become the father of Java but it is not easy. So as a procrastinator I found another way I would name one of my children Java.

Two random variables were talking in a cafe. They thought they were being discrete, but I heard their chatter continuously.

I have a quantum mechanics joke but it is both funny and not funny at the same time.

```
//be nice to CPU
thread_sleep(1);
```

A programmer's wife asks: "Would you go to the shop and pick up a loaf of bread? And if they have eggs, get a dozen."
The programmer returns home with 12 loaves of bread.
"They had eggs."

Journalist: What makes a code bad ?
Programmer: No comments.

Riddles

1. The more you code, the more of me there is. I may be gone for now but you can't get rid of me forever. What am I?
2. I'm a language for everything yet I have no real identity of my own. Good luck trying to compile me. What am I?
3. As a developer I'm your eyes, showing you the result of your code in your language of choice. What am I?
4. I'm fundamental and used to build larger structures. While you'll find many different kinds of me, we all just mess with information in different ways. What am I?
5. As a developer, you usually get mad at me because I complain a lot, although I'm usually right. What am I?
6. I'm sent before I'm ready, I'll break before you know it and you can't find me many places. What am I?
7. I'm a simple thing, nothing special. While I have many cousins we're all very similar because we set your project up. What am I?
8. I'm pretty focused so I don't do too much. However whatever you wish is my command. What am I?
9. I'm your "waiter" for information. What I am?
10. I come small, as small as you can get in fact. With many well-thought-out versions of me I bring stability. What am I?
11. You make me often and you're always messing with me by pushing and pulling me all the time. Don't you have any manners 😠😤? What am I?
12. I'm a shape shifter. You could call me someone who could possess multiple qualities but only has one set of them at any given time. What am I?
13. I'm a red and black structure and often forgotten about after learned. Although you almost always use a different color of me for Christmas. What am I?
14. I have a pulse but no heart, a brain but can't think and while I can sleep, I usually don't stay asleep for long? What am I?

Answers : 1-A bug | 2-Pseudocode | 3-A print statement | 4-A data structure | 5-A compiler | 6-A beta release | 7-A configuration file | 8-A command | 9-A server | 10-A unit test | 11-Code | 12-Polymorphism | 13-A red-black tree | 14-A CPU

The Team Behind

Ariba Ather
Full Stack Developer
Content Team

Arjun Singh
DevOps/Scala Developer
Think Tank Team

B. Muskan
Software Developer
Content Team

Bilal Ahmad
UI/UX Design
Graphics Team

Jaanbaaz Akhtar
Full Stack Developer
Think Tank Team

Jawed Alam
Machine Learning
Think Tank Team

Kashif Iqbal
Backend Developer
Graphics Team

Maarif Ul Haque
Frontend Developer
Graphics Team

Mohd. Usama
Frontend Developer
Think Tank Team

Rahima Khanam
Frontend Developer
Content Team

Saba Sarwar
Full Stack Developer
Think Tank Team

Sana Eram
Full Stack Developer
Think Tank Team

Sandeep
Frontend Developer
Think Tank Team

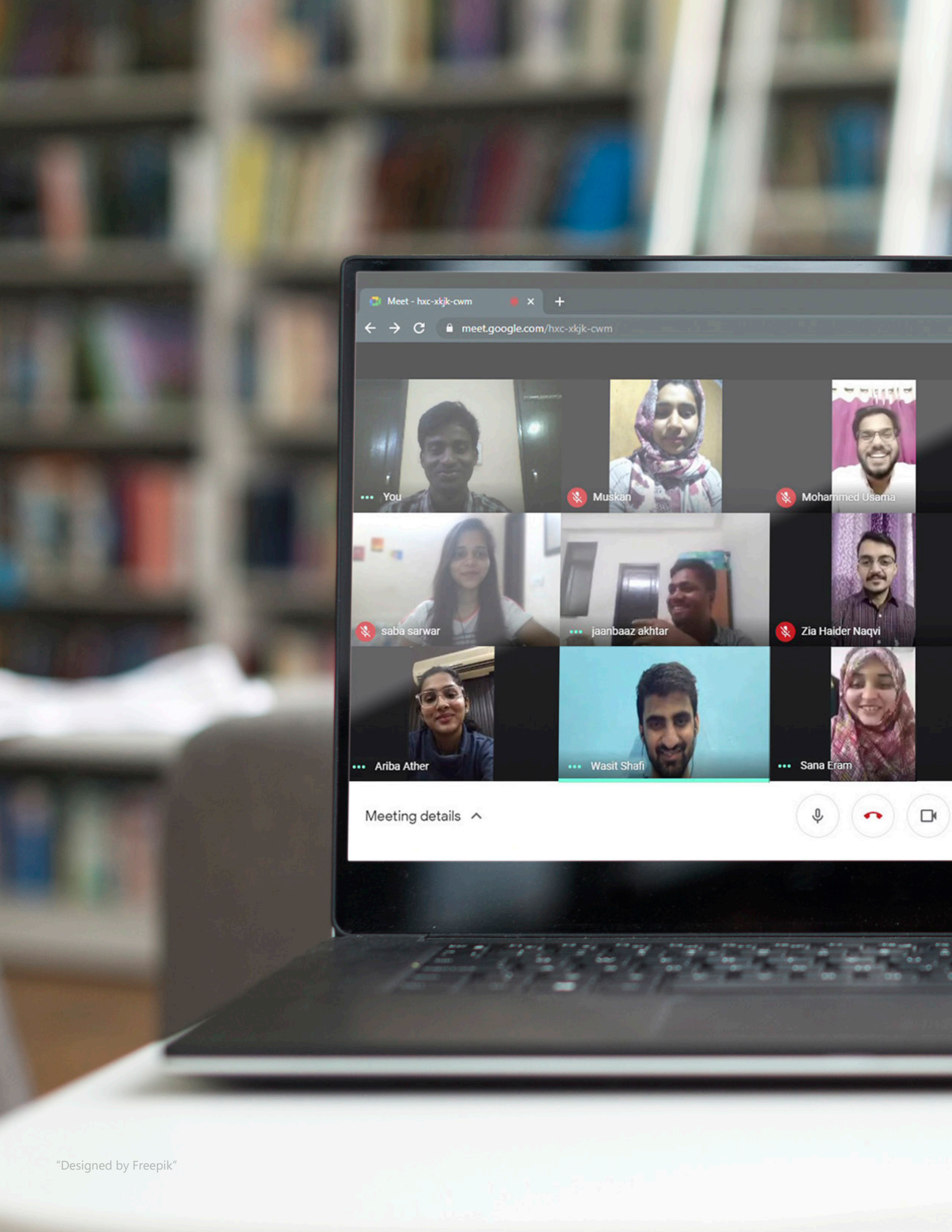
Sangam Mishra
Frontend Developer
Think Tank Team

