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TECHNOLOGY for SOCIETY

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IEEE Chairperson and Student Editor

The Tree with Golden Apples

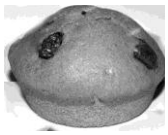
As the king walked through the streets of his kingdom that night, he was perturbed by the hunger, the poverty of his people. He wished he had the Midas touch to remove misery from his subjects' lives. For the entire night, he sat up and mulled over the problem. Early next morning, he sought out his advisers and asked them what could be done. His advisers said "Since you wish to elevate their hunger and also their poverty, it would be best to plant Trees with golden apples. The gold will make them rich and the apples will fill their hunger." Within two days, apple trees of gold were planted. To stop people from stealing they were put under guard.

Three months later, the king roamed the streets at night, but was surprised to find the people complaining yet again of hunger and poverty. When he asked a farmer if the golden apple trees had been of no use, the farmer replied "When common man can neither plant the trees, nor use them freely without permission, it only makes the thieves greedier, and the poorer poor. Besides, who ever heard of eating golden apples? The trees have neither made us wealthier nor less hungry, Your Majesty!"

Technology, very often can turn into a tree with golden apples. This is where Science and Technology differ – Science lives to discover the world, technology survives to bring science to people's lives. When technology ceases to be for society, technology has no meaning at all. It becomes a redundant piece of work that some people spent a lifetime working on.

The scores of research papers and research work happening across the globe should have helped improve health and education and alleviated poverty and hunger, yet United Nations statistics suggest that we are not even close to achieving the UN Millennium Development goals of 2020. Somewhere, in the world of development and politics, research has remained as a sole means of status and glamour for scholars and gotten lost before it reached the masses.

This issue is dedicated to finding out where our mechanism got choked, about initiatives by world leaders and industries, about technology for you, me and everybody else in the world that breathes to live and die – animals, trees and humans.

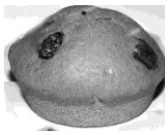


MOCHA MUFFINS

WIE Chairperson and Student Editor

A log of wood rolling down the acclivity kindled the imagination of the prehistoric homo sapiens who came up with the most brilliant inventions of mankind, the wheel. Four circular discs attached to a planar surface, could be used to transport heavy objects with ease to distant places, metamorphosed into an annular ring with variable number of spokes the number proportional to the encumbrance that the plane had to support.

The curiosity that troubled humans for century, regarding the fundamental constituents of all the entities of earth, decimated like the dark clouds clearing the sky gradually. The smallest material entity, which was called by it's Indian discoverer as "anu" was hailed later as seed which gave birth to the systematic study of matter, chemistry. It's later extrapolated, hypothesized and experimentally proven by the westerners not only improvised the existing theory, but acted as a precursor for further investigation. Like the thermonuclear chain reactions, these investigations rubbished the indivisibility of atoms, and forged us towards the elementary theory of three mutually interacting subatomic particles. All these were the hairpin turns in our journey towards the summit, which we ultimately endeavor to conquer. It gave rise to parallel inanimate systems that co-existed with the already mind-boggling, organic super systems. Suddenly, our knowledge about momentum, velocity and other motion descriptor in kinematics became redundant. Incapable of explaining the behavior of the new entrants using the classical theory, scientists looked for a new alternative theory, much like the doctors prognosticating a new pathological condition. Thus, we bumped upon the theory of randomized, almost unpredictable behavior of particles at microscopic levels. Stumbling upon the quantum theory was like opening a Pandora box of new opportunities. It led to an outburst of new discoveries and inventions. From the radioactive decomposition of matter to fundamentals of CRT tubes, these inventions spoke of the irrefutable human ingenuity marginalized and underestimated by the insularity of the dark ages.



