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Leading Transformation through Crafting Technology Vision for India's Future

SOUVENIR

Editor(s) Dr. Sunil Kr. Pandey Dr. Umang

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Distinguished Speakers

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Mr. Pankaj Dubey MD Polaris, Gurgoan



Mr. Deepak Bhatia COO, Infosys BPO, New Delhi



Mr. Anurag-Gour Director-Marketing Microsoft India, New Delhi

Session 2: Technology Roadmap for Inclusive Growth



Mr S Sridhar

Strategic Adviser Inventors India

Research Foundation Ex. Director Asia Pacific & Japan, Dell Bangalore



Mr. Sathyanarayn Venkatraman CTO, IBM(GTS), Chennai



Mr. Rajesh Rampal CIO, Aircel Gurgoan



Dr. Debabrata Nayak CSO, Huawai Telecommunications

Session 3: Integrating Technology with Digital India Mission



Mr. Joydeep Dutta CTO, CDSL Mumbai



Mr. Pavan Malladi CIO, Dhiraagu Telecom, Maldives



Mr. Prakash Kumar S.K. Principal Consultant, IT Advisor, Tech Mahindra, Banglore



Mr. Bhagvan Kommadi CTO & Co Founder, Voyzon Technologies, Hyderabad & Architect Corner



Mr. Ashok Jade CIO, Shalimar Paints

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From The Editors

This is evident from various research reports of leading agencies including BCG, NASSCOM, IAMAI and many other, that Indian IT industry continues to develop capabilities around conventional and promising markets, verticals and customer segments, expand global delivery presence, and increase focus on high value services including product development. The increased usage of technology and its reach, global market conditions, changes in requirements and demand have forced all of us realize and agree that volatility, uncertainty, complexity and ambiguity is the new normal.

Various factors including economic and political turmoil, disruptive technologies, increasing & expanding competition and rapidly evolving customer requirements presents both- new challenges, and new opportunities for the global IT industry. This has created a need to serve two distinct requirements simultaneously- drive operational excellence and create enterprise digital transformation which can enable organizations to improve customer reach and engagement, make faster decisions, improve time to market of solutions and help clients grow their businesses. While operational excellence currently garners major share of IT investments, enterprise digital transformation will increasingly drive future growth of the technology industry, and success of individual industry players will rest upon their ability to create sound business strategies that address both opportunities.

These developments and trends needs to be understood, work upon strategically so that we are ready with competent pool of talent which is ready to deliver, when required. This CEO Meet, being organized by Department of IT, Institute of Technology & Science, Mohan Nagar, Ghaziabad, aims at creating a forum and bring bringing the Industry Leaders, who are leading the IT Industry with their vision, to share their vision, experience & views. This will not only be an enriching opportunity for audience but will also lay down a foundation before future technocrats, managers and academicians to realize, understand the industry needs and directions in which it is moving ahead, needs of skill sets and prepare themselves to counter the challenges ahead and at the same time to exploit the opportunities.

The present Souvenir is the collection of Articles which are primarily based on the experience, vision, self contribution and exploration from the experts and practicing professionals. We are confident that this collection of articles, ideas and vision will be a useful source of reference for researchers,

practitioners and academicians. Our sincere thanks are due to all those who have, in spite of their pressing professional commitments, contributed articles and shared their thoughts. We wish to take this opportunity to thank all the contributors for their efforts and cooperation.

We are thankful to the Chief Patron and Patrons of this event for their involvement, encouragement and continuous support in organizing this event and for sparing valuable time to boost our morale in this humble effort. The efforts and endeavors made by the faculty members of Department of IT, MCA students and administrative staff should not go unnoticed. We wish to acknowledge that without their efforts, this event would have never been a grand success.

Dr. Sunil Kr Pandey Dr. Umang



Dr. R.P. Chadha, Chairman, I.T.S - The Education Group



he ongoing researches in the field of IT, efforts towards reducing digital divide and social empowerment through digitization, Internet of

Things, Agile Entrepreneurial ecosystem, improving business environment and many other such trends are contributing in making of Digital India.

The IT industry continued to evolve over the years and prioritized on enhancing efficiency, enabling transformation, agility and partnering for digital initiatives. This is evident from the recent report that aggregate industry revenues for FY2015 are estimated at USD 146 billion.

These developments and ongoing researches have led to their wide diffusion thus increasing their economic and social impact. Virtually every domain such as telecommunications, health science, electronics, business enterprises, transportation, governance and judiciary and others streams are witnessing the developments & inclusion of newer tools, applications and IT services to improve their performance and operations.

I am confident that high level of deliberations, sharing of vision by those who are leading the Industry from the front, will provide the audience an opportunity to understand the current state of affairs and visualize the future, where the Indian IT Industry is marching ahead. This event will also help in understanding the challenges and limitations, those needs to be understood and countered to ensure the attainment of goals set by the Industry.

I wish the organizing team very best in their endeavor.

Dr. R.P. Chadha Chairman I.T.S The Education Group

राजनाथ सिंह RAJNATH SINGH





गृह मंत्री भारत नई दिल्ली-110001 HOME MINISTER INDIA NEW DELHI-110001

Date : 14.10.2015

Message

I am happy to know that the **Institute of Technology and Science (I.T.S.), Ghaziabad** is going to organised a CEO Meet with the focal theme of "**Leading Transformation – Crafting Technology Vision for India's Future**" on 17th October, 2015 and also publish a souvenir to mark the occasion.

I am confident such events shall immensely contribute in bridging the gaps in academia and Industry requirements, help in developing understanding among each other and will inspire other institutes too in taking such initiatives.

I wish all the best to the Management of I.T.S - The Education Group and organizing team of this CEO Meet.

With good wishes,

(Rajnath Singh)

Office : Room No. 104, Ministry of Home Affairs, North Block, New Delhi-110 001 Tel. : 23092462, 23094686 Fax : 23092979 E-mail : 38ashokroad@gmail.com Souvenir of CEO Meet

जनरल (डा,) विजय कुमार सिंह पोनीएसएम, एनीएमएम, वाईएसएम (से.नि.) GEN. (DR) VIJAY KUMAR SINGH PVSM, AVSM, YSM (Retd)



विदेश एवं प्रवासी भारतीय कार्य राज्य गंत्री साख्यिको एवं कार्यक्रम कार्याच्ययन राज्य मंत्री (स्वतंत्र प्रमार) भारत सरकार, नई दिल्ली Minister of State for External Affairs & Overseas Indian Affairs Minister of State (Independent Charge) for Statistics and Programme Implementation Government of India, New Delhi



MESSAGE

I am delighted to learn that Institute of Technology & Science, Mohan Nagar, Ghaziabad is organizing the CEO Meet - 2015 on 17th October, 2015. I am confident that this event, under the leadership of the Management of I.T.S - The Education Group, will witness grand success and shall be a milestone in creating awareness about the developments & research taking place in the field of IT Industry and the future directions.

India is known as the major IT enabled service provider in the world. In fact, the Information Technology has so much revolutionized that it provides an easy basis for visualizing the effects of urban growth and societal transformation. Information Technology (IT) is now acting as a catalyst in speeding up the economic activity in efficient governance, and in developing human resources. Emergence of IT on the national agenda and the Digital India Mission Program in the country are leading to the "Convergence of core technologies and E-Governance" as the tool for good governance, sustainable development, globalization of economy and social empowerment. With the tremendous growth of IT, it has become possible for the common man to access global information and to take the benefits of it.

Emerging digital techniques, intelligent networks, developments in more sophisticated database applications, availability of high bandwidth communication technology, and stateof-the-art software for Network functions & services, are driving social and economic changes. The benefits of these technological developments somehow are not reaching a large segment of society. To bridge this gap the only sustainable route is to create awareness, ensure the availability and accessibility of tools and technologies to every individual of the society irrespective of his affordability and status. Information Technologies can improve the quality of life for poor rural communities who do not have access to these facilities.

I extend my warmest wishes to the organizing team of this CEO Meet. I am sure that it will continue to maintain its excellence and character with great distinction.

Gen. (Dr.) Vijay Kumar Singh



Padma Bhushan (Dr.) F.C. Kohli

Former Dy. Chairman - TCS Former President - NASSCOM Founder CEO - TCS



Adoption of Information Technology

ndia has done well in the export of software all over the world. Last year, India's software development was USD

[•] 120 billion in English language. Out of this, USD 105 billion was for export, and the rest for use within the country. This would indicate that there is very little computerization in India in Indian languages. There are about 800 million people who are not conversant with English. Further, India has about 22 languages. Rather than viewing these as road blocks, they must be considered as opportunities for introducing computers in Indian languages. Considerable work on Indian language software is being done at CDAC, NCST, IITs, Central University and many others in academia. Therefore, it is well within our capacity to address the matter of computerization in many Indian languages. Incidentally, China's software revenue is same as India with no exports.

Information Technology is both software and hardware. We have a very limited hardware industry. India assembles 5-7 million PCs a year. Whereas China, which has computerized everything in Mandarin and Cantonese, manufactures over 40 million PCs. In present scenario India needs to:

- a) Upgrade and revamp Micro-electronics education and introduce new Nano-electronic equivalent to what it is at MIT (USA)
- b) Study and upgrade existing electronics manufacturing in the country and promote and facilitate new ventures.

It is estimated that extensive computerization in India will create millions of jobs in manufacturing and other areas. It will lead to better Government, Education, and improvement in every aspect of life in India. It is estimated that India can achieve business of \$ 300 billion in software and hardware in 5 years.

I appreciate the efforts of organizing team and wish all the best to the organizing team and the management of I.T.S, Ghaziabad for thinking, conceptualizing and organizing this ambitious event at an academic institute.

I wish the event a grand success.

Dr. F.C. Kohli



Prof. (Dr.) Ajith Abraham

Director - Machine Intelligence Research Labs (MIR Labs) Scientific Network for Innovation and Research Excellence, Auburn, Washington, USA

In the past century, our Society has been through several periods of dramatic changes, driven by innovations such as transportation systems, communication networks etc. Last few decades have experienced technologies that are evolving so rapidly, altering the constraints of space and time, and reshaping



the way we communicate, learn and think. Rapid advances in ICT and other digital systems are reshaping our ecosystem. Innovations in ICT allow us to transmit information quickly and widely, propelling the growth of new urban communities, linking distant places and diverse areas of endeavor in productive new ways, which a decade ago was unimaginable.

The role of information dates backs to Shannon (1949) and Wiener (1948) but now a days Information is the central theme of several new sciences. It is easy to visualize that we are going through an information revolution era, which emphasizes its role in economic, social and technological arenas.

Fourth industrial revolution, which is popularly known as Industrie 4.0 is a collective term embracing a number of contemporary automation, data exchange and manufacturing technologies drawing together Cyber-Physical Systems, the Internet of Things and the Internet of Services. The modern IT Industry is all set to embrace Industrie 4.0.

I am happy to learn about the ITS CEO Meet 2015 Organized by the Institute of Technology and Science, Ghaziabad, India. The theme of the event is 'Leading Transformation through Crafting Technology Vision for India's future'. This is exactly in line with the Digital India initiative of the Government of India to ensure that Government services are made available to citizens electronically by improving online infrastructure by increasing connectivity. Digital India is not an easy task, as it requires the creation of modern digital infrastructure, delivering services digitally and improving digital literacy. This requires lots of efforts from the government in coordination with the IT Industry, Academia, various Public and Private sectors and Citizens.

This event is very timely and I sincerely hope that the presentations and following discussions will inspire the community to take up any challenge and make the Digital India concept to a reality very soon.

I wish to congratulate the Organizers for their wonderful efforts to make this event happen. All the best!

Prof. (Dr.) Ajith Abraham



Shri Arpit Chadha, Vice Chairman, I.T.S - The Education Group



ndian IT Industry has seen enormous growth in IT Sector and has placed itself as the world's largest sourcing destination for IT industry, accounting for approximately

67 per cent of the US\$ 124-130 billion market. The Indian IT Industry employs about 10 million workforce and more importantly, the industry has led the economic transformation of the country and altered the perception of India in the global economy.

The advantage of cost competitiveness over global workforce in providing IT services, which amounts to be approximately 3-4 times cheaper than the United States, still enjoys & continues to be the mainstay of its unique selling proposition in the global sourcing market. In recent past, the Indian IT Industry has also started establishing and gaining prominence in terms of intellectual capital with several global IT firms setting up their innovation centres in India. These developments are positive sign and giving confidence in becoming a digitally empowered and engaged India.

However, it is also true that these growing signs needs to be consistent in terms of efforts, engagements, competency & skill enhancements, creating talent pool that can fuel the future needs. This requires a great vision, strong and competent leadership that can show the path and guide the frontrunners to achieve the required goals.

I am confident that this CEO Meet, a unique event of its nature, will be a milestone in creating awareness among future technocrats and Managers to understand the vision of Industry Leaders, the direction in which Indian IT Industry is heading towards.

I congratulate each member of Department of IT for planning and organizing such an event.

Arpit Chadha Vice Chairman, I.T.S - The Education Group



Shri B.K. Arora, Secretary, I.T.S - The Education Group



he core competencies of Indian IT Industry and the strengths have attracted significant investments from major countries. According to data released by the Department of Industrial Policy and Promotion (DIPP), the

software and computer hardware sector in India attracted cumulative foreign direct investment (FDI) inflows worth US\$ 17.575 billion between April 2000 and May 2015,

According to the Economic Survey 2014-2015, IT and ITeS make up the single largest contributor to India's Services exports. The Economic Survey 2014-15 says the IT and ITeS sector, including Business Process Management (BPM), continues to be one of the largest employers in the country, directly employing nearly 35 lakh people. Also the internet economy in India is expected to reach Rs 10 trillion by 2018, which, according to BCG and Internet and Mobile Association of India (IAMAI), amounts to 5 per cent of the country's gross domestic product. This is supplemented by India's internet user base reach over 350 million by June 2015, the third largest in the world, while the number of social media users grew to 143 million by April 2015 and smartphones grew to 160 million.

