



SAHYADRI
COLLEGE OF ENGINEERING & MANAGEMENT
MANGALURU



- ARCHIVES

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Technical magazine of Information Science & Engineering department

DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING

VISION

To be a center of excellence in Information Science and Engineering through the interactive teaching learning process, research, and innovation.

MISSION

- M1. Creating competitive ambience to enhance the innovative and experiential learning process through state of the art infrastructure.
- M2. Grooming young minds through industry-institute interactions to solve societal issues and inculcate affinity towards research and entrepreneurship.
- M3. Promoting teamwork and leadership qualities through inter-disciplinary activities in diversified areas of information science and engineering.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- PEO1: Possess theoretical and practical knowledge to identify, scrutinize, formulate and solve challenging problems related to dynamically evolving information science.
- PEO2: Inculcate core competency, professionalism and ethics to cater industrial needs and to solve societal problems.
- PEO3: Engage in Lifelong learning and stay intact to the transformation in technologies and pursue research.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- PSO1: Exhibit competency and skills in distributed computing, information security, cyber security, data analytics, and machine learning.
- PSO2: Able to provide sustainable solution to implement and validate information science projects.

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TRENDING TECHNOLOGIES

1. PROGRAMMING LANGUAGES

A programming language is a vocabulary and set of grammatical rules for instructing a computer or computing device to perform specific tasks. The term programming language usually refers to high-level languages, such as BASIC, C, C++, COBOL, Java, FORTRAN, Ada, and Pascal. Each programming language has a unique set of keywords (words that it understands) and a special syntax for organizing program instructions.

Machine and assembly languages

A machine language consists of the numeric codes for the operations that a particular computer can execute directly. The codes are strings of 0s and 1s, or binary digits (“bits”), which are frequently converted both from and to hexadecimal (base 16) for human viewing and modification. Machine language instructions typically use some bits to represent operations, such as addition, and some to represent operands, or perhaps the location of the next instruction.

Machine language is difficult to read and write, since it does not resemble conventional mathematical notation or human language, and its codes vary from computer to computer. Assembly language is one level above machine language. It uses short mnemonic codes for instructions and allows the programmer to introduce names for blocks of memory that hold data.

Assembly language is designed to be easily translated into machine language. Although blocks of data may be referred to by name instead of by their machine addresses, assembly language does not provide more sophisticated means of organizing complex information. Like machine language, assembly language requires detailed knowledge of internal computer architecture. It is useful when such details are important, as in programming a computer to interact with input/output devices (printers, scanners, storage devices, and so forth).

High-Level Programming Languages

High-level programming languages, while simple compared to human languages, are more complex than the languages the computer actually understands, called machine languages. Each different type of CPU has its own unique machine language. Lying between machine languages and high-level languages are languages called assembly languages. Assembly languages are similar to machine languages, but they are much easier to program in because they allow a programmer to substitute names for numbers. Machine languages consist of numbers only.

Lying above high-level languages are languages called fourth-generation languages (usually abbreviated 4GL). 4GLs are far removed from machine languages and represent the class of computer languages closest to human languages.

The Top Programming Languages?

According to IEEE Spectrum's interactive ranking, Python is the top programming language of 2017, followed by C, Java, and C++. Of course, the choice of which language to use depends on the type of computer the program is to run on, what sort of program it is, and the expertise of the programmer.


Language Rank	Types	Spectrum Ranking
1. Python	 	100.0
2. C	  	100.0
3. Java	  	99.4
4. C++	  	96.9
5. C#	  	88.6
6. R		88.1
7. JavaScript	 	85.3
8. Go	 	75.7
9. Swift	 	74.3
10. Ruby	 	72.0

Image By: IEEE Spectrum Interactive Ranking (2017)

There are several considerations that come into play when making your decision, like the difficulty level you're willing to learn, the skills you already possess that might align with a language and your personal reasons for learning a programming language. Whether you want to develop a mobile application, get a certification for programming knowledge, or learn new skills, you need to choose the right programming language to learn.

