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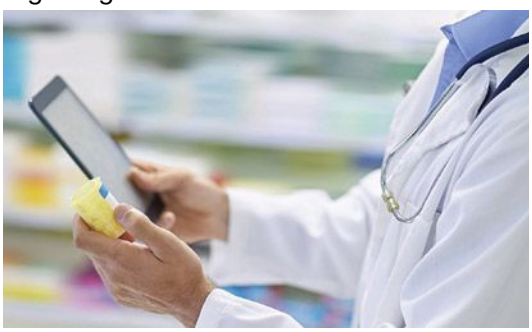

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Are You Ready to be the **Next CEO?**

Sometime mid last year, Mark Fields was ousted as the CEO at Ford Motors, because the company's board believed that it did not want an executive who saw the company's future as an auto company.

Bill Ford, Ford's chairman and great grandson of the company's founder, wanted "transformational leadership", and thus Jim Hackett was hired as the CEO. Jim has promised to deliver a self-driving car from Ford by 2021.

This is a telling example of how technology and digital disruption is changing the models in corporate strategy and leadership. The CEO of the future is one who can out-think and out-pace its competition and transform the industries they are in.

I got to see a few glimpses of such thinking recently when I met two executives, both from life insurance companies, who are using technology to drive and define their business. I am free to name them: Martijn de Jong, CDO and CMO, Aegon Life Insurance and Mohit Rochlani, Director- Operations and IT, IndiaFirst Life Insurance. There are similarities and dissimilarities between them, but the common thread is that both are new generation life insurance companies and they are using technology as the differentiator. Here are some observations:

- Martijn said that the insurance industry has always been a reactive industry in that 'it comes into play after something untoward has happened'. He is trying to turn this logic on its head by making insurance more proactive and predictive using tech. Aegon is working on a slew of healthtech initiatives that use data for preventive health management.
- IndiaFirst used tech to achieve nationwide scale despite its lack of physical presence in the country. It is the most recent entrant into the business but used mobility technology to build a salesforce of nearly 900 who sell insurance digitally without manual intervention.
- Both companies are incubating projects in latest technologies like AI, IoT, machine learning, and robotic automation.

Ed Nair
Group Editor-ICT Business

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2018 Will Bring New Technology Trends That Will **Change the Way Industry Works**

Technologies such as blockchain, IoT, artificial intelligence and cloud will transpire to be the game changers for the year 2018

The year 2017 undoubtedly was a banner year for AI and IoT, there was a massive boost in the number of connected devices which is likely to grow even more in the upcoming year. We are already witnessing how the use of such technological solutions has made organizations dependent on them for their everyday operational processes. In the last few years, the importance given to technological innovation has rapidly grown.

In almost every industry, technology will be disrupted in the ways one has never seen before- it will irrevocably change the world of work in future.

"Technologies such as blockchain, IoT, artificial intelligence, cloud etc will transpire to be the game changers for the year 2018. These disparate technologies will integrate in the year ahead to create extremely practical business solutions.

Also, various facets of AI such as Machine Learning, Robotic Process Automation are expected to evolve in 2018. AI will help organizations to achieve higher customer satisfaction levels – with chatbots likely to emerge as the key differentiating factor for enterprises to keep that crucial connect with their customers and remain engaged. With the innovations of today providing just a small glimpse into future advancements, the robotics industry will rise in 2018 – especially with increased adoption in military and healthcare space.

With all the above technologies taking centre-stage, Blockchain-enabled solutions have the potential to bridge the gaps of device data interoperability while ensuring security, privacy and reliability. This is majorly due to Blockchain's ability to re-engineer transparency, trust and security in the wake of recent cyberattacks, an increased adoption of the technology has been noted in the Indian BFSI and many other sectors," said Ritesh Gandotra, Director, Global Document Outsourcing, Xerox India.

Narinder Kumar,EVP, Technology Services, TO THE NEW said "The nature of blockchain makes it perfect way to store the financial information in a secure way. Several companies in the BFSI sector have already started blockchain-based projects. As the technology is garnering significant interest across industries, in 2018 we will see many full- scale implementations in retail, healthcare, banking, insurance, government sector and many other industries are on their way to explore blockchain use."