All these developments are contributing significantly in ensuring, availability, accessibility and affordability of Information Technology tools and ITeS. The vision of Industry leadership, with which the Indian IT Industry is moving ahead, is opening new opportunities for businesses. This is evident from a report by NASSCOM and Zinnov Management Consulting Pvt Ltd that India, the fourth largest base for new businesses in the world and home to over 3,100 tech start-ups, is set to increase its base to 11,500 tech start-ups by 2020, as per.

I am confident the vision sharing of Top Industry Leaders will help the delegates of this CEO Meet to understand the underlying principles and thoughts which will help them in taking a long way.

My best wishes to the organizing team for their success in their endeavor.

B.K. Arora, Secretary I.T.S - The Education Group

On Technology Readiness for the Future

n the year 1859 Charles Dickens began his famous novel 'A Tale of Two Cities' with the immortal lines "It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us, we were all going direct to Heaven, we were all going direct the other way..."



Prof. M.M. Pant Former Pro Vice-Chancellor IGNOU

This contrast between those who are future-ready and those who are not is very stark today. Compare the 2.3 million

graduates some with Engineering and PhD degrees applying for a few hundred jobs as peons (which also none got) and the large number who have been successful in the world of IT and entrepreneurship. The success that we see of IIT graduates today was the result of their future readiness in the 1960's for the last decades of the Twentieth Century and the first decade of the Twenty first Century.

If we want to succeed in the 2030s and beyond we have to anticipate a future being shaped by emerging technologies of IT, energy, medicine and their intersections and convergences. Some part of this future can be anticipated and projected, but there will be disruptions along the way. We therefore have to prepare for a VUCA (volatile, uncertain, complex and ambiguous) world.

This quest for what is worth learning for an uncertain changing world, leads us to suggest that 'lifeworthy knowledge' and 'timeless Lifeskills' are the twin pillars on which the preparation for the future is founded. There is a very appropriate quotation from Eric Hoffer: In times of change, learners inherit the earth, while the learned find themselves beautifully equipped to deal with a world that no longer exists.

We can be complacent with what we have achieved in the last 2 decades with the opportunity provided by the Y2K situation, the emergence of the web and the proliferation of IT. As the pace of technological development accelerates we have on the future horizon a whole new set of opportunities and challenges.

Some of the clear global mega-trends are:

- The importance of Big Data and its analysis and insights with implications for business, Governance, Healthcare and education
- The acceleration in the creation of the infrastructure supporting the Internet of things

- The realization of digital additive manufacturing across almost all sectors of manufacturing possibly resulting in the destruction of low cost and large scale manufacturing as a competitive advantage
- The general purpose robot transforming labour as evidenced in the mining operations of companies like Rio Tinto and in the service sector by the Tokyo Hotel run entirely by robots
- Drones as 'robots that fly' replacing foot folders and not demanding 'one rank one pension' greatly undermining the importance of human armies.
- Machine intelligence as demonstrated by the IBM technology of Watson and their availability in a large number of human endeavors

If we look at the implications of the above mega-trends we can foresee a very different world from what we have today. Where old roles and tasks disappear and completely new opportunities to create new economic, social and political worlds are abundant.

Closer home, there are 2 interesting recent developments worthy of note. One is the NASSCOM report projecting that the IT industry will create significant value during the coming decades. But will create the same value with lesser people as the productivity per overdone us greatly enhanced with the emerging technologies. The other which is being vehemently opposed and resisted by the software industry is the possibility of software and business methods bring patented. The industry which has got do used to 'harvesting what it dud not sow' is up in arms against acknowledging Intellectual Property in software, much like counterfeiters opposed efforts to control manufacturing of pirated and counterfeit goods.

But together these trends will have a very salutary and sobering effect on our youth. It is an old adage that 'necessity is the mother if invention'. And creativity, imagination, invention and innovation will be the only way forward to flourish, prosper and thrive in the future. The seekers of protection, reservation, subsidies etc. will perish. That has been the story of evolution and Darwin has enunciated its twin principles rather elegantly.

So the goal of learning changes from today's ability "to be able to repeat what is given in the book without looking at it" to being able to apply and build in what one has learnt to create new solutions and newer technologies. So the answer to the question of 'what is worth learning?' is not 'what is in demand today' but rather ' what computers, software, robots and drones cannot do tomorrow'. And the answer to the question of 'what is worth doing with your learning ?' is not ' getting an AICTE approved qualification' but being able to create new Intellectual Property that is possibly patentable and solves erstwhile unsolvable problems. This is the path to follow.

Indian IT Industry: Future Ahead

It is now well established that India's growth and future development will be largely helped and supported by IT. From being the back office support role, IT has now become the main stream with almost all activities are planned, executed, monitored and enhanced using IT tools and technologies. IT must be implemented to suit the country aspirational requirements in more agile, efficient and effective manner. The IT Transformation would yield increased service level and performance leading to increased efficiency and improved service level across various services rendered to the masses. IT has the necessary importance and



Sanjiva S Dubey Service Delivery Executive, Asia Pacific IBM Global Services (IGA)

position to shape and enhance transformational initiative. It can help in increased growth through better business model change. IT can lead to new sources of revenue through thousands of startup ventures hence needs to be treated as production center and not just a back office cost center.

But this road ahead need to be traded with extreme caution professional approach. Think of IT in a digital world of tomorrow where it is likely to bring in disruptive changes that will cause opportunities to some and threat to many. Already e-commerce firms are being perceived as a threat to small kirana stores and large format stores and debate is on as to how to regulate one and support other. IT in digital world of tomorrow will increase collaboration, removing the time and location boundary and ultimately creating more value for the customer.

For the enterprise as well as government, IT will remain an important source to reduce cost though more automation and process efficiency. But now IT can also help in increasing opportunities such as

- Creating multiple channels to reach out to customers, both current and new
- Reaching out to new customer, new markets through new digital platforms
- Visualizing opportunities to increase scope of the products and services using digital platforms
- Market and sell products/services: through creation of new business models New Markets can be explored and new products can be sold.
- Run the factories: Making factories more automated yet flexible to adopt changes
- Manage Human Resources: IT will create platforms for better collaboration and exchange of ideas.

Given all these transformational road map, Indian IT industry should focus on created new value added products which are innovative and market defining. The old model of providing low cost labour for developed countries without creating any Intellectual property will not work in the long term. IT has to get ingrained in designing new products and new services many of which are not yet have been thought. These new initiatives will come from millions of fresh and young minds who are graduating from colleges and universities who are not happy with the way world exists as on today and want to make a pleasant and good change. We need to support and encourage them through our experience, investment and handholding to transform India for a better future.

I wish all success to the organizer of I.T.S, Mohan Nagar, Ghaziabad for the very pertinent and relevant seminar being organized at a very opportune time.

Mobile as the Digital Identity for the Digital India

Without giving it much thought - we have increasingly started to live double lives. There is our physical, everyday "organic" life and then there is our "digital" life. Slowly or maybe not that slowly, the boundary between the two has started to become more and more blurred. This brings on a very exciting new world and at the same time some interesting challenges, the most important and interesting



Gautam Hazari Technical Director, GSMA, London, UK



'On the Internet, nobody knows you're a dog.'

one is about the

"identity" and everything around it, including "proving" the identity. Questions like "How do I know you are who you say you are?" no longer becomes absurd and starts to be in the mainstream.

In the physical "organic" life, we consciously or subconsciously use psychological mechanisms to "create a proof in our mind" that the "identity" is correct, based on personal story, contextual experiences referred as the "past personal narrative". So we know the person is Sunil, based on our past experience with the individual, our personal memory of the associated facial recognition, voice, behavior and so on. The "proving" of the identity is "authentication". In the "digital" life - it's not based on "past personal narrative", but with the little box that asks us to "prove" we "know something"

Password *

Looks familiar, right ? This little text box has survived over 5 decades!! Passwords were first used in 1961 in MIT, in a time sharing system CTSS (Compatible Time Sharing System). The purpose of the "Password" was to test "Is it really you?" and surprisingly, it is still used for the same purpose, even after more than 5 decades. This is absolutely amazing, as we hear regular stories about the high profile security breaches involving passwords, still that little text box has survived so long !! As per the Verizon's 2014 Data Breach Investigations Report, 2 out of every 3 data breaches involve passwords. The problem has been amplified with the massive proportion of our lives involved in the "digital" world. A report in Mashable in August 2013 suggests that an average person regularly visits

Source: Peter Steiner's cartoon, as published in The New Yorker

25 password protected sites but uses only 6 different passwords. This is not surprising, as this is basic human psychology - we normal humans generally can only remember those many different combinations.

Here is an interesting report from Splashdata, which lists the most popular passwords for 2014.



What does that mean - the compromise of the passwords at the weakest link in our "digital" life impacts the strongest and most secure sites as well, as we start to reuse our passwords between the sites [If my banking site password is reused at my grocery store site, then a compromise at the grocery store site impacts directly the banking site - as I am reusing the password at these sites].



The GSMA Consumer Research 2015 found out that 68% of consumers say that forgetting passwords is a significant problem, which then leads to reusing. Given a choice between security and convenience users tend to lean towards convenience in this case, and balancing the two is critical for our "digital" lives. This is extremely important for India, as there are 350 million Internet users in India, which is

growing at a staggering rate and predicted to reach 503 million by 2017.

So where is the problem? The problem is much more fundamental and not just about security implementation, as otherwise the "password" would not have survived that long.

The problem is not about "security" - it's about the "identity". We almost forget that there is a service that we use several times a day, a service that is omnipresent, a service that we almost cannot live without and something that is always with us - and still, we do not need to use password to prove our identity - it's the Mobile Phone. That does not mean that its not secure - on the contrary its extremely secure, hardened by the Mobile Network Security mechanisms, business processes and fraud prevention mechanisms. Mobile Services are an excellent example of balancing "convenience" and "security". The question then comes to mind - "Hey, why don't we use this to solve the Password problem?" That's exactly what "Mobile Connect" is, a global mobile industry solution that provides "conveniently secure and a private" way to replace passwords, utilising the mobile device and the mobile network assets. For India, it is even more critical, as 50% of the Internet users in India use it only from mobile.

So, what exactly is Mobile Connect? Mobile Connect is a simple, secure and convenient authentication mechanism in our "digital" lives, which uses the mobile device as the "authentication device". It uses the inherent security associated with the possession of the mobile device, which proves "Something I Have" along with adding additional security with "Personal PIN" to prove "Something I Know".

Souvenir of CEO Meet



Here is a journey of Sunil in his "digital" life - Sunil wants to access his online banking site, he needs to prove his digital identity, i.e. he needs to be authenticated. The banking site offers Sunil to use Mobile Connect for authentication. Sunil clicks on the Mobile Connect button, he is been asked to

enter his mobile phone number. He gets a prompt at his mobile device to enter his "Personal PIN". He is authenticated and starts to use his online banking service - No passwords to use. The same "Personal PIN" is used by Sunil when he needs to buy a gift from the online shop, again no passwords to use.

The Ministry of Communications & Information Technology, Government of India has published the "Guidelines on Mobile as Digital Identity" in July 2015, which suggests the same. It even suggests the linkage of the Aadhaar numbers with Mobile ID.

Linking the Mobile Connect account of the user with the Aadhaar creates a "Conveniently Secure" link between the user and the Aadhaar number, using the Mobile Device, so that Authenticating using Mobile Connect



links the user's Aadhaar number, without the user needing to remember or proving that the user has the possession of the Aadhaar number.

This opens up massive opportunities for the Digital India, lowering the barriers for proving identities in our "Digital" lives in a convenient and secure way, so that we can all live a "Happy Digital Life" in the Digital India.





Prakash Kumar S.K. *Principal Consultant, IT Advisor Tech Mahindra, Bangalore*

Future of Indian

t is a risk to predict the future of anything not just about IT. But you will make a fool of yourself in the current fast changing world of technology if you try to predict IT. As I am writing this piece there is lot of buzz around Digital India Initiative across the coasts of America. We back in India are wondering what this is about.

But when you get beyond the headlines and look at the opportunities that technology is bringing to the youngest country in world is phenomenal. I feel lucky to be born at this juncture where technology can elevate the leaving of billions across the globe and millions in our country. But

what is this opportunity about, why now and how long will this be are questions that many might wonder. I don't have all the answers. But I give my humble point of view in few words.

Broadly if we look at the entire industrial revolution of the past and the unravelling IT revolution of the current era, it is around the aspect of how humans can accomplish their activities faster, cheaper and error free. This constant endeavor has lead humans to innovate and improve our lives. I feel we are still at the start of the IT revolution which is at cusp of entering a virtuous loop. It all started around the 1950s and 1960s when computers were first introduced. Computers have become faster and smaller enabling mass adoption. In the late 1990s the Internet came around. This changed the way we think about the world. It changed India for ever opening new jobs which were well paid and elevating millions from poverty and creating neo middle class. I call this first phase as era of 'Productivity'. Era of productivity improvements has not ended. It is will continue and would be enabled through different means.

With internet becoming faster, cheaper and smarter today we see a lot personalization that is happening around the world. Today you get personal help, advice and information based on 'YOU' the individual. This has created many more opportunities. You can create your own mobile tariff plan which suits your usage as an example. This era of individual personalization provides you an opportunity build your public profile. It is so empowering. This is the 'Personalization' era. Technologies like 'Cloud', 'Mobile' and 'Internet of Things (IOT)' is taking the personalization to a completely different level providing undivided attention to "I" the individual. This personalization has of course improved individual productivity.

What this age of personalization will do is to create huge amounts of data. IOT will make everything smarter right from the bulbs to books to buildings to boardrooms. With sensors, you can make your cooking smarter, your car usage smarter and your air cleaner. IOT and Mobile through continuous availability will generate lot of data which can be used to predict behavior of processes and systems. This will lead to the era of 'Prediction'. Prediction will lead the wave in the next generation of technology driven transformations. Many companies are already analyzing user data like the calories

they burn v/s the calories they eat and fix the insurance payments based on the resulting health condition. Such capabilities will differentiate companies in the market place

Prediction still does not solve the problems that societies face. The question is that with so much technology, sensors in place can we 'Prevent' incidents from occurring. A combination of data, sensors, automation and artificial intelligence can create systems which help us to prevent problems from occurring. This is would lead us to the era of 'Prevention'. Can car companies build cars which prevent accidents, can municipalities prevent disease outbreaks, and can governments prevent crime by tracking criminal psychology.