- Mr Prahas Amin

Asst Professor, Dept of ISE

2. INTERNET OF THINGS (IOT) IN INDIA: SCOPE, BENEFITS, CHALLENGES, AND FUTURE

An interesting fact in the history of mankind is that it took nearly 11,000 years for experiencing the first revolution – the Industrial revolution, which completely changed the dynamics of society. The industrial revolution paved a way for rapid urbanization and the rise of cities and universities, a rise in the count of the middle class, etc. Another great revolution came in the form of the Internet, which changed not only the technical aspects but also the societal aspects. Access to the information first hand, combined with the global supply and demand lead to the reformulation of the established conventions.

IoT is the next big thing, which has disrupted our lifestyle and ways of doing business to a great extent. Though at a preliminary stage, IoT, in developing countries like India, is deemed to be a disruptive technology of the 21st century, which embeds the internet to every smart device, thereby extending the Internet into the physical world. This extension has created an environment of convergence in society and has brought about a paradigm shift in our professional as well as personal life.



The concept of IoT is relatively simple – A large number of Sensors, devices, data, and connectivity technology are joined together via the internet to form a mesh of “Things” which can interact, exchange and even act with intelligence. Each device/object will be provided with a unique address through which it can be identified in a network. Each device will be equipped with various sensors, which gather information pertaining to the device. These data may be transmitted over the network to other devices or sent to remote servers for further processing via a suitable connecting technology. For enabling this process, one needs a special kind of smart architecture (dedicated for IoT), since the existing traditional architecture fails when handling such a “large” number of devices. The term “large” here refers to millions to billions of smart devices.

Though in general, IoT touches almost all industries like energy, telecom, healthcare, retail, transportation, manufacturing, yet in developing countries like India which has vast geography, demographics, and

Cultural set-up, several other use cases are available, which are yet to be explored. According to NASSCOM, by 2020, the IoT market in India alone is expected to reach \$15Bn, which will be around 5% of the global market. Nearly 120 companies offer IoT solutions and the count is expected to rise in the upcoming years. One of the major highlights is, the advancement of IoT has triggered a massive establishment of Start-ups across the country. Out of the 120 companies, roughly 70% of them are Start-up companies offering IoT Solutions. Investors too are keen to invest more into start-ups offering innovative IoT solutions. In the last two years, a cumulative amount of nearly \$60Mn has been invested in Start-ups. At present, in India, Health care and Manufacturing sectors are the two leading verticals demanding IoT solutions. With the government's great digital push, everything around us will end up becoming a part of the IoT network in one or the other way, leading to the massive build-up of IoT Sectors.

Mr. Raghu Gullapalli, MD-Products, Accenture, India, has rightly pointed out that, "Though the progress on adoption IoT in India is in the nascent stages, IoT holds a promise of significantly impacting India's economic and social growth. Indian government's Make in India initiative is expected to boost GDP contribution from 16 percent in 2017 to 25 percent by 2022. Investments and Innovation in Product development are central to achieve this goal and Industrial IoT can play a key role for the same"

Though IoT and its benefits appear to be lucrative, it is hardly free from challenges. The main question to be asked here is: Even if we manage to implement IoT, will we be able to maintain the amenities required for it? The main issues of IoT in India are Governance, Security, Interoperability, Privacy, Regulation, etc. Added to these issues are technical challenges like data processing and security. When a large number of critical devices are connected in the IoT environment, security becomes a major concern. In 2016, a famous Japan-based botnet called Mirai attacked Dyn Service provider, which took down a large portion of the Internet. Once a system (object) is infected with the Botnet Mirai, it continuously searched for insecure devices and took it down causing a DDoS scenario. This was one of the largest DDoS attacks in recent times. The most recent malware, called Silex (launched on June 25, 2019) is wiping the firmware of IoT devices. Within a few hours of its launch, Silex took down nearly 2000 devices and the count may further increase. Similar to the old Brickerbot malware which took down millions of devices in 2017, Silex also has the ability to create huge damage (Much more than the Brickerbot malware). Silex targets the storage of the device, drops the firewall rules, removes the network configurations and finally stops the device, thereby creating an illusion to the owners that the hardware of the device has failed (in reality, the device is compromised). The only way to recover is to manually reinstall the device's firmware, which is too complicated for the majority of the owners.