MOCHA MUFFINS

The third event that one might bookmark in the tome of scientific developments and advancements would certainly be the discovery of electromagnetic waves. Radio waves and Micro waves were soon chosen to carry information, a non physical entity that was carried by humans and their domesticated companions for centuries. Now this degree of uncertainty would be represented in the form of continuous and later discrete signals. Through modulations and demodulations any of the three characteristics of the waves, could be altered using the freshly designed electrical and electronic circuits. Wireless communication meant unrestricted mobility and ease of deployment could be complemented by low requirements for maintenance and seamless potential to extend services to all the regions irrespective of their topography.

An invention that brought us closer to the much fantasized automatons was the computer. An idea initially conceived to overcome the difficulties of lengthy calculations led to the creation of a multipurpose contraption that would in the future perform several Herculean tasks. Managing every nuance of human life, computer has became virtually an inseparable entity and an intrinsic part of our lives. From database management to synchronizing the atomic clocks situated at different geographical locations, processing musical tones to conducting pinhole surgeries; computers have made their presence felt in each and very field of study and research.

Every time I stumble upon a novel ground-breaking human creation, I would wonder whether we have moved another step towards the brave new world that Huxley once described in his revolutionary novel.

Parul Raj

PUBLIC GOOD OR PRIVATE GAIN ??

Greetings to all, who are living in this high-tech world of gadget and appliances, which form an important and crucial part of our lives. In this world, every now and then a new technology is born and within a fraction of time it gets integrated in our lives in one way or other. The best part is that these new technologies are meant to help us perform our chores in a much better and efficient way, hence giving solace to our lazy souls. We are just so happy in this world. Companies help us to fulfill our 'needs' (if correctly quoted, they are 'desires') and that to for a quantum of price. Truly a heaven……..don't you think so!!

TECHNOLOGY IS BLESSING

Obviously, it is. Let us talk about some of the companies that have given us these blessings.

The first giant that comes to my mind is INTEL. This company has without failing followed Moore's law (because Moore is its founder) and has produced smaller and smaller ICs which were loaded with more and more features like integrated Bluetooth devices, larger memory, fast computing and the list goes on.

The best products were the Pentium series processors, dual core processors and now we are having 'xeon' processors which have integrated server.

Next in the line is MICROSOFT, a software giant. The unforgettable fruit of this company is the 'windows' OS. Packed with all the applications catering to needs of an average user with its unbeatable user friendly interface, this OS has already made history and is going to be part of our future as well.

APPLE is another software and hardware giant with a bouquet of software and hardware for its customers. Some of the prominent technologies are: apple iPod, MAC OS, iPhone and MacBook air, the ultra thin notebook.

Other giants in this category are DELL, LENOVO, Sun Microsystems and SONY. Specifically speaking about Sony, it is one of the first companies which captured the hardware market by launching music players, first of their kind. Then as people say, rest is history.

They came up with the best of entertainment and storage media which flooded world markets in no time. The recent products of this company are the speakers which are meant for dockable iPods.

This list of giants is incomplete without the mention of those who gave us technologies like mobile phones, LCD monitors, media players and other home appliances. These include NOKIA, SAMSUNG, LG, MOTOROLA, SIEMENS and others.
Isn't it amazing to know that so many companies utilize all the resources that they can lay their hands on, just to make our lives more comfortable and easier!

'TECHNOLOGY IS BLESSING' ……REALLY??

It seems that every company is serving us with the best products and we like their attention. But is our betterment the true reason for companies to make so many products or is their main aim private profit? Is the primary goal of these giants 'public benefit' or 'private gain'?
Looking at the entire picture, private gain is the only obvious reason. These companies spend zillions on research and experimentation to produce a service which they can sell to us by telling us that we are in pathetic conditions and their product/service can make our lives heaven. We believe them and spend our hard earned money on their 'not so useful' services.
Being an important part of our societies, it is the responsibility of these firms to take measures to improve the condition of our society, because they are the ones who are playing an important role in degrading our environment and our society.
The rate at which these firms are polluting our environment is very high and the rate at which these firms are taking corrective measures is very low.
The waste from these firms, especially non-biodegradable has been damaging our environment for long and it will be continued in the future also.