According to Dr. Shane Archiquette, CTO-Global

Telecom & Media, Hitachi Vantara, 2018 will bring new technology trends that will begin to change the entire experience of connecting and interacting with the internet. Some of these technology advancements are in 5G networks, location based digital lifestyle spaces, VR/AR, NFV, IoT, IIoT, and IoE. Consumers will be able to enjoy 1Gb speed to their phone, tablet, Smart Tv allowing 4K multi-channel streaming, immersive VR and AR, and new broadband services. IoT services for consumer, enterprise, public, and first responder will dominate the coming years for advancement of dynamic location based experiences.

"We believe that next year enterprises will work towards harnessing opportunities created by integration of new technologies. We see a huge surge in the adoption and usage of digital workspace technologies, which will create ripples in the earlier established organizational structures. Therefore, workspace transformation is inevitable and benefits far outweigh the transitional hurdles that might come up," said Makarand Joshi , Area Vice President & Country Head, India Subcontinent, Citrix.

According to Sanjai Gangadharan, Regional Director SAARC, A10 Networks, AI will empower emerging security technologies in 2018. The rise of commoditized machine learning capabilities and chat bots being built into just about every new product will allow for human and electronic intelligence to be combined more effectively. Come next year, this will give security teams the ability to assess and prioritize security vulnerabilities based on more than just a single label, thus offering deeper protection.

Siddhartha Chatterjee, CTO, Persistent Systems claims that the top five technology trends affecting enterprises in 2018 will be:

- Increased focus on enterprise security;
- The rise of automation and self-service;
- Across-the-board adoption of data science and machine learning;
- Richer human-machine interaction modalities (including voice, touch, gesture, and augmented reality); and
- Cloud platforms as delivery vehicles for software and services.

Today, digital transformation is the key to success for enterprises, SMBs and start-ups. At the centre of this transformation is data making data management the prime focus for a company's IT strategy.

Aniketh Jain, CEO & Co-Founder of Solutions Infini Pvt. Ltd. said that although Artificial Intelligence and Machine Learning sound to be promising technology trends; however the infrastructure and maintenance costs are going to be the key deciding factors for their implementation, especially in startups and SMEs. It's also just the beginning for "FinTech" services, as more financial corporations are looking ahead for automated blockchain technologies in their industry processes.

> "Today, digital transformation is the key to success for enterprises, SMBs and start-ups. At the centre of this transformation is data making data management the prime focus for a company's IT strategy"

"Recognizing the need to properly manage unprecedented data that's being generated today, NetApp recently expanded its Data Fabric solutions and services portfolio in India. As data becomes self-aware and diverse than it is today, the metadata will make it possible for the data to proactively transport, categorize, analyze and protect itself in coming years. With data becoming incredibly dynamic and the ability to transport it is getting more and more challenging, the applications and resources needed to process it need to be equally efficient. This will have implications on new architectures like edge, core, and cloud. At NetApp, our aim is to enable every customer to unleash their data's full potential," said Anil Valluri, President, NetApp India & SAARC.

"Technology, in particular has seen a facelift year after year. In the e-governance space, the concept of 'paper work' will go down drastically. Even now, most of the work is done and stored online on cloud based services which eliminates the problem of limited storage. This wipes out the possibility of misplacing files and their retrieval becomes supremely easy.

Even linking one's Aadhaar to the bank account would smoothen the process of making payments. This would mean making payments using just your fingerprints. The 'ease' of doing things, is what is taking the whole concept forward," added Ankit Agarwal, MD, Alankit Ltd.

In this era of endless innovation, we have to wait and see what future has in store. The one thing we are sure of is that future will look different from today and definitely more efficient.

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Tech outlook **2018**

Dr. Jai Ganesh, Vice President & Head, Mphasis NEXTLabs shares the top tech trends for 2018

SMART ENVIRONMENTS WITH PERVASIVE HUMAN AND MACHINE NETWORKS

As more devices are getting linked to the internet, connectivity is growing exponentially and getting extended to appliances such as televisions, home appliances, cards etc. For the various connected Internet of things to work, they need to have common language for interaction and data exchange regardless of the type of devices and wireless connection networks. Software standardization initiatives for IoT are designed to be embedded in a vast gamut of devices across manufacturers, operating systems and wireless links such as Wi-Fi or Bluetooth. As devices get connected through common standards, they can work in conjunction, for example a motion of temperature sensor can work with other nearby connected sensors such as gyroscopes, accelerometers, door and window locks, video camera, light bulb or speakers which alert the owner. Smart environments are embedded with sensors which collect data across distributed locations. Sensors enable enterprises to monitor a phenomenon remotely and transmit the information to other sensors or to a control unit. Embedding sensors, controllers, devices and data into the physical spaces of human beings facilitates immersive interactions and mul-

ti-modal interfaces, resulting in seamless experiences. Given below are some key enterprise trends from leveraging smart environments:

- Connect and engage end customers accessing products and services via multitude of devices such as mobile, TV, sensors, appliances as well as via multitude of delivery and interaction channels
- Embed sensors into the eco-system and supply chain for enhanced insights and experiences with regard to humans, goods, products and machines across their life cycle usage
- Offer location based experiences, services and payment processing by leveraging bionic sensors and hand held devices

PREDICTIVE ANALYTICS DRIVEN CUSTOMER 360

Enterprises need to correlate customer data footprints from across multiple interaction channels and build an accurate customer profile with product recommendations specific to the channels of interaction. This involves complex event processing which co-relates Customer demographics and transactions data, Call Center data, Web browsing behavior data, Online chat data, email Campaigns data such as click through rates, Display Advertising data, Voice data etc. This leads to a number of challenges such as consistency of message across channels, launch of offers across channels. Fragmentation of the channels also means that customer voice and opinion is distributed across the internet and in various forms – blogs, tweets, Facebook update etc. Systems need to in place to keep a real time watch on all this conversation and deliver timely insights to marketing team to respond in a timely fashion. Opportunities exist to break digital silos by combining data such as user reviews with enterprise transaction systems so that every time a customer gave a lower rating, an alert is generated which goes to a customer service agent who then will connect with the customer.

Digital Customer 360 helps generate unified customer insights based on data from multiple sales and interaction channels. Enterprises need to leverage customer footprint correlation engines which takes slivers of customer data from multiple interaction channels and builds an accurate customer profile with product recommendations specific to the channels of interaction. This involves complex event processing which co-relates Customer demographics and transactions data, Call Center data, Web browsing behavior data, Online chat data, email Campaigns data such as click through rates, Display Advertising data, Voice data etc. Given below are some key enterprise trends from leveraging predictive analytics driven Customer 360:

- Build enterprise level Build Big Data correlation engines that generates Customer 360 insights by correlating data from multiple internal and external customer touch points as well as open data
- Create engaging experiences across multiple customer touch points by better understanding of customer behavior using techniques such as text analytics, natural language processing as well as social network analysis.

ARTIFICIAL INTELLIGENCE DRIVEN MULTI-STRUCTURED ANALYTICS

Multi-structured analytics constitutes combining multiple types of data varied in terms of their type and frequency including structured, unstructured, multimedia data, streaming data etc. Big data analytics about people and machines would give us a historical picture of customer behaviour, and known elements that constitute a claims fraud and their evolution.

This can be coupled with other techniques such as social data analytics from mining the customer's social profile, voice analytics of the customer and cognitive intelligence based user profiling and modeling based insights. Cognitive Intelligence can enable insurance companies in analysing contact centre as well as chat data interactions in real time to predict propensity for fraud based on voice, video and text analysis and correlating the same with other similar fraudulent customer behaviors. The long term objective in such scenarios is to build machine learning based intelligent systems which learn on an ongoing basis based on historical pattern based analysis of billions of user and machine data points and predicts events.

AI driven multi-structured analytics is going to impact various facets of enterprise value chain. These could be the search and advertising algorithms, friends, movies and books recommendation algorithms, driving patterns recommendation, money lending related credit recommendations of peer to peer lending platforms, predicting journey times to frequently visited locations etc. Predictive intelligence, combined with context awareness, semantic technology, voice analytics, and personalization of user needs anticipates user behaviour by drawing upon phone usage, user data, and historical behaviour. The power of prediction gets enhanced as more partners such as hotels, car rentals, airlines, banks and retailers share user data. Given below are some key enterprise trends from leveraging Artificial Intelligence driven Multi-structured analytics:

- Generate insights from multi-structured and multimedia datasets, digital footprints of customer interactions and customer intelligence across multiple channels, touch points as well as social networks
- Leverage predictive analytics for better planning, forecasting and decision support (for decisions such as cross-sell, upsell, retention, loyalty management, risk mitigation, fraud detection, campaign management, inventory management etc.)