When critical systems connected on the internet are compromised, one cannot imagine the scale of destruction, that may be caused. All the currently used IoT devices employ a highly insecure and vulnerable firmware, which exposes the devices and its critical data, thus endangering innumerable human lives and property. With a prediction of nearly 75 billion connected IoT devices by 2025 across the world, one can only expect the worst in the upcoming future. With the main aim of improving the security features of the IoT environment, massive research work is being undertaken in IoT. One has to note that to realize the real 'essence' of digitization, technological amalgamation is required. With the advent of AI, a platform is set for the amalgamation of various technologies, which can be used for training systems. IoT and BigData technologies go hand-in-hand, since, for handling a large amount

of data, one requires BigData technology. BigData requires a large amount of data, for which, IoT can be one of the sources.

Despite several roadblocks, IoT is still being preferred nowadays, especially in developing countries like India. IoT, if used in the right way, will accelerate the growth and development of a country. With much more improvement, one can actually make use of the technology for creating a safe world and make it a much better place to live in. Every technology is beautiful in its own accord, which could be used for constructive purposes or destructive purposes. It is left to us, the human beings, the options to choose. The fate of the upcoming generations and the entire humanity depends on the choice it makes.

- Ms Jayapadmini Kanchan
Asst Professor, Dept of ISE

SUCCESS STORIES

1. AMAZON.IN

HIGH-TECH creation myths are believed to start with their Business in a garage. Amazon, impatient with ordinary from the outset, began with a road trip. In the summer of 1994, Jeff Bezos quit his job on Wall Street, flew to Fort Worth, Texas, with his wife Mackenzie and hired a car. While Mackenzie drove them towards the Pacific Northwest, Jeff sketched out a plan to set up a catalog retailing business that would exploit the infant internet. The garage came later, in a suburb of Seattle, where he set up an office furnished with desks made from wooden doors. About a year later, Amazon sold its first book.

The world saw a website selling books and assumed that Amazon was, and always would be, an online bookshop. Mr. Bezos, though, had bigger plans. Books were a good way into online retailing: once people learned to buy books online they would buy more and more other stuff, too. The website would be able to capture much more data about what they looked at and thus might want than any normal shop; if they reviewed things that would enrich the experience for other shoppers. He saw a virtuous circle whereby low prices pulled in customers and merchants, which boosted volumes, which led to ever-lower prices—a “flywheel” that would generate growth for as long as the company put the interests of the customers first. Early on, Mr. Bezos registered “relentless.com” as a possible name; if it was a little lacking in touchy-feelings, it captured the ambition nicely.

Selling books on this new thing called the Internet. Some called him crazy, but the bold entrepreneur got his online “bookstore” started in his garage in 1995. And lo, 19 years later, it has annual sales of nearly \$100 billion and has made Bezos the 13th-richest American.

Amazon is incredibly popular and has become an everyday part of our day to day lives in the past and has skyrocketed since Amazon is incredibly popular and has become an everyday part of our day to day lives in the past and has skyrocketed since it starts in 1994. We don't realize how often we really use Amazon. When in reality, we use it almost daily. This has become such a great change in how we shop, within the past 19 years. In just 19 years we went from shopping from stores to shopping online. Imagine what we could accomplish in the next 20 or 40 years! The possibilities are limitless!`s start in 1994. We don't realize how often we really use Amazon. When in reality, we use it almost daily. This has become such a great change in how we shop, within the past 19 years. In just 19 years we went from shopping from stores to shopping online. Imagine what we could accomplish in the next 20 or 40 years! The possibilities are limitless!