For instance, let's take in consideration the carbon footprints of these firms. Carbon footprint is the measure of the impact that human activities have on the environment in terms of the amount of greenhouse gases produced, measured in units of carbon dioxide.

According to the Carbon Disclosure Project (a project to calculate the carbon footprints of companies of various nations) results, Intel carbon footprints were 4 million tons in 2006 and Sun Microsystems' were 255,000 tons last year.

These numbers are very high and these are continuously increasing as the years are passing by. These increased green house gas emission are playing a major role in Global Warming. To curb these green house emissions, the giant firms have taken up initiatives like Climate Saving Computing initiative and EPA's climate leader program. Speaking of Climate Saving Computing initiative, the member companies report their annual carbon footprints and take apt measures to control them. In EPA's climate leader program, the member companies set tangible carbon footprint reduction goals and strive to achieve them in least possible time. The prominent members are Intel, Google, Sun Microsystems, Dell and Microsoft among others.

Another step taken towards saving our environment are the environment friendly HP desktop PC and displays. These are equipped with advanced power management features which reduce the power consumption up to 45%.

There are also some devices like the Solio which is a handy solar gadget that can be used to charge mobile phones and iPods and can even power them. This is a very useful device which saves on a 'phantom loads' i.e. the power consumption when mobile phones are left on chargers for a time period longer than needed.

These initiatives might look like big steps toward saving environment but as the saying goes –"too little, too late".

These steps taken to reduce carbon footprints are not producing results which are expected. The member companies spend zillions while increasing carbon footprints and less than 10% of that while reducing carbon footprints.

It is the responsibility of these giant companies to direct their resources in adequate amount towards reduction of carbon emissions. Not just these companies, we are also equally responsible for contributing towards reducing energy consumption and for judicial use of our money instead of spending it on useless services and products. We have to learn to distinguish between our 'wants' and 'needs' because being the customers of these companies it is our duty to force them to produce products which are environment friendly and at the same time to judicially use the resources available to them. Otherwise technology would no more be bliss rather it would be a curse in disguise!!

Hence, now the companies have to decide what is important for them- **public good** or **private gain**.

Kamakshi Sharma, Somya Gupta

The Curious Case of Maya

It was chilly December morning; we shivered beneath our gloves and jackets, my friend and I, as we stepped out of Wenger's at Connaught place after our weekend MBA class. Boy! Data Interpretation gets on your nerves sometimes! A quick milk shake at Keventor's or a truffle pastry at Wenger does have that knack to turn around your mood, I reflected happily. But Oh! Great, it was those damned street children again! They just don't let you do anything in peace! Why don't they put them in some orphanage or some shelter?! It's such a mood spoil because after seeing them you never feel like eating! We vainly tried to shoo them away and I ended up losing my pastry to one of them... Uhh! CP has always been a bittersweet experience.

Just then, I felt some one grabbing my thighs I swear I'd..! if it was another one of those street children. Frustrated and angry, I turned around to see this tiny little girl around a year and a half without a scrap of cloth on! That made me stop shivering for a while! **She gave a shy smile and handed me my wallet, apparently I had dropped it while dealing with those rowdy street children. She begged me for a glass of water as I realized she was too little to be able to form coherent words**. I bought her two and my friend gave her ten rupees. She skipped away happily to her mother who stared at us in a way that gave me goose bumps!

Her mother seemed to be in her early twenties. She looked like she needed a good wash and some real clothes; otherwise she had a really pretty face and haunting grey eyes. She yelled a lot in a language that was alien to us… most of it anyway. Frankly, she seemed a bit mad so we rushed back home. A week later they were out of my mind.

The next weekend I saw the mother daughter pair surrounded by two or three policemen who seemed to be laughing at the young mother. A little while later they took her to the police station… I trudged back home feeling weird.