Shahid Raza
Frontend Developer
PR Team

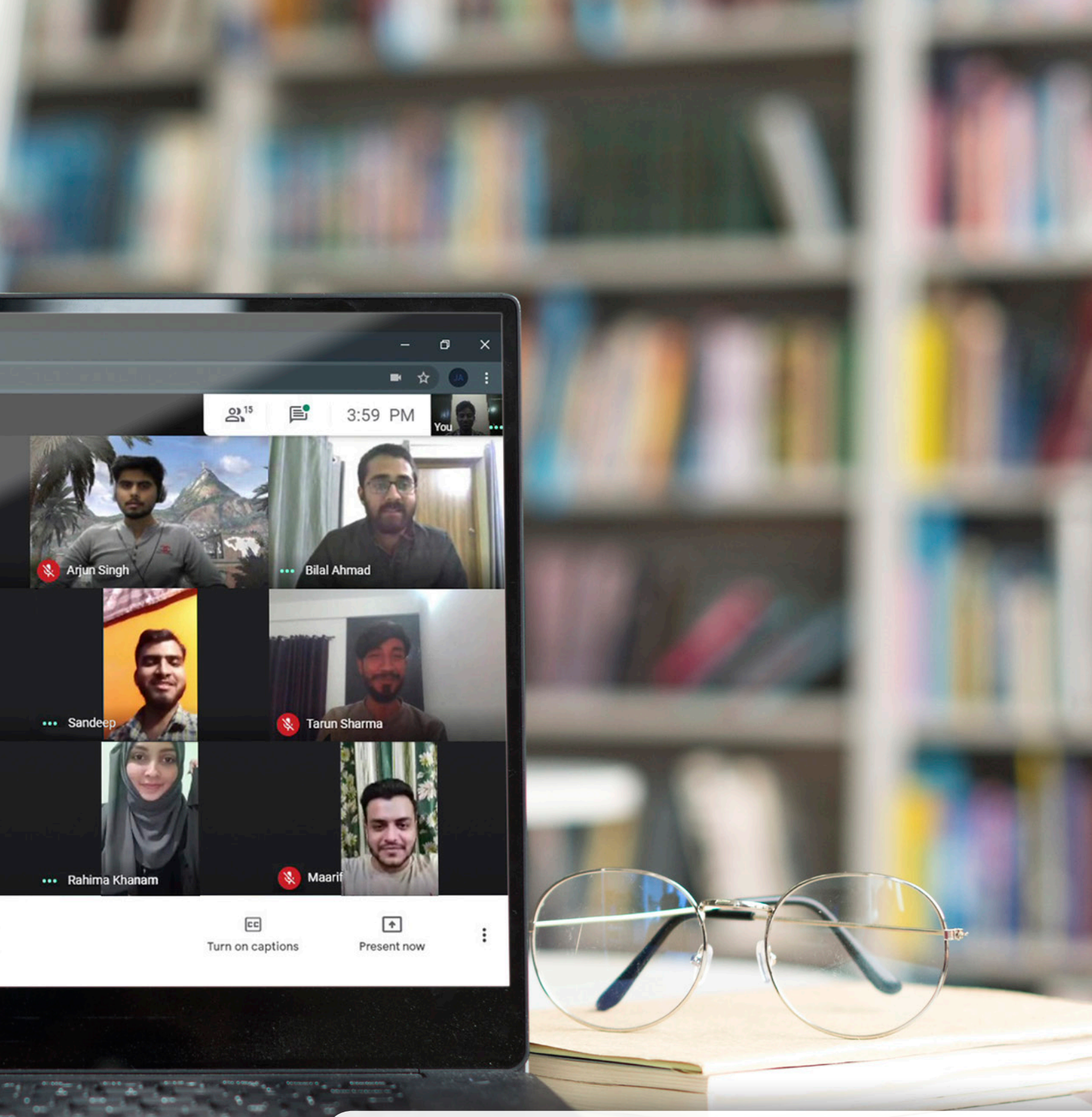
Tarun Sharma
Data Science, MERN Development
Think Tank Team