- Ms Rajatha

Asst Professor, Dept of ISE

2. STEPHEN HAWKING: A MOTIVATION

Born on 8 Jan 1942, Stephen William Hawking, the world-renowned physicist, and cosmologist need no introduction. He was noted as the most brilliant person alive and apart from being a notable cosmologist he was an amazing person.

Though he was born to well-educated parents, the time he was born was quite difficult as his parents did not have the money back then and also the second world war was making livelihoods rather challenging, in search of a safer place his family returned to Oxford.

His early school life was not outstanding, he was third from the bottom in his class but he enjoyed playing board games, he with his friends created their own board games, he also made computers out of the waste part to solve mathematical equations. He began his university education at University College, Oxford. He loved mathematics but as Oxford did not have the degree he had to take up Physics and later Cosmology.

At the age of 21, he was diagnosed with Amyotrophic Lateral Sclerosis (ALS or the motor neuron disease, a terminal illness that affects and causes the death of neurons that control the brain and spinal cord) and led to gradual paralysis, to the extent that Hawking could use only his cheek muscles. The general life expectancy of a person suffering from ALS ranges from two to five years. When everyone lost hope, Stephen believed that the disease helped him to become a scientist. Hawking said, “Before my condition was diagnosed, I had been very bored with life, there had not seemed to be anything worth doing.” With the sudden realization that he might not live long enough to earn his Ph.D., Hawking dedicated all his energy to his work and research. In one of his interviews, he also mentioned “My expectations were reduced to zero when I was 21. Everything since then has been a bonus.” He did not recover from his disease and it made him physically weak at the time, but what kept him going was his willingness to work from the mind as he says “Although I cannot move and I have to speak through a computer, in my mind I’m free.” He did not close his mind when his body failed. One possible explanation that Hawking himself gave for his prolonged life-span was his die-hard interest and passion for research. He believed that his branch of study -theoretical physics -kept his mind young and alive. And also the quality of medical and domestic care that he received all through, has resulted in such a long life-span of 76 years.

Stephen Hawking’s main contributions to the field of physics and cosmology lie in the studies of:

- The origin of the universe
- Time
- The Big Bang Theory
- The universe began with a gravitational singularity
- Singularities (gravitational and space/time continuum singularities) are more common in-universe than we think
- Black Hole radiation
- The universe has no space/time boundaries
- There is no god
- The balance of probability is strongly in favor of the existence of alien lifeform elsewhere in the

universe. Some may be intelligent; though the balance of probability is lesser.

Stephen Hawking has published many books. 'The Universe in a nutshell,' 'A brief history of time' are also among them. He has received numerous awards and honor.

Death has to come but the life which we have between birth and death is up to us and it's all our will how we want to live. Hawking died on 14 March 2018, at the age of 76.

"Remember to look up at the stars and not down at your feet. Work gives you meaning and purpose and life are empty without it." (Stephen Hawking)

Stephen Hawking's life is inspirational and motivational, for it is the fact that no matter how hard the battle of life might seem, no matter how daunting and unachievable the task might appear, giving up should never be an option or alternative.

- Navya BL
4SF16IS052

3. FROM SELLING SIM CARDS TO BECOMING CEO OF OYO ROOMS

Born at Bissam Cuttack, Ritesh grew up in the small town of Rayagada. The young Entrepreneur, who is now based in Gurgaon says, "My childhood was similar to any small-town kids. I was raised in a middle-class family in Rayagada, Odisha. The only difference was, I had big dreams even as a child I always knew I wanted to be an Entrepreneur. "As a child, he loved writing and was deeply interested in computer programming. He gained a keen interest in software. He borrowed his elder brother's books for programming. He started coding when he was just eight years old. Hence, Software had obviously become his first love.