IMMERSIVE MULTI-MODAL USER EXPERIENCES

The future of immersive experiences would involve combining the physical world and an interactive, three-dimensional virtual world. This is achieved by integrating synthetic information into the real environment. Rather than immersing a person completely into a completely synthetic world, technologies need to embed synthetic supplements into the real environment. The need is for technologies which blurs the line between what's real and what's computer-generated by enhancing what we see, hear and feel. Augmented Reality has the potential to enable natural interactions and immersive user experiences by blending physical and virtual worlds.

Immersive user experiences are predicted to grow exponentially with increasing focus on location-based search, search, games, lifestyle and healthcare, education and reference; multimedia and entertainment; social networking, and enterprise applications. Other drivers include the

widespread adoption of mobiles and the increasing trend towards the adoption of wearables and sensors which makes the availability of mobile devices with camera, GPS, digital compass, tilt sensors and mobile broadband connectivity. Since immersive technologies intersperses the real and virtual worlds, it presents new challenges in the ways of conventional user interaction design methods. Going beyond the technological complexity of building immersive systems, there is the larger challenge of involving various system stakeholders during the system design process.

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Top Technology Trends That Ruled the **BFSI sector in 2017**

The year 2017 witnessed quite a revolution in the Banking and finance industry as far as technology integration is concerned

Today, people have more financial options available to them than ever before, leading to less reliance on and engagement with traditional banks. At the same time, globalization and regulatory complexity is driving a continued need for simplification and automation. How can banks transform and perform in this new environment, satisfying clients and shareholders alike?

The year 2017 witnessed quite a revolution in the Banking and finance industry as far as technology integration is concerned. As India's economy continues to grow, the BFSI sector needs to be well-equipped to address dynamic market pressures and rapidly evolving industry needs. It has become imperative to transform technologically to sustain a competitive edge. A digital culture shift, designing a modern workplace that harnesses digital intelligence and enabling mobility are key aspects.

We've become quite used to banks continually revolutionizing their technology capabilities to develop a seamless business process, enhanced customer experience and efficient partners collaboration. To round up the progress that has been pioneered by the big 5 banks in India and followed by the rest, here is a power packed performance index of the BFSI industry as part of the 'Digital Transformation series' by Microsoft.

We bring you the top 5 technology trends picked up in 2017 that won businesses, customers and eventually, success for the banks and financial institutions in India.

Rise of Self: service technology for partners and consumers- A self-service channel can not only reduce servicing cost for enterprises drastically but also improve customer satisfaction. But deploying a customer self-service channel is a daunting proposition for most enterprises. With Kaizala, a mobile app and service for Android, iOS and Windows phones, designed for large group communication and work management, it easy to connect and coordinate work with your entire value chain, including field employees, vendors, partners, and customers wherever they are.

Banking on Cloud: Cloud is the future of progressive banking systems. An excellent productivity solution, cloud

offers its unique advantages on three levels- making banks agile by rapidly upgrading to cloud based technology, focusing on user adoption by identifying use cases based on work profiles, and transforming business by process alignment with the new tools, all of which together will ultimately enhance, both, branch and customer experience. Very recently, SBI bank, the largest public-sector bank of India has chosen Office 365, the cloud powered productivity solution from Microsoft to improve communication and collaboration among its workforce, addressing the banking behemoth's requirement of transforming it into a modern workplace, naming this as the largest deployment of Office 365 in India.

Artificial Intelligence: Artificial intelligence (AI) has the potential to transform both front office and back office operations with its self-improving programs. With information now coming in a variety of forms and from a variety of sources, it's vital companies use systems of intelligence that are built around processing vast amounts of disparate data.

Database Management Innovation with Technology: In financial services data is the business, so it is extremely mission-critical to have the right data to delight your customers, manage your risks and run your business. Managing data has a lot to do with security and banking and finance institutions are sitting on a dearth of confidential information that requires technology intervention. Stable and high performing BankingEasy applications, enabling small to mid-size banks to offer the same services and digital experiences such as centralized clearing, multi-channel banking, relationship banking, real time dynamic reporting, inter-branch reconciliation, offer exciting products and services etc. that the end customers expect from any large bank. Solutions like Microsoft Azure and BankingEasy offer improved analytics capability and the data analytics reports.