Wasit Shafi
Mobile App Developer
Think Tank Team

Zia Haider Naqvi
Frontend Developer
PR Team



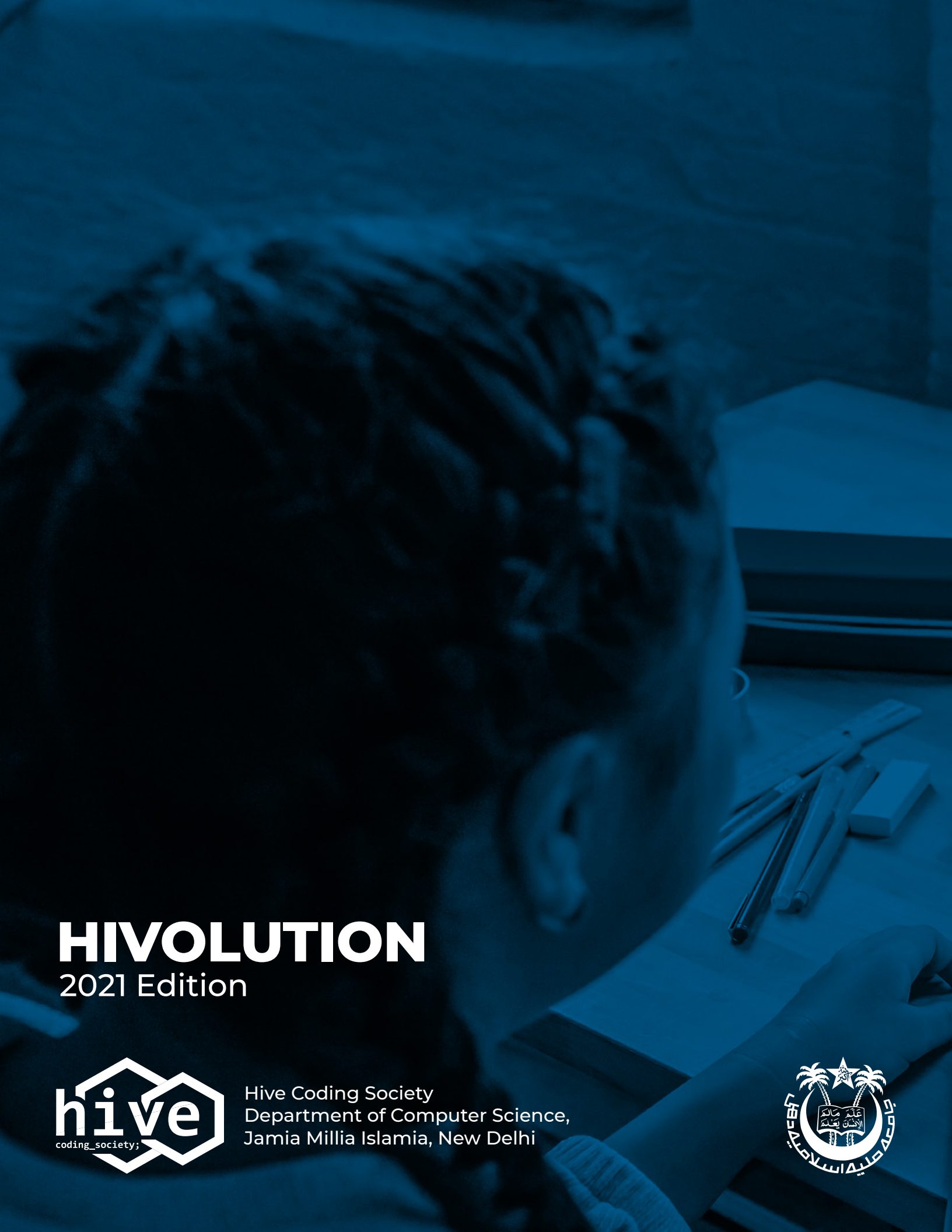
"Designed by Freepik"



The Hive Coding Society team worked together amid the lockdown to make Hivolution a reality.
We came together virtually to brainstrom and deliver this to you.

Thinking is the hardest work there is, which is probably the reason very few engage in it.

Layout by Bilal Ahmad



HIVOLUTION
2021 Edition

Hive Coding Society
Department of Computer Science,
Jamia Millia Islamia, New Delhi