Agarwal, hailing from a business family moved to Delhi in 2011, to start his entrepreneurial journey after deciding to skip engineering college entrance exams. It was when he was 18 that he founded Oravel Stays, which was building the Indian version of home-sharing portal AirBnB. Agarwal who stayed at over 100 bed and breakfast rooms while running Oravel, soon discovered the problem. "The big problem was that these portals are not standardized", Agarwal told ET in 2015. As a dropout, Agarwal became the first Indian to be chosen for Thiel Fellowship, where he was given \$100,000 grant by early Facebook investor and PayPal co-founder Peter Thiel. It was given to Entrepreneurs below 20 years of age who skips college for two years to start running their own business. With this newfound confidence, he worked even rigorously. But to his hard luck, the Business model didn't seem to be picking up. He went into thinking mode and realized, the biggest pain while traveling was to find affordable and available hotels to stay in. This motivated him to create an online social community, to bring information about all good places together in one good platform. As a result in 2013, he relaunched Oravel to OYO Rooms which means 'On Your Own'.

"It's funny in India, I haven't come across any dropouts who are smart and high quality. Hopefully, in the next few years, we will have more high-quality dropouts. When I go to college for talks, I encourage the students to drop out", Ritesh said. 'A Dream does not become reality through magic, it takes sweat, determination, and hard work'. OYO's Ritesh draws inspiration from Bill Gates, a fellow drop out and has now become the leading Entrepreneurs.

- Prakhyath
4SF16IS062

READER'S CORNER

1. WHERE THERE IS NO STRUGGLE THERE IS NO STRENGTH

We all will be thinking about why we have to struggle in our life. In one or the other way, we all will be struggling to make our life status well and good. Struggles are the ones that will make us very strong. In order to make our direction towards our objective or goal, we have to struggle and do sacrifice and do suffer. No man becomes a successful person overnight. As he goes through life struggle he will become more strong than before. Person success is not at all an automatic process. If we hear the stories of famous successful persons they all have struggled in their life to achieve their goal. The main thing is they struggled and they have not stopped their struggling in between. It was a continuous struggle so they had glorious triumph. Life career will not be progressed without any struggle.

Just we take an example of a butterfly. The butterfly is famous for its beauty. Without the struggle, it will not become strong enough to take flight. One day one man saw the butterfly cocoon in a small plant. The next day he again saw the cocoon and he observed the small opening in the cocoon. The butterfly was struggling to squeeze its body through the tiny hole. Man watched this process for an hour and butterfly could not come out. He wanted the butterfly to come out soon. So he thought of helping the butterfly to come out so he took a scissor and just snipped off the remaining bits of cocoon. Butterfly came out but it could not fly as it is having swollen body and shriveled wings. The continuous effort of the butterfly to come out of the cocoon lets the fluid stored in the body to be converted into wings so that wings become larger and the body becomes smaller and light so it can fly. In life also if we don't undergo struggle it cripples us and we will not grow and moreover, we will not become strong enough to face the situations.



- Mrs Akhila Tejaswini
Asst Professor, Dept of ISE

2. “YOUR CHANGE CAN BE A CHANGE”

The little amount of money that you keep in the wallet in a form of coins or small-sized note, that we call “Change” Has the capability to change someone’s life

One fine day, a man was walking on the footpath across a busy street. The time was when all were returning to their homes after their work. It seemed to be humid and people scrambled around. Besides a telephone pole on the footpath, stood a young boy with his hand extended ahead begging for money. Hundreds of people passed by this boy but no one had the courtesy to help. He looked at everyone with eyes which claimed not money, but love. He was in need of someone who would make his life better. He expected neither luxury nor comfort but he expected stability in this insane society for his survival.

This man making his way back home stalled near this boy and looked at him. He just viewed this young kid from head to toe and asked him what does he want. The kid told me that he would be pleased if he would get a rupee from him. The man just took his wallet from the pocket and saw that he had nothing else than a couple of 500 rupee notes. He looked at the kid giving an expression that he is helpless and saw the wet eyes of the boy. The man just held his hand against his chin and rubbing his French beard for a few seconds, ran down his hand towards the wallet and inserted his fingers into the compartment of the wallet and withdrew a five hundred rupee note, handing it over to the boy with a smile said “Go get a life”.