Mobility and automation: with the new workforce expecting more and more ease of working on-the-go, technology that enables mobility like Azure cloud, the application must confirm to the high mobility standards today's employees are expecting. With cloud services, automation is only a byproduct of technology enablement which further brings down the required time and human errors. Further innovation in technology to enable banks in their turnaround time and minimize errors, will be a big boon for the banking and financial institutions in the coming year.

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Indian Enterprises Will Invest In **Security Big Time in 2018**

With the threat landscape changing by the day, 2018 will see aggressive adoption of various security technologies as enterprises look at ways and means to secure their digital assets

2017 will undoubtedly be considered as 'Year of ransomware', the year when the global security landscape was forever changed by attacks like WannaCry and Petya. The havoc caused by these attacks reached far beyond the paltry ransom demand. Hospitals turned away patients. Production lines came to a halt. Nuclear radiation monitoring was disrupted. Cyber events like these were a wakeup call to the brave new world of cyberattacks and how they could reach further into the 'real world' than ever before.

But it's not just ransomware and the threat landscape that have changed. Digital transformation initiatives like the move to the cloud and the increasing convergence of IT and operational technology (OT) have drastically changed networks and expanded responsibilities of security teams tasked with protecting them. These initiatives, for all their business benefits, have caused network complexity to skyrocket — an issue cyberattackers are all too eager to exploit. All the while, the labor force to safeguard against attacks remains stubbornly inadequate.

As we head into 2018, here's a look at the cybersecurity trends sure to emerge amid the intersection of the most capable threat landscape, the most complex networks and a worldwide —including India — skills shortage:

HYBRID NETWORKS STRETCH ATTACK SURFACES

The attack surface — the total sum of the ways an organization is susceptible to cyberattack — is like a balloon. It expands with the introduction of new attack vectors and attack targets, like extensions into virtual, cloud and operational technology environments. It contracts with the good cyber hygiene and risk reduction. The larger your attack surface, the more likely it is to pop.

To control an attack surface that encompasses hybrid networks and that's affected by a constantly evolving threat landscape, organizations will need to unify visibility and centralize management. Gaining seamless visibility across physical IT and OT networks, as well as virtual and cloud networks, will give them a holistic foundation on which to build a security program ready to address an agile threat landscape.

While different technologies, processes and teams may be involved to secure various types of networks, attackers don't pay attention to such divisions. If anything, they exploit these divisions in security management, and simply follow the path of least resistance to reach their intended target, no matter where the attack originates. In 2018, we'll likely see attackers leverage hybrid network connectivity to infiltrate cloud and OT networks where traditional cybersecurity measures are still being fleshed out.

ONGOING EVOLUTION OF DISTRIBUTED ATTACKS

While NotPetya was originally dubbed a ransomware attack, seemingly a new iteration of WannaCry, it was pretty lousy at the ransom part. What it and WannaCry demonstrated, though, was the distributed attack model on which modern ransomware relies. It targets as many victims possible, looking for low–hanging fruit, so attacks can be carried out easily and automatically, maximizing the attacker's ROI. Ransomware is a perfect fit for this model, in that any target can be extorted for payment. Now that the distributed attacks have proven global–reach capabilities, we're sure to see more mass–scale attacks in 2018.

The good news about the distributed attack model? Cybercriminals sell or share proven attack methods, such as vulnerability exploits, to carry out distributed attacks. Again, this practice gives them a better ROI than developing new, native exploits or exploits for a specific target. It also means a relatively small number of vulnerabilities exploits are being used and reused. If vulnerability management programs can take a threat–centric approach and focus on this subset of vulnerabilities, they'll have a greater impact on their organization's security than if they targeted only CVSS critical vulnerabilities.

SECURITY GOES AUTOMATED OUT OF NECESSITY

As mentioned earlier, networks are growing increasingly complex, meaning that IT security teams must contend with growing amounts of data that needs to be contextualized, analyzed and acted upon. At the same time, the industry is suffering from a worrying talent shortage, which means that there are fewer skilled workers available to manage these issues. This is creating an environment where attack vectors abound, increasing the organization's risk of attack.

As a result, in 2018 we expect to see a surge in the adoption of automated solutions, particularly for integrated analytical workflows. These can deliver actionable intelligence to security practitioners of what to focus on — such as vulnerabilities posing an imminent threat — what tools are at their disposal to take action and tracking the workflow to ensure tasks are carried out to completion.