The prevention era will lead to the era of 'Perfection'. By this stage humans would understood so much about a problem and for example possibly can create that perfect cooking oil which will not create any side effects like heart ailments. Can we humans create that perfect material and automobile model which can protect human life in any car crash without any collateral damage? I feel I am entering into fiction territory. But that is true. The final stage in the continuous virtuous loop is the era of infinite 'Possibilities'. Driverless cars, human less factories, defect free human births, zero effect automobilesetc all seem possible in the near future.

- The 6P (productivity, personalization, prediction, prevention, perfection, possibilities) virtuous loop can create great opportunities for India IT. In India, where IT penetration is still less than 20%, we can leap frog many technology frontiers like we did moving directly into mobile before everybody had a fixed line. Today India and Indian IT is at the cusp of change that comes once in a millennium. Whether we will be successful in transforming India dependents on multiple factors which I just want to list and not elaborate
- 1. Can we relook at the education right through primary to professional to vocational training to accommodate changing technology needs?
- 2. Can education create more entrepreneurs and not just employable (doubtful in many cases) graduates?
- 3. How do we penetrate IT across sectors, society barriers, rural and urban areas and across ages?
- 4. How do we create companies that invest in future through R&D. Today R&D budget of bell weather service sector companies is less than 1% and many companies even don't have R&D line item in their quarterly statements

The list can go on. But students should keep their options and mind wide open. Today technology can be applied in all areas and if you have mindset of taking initiatives, you see only opportunities otherwise you might see less of low skilled jobs and automation even resulting in job losses.

So one thing I can predict with surety is the factors that made IT industry succeed in the past 25 years will not be the same in the next 25 years.



The In-memory computing -Countering with Speed & Large Volume of Data

he underlying principle of In-memory computing primarily relies on keeping the data in a server's RAM as a means of processing at faster speeds. In fact In-memory computing is the storage of information in the main random access memory (RAM) of dedicated servers rather than in complicated relational databases operating on comparatively slow disk drives. In-memory computing helps



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business customers, including retailers, banks and utilities, to quickly detect patterns, analyze massive data volumes on the fly, and perform their operations quickly. The drop in memory prices in the present market is a major factor contributing to the increasing popularity of in-memory computing technology. This has made in-memory computing economical among a wide variety of applications.

Big Data is the popular term describing the fast-increasing volume, velocity, and variety of information that can help improve enterprise operations - but it is only part of the story. In-memory computing is the breakthrough that makes Big Data possible, that shatters performance barriers for applications including Airline flight availability searches that need to include constantly changing flight records, Personalized offers and optimal customer experiences on ecommerce websites, Real-time reporting of mobile customer texting to enable pre-pay plans, Extreme low-latency risk management and algorithmic trading applications and Additional payment channels for faster revenue capture.

It especially applies to processing problems that require extensive access to data -analytics, reporting or data warehousing, and big data applications. The driving force behind the increasing implementation of In-memory processing is due to the drop in computer memory prices, exponential data growth and an increasing trend toward using analytics for decision making.



The benefits of using in-memory computing are coming up in the form of Better, faster, decision making. This includes the ability to reduce cost, identify competitive opportunities, grow revenue, become more efficient and reduce risk.

Many technology companies are making use of this technology. For example, the in-memory computing technology developed by SAP, called High-Speed Analytical Appliance (HANA), uses a technique called sophisticated data compression to store data in the random access memory. HANA's performance is 10,000 times faster when compared to standard disks, which allows companies toz analyze data in a matter of seconds instead of long hours. Some of the advantages of in-memory computing include The ability to cache countless amounts of data constantly. This ensures extremely fast response times for searches, The ability to store session data, allowing for the customization of live sessions and ensuring optimum website performance and The ability to process events for improved complex event processing

IBM has pioneered the next generation of in-memory computing in its DB2 with BLU Acceleration product. With BLU Acceleration, the entire data set does not have to fit into memory, and data is made available in the fastest memory class possible, just before it is needed. It delivers fast business answers with next generation technology in a simple "load and go" solution. It is an agile platform that can be used on the cloud or as on-premise software with the proven DB2 database technology.

It is important to note that there is a new crop of traditional databases with serious In-Memory "options". That includes MS SQL 2014, Oracle's Exalytics and Exadata, and IBM DB2 with BLU offerings. The line is blurry between these and the new pure In-Memory Databases, and for the simplicity I'll continue to call them In-Memory Databases.

It is true that every good thing comes with inherited challenges and thus concept of In-Memory Computing too. One challenge with in-memory computing is that most solutions require massive data sets to fit into RAM in order to process a query. This is a brute force processing method that is not sustainable as data volumes continue to explode in a big data world. Consider a sensor device at a utility company, for example, where each sensor can generate as much as 400 MB of data per meter per year. Multiply this by the tens of thousands of meters the company may have available. Or, think of an application generating terabytes of data per day. Fitting all of this data into memory in order to process it is not a sustainable proposition.

Also, modern servers are capable of processing data at CPU speeds faster than the speed at which RAM can be accessed-making the speed of RAM access a bottleneck. New solutions are needed to process data at the fastest speed - the CPU speed. More sophisticated management of data is required to replace the brute force approach of fitting the entire data set into memory no matter its size.

The Patterns of thinking for the Digital Age

Jeff Bezos's Amazon has created a big market for online retailers by building a market place for goods online. His ideas were spurred by analysis of the growth of the internet and he left an investment banker job to create a new market place. Mark Zuckerberg founded Facebook at a much younger age. But we know some of these famous names and stories already. There are new innovators using technology and building a new digital world that are doing it at younger



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ages. For example: Jack Andraka was only born in 1997, but by the age of 15 he has already changed the world with his innovation. Andraka has developed a new way to detect pancreatic, ovarian, and lung cancer during early stages when there is a much higher likelihood of a cure. His inexpensive method, which could save countless lives, won the 2012 Gordon E. Moore Award, the grand prize of the Intel International Science and Engineering Fair. Eesha Khare is another impressive young innovator, who at the age of 18 created a tiny device that could charge a mobile phone in 20-30 seconds-a revolutionary technology she calls a "super-capacitor." She won the 2013 Intel Foundation Young Scientist Award for her invention, and plans to use the prize money to pay for her tuition at Harvard and continue her work as an inventor.

What is it that makes them innovate or even invent?

Many traditional companies now are also looking at how digital ways of selling, marketing, delivering and serving customers can make them as successful as some of these big companies. So even if young people coming out of college don't choose to be an inventor they will still need to be innovating soon to either start your own companies or to have great careers in established industries. This article argues that these great moments of the new digital world are driven by a new process of thinking rather than as accidents that just happened. It makes a premise that these companies and individuals have a structured process to build such kind of new age products and services to help young people understand what kind of mindset and thinking that is required and possible in today's world to succeed.

The Process:

The Three Big Questions to Ponder:

The process is answering three big questions:

1. What is the big societal issue that affects a mass scale?

- 2. What assets do we have? (To determine if our assets can be used in a different way OR to re-use common Assets (air, water, roads, railway lines etc. in new ways?)
- 3. How can we digitize our assets to solve issue? (To access this market faster and create multiplication of business mainly)?

If you answer these three questions you can build a new digital business clearly. It however is not as easy. I do believe that these three steps are first of all not in chronological order. For example most digitization initiatives begin with point three. I do believe point 2 on finding and listing down assets available today is probably the most important step.Take Telco, an industryI come from for instance to list down the assets that a Telco has today, measure the utilization of these assets and to prove that better utilization of assets presents an opportunity which can eventually be realized via digitization is a good way probably for Telco CIO's to take a step up from their current roles.Everyone is now urging Telco's to become two sided. On one side do what they do best which is run robust, highly secure systems with great operational efficiency but on the other side think about the above paradigm to change the way assets in their companies are being utilized today. I believe therein lies a new initiative that can energize both new age and established industries. And this every young person should know.

The business Model innovation:

Business models enhanced via digitization and that are possible now rather than traditional product, service, only models:

- Many new business models have emerged due to digitization such as Loss leaders (making losses initially to build mass adoption); automation, outsourcing, two sided markets, discriminatory pricing etc. are new business models. Google Ingram tracks and gives usage of any term across all published material) shows a dramatic increase in business model terminology across the world. The reason is that using digital technologies business models are changing rapidly. There are many more models than what we traditionally know. We have to adapt to these. The nominalization(finding a term for a new phenomenon) of these models is slow and therefore you won't find them on google. You will need to observe and find what is happening. For example: what is a mobile app company gaining by getting cheaper taxis to folks who order them from their mobile phones? For example some of these that have been nominalized are
- Two sided-markets: Earn from producers and consumers by creating market places such as Amazon, Flipkart.
- Servitization: adding services to a product, to increase customer stickiness via life cycle services. Such as a bearings company providing sensors that can measure productivity of machines like SKF bearings.
- Bounty based creation: Pay for open innovation toploader.com.
- Digital adjacency: Creating new business from adjacent markets rather than primary core business, Example: Tesla reinventing cars to reinventing battery of cars to battery manufacturer.

Developing Digital DNA:

To succeed in this companies need a digital DNA(genetic modification of mindset) this is essentially having set of genes that are structurally important to succeed as an enterprise or as a team:

a. Information genes ex: different data sources

b. Money genes ex: freemium usage based models.

c. Socio genes ex: creating a game to change habits and then use those habits to sell a service.

d. Channel genes ex: different channels mobile store fronts etc.

e. Phis' genes ex: maker communities (define a problem and have a community build solution for you online, don't hire but source talent).

Continuous Un-relenting innovation:

Here are some innovations you can now interpret using the above model to innovate creating even when you join existing companies or innovating continuously within a companythat you create. These companies don't stop. It is important to continuously innovate. Examples: o Amazon retail to reinventing products (digital books) to digital adjacency (usage based pricing i.e. create data centers and provide these in Amazon Web Services.)

- Hackathon (solve problems socially not by hiring talent).
- Top coder: (bounty based monetization, provide a bounty for digital bounty hunters who solve a problem to you).
- Mpesa :(digital adjacency from Telco to banking access)
- Kickstarter: crowdfunding
- LinkedIn Freemium, 2 way market (between employers and careerists)

Key Dos and Don'ts:

- Don't ignore digitization, its rapid and if you ignore you will be irrelevant.
- Don't silo them as this is for other industries not mine. If you happen to be a mechanical engg or a medical doctor or anyone else not directly related to digitaltechnology don't Silo this thinking. It will apply to you too.
- Don't worship (Googlesetc.) only de-construct as they themselves will become irrelevant soon.

Some very good innovations even done by companies other than the most famous ones are discussed below to show that this kind of thinking pattern applies to everyone in every industry not just the most famous ones.

The Government of Australia made a lot of public data actually publicly available for anyone to look up on the internet. Nothing happened and no one cared. Then they created a game to manage a

game using real public data, where people use this data to invest and see if they succeed or lose. Folks can put in their zip code and make investments and see how they can change the city. It's a fun game but learning on what people want and would invest is what Aussie govt. is learning and making sure only those become its focus areas. It has increased accuracy of Govt. investments by 65%.

What is demonstrated here, Community solving by providing a solution that is crows sourced in a way where mass is included in an engaging manner. This is finding a societal issue, creating a gamification to adopt mass, find crow sourced ideas and move forward. This is brilliant!!! This is the new thinking we just talked about and who did it a Government.!

Some other examples:

Volvo cars: Volvo cars CIO thought about how cars can be used as locations for delivery of packages instead of homes where people are not there (digital keys that delivery guys get and open your car to put the delivery in by knowing the location of your car).

Smart phones to enhance driver safety - S-drive: once in car prevents use in unsafe way and track driving behaviors resulting in points for better insurance. Gamifying these interactions in a social way comparing an individual's driving to a community of drivers and ranking users.

Servitization: A Swedish company which produces Ball bearings changed its product to service by providing Productivity of machines service instead of a ball bearing product. Placing sensors in ball bearings and then measure productivity of machines and offer this service. The result was a 45% increase in top lines.

City of Boston-Street bumpers: detect bumps on roads by drivers and find these bumps effectively and solve the problem.Now selling the service to other cities.

Some already famous thinking patterns:

- Dilemma flipping: look at big problems and turn them to opportunities.
- Apply digital capabilities: to persistent company and societal issues.
- Digital adjacency: look at assets and apply digitally to offer something new (sometimes taking your company into a new domain).
- Servitization: electronic cigarettes, sensors selling a service on top of a product.
- Information asset solutions: bringing together info Ecosystem: how we can engage others where other people invest in your success, mass markets, 2 sided models.

So in summary there is a lot to think about and an abundance of social issues especially in our own country. Can we apply these patterns and think in a new way to create or contribute in a big way to the industries that you will be joining? Are we ready to take this on?

Hope this was fun and provocative reading..!!

Engineering Studies v/s Industry Requirements - Gaps and Remedies

onventionally, our higher technical educational system has focused on a course content that has been inherited from previous generation. This has resulted in an inflexible and old course curriculum that is not of much help in the real world. This often results in the following gaps:

- Course content not up-to-date (still focused on C, DBMS, Mainframes...)
- · Lack of understanding of business expectations
- Unaware of current technologies
- · No focus on specialized skill learning

Wherein the real world has quietly and quickly moved on. Today, the business requirements in various IT segments are as follows:

Software Development Tools

- Main Frame Systems RPG, DB2
- Client Server Technologies COBOL, FoxPro, Clipper, Access
- ERP/SRM/CRM SAP, Oracle EBS, SFDC, Navision, BAAN
- Web Technologies -. Net, JAVA, SharePoint, PHP, C#
- Engineering software AutoCAD, Solid-works, Windchill

Infrastructure Management

- Operating systems MS, UNIX, Linux, MAC, Sun Solaris
- Middle Ware -IIS, EDI, Weblogic
- Data Base Administration Oracle, SQL Server, DB2, Sybase
- Infrastructure Landscape LAN, WAN, Servers, DC/ DR



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• Switches, Routers, Firewalls, Anti-Virus, Domain controllers

Digital Technologies

- Cloud Computing Iaas, Paas, Saas, Taas
- E-commerce- On-line portals, Magento
- Mobility Native, Hybrid, Browser-based, MDM, SMP
- Big Data/ Analytics HANA, Hadoop, Hyperion, BPC
- Social Media Linkedin, Facebook, Twitter, Instagram, chatters
- IoT, 3D Printers, connected cars......