The kid was very happy receiving the money from this nobleman. He bowed to him and just walked away.

A lady came to the man and told “Are you mad? why did you give him a 500?”. The man kept quiet and observed the child cross the road. The kid first went to a grocery store and bought a samosa and a bottle of water. Later he moved to a textile shop and bought a shirt and then went to a cobbler and got his footwear stitched. He then went to a mandir beside and prayed and thanked God for this day. The man was smiling looking at the action of this kid. At last the kid went to a small office at the corner of the street. He went on with the change in his hand and came back empty-handed but had a huge smile on his face.

The man and lady watching this kid were wondering where did he invest the money. They went to the office and enquired. They were astonished and turned happy to know that the place where the boy gave the money left was an orphanage.

This was a difference between a beggar and us. We ignore even when we know we are very capable to help, they help even with their everything. The lady asked the man “Why are you smiling on your loss? You just lost a 500”. The man told “ I’m working and I earn enough, but that boy earned nothing but still, he gave up all his comfort for the welfare of others. If such small losses give people a better life then I’m ready to bear them every time”.

- Mr Ganraj K

Asst Professor, Dept of ISE

3. CAN TECHNOLOGY CURB CORRUPTION ?

Remember the time you thanked your little brain for assisting you when you thought you couldn't crack that exam or come up with a mindboggling idea for your project? Of course you would, because our lives have gone through tremendous changes and has become so much simpler now, thanks to the fast pacing world that copes with the advance in technology. And now, technology has played a majorly significant role in our lives, to an extent where man trusts the gadget more than his own tribe. Feeling bored? Hit me up, Alexa. Crave for a midnight snack? Boom, you have your burger and coke right at your doorstep. Forgot your wallet? There's your PayPal. Life's become so convivial, you might simply evolve into a tech-glutton. But is it okay to be one or not, is solely left up to us as individuals of this diversity.

Over a period of time the digitization in technology, and the innovative ideas of man have led to a race inhabiting a world where one can easily perceive something through mediates like the current gadgets we make use of. But the question here is, are we able to differentiate between the boons and banes of the technologies that are taking over our lives? Is the man corrupting technology or technology corrupting the man?

We all have different answers to these common questions imposed by the interrogatives. They differ because of the way we tend to see and understand things in our perspective. Man has innovated technology, for our enhancement and convenience. Technology has been one of man's major success, for this benefaction to humankind has completely brought a change in lifestyle.

Then why the corruption?

The misuse of something can happen due to 2 reasons, culture and education. Some people are not cultured and educated enough to even know the use of technology, while those who have been granted the fruits of education tend to misuse it, it's either of the two. Logically speaking, one cannot entirely blame the one who isn't well versed in technology, but one sure can accuse the educated who misuses it for their 'good'. Well then, what about the government who is handling technologies for developing its nation? Aren't they educated enough to know the difference between what is right and what is wrong?

We live in a country which is run by a democracy where the people themselves fail to understand the usage of technology as one of the key elements for the betterment of the country. In reality, the modernization by man has become a secret hub to manipulate the monopoly of the people, and that is something which isn't highlighted to the people themselves.

The above was just an instance, while there are quite a few more dark sides to the misuse of technology in our own country. So then, what could be the ultimate solution to get rid of this corruption? Modernization and digitization has been innovated by man, and it is he who pilots them as well. If the thoughts of the man aren't transparent, then the outcome of his actions will undeniably be adulterated. So here's the thing; preventing its further misuse is a lot better than trying to curb corruption, as we

all constantly live in hope for something humungous that can possibly scour away the epidemic of corruption at present.

We've all been gifted the ability to contemplate and reflect over our actions; it's high time we need to mend our fallacies and slog till our conscience awakens us to play fair. Only then, will we able to counteract what is deceitful in our community.

- Akshatha RN

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