As fate would have it, we met them again the next weekend in front of Mc. Donald's but things were a little different this time. The little girl looked badly hurt, her left hip had been grazed and was bleeding. She was lying on her back (again December and no clothes!) and her mother was sitting next to her, crying for help as people passed by… so did we. We wanted to help but the little girl's mother scared us. On the way back home we felt disturbed and started discussing the two, we ended up buying warm clothes for the little girl from the street market planning to give them to her next weekend.

The week passed by in a blur and we were in CP once again the sight that met our eyes would've made your stomach lurch. **The little girl was on her back her left hip was totally skinned there was nothing but dried, caked blood in its place and there was a piece of newspaper stuck inside the wound! Her mother was still crying for help.** Horrified we got some medical supplies scotch tape, Savlon and the works. Now approaching the mother who yelled incoherently for most part and stared in a scary manner was a whole new deal. We steeled ourselves and went over to her to ask if she needed help, after what seemed like hours of intense staring we got a positive response, I think I skipped some heartbeats! But she took the stuff and with our instructions bandaged the child. We then handed her the clothes we had got for the little girl. But she just kept them beside her and didn't seem to want her girl to wear them. It took some persuasion and guts to get her to cover the poor kid.

Just as we were leaving three northeastern youngsters in green tees caught up with us. They informed us that they were from Greenpeace, India and had been studying the beggars in CP particularly Maya, the little girl and her mother for the past 5 days. **What followed was unnerving to say the least; the young mother was a drug addict she purposefully used to skin the little girl's hip every night so that people would pity her and give her money for the drugs. No wonder she was so reluctant to dress up her child.** Apparently we weren't the only ones who'd tried to help the two, the clothes given to the little girl out of charity were sold at the nearby flea market and similar was the fate of all the other things given in kind. We were warned not to hand her cash…

This is just one aspect of the torturous lives of street children, children begging in the name of Saturn god (Shani Dev) at traffic intersections, rag pickers, 12 year old 'pappad wala' boys selling for survival of their family, sale of balloons on the busy roads by a disabled girl child, self employed minors polishing shoes on footpaths, children performing circus in the busy market place,

child dancing in the local train in the hope for money… are a common sight, especially in the so called 'rapidly advancing' and 'high-tech' metropolitan cities.

Today, children like these can be found everywhere you go. India has the largest population of child laborers in the world – estimated at up to 100 million and about two million orphaned children. Most of these children are homeless, extremely vulnerable to being trafficked into child labor if they're lucky, or exploited by brothels if they're not.

Last month a couple of articles in the newspapers exposed an even gloomier scenario for children living in several orphanages.

In most orphanages children are deprived of their basic rights. "***These children are treated like slaves. They can't protest if they fall ill. No regular meals, contaminated water to drink and dingy toilets in the Delhi Boys' Home. That's what the National Commission for Protection of Child Rights (NCPCR) found after an inquiry***"

Reported an article, **Lost Innocence**, in Hindustan Times in October 2008.

Another such article reports about children between 7 to 14 years of age being trafficked from flood-affected districts in Bihar with promises of employment and a better future but found living in cramped rooms without wages in a small industrial unit.

But the worst is yet to be told; there are no counseling programs, no effective system of supervision and management of the likes of these units and orphanages. Most of the State governments spend quite a lot of money on welfare of children and protection of child rights, but despite that the condition of street children, child laborers, and orphans remains gruesome.

We always hear about miseries of the poor in India and how drugs and drinking are ruining their lives, spoiling the future of their children, the present of their families,

what is the way out?

Can we do something about it?
Do we want to do something about it?
It's easy to shut the eye and go on about life as if these things don't matter. It's convenient to suppress feelings which make you want to help and reach out the distressed. After all, we are running in a rat race with little time for anything but ourselves. Yet I can't

Education and their getting two decent meals should be the moral responsibility of the government and the entire society. Money can be generated by selling works they made in vocational classes, collecting financial aid from corporate and rich individuals, anything for the betterment of the future of India represented by these children. Not only would it increase the aesthetic appeal of our streets, it would asymptotically improve our future prospects as a nation.