Verticals/ Domains

- Travel & Transport- Airports, Airlines, Railways, Roadways, Ports
- Logistics 3PL, Warehouses, Freight, Courier, Customs
- Manufacturing R &D, Plants, Distribution, Retails
- BFSI Banks, Insurance, Financial sector, Risk management
- Pharma Hospitals, Drugs supply-chain
- Media Books, Journals, Newspaper, Digital media
- Defense, Aerospace, Mining.....

The above requirements have resulted in large opportunities in the market ranging from large IT companies to Startups ... from large IT OEMS to end-users. Some of these are:

Opportunities in the Market

- Large IT OEMS Microsoft, Oracle, SAP, IBM, CISCO, Google
- Large IT companies TCS, INFOSYS, WIPRO, COGNIZENT......
- Mid Tier IT Companies- NIIT Technologies, Polaris, KPIT.....
- Small IT Companies (< 1000 employees)
- Startups Mobile/ Web Dev. Companies (< 200 employees)
- E-Commerce Snapdeal, Flipkart, Alibaba, Amazon, Yatra, IRTCTC
- End-Users Institutions, Non-IT Organisations

To overcome the gaps between what we teach our young students and what the IT industry really

needs, we need to ensure the following:

What is needed

- Include latest technologies in the course curriculum Java, Android, iOS, Windows, .NET/Sharepoint, Open Source etc
- Alignment with current business requirements eCommerce, Social, Mobility Analytics (Big Data, Hadoop), Cloud (Salesforce.com), Digital
- Watch new trends: JavaScript Frameworks: AngularJS, Kendo,Sencha, jQuery Mobile CSS Frameworks: HTML5, Responsive Web Design.

In addition, we should create the following differentiators to enable our young workforce to meet the real-world business challenges:

Differentiation

- Do not be a generalist Me too
- Create a Brand -
- Specialized resource provider for XXXXXXX Technologies
- Goto ITS for YYYYYYYYY Vertical/ Domain
- · Students to focus last 2 semesters on specializations
- · Identify companies in your chosen technologies and domain
- Invite them to share required skills and expectations
- Work on their live projects



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Indian IT Industry - Hopes, Expectations & Challenges



Dr Umang Asstt. Professor I.T.S Mohan Nagar, Ghaziabad

fter a severe slow down, the IT Industry is recovering and moving ahead with sustaining a double-digit growth, the \$120-billion Indian IT industry had a remarkable 2014. This was year with consolidation of business functions and using disruptive technologies, that ensure innovation to shed the traditional old methods and adapt to new products and services.

Though, the initial half of the year was exigent due to various factors, which were beyond the control of industry, the sentiment turned around and has been upbeat for the latter half of the year. This could be a reason that a stable government came in place, in the post-elections phase. In terms of human capital, the industry generated an additional 150,000 direct jobs and 450,000 indirect jobs across the country during the year. Now we are seeing that IT enterprises and product-based companies are stabilizing, delivering more business values and bringing transformation to their clients overseas, using disruptive technologies such as cloud, big data, analytics, mobility, social media and the Internet of Things and providing software, hardware, process management, engineering, research and development, and innovative products.

According to Mr. R. Chandrashekhar, President, NASSCOM "There is a dramatic shift in sentiment, as evident from positive perception of India abroad. Embracing new platforms, using different business models and competing with global firms has enhanced our industry's value proposition,".

Disruptive technology is described as one that displaces something that is already well-established and shakes up the industry with products and services that create a completely new industry. In fact the Indian IT Industry is restructuring itself to compete & keep pace with the new wave of technologies. There is still a good sign that American market accounts for some 60 percent of India's software exports and there are signs of more spending in this space. The pace with which IT Industry is moving ahead with inclusion of disruptive technologies, a promising market, high degree of expectations and willingness & commitment to extend support and promote these Industries by the Government are really encouraging. According to NASSCOM, it is expected that industry will add overall revenues of \$13-14 billion in this financial year to \$118 billion achieved in last financial year, with software exports touching \$100 billion and domestic sales reaching Rs.128,000 crore (\$20 billion).

The latest survey reports of NAASOCM indicate that the Indian IT and ITeS industry is now on track and speeding up to reach its target of \$200 billion to \$225 billion in revenues by 2020 and furthermore, to reach revenues of \$350 billion by 2025. This is well supported by a report based on the researches conducted by leading research agency McKinsey & Company over a period of one year titled '**Perspective 2025: Shaping the Digital Revolution**' states that technology is becoming a dominant factor in capital expenditure, making return on technology investment a key success factor for enterprises. With a \$6 trillion cumulative technology capital investment globally, the economic landscape will be split among three types of enterprises: digital leaders and attackers, smart followers, and digital laggards. Each of these enterprises will operate a varied mix of disruptive, transformative, and traditional technology and business services, driven by the adoption of digital technology, are likely to expand significantly at the growth rate of 3.6% and to touch about \$4 trillion by 2025.

Not only in International Market, but in the domestic market too, The Digital India and Make-in-India campaigns initiated by Honorable Prime Minister of India, are making the industry develop solutions and customize products required for greater inclusion and accessibility with greater degree of availability and affordability.

With the increased usage and penetration of Mobile devices and Smart phones, in particular, there is huge scope of mobile applications. This needs a focused, strategized way of capacity building and expansion. This is a fact that presently there is demand but we, as a nation, are lacking in terms of Mobile App developers. There is another trend visible now with new startups who are coming up & growing successfully. However, the lack of investors and under-developed infrastructure are not fueling this untapped segment. However, recent initiatives of IAMAI of establishing Mobile Startup Hubs to facilitate the startups in Mobile App development through testing services & infrastructure, on-line mentoring and training engineering graduates at college level. The first such center is coming up in Bangalore towards end of October, 2015 and subsequently in Gurgaon in the month of December is likely to boost and will have a great impact on in-house Mobile App development in next few years.

With all these developments coming up, there are some serious implications for the companies such as: the need to develop new service lines. It is predicted that new service lines will account for 40 percent of all revenues by 2025; shifting portfolios to advanced, disruptive technologies; managing customer digitization at different speeds. Companies will need to cater to customers who are Digital leaders, Smart followers as well as the Digital laggards; re-skilling of people as revenues decouple from headcount; and forging new capabilities through M&A, partnerships, incubators and open innovation.

The last year has shown the commitment and strength of the industry to recover from slowdown and ensured the sustained double digit growth. The recent past has also witnessed the beginning for capacity building, Adoption of disruptive technologies and new models of engagements. With the commitment, support that is given to Industry and market confidence has shown in recent past and improving relations with other countries, futuristic vision of our Government and new initiatives for Digital India is setting up a direction of growth in terms of IT infrastructure development and thus creating enormous opportunity for Industry. This will definitely contribute in taking the benefits of IT & ITeS to the common man and will play crucial role in Digital & Socially empowered society.

Big Data Traps-How to Avoid

The "big data" projects often give CXOs short-lived confidence about information they are gathering. As a result, precious time and resources are wasted chasing wrong targets and missed business opportunities. No doubt, Big data provides the necessary insight to decision making, but without great analytics and understanding of enterprise structure, this will also end up as another wild goose chase.



Bhagvan Kommadi CTO-Voyzon Technologies & Co-Founder, Architect Corner, Hyderabad

The classic Traps shared by CXOs are:

- You can't manage what you don't measure
- Meaningless metrics just because you can measure something doesn't mean you should manage it
- · Ability to process huge amounts of data means success and win in business
- Big data is a black box
- Big data can predict the future
- You are wrong, big data results are correct
- Chief executive data analyser effect
- Data does not make decisions, people do
- There's no magical end point, but big data based decision making is related to continuous improvement and iterative decision making
- No key performance indicators
- Businesses need to have a "revenue-driven" or "risk management-driven" business case for using big data.

Data Relationships

False Positives

There is the problem of "false positives." If we look at 200 variables and the relationships between them, we have 40,000 possible relationships. That will inevitably mean a lot of correlations which are

statistically significant but in fact random. The classic case here is the "Ashes Stock Market Predictor." It holds that if England team wins, the market will rise in that year. If Australia team wins, the market will fall. But it was clearly a statistical fluke. This particular case is too obvious to fool anyone, but other accidental correlations will be more subtle, and we will not waste a lot of time getting excited about equally spurious phenomena.

Zero-touch processing

It may not be possible or economical to fix all data-quality issues, such as those associated with external data, at the source. In such cases, companies could employ middleware that effectively translates "bad data" into "usable data." As an example, often the structured data in an accounts-payable system does not include sufficient detail to understand the exact commodity being purchased. Is an invoice coded "computing" for a desktop or a laptop? Work-arounds include text analytics that read the invoice text, categorise the purchase, and turn the conversion into a rule or model. The approach can be good enough for the intended uses and much more cost effective than rebuilding an entire enterprise-software data structure.

Other factors - to be look into

Bigger is Not Necessarily Better

Even though big data allows for the collection of masses of information, only a small percentage of that information is actually useful.

Quantity Does Not Mean Quality

Having enormous piles of data where the data is supposed to represent "all" can end up skewing results. A case in point comes from social media, where every tweet may be collected and used to gauge overall public sentiment or mood. This method automatically fails the accuracy test as Twitter users do not represent the entire population. Many rarely tweet while others may have never even set up accounts.

'Found' Data is Not Always Truly Accurate Data

Big data often consists of "found" data, rather than data you purposely go out to collect. Relying on found data may not include variables that play a role in the results, such as credit rating agencies reporting firm facts on mortgages based only on data they collected at a time when the real estate market was soaring.

Data Based on Behaviours Can be Misleading

Basing conclusions on past behaviours can be risky, particularly if you're not sure what caused those behaviours. Here the errors don't necessarily come from the data itself, but rather the interpretation
of the data. This can be especially dangerous when people insist they "have the numbers to prove" whatever notion they're touting.

Challenges for Enterprises

Enterprises face challenges based on their size, profile, dependency on its correspondents, provision for correspondent services and capabilities. Performance and Breakdown of big data solutions are the bottleneck points. Enterprises have traditionally faced complexity in handling data sizes, scale, extent, speed, efficiency, complexity and different formats. Emerging types of partnerships and vendors especially in banking and telecom are broad based programs driven by cross selling with telcos and retailers and banks working with nimbler, local and regional vendors. Customer demand for faster and efficient payments, entry of non-banks and convergence of channels are the emerging trends in banking business model. The challenges faced in any vertical industry are bringing the channels together and handling big data from complex multi channel service environments. Regulations, Privacy, Ethics, Risk Management, Counter party risk management and Treasury technology compliant with corporate IT standards are the challenges for enterprise to adopt Big Data Frameworks.

Best Practices

The best practices followed during big data analysis are evolution of a legacy big data environment, having sandbox and production box, backup and archiving, having multiple cache for increasing latency, master data management and data cleansing. Enterprises need to centralise data into a single high-quality, on-demand source using a "one touch" master-data collection process. MDM Enterprises need to have a pilot program in advanced analytics to act as an incubator for developing big-data capabilities in its business units and creating a path to additional growth.

Within a Business unit, Big data prototyping need to be on public cloud as it can be scaled instantly. After prototyping is done, big data solution is moved to private cloud. Boundary crash can be avoided by implementing far limits on scalability. Streaming data analytics are implemented for specific applicable cases. Data world is modelled by dividing the data into dimensions and facts. Separate Data are integrated using separate data sources. Structured and unstructured data are integrated. Name valued pair data sets are stored in no sql data sources.

Big data governance consists of data quality, metadata management, master data management, privacy, security and compliance. IT need to work with management and support the cross-organisational cooperation. Private data need to be secured and shared data will be shared to third parties, vendors, institutions and other enterprises. Roles are identified within enterprise for data stewards, sponsors, program drivers and users. Assign a business owner to data. Data must be owned to become high quality. Companies can't outsource this step. Someone on the business side needs to own the data, set the pace of change, and have the support of the C suite and the board of directors to resolve complex issues.

Enterprise Adoption & Overcoming Challenges & Traps

Enterprises are enhancing their capabilities for establishing data gathering and assembly guidelines, guidelines for external data sharing, data security privacy, alignment of new product releases with customer preferences, expertise to solve big data analysis and performance data analysis.Enterprises are focussing on big data initiatives towards tactical business objectives, product information management, performance management, business execution correction, innovation through new products and predictive capabilities.

Enterprise Resource Planning: An effective tool for improvement of business processes

ERPs were generally a big boy toy and were being used by established business houses primarily. But there was a big paradigm shift in mid-size industries wherein they started to look out for tools which were being used by their larger counterparts. So we got motivated to work with growing



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companies and partnered with SAP for their SME product offerings. Usually ERPs are considered to take care of CRM, Sales & Distribution, Procurement & Planning, Inventory, Manufacturing, Finance and Banking.

Companies where ERPs were being used for years, the normal graduation was to get Business Intelligence and let the top users empowered to draw desired data to play around to help in conformed decision making. We, with help of SAP, are targeting to offer most advance extended ERP systems which are helping companies to collaborate every bit of data (even data from biometric devices) and churn it through one of the fastest database available with in-memory computing and make it available for pervasive, predictive and disruptive analysis. Outputs are shared on cloud, mobile or even in multiple formats which could be fed to other systems.

ERPs are not mere data entry systems now rather it is bringing the slight flavor of artificial intelligence which can transform an ordinary organization into proactive, well managed and agile house!

Enterprise Resource Planning (ERP) systems are commercial off the shelf solutions with modular design that provides comprehensive yet integrated solutions for all aspects of a business enterprise. As the name suggests the ERPs are meant for large organisations. As early as 2001, more than 60% of the Fortune 1000 companies had ERPs installed or were in the process of implementing ERP packages to support their back-end business activities. The trend has only improved over the years. Closer home companies like Dabur India, Bajaj Auto, Lanco Industries, Larsen and Toubro, Bharat Earth Movers Limited (BEML) exploit ERP solutions. Recent successful implementation of System Application Product (SAP) based ERP in Malabar Cements prompted the Industries department to call for Expression of Interest (EOI) in June this year, to extend its implementation to 39 public sector enterprises (PSEs) in Kerala.