THE SCALES TIP TO THE CLOUD

At present, most firms are in a transition phase, with networks made up of a hybrid of physical, virtual and multi–cloud environments. 2018 is set to be the tipping point, as corporate networks become predominantly or entirely virtual or cloud–based.

Organizations will need to be sure they understand and can support the shared responsibility model of the cloud, in that the cloud service provider is responsible for security of the cloud while the organization is responsible for security in the cloud. The assumption that cloud networks are inherently secure needs to be overcome, and security teams need to have the means to understand how traffic moves into, out of and within cloud networks to put the proper security controls in place.

The importance of automation, as mentioned above, becomes even more important in cloud–networks. The elasticity of clouds makes their security management too much to handle via manual processes. If organizations are aiming for a complete move to the cloud, they need to ensure that security programs are poised to support the approach.

INCREASED ATTACKS ON OPERATIONAL TECHNOLOGY

The convergence of IT and OT networks presents several advantages in terms of productivity, ease of management and cost–effectiveness. But it has also introduced new cyber risks to critical infrastructure organizations such as utilities, energy producers and manufacturers that could have very real impacts on uptime, human safety and the environment.

Because of the havoc that can be caused, OT networks have become an attractive target for APTs as well as cybercriminals. In 2017, we've seen an increasing trend in the application of IT threats to OT networks, such as ransomware. NotPetya disrupted radiation monitoring systems at the Chernobyl nuclear site, and cost Maersk alone $300 million. WannaCry forced hospitals to turn away patients and brought production lines to a halt.

These attacks were just a glimpse of the risks present in the networks we rely on in our everyday lives. In 2018, we'll see attackers further testing the security of OT, whether for their own financial gain, mayhem or nation–state attacks. Organizations need to wake up to the fact that they need to get a hold of the interaction between these converged networks, their risks, the threats against them and the tools available to secure them.

COMPLIANCE–FOCUSED H1

By May 2018, the General Data Protection Regulation (GDPR) will take full effect, impacting any business with E.U. operations as well as any that process E.U. citizen data. This latter component is still taking some non–E.U. companies by surprise. Organisations late to the preparation game will make for some panic in the first half of the year.

There is a bit of good news, though, in the race to GDPR readiness. First there have been some assurances that if organizations can demonstrate good faith efforts to comply with the new regulation, they will likely see some leniency. If they ignore it, however, they risk fines much larger than the current regulation — up to €20 million or 4 percent of turnover.

The other good news is that if companies are working on cloud transitions and also need to be ready for GDPR, both initiatives require similar prep work. It all starts with visibility. Both from a security and compliance standpoint, organizations need to know what data resides where, the paths around it, the controls in place to protect it and its risks. With this type of foundational knowledge, organizations can implement policies with better accuracy and efficiency and stay abreast of their overall security and compliance status.

MASSIVE GROWTH COMES WITH NEW SECURITY CHALLENGES

For India, there are a good number of large infrastructure projects in the pipeline, such as: large scale government sponsored digitization endeavors; the fostering of smart cities;the "Make in India" initiative; new transportation projects (airports and metro railways);thedevelopment of electronic cities; andthe formation of new banking and finance organizations. These large-scale projects are driving massivegrowth in India,which in turn will drive growth in managed security services.Growth in these areas will also increase IT and OT (operational technology) network size complexity and lure moretargeted attacks. Consequently,Indian organizations (including businesses in the private sector,government and PSUs)willheavily invest in multi-layer security solutions that provide a holistic approach to cybersecurity and can address the complexity of managing risk and protecting against advanced threats on very large, heterogeneous networks.

(The author is CTO and Vice President, R&D, Skybox Security)