We realized that day that helping these street children with clothes and money was no solution to this evil - it was a life style change that was needed. We need to change the mindset of people, to counsel them and make them want to achieve higher goals and realize the need of education, literacy and how it opens gates for a better tomorrow.

All these measures should go along with providing them with the basic means to tackle their present. This is not a one man's task nor can the government be solely held responsible. We all need to sit up and think. To ask ourselves what can be done and whether we are willing enough, compassionate enough to spare some time off our daily schedules - to bring change in the lives of those who so desperately need it.

Can Tech Society do what a Political Society couldn't?

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If this article moved you, then please send your suggestions, feedback to kamakshi.sharma@gmail.com or to somya.gupta1@gmail.com.
We'd appreciate an opinion.

U.Vineeli

Indic Innovation breaks English Monopoly

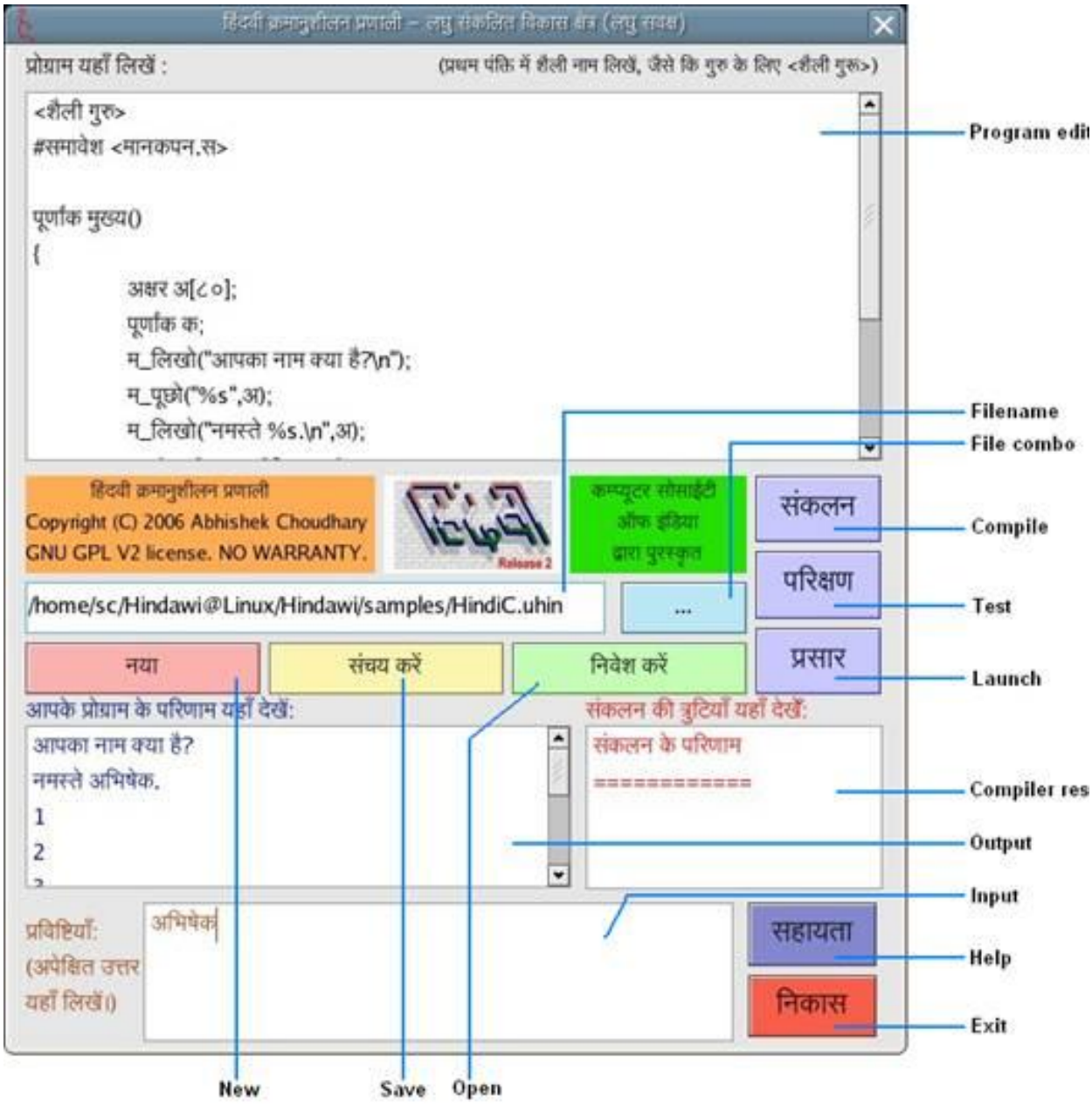
On a recent trip to Andhra Pradesh, I visited the flyspeck town of Tenali. Sitting on the charpoy I was fiddling with my uncle's laptop. All of a sudden, the laptop picked up a wifi signal. As it required no password… I was all the more elated to use free Internet. Man! Who would expect this in Tenali! A town with no fancy coffee shops! No McDs, no CCDs…