Organizations choose to implement ERP to attain numerous benefits. Multiple conflicting representations of the same data become a single version of truth. Many standalone packages become a single integrated system, ensuring seamless integration across and between processes. The implementation not only brings in transactional traceability and referential integrity but also provides the senior management with absolute visibility with regard to business operations. ERPs contain a bouquet of best practices which have been tested in large number of organisations and proven across thousands of implementations. The business processes of the ERPs are configurable such that these can be suitably altered by addition/deletion/modification of steps to suit peculiar requirements. Configuring requires good knowledge of the organisation's processes and those being offered by the ERP, and an understanding of the difference between the two. Where the differences between user expectations and what is being offered by the ERP becomes intolerable, customisation is restored to by writing of additional programming code, through RICE (Reports, Interface, Conversion and Enhancement) objects.

Implementations in the industry have made it apparent, that in order to successfully use COTS solutions, organizations have to accept minimal customization of the software. However, at the same time, customization is not easy to avoid. In the first place, the ERPs were designed for the corporate. A business company and a defence enterprise are not much similar in terms of goals, organisational structure and business functions. ERP systems are enabling technologies which are designed with the intent to transform business operations. Their effectiveness ultimately depends on the ability and willingness of an organization to change its behavior and its processes. Successful implementation of an ERP, implying that benefits and operational improvements are realized to the planned extent, is contingent upon such fundamental foundations as:

- Sustained involvement of senior leadership with authority over and accountability for execution of all end-to-end processes impacted by the ERP.
- Willingness and ability of the leadership to make hard decisions related to proceeding or not proceeding with an implementation based on program performance.
- Strong integrated governance that includes representation of and participation by all impacted stakeholders. The representatives must have the authority to make decisions that are binding on the organizations they represent. Decisions must be made rapidly and the effectiveness of the governance must be actively measured and reported.
- An organizational operating model (structure and process) aligned to the design of the ERP with minimal requirements to cross organizational boundaries and which execute components of a process outside of the ERP, thus breaking the inherent integration of the ERP.
- A strategy and approach that address the root cause (not just the symptoms) of the problems being solved and the measurable operational improvement to be gained by solving them.
- Personnel with the requisite skill set and experience necessary to define and execute an ERP implementation (eg. source selection, contracting, vendor management, change management, technical oversight).

- Defined metrics for operational improvement to be gained, supported by a baseline describing existing business performance.
- Accurate, consistent, and authoritative data.

One must remember ERP is not implemented to flaunt or gain competitive edge but clearly to improve business processes. One should go for it if it really finds the need to do so. Unsuitable, unplanned and forced ERP implementation may prove disastrous for the companies where they lose time, money and customers.

To summarize, when an organization decides to implement an ERP solution, it has no option but to minimize customization, which implies that the organization must be willing to change its business operations and align it with those being offered by the ERP chosen for implementation. Changes to processes, roles, responsibilities and organizational structures are inevitable. Therefore, the need to train, prepare and plan transition, inspired and guided by a completely involved and authoritative leadership is the key to a successful implementation.



Aditya Sharma Global Head - Innovations, Birlasoft Solutions

Indian IT Industry: Future Ahead in Global Perspective

T industry has been the trend setter and in the last 20 years especially has been a vital force in transforming the lives of common people across the world. The way we manufacture medicines, cars, machinery; the way airlines, trains, ships, buses move; the way we cultivate land; everything around us is changing so fast and so visible.

Today, we cannot separate technology from our daily transactions and interestingly, across age groups, people are catching up fast and demanding more!

Before we get ready for the giant leap there are few basic questions which the developing nations have to address which shall define the way forward for growth. There is a great need and urgency to up skill their people, especially the younger generation which can translate their thoughts into tangible outcomes addressing common issues impacting people around. For every nation, it is important to prioritize where they remain strong, resources that enrich them and areas to focus for inclusive growth.

And, it starts with the way we articulate, educate and provide an enabling environment for development.On the other side, the demand from people or consumers defines the course of change or transformation. To highlight top 5 expectations from consumers which we have been hearing continuously are:

- 1. Speed of service
- 2. Reliability
- 3. Ease of use
- 4. Efficiency
- 5. Transparency

You may rank the priorities but these questions or expectations help organizations build their products / offerings and be relevant to the consumers. Interestingly, cost of product or service comes up in later discussions.

IT industry today has evolved significantly and maturing the way it conducts business. New business models, pricing models, operating procedures, people utilization, products/service innovations are being thought-through which helps them maintaining the edge over their competition ad remain close to the consumers.

The Indian IT Industry continues to attract the world with their subject knowledge, expertise and ability to address the customer business problems.

Today, our industry is at about \$118b in size and deploys over 3 million workforce but growth in future won't come with adding more people, the way it happened in last decade. The growth shall come in turn from automation of processes, make them people independent and utilizing the skills of people in more meaningful and impactful assignments. Indian companies are expanding in engineering and R&D market. At the same time, it is important to identify the core skills, expertise one has and add the most current technologies which shapes the present.

The future demands more automation, role of robotics and lesser human intervention like monitoring, data collation, reporting etc. One of the best example is that the industry experts believe that BPOs can be completely automated which means sophisticated software talksto the caller and gets job done with no human intervention.

The advent of Internet of Things, experts in the domain are working on advanced machine to machine communication and massive reduction of human manual intervention. It means as simple as your car engine or tyre signaling that it requires a replacement as has worn out. This can be captured by the insurer to validate owner's claims.

There are many such examples but imperative for each one of us to understand the need to pick up skills basis our competence and interest to relate to business scenarios with the objective of improving quality of life.



Prof. M. N. Hoda *Chairman - Division - I Computer Society of India & Director - BVICAM, New Delhi*

ICT Enabled 21st Century Teaching Learning System (with Special Reference to Higher and Technical Education)

hange is the only constant phenomena on this earth. If changes are not adapted upfront, the environment will make us irrelevant and redundant in the system. The basic definition of education, in 21st century, itself has changed. Those who can read, write and speak are not considered as educated in the digital age, now, educated are those who can Learn, Unlearn and Re-learn. Traditional Teaching Learning System (TLS) is not able to address the current productivity challenge of the corporate houses. Professionals are expected to be productive right from day

one instead of being trained by means of 02 - 06 months induction training or so in the industry. The way re-usability of fully furnished components are overemphasized in IT based applications, students of professional courses have also to be groomed in professional way so that they can be productive right from day one i.e. the day they join industry. For this, 21st century teaching learning system has to focus on learning component rather than just teaching. In this context, students will have to be Active Learners and Problem Solvers in the classroom itself, instead of being a Passive Listeners and teachers will only be a Facilitator rather than being a Tutor. Problem and Project Based Learning (PBL) will need to be introduced.

Activity Oriented Learning will need to be followed, right from pre-primary level, in a big way. Right kind of 21st century Teaching Learning System will be based on 40% lecturing, 20% subject related videos and movies and 40% students based projects, exercises, activities, where in learners are engaged actively. Extensive uses of ICT and its integration with Teaching Learning System (TLS) will have to done at all levels. ICT will be at the centre of the 21st Century Teaching Learning System. Present system of teachers' push or forced teaching methodology will not work in 21st century. We will have to change our Teaching Learning System from existing faculty centric to students' centric. There is also need to focus on presentation skills of Students. It can be strengthen by conducting group discussions, presentations etc. Flexible and group learning will need to be actively encouraged.

Collaborative learning is the order of the day. New age learning tools will be social networking sites like Facebook, Twitter etc. Nowadays it is easy to access download and upload the course contents, e-books, sample question papers of related domain through communicating sites. Universities will need to focus on nurturing and polishing the life skills rather than just imparting subject knowledge. Students' feedback will have to be considered to evolve and fine tune the Teaching Learning System and make it more pro-active and responsive. Students will need to be considered as a customer and Universities will need to function as an enterprise. Teaching Methodology is enhancing day by day with the help of new emerging tools like smart boards, iLCD. These tools provide strength in learning process by accessing information through virtual class rooms, videoconference, digital audio and video. Skype, Viber, Hangout, Line are important applications for sharing the contents. Transformation of teaching from conventional to virtual is not an easy going task. In modern digitization, virtualization concept along with the help of mobile technologies and seamless communication support enable round o clock in learning process. Accessibility, Extensibility, Transformation, Sharing of information are important key features for strengthening self learning capability of an individual student. Undoubtedly, Incorporation of these key features in all level of education will improve overall e-learning process through ICT. Virtualization with ICT will be potentially powerful tool for offering educational opportunities. Contents Delivery to students is important factor in learning process. Interactive session depends on the way of content delivery to the Students. Use of questionnaire and illustration on real life applications may influence students to access the information.ICT not only focuses on Learning outcomes cum learning objectives, it evaluates understanding of students through performance. Students from the different corners of world can do training and enhance their skills without knowing physical location of education university.

By 2020, physical Libraries will be replaced by virtual libraries known as Cryberaries and Teaching Learning System will become Learner Pull rather than existing teacher push.



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Leading Transformation through Crafting Technology Vision for India's Future Digitization of Information

The digital revolution throughout the world has brought about new challenges as well as new opportunities in the field of information technology. The developing countries are grappling with problems like weak infrastructure, lack of skilled manpower, financial stringency etc. in implementing the digitization of information resources. The article begins with some light on

the current scenario and potential in the digitization of information in the market. The focus then shifts to the challenges in the current scenario and how new models or methods can be brought in to successfully overcome these challenges.

The digitization of the information has been a forward march for years and it looks pleasantly surprising the transition from how reading the book on paper has changed to reading an e-book and the physical stuff has entirely been converted to digital media may it be books, music, pictures, etc. courtesy Digitization. The terms "Digitization" and "Digitalization" though closely associated but are conceptually different. The term "Digitization" means the act of converting data from analog to digital form whereas in contrast "Digitalization" means the rapid increase in the use of computer or digital technologies such as mobiles and tablets. Adopting and implementing a digital transformation strategy is imperative.

Current Scenario

With the development and expansion of internet, the information technology field has switched to the use of modern Information Communication Technologies (ICT) to make information and knowledge easily accessible irrespective of the geographic and political boundaries. The digitization of information in current scenario in our country is at infancy level. There are no statistics which tell about the knowledge digitization or institutional repository or knowledge base. A few Data acquisition

- Handling the physical data Digitization
- Converting data to digital format Creating repo
- Creating an online/offline database or repo

Access

Accessing the data by public/organizations

Initiatives have been taken by the government in this direction so as to preserve the data which is in physical form such as the digitization of libraries under the DeitY (Department of Electronics and Information Technology). The documents are digitized using the latest digitization technologies. It works on the methodology of first acquiring the data, digitization using scanning or desktop publishing, creating an online database or repositories and providing the accessing or download facility either online or offline.



These digital repositories can give quite an easy access to a large collection of these digitized documents where one can fetch the things as per one's interest in a fully networked environment. These digitized documents are required to be present on a centralized server. The users can gain access to the server using proper authentication methods and can then browse the documents of their choice.

The benefits of digitizing information-intensive processes are huge and will lead to paperless processing. It will help the organizations to cut their cost by around 70 percent and in turn can reduce the processing time drastically. Replacing the traditional paper and manual processes can lead to a better and improved performance in a system. Think of a digitized bank loan application and digitized decision process which will reduce the cost of bank as well as reducing the approval time to a few minutes.

- A few benefits of the digitization are:
- · Round the clock accessibility via internet
- Preservation of old texts and documents.
- Anytime/Anywhere access using digital gadgets as mobiles and tablets.
- Easy retrieval of information.
- Cost and time saving.
- Fewer requirements for physical storage.
- Availability to a broader audience.

Challenges

Creation of such digital repositories is complex and a time taking process. Taking case of developing countries like India, where the growth of digital footprint is still at early stages but increasing every



year, there are some challenges which should be dealt with so that such digital initiatives can be a success. There are certain technical challenges in the way such as resource building i.e. the cost involved in digitizing the documents which includes the cost of high speed scanners, storage servers and communication switches, the accessibility and maintaining such digital repositories. Broadly the challenges can be classified as:

In order to overcome these challenges, it is necessary to increase the digital literacy so that people can adjust themselves with the pace of digital transformation. Moreover, there's a need for digital identity for everyone just as D-id (digital id) which may be linked with any of

the existing identity, which can help them avail any services in real time using their electronic gadgets. More improvement is required in the implementation of digital platforms so as to provide a seamless e-delivery of services.



Indian IT Industry : Future Ahead

India is amongst the top leaders in providing IT sourcing services to the world and itcontributes significantly to the social and economic transformation in the country. India's IT industry is the hub of innovation which provides world class technology solutions across the globe. Many international organizations like Google, Accenture etc.have set up their offices and centershere in India.Today almost everything ranging from shopping, ticketing to filing Income Tax returnscan be done online.The IT revolution in India has been of much greater significance than the Industrial Revolution.Millions of devices can be connected together and



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people, places can be located easily via High-speed wireless networks and sensors. Today, Smart devices can even recognize speech and gestures through artificial intelligence and soft computing techniques. The world fits well into a mobile phone having internet connectivity. E- Governance has emerged as an effective tool to improve relationships of government within its structure and with citizens and other sectors of society. With the concept of "MAKE IN INDIA" and "START-UP India", The IT industry is providing a backbone to new entrepreneurs to start up new businesses. Today, any new venture has a supporting online model which is necessary for its survival.

However, continuous growth of the IT sector asks for continuous innovation. The IT industries need to constantly come up with new innovations cater the needs of the dynamic environment. The focus of Indian IT industry has shifted from mere application development to big data analytics and cloud specialists. Zettabytes of data is generated annually over internet which requires application of analytics in order to infer actionable business intelligence in real time. This huge data can be aggregated, stored, and analyzed to find hidden patterns and insights in order to highlight the gaps and inefficiencies prevailing in the systems. Big Data is the keyword in present times. Big Data analytics is pro-actively being used by business competitors to outperform their peers. Today, Access to data is even easier with the growing number of web-enabled devices used in business environment (e.g. smartphones, tablets). Resources are available on cloud. Cloud computing allows to work out of office providing a virtual environment to give the flexibility of connecting to business anywhere, any time. Information Technology holds the responsibility exploiting the existing business information and then generate such models that optimizes the cost and performance of entire infrastructure. Big data analytics and Cloud computing provides for such optimization. Thus, Big Data Analytics and Cloud Computing are the face of Upcoming Indian IT Industry.

Indian IT Industry - Future



Praveen Pipara Associate General Manager, Sopra, Noida

ndian IT industry boomed with the opening of the economy in the early 1990s. The Y2K boom in late 90s gave the much needed impetus to the industry. Growth rates were at 50% of the Industry at



India increasingly seen

as a product

dévelopment destination

to enterprise solutions

turn of millennium.In India, ITIndustry for long has been considered by many to not understand it well. In the last 15 years, there has been a huge transformation of the way Indians live. Be in from communication through Social Media to E-commerce, IT has played an important role and brought the applications closer to the common man.

and skilled talent pool

UW-DOSE

in India

With the mushrooming of IT industry, the demand for IT professionals increased many-fold in the last 20 years. Exports have grown from 5.7 billion at the turn of is millennium to 100 billion in 2014. The total number of IT professionals has also increased many folds in last 15 years.

The IT industry is also getting transformed in the process. In the last 20 years, the selling point for IT exports was cost arbitrage. However a few things have changed, firstly countries in South East Asia, and near shore centers at US and Europe have taking a leaf out and opened development centers and secondly rising salaries have led to this advantage being diminished. Revenue Growth and salary rise has moderated to lower double digit.

IT industry serves as an enabler Industry to other industries. Consumers and Enterprises buy IT products and services to enable businesses to do things efficiently at lower cost and higher speed. Considering that more than 80% revenue of IT industry comes from export, it is heavily dependent on the growth of Developed countries.

However the future belongs to India. There will be renewed focus also on Domestic business. With the Government of India's renewed focus on campaigns like Make in India, Digital India, Smart Cities, Jan Dhan Yojana, IT will play an extremely important role. Take for example, the Digital India program; there are many axis of focus for the IT industry in next 5 years. These include expansion of broadband connectivity (only 20 million Indians have broadband connections), moving towards convergence with IoE (Internet of Everything) being the next big technology focus. Focus on cyber security and development of technologies to secure the digital life of the Citizens. Some of these will also be applicable to the International Market. Sopra and the Industry - are focused on the next set of technologies on (SMAC OS) Social, Mobility, Analytics, Cloud, Internet Of Everything and Security

In order for IT industry to maintain growth rates and increased productivity, there is a higher emphasis on **automation** and **innovation**. IT companies in order to have higher margins are moving towards high mix of product development in their portfolio. Businesses are now investing less in homegrown Customized application development and asking IT services companies to use available products and do customization as per their needs.

Businesses are looking for more value for less money. Innovation is the key. Most large IT companies including Sopra have Innovation labs to incubate ideas. Some of the innovative ideas are coming from Young minds in our companies. It will also be important for each employee to think like an Entrepreneur. In terms of processes , SDLC / Waterfall is thinking of the past, projects are moving towards Iterative development or following Agile principles to reduce Time to Market (time needed from conception of need to putting it live on production)



Saurabh Chauhan Associate IP Lead, Microsoft Patent Research Services CPA Global, Noida

On Technology Readiness for the Future

A patent is a legal title granting an inventor the right to exclude others from making, using or selling the claimed invention. A patent may be granted for "any new and useful process, machine, manufacture or composition of matter, or any new and useful improvements thereof". The term "composition of matter" relates to chemical compounds and may include mixtures of ingredients as well as new compounds. In order for an invention to be patentable, it must be new as defined in the patent law: if the invention has been described in a printed publication or has been in public use or on sale for more than one year before the date of filing an application for a patent, a patent cannot be obtained.

An inventor can apply for a patent for the same invention in more than one country. Several patenting organizations such as the European Patent Office (EP) and the WIPO, World Intellectual Property Organization, (WO) publish patent applications. The patent system is designed to promote the dissemination of new technologies by publishing full details of new inventions. Chemistry, engineering, and medicine are some of the only academic fields to have an industry that is actively engaged in novel research. The bulk of publication by industrial scientists appears exclusively in the patent literature. Patent documents are therefore an important source of information for all researchers; they often give full details of methods and of preparation of compounds, and much of the scientific information in patents is never published elsewhere.

What are the Requirements for Obtaining a Patent?

To be patentable, an invention must meet three basic criteria.

- 1. It must be **novel.**
- 2. It must be **useful**.
- 3. It must be **nonobvious**.

In order to be protected in a country, the invention must be patented with that country's patent authority or with a patent authority acknowledged by that country. For example, if a patent is filed with the U.S. Patent and Trademark Office, it does not protect the invention in Japan or in Europe.

Role of Patent Analysis in Business Strategy

A Patent is the right provided to an inventor not for the use or practice of the invention but for preventing others from practicing or using the invention. In the recent years the role of patents has changed dramatically. Patents used to be the concern of only a bunch of legal practitioners or specialists and no one else was really bothered. But with changing times and ever increasing competition in business, patents have become a key factor for any business.

Patent analysis and information benefits many areas of business. It helps in getting the know-how of the relevant technology field in order to forecast market needs. This forms the basis of judging the right time to invest in R&D. Patent Analysis helps in getting an overview of the technologies the competitors' are working on. This is a medium to assess the competitors' strengths, weaknesses and most importantly business strategy.

It also plays a major role in licensing technologies/inventions. In mergers and acquisitions, the patent information helps in narrowing down the choices of the companies and technologies to consider. Patent analysis provides a source of technological information that can be used by researches and inventors to find new solutions to technical problems.

For starting a new business or a developing a new product or even buying out some company, it becomes important to go through the patents' database to make sure you are going in the right direction. Patent searching and analysis was a very tedious and time consuming job a couple of years ago when only patent experts could do this job manually sifting through a huge pile of patent files. But now there are patent analysis software available which are designed to make the job of patent searching much easier - and by a big Margin!



Fig. The role of 'IP intelligence'

Top 10 Strategic Technology Trends for 2015: By Gartner Inc.

Gartner's top 10 strategy technology trends have the potential for significant impact on organizations in the next three years. While this doesn't mean adoption and investment in all of the trends will occur at the same rate, companies should make deliberate decisions about them during the next two years. The trends cover three themes: the merging of the real and virtual worlds, the advent of intelligence everywhere, and the technology impact of the digital business shift. These trends include **Computing Everywhere, The Internet of Things** (The combination of data streams and services created by digitizing everything creates four basic usage models - Manage, Monetize, Operate and Extend), **3D Printing, Context-Rich Systems** (Ubiquitous embedded intelligence combined with pervasive analytics will drive the development of systems that are alert to their surroundings and able to respond appropriately), **Smart Machines, Cloud/Client Computing, Software-Defined Applications and Infrastructure** (Agile programming of everything from applications to basic infrastructure is essential to enable organizations to deliver the flexibility required to make the digital business work), **Web-Scale IT** (It is a pattern of global-class computing that delivers the capabilities of large cloud service providers within an enterprise IT setting),

Latest Patents War between Technology Giants

Every day we hear or read about one company suing the other for patient violation issues. In this way the companies - who have upper hand over the issue- draw huge amount of cash from the others through an agreement to step down with case in the court of law. Judge Theodore Essex of the International Trade Commission, Amy Hammer- Assistant General Counsel for Verizon and Ray Chen of the US Patent & Trademark Office agreed that the best possible outcome to bring peace is mutual understanding among each other and not suing the other for the same.

The below brief infographic represents which are the companies who stay in limelight due to legal tussle most of the time. Apple is the company that is facing most of the trouble from others. Be it Smartphone or Patent agreement Apple is facing immense heat inside as well as outside the court from competitors. The second chart below shows who is holding how many patents.

The most interesting factor is Google and Motorola in below infographic. No wonder why Google wanted to buy Motorola which has a staggering 17,500 patents, whereas Google has only 760 patents.



Fig: Estimated Patent Arsenals

OpenSource IT

Prior to redhat, I had been associated with Infosys Limited, Bangalore and mostly worked with architecture team of Infosys's only product unit Finacle. There we used to develop different frameworks required for the banking product. To name few were framework for reporting, customization and rules execution.

Moving to redhat was kind of moving from north pole to south pole. From a closed environment of Infosys, here at redhat its a open source company. Any code you write, anything you do is for community, goes to community and you are actually part of community. redhat as a company does do hardening the product on downstream, document them well and sells the support subscription only.



Shubhendu Ram Tripathi Principle Software Engineer Redhat India Pvt Ltd., Bangalore

About redhat

Almost two decades ago, redhat started with a vision to develop better software using open source. The company was founded in 1993 and its a US based MNC which provides enterprise solutions for almost the whole stack. But the real story of redhat started with RedHat Linux, that's how we know redhat. After Linux rest is history and with acquisitions of companies like Jboss and Qumranet (and the list goes on and on) redhat stepped in areas like middle-ware and Virtualization etc. Today I feel any open source you think of, redhat has a presence there as contributor and maintainer.

In current scenarios hardly I see and area which is untouched by redhat. The simple philosophy which drives redhat, is to unlock the vendors at various stack levels of enterprise solutions, reduce the total cost of ownership for enterprises with good quality open source solutions.

Bangalore office takes care of storage business unit of the company. It is mostly involved in unstructured distributed storage solutions. The two major products on which we as a team work is GlusterFS - a distributed file storage system and Ceph - a distributed block storage system.

What is open source?

There is a big myth, that open source software means free software. You don't need to pay for its usage. On contrary open source software means the code is open for contribution/modification from anybody. You can use the source code as. Even build, re-brand and sell as well. To co-relate you can think of various Linux offerings from different companies. Few examples, Redhat Enterprise Linux, Suse, Ubuntu and the list goes on (there are close to thousand flavors of Linux available may be).

Using open source, leverages the power of community for the collaborative development and in the same time, different companies like redhat and many more (to name few Hortonworks for Hadoop, SwiftStack for Swift HP for OpenStack etc) provide professional supports for these products. This makes sure development is fast, huge set of reviews for the code and lot of people to fix the issues :)

The open source companies leverage these community projects, downstream then, harden them with regressive QA, provide exhaustive documentation and yes they provide professional support for them.

Newer technologies in IT world

1. CLOUD

Nowadays we talk on newer technologies in IT, and we hear a single word CLOUD!!. Yes it is a big area, and all the big players likeHP, Microsoft, IBM do provide cloud solutions nowadays.

Cloud as a technology tells you, pay for what you use. In recent years the amount of data which is to be maintained and kind of compute required for the same is huge and yes it keeps increasing exponentially. Not to exaggerate, 90% of total data we have today got generated in last 3-4 years may be. For enterprises, the scaling always used to be big headache and huge investment goes in that. Cloud solution today provide and option to scale to any level you require with almost no downtime and within no time almost. To name few solution in this area Azure from Microsoft, HP Cloud IBM SmartCloud.

2. Unstructured distributed storage

Next huge area in IT industry these days is unstructured distributed storage. There is a huge paradigm shift from structured storage to unstructured storage. The storage market worth is expected to be 65.41 billion USD by year 2020. The kind of storage need we need in the age of Facebook, Instagram, Dropbox is huge. Huge storage with lower cost and better efficiency is the main target for storage providers nowadays. Providers like Amazon (S3), Emc are there no doubt, but again they are proprietary and come as Storage in a Box. Open source companies are targeting to tackle this need with low cost solution but at the same time with enterprise class quality and reliability.

3. Virtualization

Virtualization is another area which provides virtual compute, storage, network etc out of available resources. These solutions can provide required storage, compute and network resource on requirement basis and yes they scale up when required. Big names like Vmvare, Amazon SE, OpenStack etc are major providers in this area. There are solutions/technologies like Docker and Atomic these days which try to reduce the usage resource to avail the virtualization to end user.

Role of academics for IT industry

The pace at which IT industry has developed is exponential and personally I feel our academic institutions play the most important role to produce enough and better talents which can excel these technologies. Involving these concepts and technologies as part of academics certainly would make the engineers coming out of institutions more industry ready and they can be easily able to cope with the industry needs.

Having more campus connects with IT majors would help fresh talents to understand the industry better, the need of the industry and better their readiness for the market they are going to be part of post education.

Email – an old but powerful friend

hear many times that Electronic mail (Email) is the most unexciting way to communicate with anyone. We just type the message, choose the recipient and press the send button. That's all! No immediate response, no action, no fun! Wait for response and again follow the same process to discuss more.

It was many times announced on big journals and forums that Email is dead and has no future but here is the truth -Email is still alive - growing and working hard to make communication, deals and development happen inside and



Mr. Amitabh Verma Manager, Product Development, Zimbra

outside of the corporate world. First network (ARPANET) email was sent in 1971 and since then it has become one of the most trusted medium for any formal and business communication. Now days, Email communication can be deemed to be legal, valid and binding agreements as per local law too.

Email is growing

In May 2015, Google announced that Gmail has more than 900 million users that's up from 425 million in 2012. There were 90.7 million average monthly users for the Gmail smartphone app in 2014. Yahoo has more than 273 million mail users as per reports published in 2014. Outlook.com (earlier Hotmail) has more than 400 Million active users. There are many other hosted/SAAS/ Enterprise based email services which have many more million Email accounts.

The total number of email accounts is over 4.1 billion which are predicted to reach 5.2 billion by 2018 and there are 2.5 billion email users. The business world accounts for more than 108.7 billion emails sent and received per day, according to market researcher Radicati Group. That number is expected to increase to 139.4 billion by 2018. As per Marketing Profs, 122,500,453,020 emails are sent every hour. These are big numbers! Showing ongoing success and growth of email services.