Overjoyed, I hired a bicycle and started exploring the town. I spotted a few cyber cafes. Some open drains, some potholes. But a major kill-joy was the sight of coaching institutes. Several concerned engineering entrance preparation and some exhibited eye soaring hoardings calling learners of C/C++, Java and so on; but most concerned English speaking courses.

This made me ponder…what if a person had logical and analytical skills required for a programmer but was educated in a non-English medium? Is English the deterring force of India's IT roller-coaster ride? Is the potential of our rural and sub-urban youth untouched by IT revolution because they were uncomfortable with the universal language? While we have the luxury to correlate the keywords in programming languages with their semantics, the same cannot be said for all youngsters of our country.

As a user, e-commerce and software localization have brought in Hindi interfaces for the common man. We can access local language based sites. And, even use epatra and mailjol.

Imagine, if we had C in Bengali or LISP in Tamil, we could turn Information and Communication Technology into a cottage industry. This was Hindawi Programming Systems' vision. HPS is open source, free, Indian language based programming platform supporting all paradigms of programming languages. Created by Abhishek Chowdhary and Sweta Chowdary, their target was to construct compilers for the equivalents of C, C++, lex, BASIC in Hindi and other Indian languages. The languages have been tested and used to successfully implement a Beowulf cluster super-computer. What is more interesting is that the basic underlying technology is applicable to all languages as they have been mapped to the International Phonetic Alphabet. This indeed increases scalabilitv.



Winner of FOSS India Awards last year, they had made it possible to have even BIOS in Indic script. This was required to achieve true language independence. With 7-bit ASCII constrained compilers and limited support for direct compilation of extended character sets as required by Unicode, achieving Hindawi's objective for platform independence must have been daunting.

The languages are syntax compatible to their English counterparts so existing libraries can be easily employed. The languages can be implemented on all existing platforms including resource restricted embedded systems. It can be downloaded from the project's site. However, a GNU-GCC backend is also required for Hindi versions of C/C++, lex etc. There are also related projects contributing to control systems, robotics, and translators on the same lines.

As Hindawi allows auto-translation of the program code, the software applications produced can be globally marketed. The best part is that being open source, Hindawi is unearthing the immense vernacular literate manpower in ICT. No wonder, it's an active FLOSS community.