For some time, We have been seeing evolution of many exciting web communication services like Facebook, Twitter, Slack, Skype, Chat Apps and other mobile based communication services (WhatsApp, Viber, Line) which provides an instant and real time communication possibility but still far to be considered as Email replacement. These services are good for instant and informal communication. An exciting service named "Google wave" was launched in 2010 with big idea to provide the alternate to old boring email with real time communication, videos and photos sharing and much more things to integrate together but could not get any considerable momentum in real world.

What makes email immortal?

The Simplicity: Any successful communication medium needs to be simple enough to be adopted by masses. Not everyoneis willing to invest much time in sending information to other or receive from them and moreover when it needs to be done very frequently. Email is very simple - write in an email editor, attach items as per requirements, push the send button and it's done! Reading and writing is in human DNA since hundreds of year and email provides a very intuitive way to extend it to digital world.

Negligible learning curve: Using email service requires no extra efforts other than knowing how to work with World Wide Web (www). Anyone who knows how to work withinternet, can start communicating over email in few minutes. Google wave was a good attempt with much more advance features but it was not very intuitive and many usersfound it difficult to understand how the communication is happening, what are the message threads, they could be edited/modified, tons of extensions and much more. It might have done well for technical audiences who have good understanding of complicated communication suites but general masses don't like bigger learning curve.

Ease of Access: Email services can be accessed from desktop, laptop or any other internet enabled (of-course with browser or thick client) device. Type the email service URL and you are ready to read or write emails. No extra configuration.

Delegation: Corporate world needs a simple communication service witheasy features to delegate and share responsibilities. Email services provide facility to read and write mails on behalf of others. A secretary or an admin can filter out the not so important mails or respond on behalf of busy boss. They can send the meeting invitations, create schedules and do other routine scheduling with calendar services which comes with most of the messaging suites.

Legal: Email communication is considered a mean of legal communication in many countries. All the negotiations and discussions running over email can be considered as legal ones as per local law.

Business value: Email proved to have great business value for commercial communication. 81% of US online shoppers are more likely to make additional purchases as a result of emails based on previous shopping behavior and preferences. 72% consumers said that email promotions are preferred by them from the companies with who they do shopping or business. 68% of consumers find email to be most preferred way for receiving commercial messages. 66% of consumers have made a purchase online as a direct result of email marketing message as pet Direct Marketing Association in 2013.

<u>Commercial service integrations</u>: Many enterprise email solutions are integrated with other commercial communication or business service suites to run complete service and solutions. Email is an integral part of many automated business process to send reports, status, business outputs (invoice, statement, summary etc.) and any alert or notifications. Banking, telecom, online retail,

Insurance, transport and shipping and many more big business infrastructures are connected through automated email communication services.

Email is changing

Mobiles and other handheld devices have changed the way to use the emails. By 2017, 1.779 million people will access email via their mobile device as per Radicati group email statistics report. Mobile email will account for 15 to 70% of email access depending on target audience, product and email type.

75% of Gmail users and 68% Yahoo! users access their accounts on mobile devices. Mobile email opens have grown 180% in three years as per campaign monitor.

As per Movable Ink report, 52.99% Android users spend 15 seconds or more viewing each message. Apple users (iPad and iPhone) spends 0-3 seconds per email.

Mobile email apps are used for short and quick communications. Mobile replies have a median reply time of only 28 minutes, followed by emails sent from tablets with 57 minutes and finally replies from desktop with 62 minutes.

Analytics has changed the world of electronic data. Many public email service providers uses the email data stored in their data centers as data mine to understand the preferences and behavior to target them with more specific online advertisements. They run very complicated and sophisticated algorithms to do the user data profiling to understand various traits. This data is used to provide the specific service to third parties as well as for internal purpose for service monetization.

Another interesting use of email addresses are as **online identity**. They are unique worldwide. Many online services encourage users to use them as unique web service identity or user names. It enables users to use easy and memorable login user names.

Now, **many commercial solutions** are built around various email services. They parse and analyze the email data to come up with various business decisions, organize the attached contents in separate repositories for later analysis, process the attached business documents as per data types, use data as input for transactional services, use with intelligent Optical character recognition (OCR) software and much more. Information age is all about data and emails contains tons of personal and business data.

Why to look for alternatives?

If we know that email is doing the intended job perfectly then why to look for alternatives? Why to find ways to kill our old and beloved Email?

The business world is not all about what user wants or what is working perfectly. They need money to run these services and make profit too. One may say that free public email services earn from advertising. It's true but they are not enough. Businesses need profit and value from the service provided to end user.

Generally, email communication creates "dump pipes". In mobile network parlance, a "dumb pipe" is when a carrier simply transfers the data bits to and from without the ability to add services, applications or act as a smart gatekeeper. Carriers don't want to be just "dumb pipes" as there are very thin business margins and requires huge and complex infrastructure to maintain. Emails traffic is ever increasing with bulkier rich content and heavy attachments. More than 70% emails were spam in 2013 which came down to 66% in year 2014 but it's a huge unwanted data flowing through networks. In such a market, when data margins are dropping and many companies are finding hard to just be in positive figures, no one want such "dump pipes".

Google tried to replace it by Google Wave, Google+, adding more customizations like prioritization, flagging, categorizing but couldn't get much success.

Facebook, twitter and Slack is also trying to take this space and present their services as email alternatives. Short and informal communication has decreased quite a lot over emails with the help of such alternate services. People prefer to drop a short message over WhatsApp, Skype, twitter and other same kind of services but, still, they cannot cater the segment which needs continuous discussions, mail threads and professional communication.

I, personally, believe that it's a long way to go before emails can be replaced or any better alternative would come into picture but who knows, it's a dynamic and fast paced technology world! It would be really interesting to see what alternatives would evolve in future and how would they shape next era of digital communications.

Learning Management Systems- a Fad or Need of the Hour

ver past few years Learning and Development (L&D)sector has undergone radical changes. L&D is no longer a cost center for organizations. It has taken a center stage and has become epicenter for any organization's success.



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Learning today has become multi device oriented, gone digital, become social and is happening at one's own pace. All this is attributable to the changing technology that has taken

L&D by a storm. A key technological contributor for managing L&D is **Learning Management System (LMS).** LMS has been around for a few decades now, but it is in past few years only they have contributed significantly to L&D. LMS has in fact changed the whole spectrum of delivering, managing and tracking trainings.

The boom in the e-leaning industry has also put the LMS market on the trajectory of growth. Such is the exponential growth of this market that many top research houses have been researching the LMS market to estimate the current market size and calculate it's growth rate. According to **Forbes**, the LMS market stands at over \$2 billion and is continuing to grow. MarketsandMarketsforecasts the LMS market to grow from **\$2.55 billion in 2013 to \$7.83 billion in 2018**, at a **CAGR of 25.2%** during the period 2017 to 2018. This includes revenue from both academic and corporate users. According to the latest research on the <u>corporate Learning Management Systems market by Bersin</u>, the LMS market is expected to experience a growth of 23.17% during the forecasted period. Corporate LMS market is well over \$2.5 billion today and grew by over 21% in the year 2014. LMS market in the US is predicted to grow at a CAGR of 23.20 percent over the period 2014-2019, as per a report on LMS market in the US by

Researchand Markets.

This brings us to the question that why is the need for an LMS growing? What does an LMS offer to justify the rising demand for it's deployment? But before we look for an answer to these questions let us first understand what an LMS is. As per wikipedia, "A learning management system (LMS) is a software application for the administration, documentation, tracking, reporting and delivery of electronic educational technology (also called e-learning) education courses or training programs."

Most LMS offer a platform to create content, upload it to make the content available as e learning, schedule, administer and track trainings, collect and present training data for analysis purposes.

Features of LMS

The LMS of today are far more advanced than their predecessors. Technological advances have led to significant increase in the list of features and the complexities supported by LMS. The LMS of today not only enables e-learning content creation and tracking, it also offer a wide range of features like:

- Authentication and Security
- User Management to maintain the user details.
- · Content Authoring to create, test and upload e-Learning courses
- · Course Catalog and Content Management
- · Certification tracking and management
- Delivering Virtual Trainings using integrated tools like WebEx, Live Meeting, Go To Meeting, or Adobe Connect
- Administering classroom trainings, managing pre, during and post-delivery activities like notifications, prerequisite completion tracking, attendance marking, and certificate generation
- Resource Management to maintain and assign resources (instructors, classrooms and equipment) to trainings
- · Learner Enrollment, cancellation, rescheduling, substitution and wait listing
- Ecommerce Integration to support multiple payment methods like credit cards, procurement cards (p-cards), training units and Purchase Orders(PO) for purchasing trainings and e-learning content
- Multi-tier pricing and multi-currency support along with promotions and discounts
- Tracking Training History of learners
- Reporting features to generate various training related reports for reporting and analysis purposes
- Integration with enterprise applications like HRIS and other systems using API, web services and Single Sign-On (SSO)
- Blended Learning and Learning Paths
- · Competency and Talent Management
- · Multi organization structure for extended enterprise
- Mobile Learning
- Social Learning
- Workflows
- Collaboration tools
- Automated notifications
- Assessments
- Feedback tools

Need for LMS

The L&D division of most organizations is not well organized and does not use latest technology for administering and tracking trainings. They still rely on basic software like MS Excel to track the training data of employees or do it manually. This is not only cumbersome but is also time consuming and prone to errors especially in organizations operating in domains where there is greater need for compliance trainings. Imagine the case of aviation industry where every pilot needs to be certified on a specific category of plane before he can fly it. In an airlines employing hundreds of pilots where there are thousands of flights to be scheduled monthly, imagine if while creating a flight roster you are unable to validate whether the assigned pilot is certified to fly the designated aircraft or not and whether his certificate is valid or has it expired. Even a single error in such assignment will lead to a serious lapse in compliance. And this is just one of the many examples which emphasizes the importance of automating the administration and tracking of trainings.

Benefits of deploying LMS

More and more organizations today are opting for deploying LMS as LMS offers:

- **Centralized knowledge hub :** LMS act as a centralized knowledge repository for learners thatcan store e-learning content, videos, reference materials, presentations, word documents, you tube links and URL and even content hosted on third party site. Learners cam access these 24*7 from anywhere across the globe.
- **Consistency in training delivery :** Using an LMS helps centralize the entire training process. It is equally helpful in maintaining consistency in the content and quality of trainings delivered to people especially when they are spread across different locations.
- **Tracking and Reporting :** As the trainings are administered and delivered via the LMS only, the system itself tracks and maintains the training data. Desired reports can be created and generated and these can then be used for analysis purposes. Such is the advancement of technology in LMS that you can at any given point of time track and report the real time progress of a person on courses (using Tin Can API).
- **Compliance Trainings :** An LMS can help you to define and track the status of regulatory and compliance trainings in your organizations and thus help in meeting the compliance requirements. This is especially useful in industries operating in the fields of Oil & Gas, Aviation, Healthcare, Clinical trials, Communication and many others.
- **Cost Saving :** LMS not only helps to forecast the demand for training thus helping schedule them appropriately but also helps reduce employee travel and optimize the resource utilization (venue, instructors, equipment, content). All this leads to savings on training costs and better ROI on trainings delivered.
- **Massive Open Online Courses (MOOC's) :** MOOC's have exploded the e-learning industry and LMS provide the platform top deliver them along with proprietary as well as third party e-learning content.

- **Talent Management :** LMS on their own or via integration with other HR systems are also being used to charter individual, learning plans, performance management, goal setting and tracking and even employee appraisal
- Learning on the Go : As most LMS are multi device compatible, they have made learning on the go possible. With an increasing shift of organizations towards Bring Your Own Device (BYOD) concept, mobile learning is becoming very popular. Using their devices, people can access the e learning content via the LMS even when they are on a move.
- **Collaboration tools :** LMS of today provide collaboration tools like discussion forums, wiki, blogs, chats, RSS feeds, announcements and notifications to encourage learners to interact with one another as well as with their instructors leading to a more holistic approach to learning.
- **Blended Learning :** The latest buzz word in the learning industry is blended learning that combines both online learning and in-person learningexperiences. LMS helps to create, deliver and track courses and learning plans that provide a mix of e-learning courses together with classroom modules, workshops, events, assessment, on the job trainings and other such in person learning experiences.
- **Extended Enterprise :** LMS play a major role when it comes to tracking and training extended enterprises that comprise of vendors, suppliers, partners and customers for any organization.

Key LMS Players

As per research conducted by Bersin& Associates, there are more than 500 LMS providers

globally having market share as shown below.

The LMS market comprises of both the academic and corporate sector. The LMS needs of both these sectors differs considerably and hence the LMS providers as well.

The corporate LMS market globally is dominated essentially by SumTotal, SABA, CornerStone and

Success Factor (SAP) whereas the academic LMS market is dominated by Blacboard, Moodle, Desire2Learn and Instructure.

Though US is the current market leader in terms of LMS deployment, the Europe and Asia markets are not far behind. There is a rapidly rising demand for LMS in these markets as well that has led to many major and small LMS players to open shops in these growing markets.

Key Industry Sectors for LMS deployment





options. These not only include first time buyers but also include organizations that are looking to replace their currently deployed LMS. Listed few are some of the corporate sectors where there is a growing need for LMS owing to the nature of business they operate in. Most of the listed below sectors either have a heavy compliance and regulatory requirement or they have a large workforce deployed across geographies.

- Aerospace: Regulations in the airlines industry come from variety of sources. Some of these like IATA are global authorities while others like OSHA, FAA and DOT are country specific. Compliance to stringent regulatory requirements in aviation sector calls for LMS deployment in organizations operating in it. Almost all airlines globally already have LMS deployed.
- **Oil and Gas** : The hazardous work nature of this industry demands a strong compliance to safety and regulatory training without which the workforce cannot be deployed in oil wells and rigs. This together with a large extended enterprise that comprise both upstream and downstream business require LMS to manage the mammoth training needs of this industry.
- **HealthCare:** Need to meet regulatory requirements coupled with stand need to have consistency in training material delivery, extended enterprise have led growing demand for LMS in this sector.
- Food and beverages : with large workforce spread across different locations who need delivery with same standards, there is a need for delivering same training across all locations, with flavors of blended training and certifications add to the need to manage trainings using LMS.
- **Retail :** With workforce spread across locations there is a need to make training consistent, meet safety and regulatory compliance, focused based training as per area of operation, high turnover of employees generating constant training needs are leading to increased LMS deployment.