Other simple procedural programming languages in native-languages have also been developed. Another known contribution is that of scientist, Dr. U.B. Pavanaja who developed Logo in Kannada. As a kid, the first language I ever learnt was BASIC. But growing up, I observed my younger cousins struggling with Logo. The motive of Kannada Logo is to hone the programming skills of Kannada-medium kids. Both the language and the pre-requisite Nudi font can be downloaded. Dr. Pavanaja was inspired by MSWLogo which is in general public license format with a shareable code.

On the other hand, Systems Development Laboratory of IIT Madras started with developing Telugu and Tamil versions of BASIC. A package consisting an editor and interpreter was developed. Now, the lab focuses more on scripting in regional languages rather than developing a programming language as they think complex applications require a universal approach. With scripting languages providing necessary abstraction for numerical and data based tasks and PERL proving to be an efficient programming resource, the lab has used PERL modules which interpret scripts written in native languages. Programs are written on IITM multilingual editor and the Indian language is then processed. This module used for string processing is called 'llperl'.

A need for a full fledged Indic programming language based or an environment is itself a debate in the programming language community. A section of the community says that simply putting a layer of transliteration doesn't provide enough flexibility for the programmers. Certainly, the Japanese prefer to use Ruby than any transliterated language. Another section would argue that the need of the hour is effective interface in Indian languages developed using standard developing tools and not Indic languages.

When I joined college I thought I had most of the answers but in the first week itself I realized the answers lead to more questions. With the Indian youth caught between this question-answer maze, we have to still walk miles to achieve our own native language based OS and catch up with Japanese and Chinese systems.

IEEE Membership and Web Team Chairperson, Student Creative Editor

Technology for masses

Technology in India, unfortunately, has been always seen as fancy, elite, urban, expensive and, at times, intimidating. Technology should be about what problems we are solving at this point of time. Solar power will be cheaper, biotech will advance more drugs. But the litmus test will be how we use the technology to solve the problems of majority of our population. For the wealth to percolate we need to focus on the technology for the masses.

Best brains are solving problems of the rich. Why don't we go and improve the design of areas where nearly half the Delhi's population lives – the ubiquitous urban slums. We need to apply the technology to solve these problem areas.

Water is a constant problem and storage of water takes a lot of precious space. How about designing an inexpensive plastic bag, which can be used to store water and hung from the wall. You can save all the floor space that people can use to sleep and cook.

Design of an inexpensive photovoltaic cell, which could be mass produced, will go a long way to bring 'Light' in the life of majority of Indian population.

We talk about universal education for the under privileged children / street children who have the additional responsibility of contributing towards the family income. To improve their skill-set for better future life we can upgrade the concept of "**Each One, Teach One**" by delivering the educational contents through an electronic kiosks and other modes anytime and anywhere. We can create a whole new concept of learning that kids network themselves in groups, at their convenient time but follow a schedule. The teacher then becomes a mentor and not a delivery agent. The cost structure of providing the universal primary education will dramatically change.

In every aspect of technology there has to be a massive change of thinking if it has to be of any relevance to the masses. The processes involved for the interface of 'Aam Admi' with the ever increasing bureaucratic set up in the country need to be modified to make them more suitable for delivery by electronic means.

We do have the answers, and the capacity to implement it as well; then is it just the lack of authority that each one of you who is reading this is moving forward every year but the majority of India is still standing where it was 10 year back?

How many times we ponder over these problems and think about making a change in our lives to improve others', how many of us actually do? Is it a resistance to change or simply the adaptive human nature, or is it the selfish pursuit of money? If social contribution could be made an integral part of various educational institutions; it would definitely rope in more people... call it mass behavior or simply providing the means! Again this whole scenario depends on the initiative of the individual heading that institution. Authority once again creeps in…

Imagine if IP University replaced one subject every semester with social responsibility, the engineering departments would explode with ideas and projects in no time, the civil departments can gain and give more in field work, the medical students can take part in the camps. The effect of such level of participation would be immense…far more than what can be achieved if social responsibility is left to individual conscience.