The LMS market is clearly on a boom. The rapid growth in e-learning industry is also acting as a catalyst to the ever increasing demand for LMS. With non-stop technological advancements and improvements happening in the e leaning sector, it is equally important for LMS providers to keep pace with the changes and continuously upgrade their LMS with new features. Few of the key LMS features that will dominate the future LMS market include cloud based LMS, web 2.0 technologies, HTML 5, mobile learning, personal learning environment (PLE), integration with social media, gamification and Tin can API.





Arun Goel Software Engineer Team Lead & SME Multiplatform Mobility Application Accenture, Bengluru

Hybrid mobile application development

ybrid mobile application development has gained popularity in the recent years. Now is not an unknown or new technology.

Is Hybrid Mobile application development something different from old mobile application development? It is same like other mobile application that install and reside on your device. Then the question is why this technology and what is difference with traditional mobile application?

A traditional mobile application or native mobile application is coded into a specific language like C, C++, java, objective C and build using respective platform SDK and IDE and

then install on the device. A hybrid application built using the web technology like HTML5, java script etc. This hybrid app is hosted inside the native application and utilizes the device web view.Since hybrid application is not using the mobile browser but a web view object is used inside the native application container so it can access the device hardware capability like camera, GPS, microphone etc and similarly access the device software feature i.e browse the file system, calendar, gallery etc.

A simple question comes into mind how html, java script code run into native application and access the native hardware and software feature, an object of the web view created inside the native application that web view object run the html5 code and device OS\SDK provide a framework to write the java-script plugin for communication between native and JavaScript.

As a user I can't identify whether the application is written in native language or hybrid language and a user or client is also never bothered about until it meets his expectation. A well written hybrid application behaves same like native application.



Quick comparison Hybrid Vs Native

Description	Hybrid	Native
Design of User interface	Easy to develop due to html5 and very close to native but some time it become tedious and time consuming to match with Native.	Provides tools to design interface, widget etc.
Cost effective	Yes, single code base and reuses it into multiple platform.	No, Need to develop separate application and maintain multiple code base for each platform
Performance	Slow compared to native application	Better performance, responsive and fluid experience
User experience	Moderate user experience.	Native SDK p rovides tools for design and user interaction widgets which help to create rich application UI.
Access to native feature	Yes, need to write java script interface or phone-gap plug-in etc to access the native feature and system api.	Yes
Tool and debugging	Limited environment and dubbing tool and sometimes developer struggles to fix the issues.	Has better environment and tool for debugging and testing.

Tools and platforms for Hybrid application development

Ionic : IONIC is one of the most promising HTML 5 mobile application frameworks, built using SASS, it provides many UI components to help develop rich and interactive apps. It uses the JavaScript MVVM framework, AngularJS to power applications.

Mobile Angular UI : Mobile Angular UI is an HTML 5 framework which uses bootstrap 3 and AngularJS to create interactive mobile apps. Mobile Angular UI provides directives for building UI component like overlays, switches, sidebars, scrollable areas and absolute positioned navigation bars that don't bounce on scroll. Two-way data binding, interaction with backend services and APIs makes AngularJS a mobile developer's common choice. With the coming release of AngularJS 2.0, it is focused on capturing share in mobile application hybrid market.

Sencha Touch : Sencha Touch is an HTML 5 mobile app framework for creating apps for several platforms including iOS, Android and Blackberry and windows. Sencha Touch is an enterprise grade product for building cross platform end to end mobile web apps with HTML5 and JavaScript. You can call it as the big daddy of mobile application development platforms in the commercial space, mostly enterprises.

Kony : Konyoffers a range of tools as part of its enterprise Mobility Platform to help business create apps from a single codebase. The Studio platform uses JavaScript and features simple drag and drop reusable widgets and the ability to import existing or third party libraries

JQuery Mobile : The focus of jQuery mobile is to empower developers to build web apps and mobile apps that run seamlessly and with unique user experience across mobiles, tablets and desktops. It doesn't focus much on providing native look and feel to apps for individual platforms like iOS or Android.

Phone Gap : PhoneGap is the odd one out in this list as it's not a framework for creating an app, but for packaging and releasing an app. PhoneGap is based on the open source Cordova With a dedicated support team, PhoneGap is popular amongst many mobile developers.

Intel XDK : Intel XDK is the new kid on the block and a little different from the rest of the pack. It includes the complete range of tools that support development, emulation, and testing as well as debugging and publishing cross platform HTM5 hybrid apps. App framework themes support iPhone, iPad, Tizen, Windows phone, Blackberry and Android look and feel.

Framework 7 : Framework 7 leads the race among hybrid app frameworks in iOS mobile apps development space. It is not like other framework which support for building cross platform application but it is the finest and most feature rich for iOS hybrid application. The main advantage of Framework 7 is that it empowers developers to build iOS apps with just CSS, JavaScript and HTML, the technology that web developers already know.

Future in hybrid App

Mobile application industry is competitive for all vendors, application and solution providers. The time taken to market and provide to support in wide range of devices and platforms is a real challenge for them. They have to adopt and promote the solutions which gives quick development and supports wide range of devices and platforms. Hybrid is a realistic option for them.

As per Gartner report, "With enterprises under extreme pressure from management and employees to develop and deploy mobile applications to accommodate mobile work styles and increase customer engagement, Gartner, Inc. predicts that more than 50 percent of mobile apps deployed by 2016 will be hybrid" (http://www.gartner.com/newsroom/id/2324917).

Hybrid application development is still not mature but all the big players like Google, Oracle, Intel, SAP are investing to create robust hybrid mobile application development framework and pushing the industry to create more applications using hybrid technology. In this dynamic mobile application development industry, it seems, hybrid application development is here to stay for some time.



Indian IT Industry : Future Ahead in Global Perspective

ndia is renowned for its treasure of intellect and conscientious class of people. We have gifted the world unrivalled CEOs, consummate authorities and dexterous personnel. Looking at the history, India has come forward by leaps and bounds. We are now noted amongst the nations excelling in Information Technology.



Nidhi KM Founder Director, WWW.Viharin.com

The industry of Information Technology has penetrated even in remote areas of India in daily lives of its citizens. I have witnessed the change myself when I compare my childhood

days to today. Every section of society has become an addict of Information Technology in one form or the other be it the humongous usage of mobile phones or internet or softwares strengthening businesses.

In today's world, people don't want to commute to shop, they want to try clothes online from giants like Myntra.com , buy books etc from Flipkart and many more. GenY reads news online. They don't understand the concept of opening a cumbersome newspaper and turning page by page. We book train, air tickets, hotel bookings online. People are trying jewellery online. What more, Corporates dont want their employees to commute, they are offering work from home opportunities to solve real estate issues. Employees too feel good as they become flexible by working from home. Imparting education online has now become so prevalent.

Information Technology has today gained many forms and shapes. Social Media is presenting a big challenge to traditional media these days. Online networking platforms like Twitter, Instagram, Facebook, Linkedin help in a great way to propagate messages across. These days almost all Media companies are going online along with their traditional ways. Infact many companies have shifted from printed versions to online versions.

How Information Technology has helped me turn my passion into profession?

While completing Masters in Information Technology at Institute of Technology of Science (ITS), Ghaziabad, I myself was super curious to understand Information Technology and its implementations and impacts. I would define impacts in two ways - personal and professional. Personally, I always felt inspired to learn and felt accomplished whenever I achieved a milestone, be it a synopsis of railways ticketing software or payroll system. Being guided and inspired by my esteemed professors - Dr. Sunil Pandey, Dr.Kumud Arora and Dr. Deepak Bagchi my journey of professional impact or implementation of Information Technology began by building an informative website for National Institute of Personnel Management to creating a Loan disbursement software for

Indian Oil Corporation Ltd to data analytics for Marketing of American Express India Pvt Ltd. contributing to Billion Dollar revenue generation for the Industry Credit Card Leader.

Having spent around good 12 years with American Express, gaining tremendous knowledge and experience and drawing an inspiration of 'Generate employment rather than be an employee' from our Honorable Prime Minister Mr. Narendra Modi, I moved ahead with my passion of travelling across the world to convert it to a profession. I have been travelling since I was an infant. Having been a travel addict since birth, I developed a passion to share my experiences to the world. So, wrote an experience of chasing a Tigress at Ranthambore National Park which was well received by the social media in Germany. Writing more such articles and recieving stupendous response on the platform I converted my blog into an online travel and hospitality experience platform www.Viharin.com.

Who knew my hands on software skills from ITS would support me to create an interactive website without spending a single penny. My marketing and analytical experience from Amex helped me excel further in its promotion. Being from a purely technical background I had no contacts with in the media industry and started from scratch. Social Media has supported me enormously to showcase my website to the world. Today, I am proud to say that of 877million websites in the world, www.Viharin.com ranks within top 1million websites in the world and amongst top 96,000 in India by Alexa. Viharin.com is now spread across more than 120 countries of the world. This is quiet an achievement for a starter website in first 10 months of its professional inception. What more, I personally got to meet Veteran Actor Dharmendra, Delhi Daredevils IPL team- Zahir Khan, Amit Mishra, Imran Tahir, JP Duminy, Albie Morkel , Boxing icon Mary Kom and celebrity actors like Diya Mirza, Richa Chadda, Ayushman Khurana and Neha Dhupia and many more to come. Many luxurious properties, brands are approaching Viharin.com for collaborations like Park Hotels, Sewara Hospitality, JW Marriott, Lemon Tree, Ask me.com , NDTV, Le Meridien, Wizspk Communications, Tupperware, Mahagun and many more. All thanks to Information Technology.

I foresee many out of the box innovations in the world via Information Technology. There will be less traffic on roads as people will only travel when they will be actually travelling. No need to go to the Corporate offices, no visits to Doctors, just online scans, no physical lines for bill payments, no physical shopping unless and until its a street shopping, (that will also vanish one day)no commuting for movies as with the progressive technology, home theater concept would be within reach of most pockets. Today, we are able to see the dishes on Food shows, who knows a device will be invented to enabling online tasting. As it is the world has shrunk by the internet. Hologram and Information Technology combined together are already doing wonders. Looking forward to wonders of wonders via Information Technology. Who knows you will have to shell out just few pennies to experience Times Square in New York while being at home in India with just a click away being virtually shopping n trying stuff online.

Windows PowerShell

Windows Power Shell is a task automation and configuration management framework from Microsoft, consisting of a command-line shell and associated scripting language built on the .NET Framework. PowerShell first time appear in 2006 by Microsoft.

This tool allows to configure all framework management activities at one place and also provides the better handling of the each task smoothly.

Working on the tool is like making a batch for numbers of operations and providing a single point shop to execution of those tasks like copy file during installation of the



Shivam Sharma Team Leader, Prologic First, Gurgoan

application and checking for existing version of .Net framework, installing desired .net framework. In short this tool proving you a one point automated version of the plentiful tasks.

Syntaxes in this tool are more like dos based command line while providing the feature like a programming language where we can have conditional statements and looping kind work methodologies.

Like creating a directory and/or checking for existence of the directory can be managed by a single line command -

Syn, md -f dirPath

Snippet, md -f c:\windows\temp\MyDir

Power Shell also allows to include the complex tasks like automating conditional database backups, checking and installing of the .Net framework in the background, allows installing application directly from the web browser in the background etc.

Cmdlets are the heart-and-soul of Windows Power Shell, Microsoft's new command shell/scripting language. This series provides a task-based introduction to Windows PowerShell cmdlets. These tasks include everything from reading and writing text files to managing event logs to sorting and filtering data.

Let's have an example of "automating the process of checking the desired version of .Net framework on the system and if not present installing framework directly from the Microsoft website and running the downloading and installation of the framework in the background."

Code Snippets -

Write-Host "Verifying if .Net Framework 4 is installed. Please wait while checking..." - ForegroundColor "White"

```
Start-Sleep -Seconds 3
```

\$DotNet4_Installed = (Get-ItemProperty 'HKLM:\SOFTWARE\Microsoft\NET Framework
Setup\NDP\v4\Full').Install

```
If ($DotNet4_Installed -eq "1")
```

{

Write-Host ".Net 4 Framework is already installed on this computer !!" -ForegroundColor "White"

....

Write-Host "This power shell script will now exit. Please wait unloading..." -ForegroundColor "White"

Start-Sleep -Seconds 3

Exit

}

#EndRegion

If .Net 4 Framework is not installed on the computer, download the offline version and install it

#-----

#Region

```
ElseIf ($DotNet4_Installed -ne "1")
```

{

Write-Warning ".Net Framework 4 is not installed on this computer !!"

"" Write-Warning ".Net Framework 4 is installing on this computer, Please wait..."

\$DestinationFolder = "c:\windows\temp\DOWNLOADED_DOTNET_FRAMEWORK"

Verifying the Destination folder

if(!(test-path \$DestinationFolder))

{New-Item -path \$DestinationFolder -type directory}

Write-Host ""

Write-Host "Downloading .NET framework v4.0 installation package on this computer. Please wait... "-ForegroundColor Yellow;

Setting up Source path from . NET Framework would be downloaded
\$src = "http://www.microsoft.com/downloads/info.aspx?na=41&SrcFamilyId=0A391ABD-25C1
4FC0-919F

```
B21F31AB88B7&SrcDisplayLang=en&u=http%3a%2f%2fdownload.microsoft.com%2fdownload%2f9%2f5%2fA%2f95A9616B-7A37-4AF6-BC36-D6EA96C8DAAE%2fdotNetFx40_Full_x86_x64.exe"
```

#Setep the destination folder

\$dest = "\$DestinationFolder" + "\" + "dotNetFx40_Full_x86_x64.exe"

\$wc = New-Object System.Net.WebClient

#Downloading Framework

\$wc.DownloadFile(\$src, \$dest)

args = "/q / norestart"

Write-Host "Installing .NET framework v4.0 on this computer. Please wait... " -ForegroundColor Yellow;

Installing the Framework

Start-Process -FilePath \$dest -ArgumentList \$args -Wait

#removing temp folder

Remove-Item \$DestinationFolder -recurse}



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