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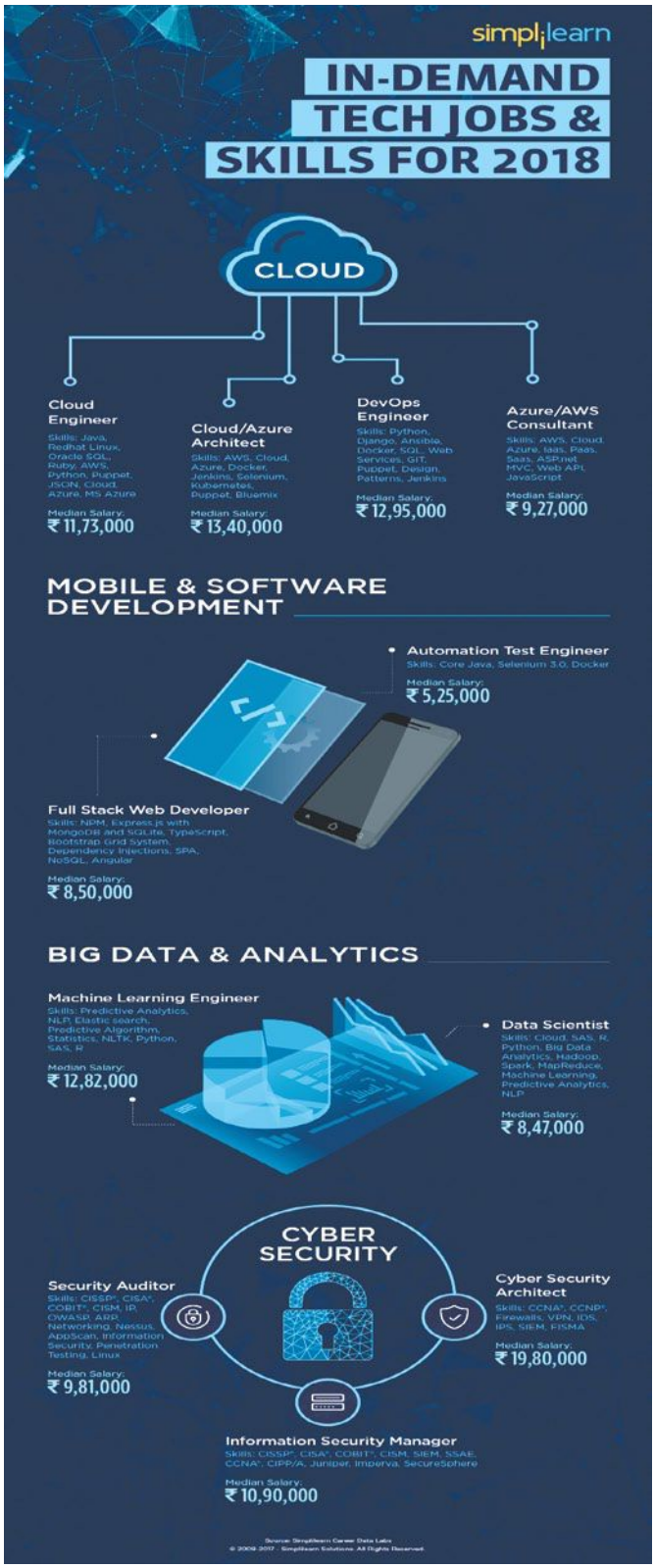
Tech Jobs & **Skills for 2018**

Digital economy training company, Simplilearn's Career Data Lab has curated a list of top tech jobs and skills for 2018 based on the course consumption pattern that the company has observed over the last six months (starting June 2017 onwards)

The year 2017 witnessed automation and other emerging technologies becoming the norm at enterprises, making certain legacy IT skills irrelevant. Individuals have realised that re-skilling is no longer a mere buzzword and they are taking measures to learn new tech skills..

According to Krishna Kumar, Founder & CEO of Simplilearn, "Given the pace at which digital transformation is becoming the main component of business strategies, 2018 will be a crucial year for working professionals to acquire skills in digital technologies and applications such as cloud, big data, machine learning, full-stack, cyber security, digital marketing and more. The global awareness on the



need to up-skill has enabled professionals to move out of their comfort zone and invest in continuous learning to remain relevant in today's competitive digital work age."

IN-DEMAND TECH JOBS & SKILLS FOR 2018

- **Cloud:** Cloud computing already has and will continue to change traditional IT roles and functions for the coming few years. The demand will be high among enterprises to hire for Cloud Engineers (Median salary - ₹11,73,000), Cloud / Azure Architects, DevOps Engineers and Azure/ AWS Consultants.
- **Mobile and Software Development:** In software and mobile development, change happens at a lightning-fast pace. With new apps, products and tools getting released in the world everyday, there will be an uptick in job openings for Full Stack Web Developers (Median Salary: ₹8,50,000)and Automation Test Engineers (Median Salary: ₹5, 25,000).
- **Big data and analytics:** Big Data sector will continue to be on a roll and is expected to see robust hiring with lucrative offers from startups to Fortune 500 enterprises. Machine learning engineers (Median Salary: ₹12, 82,000) and Data Scientists (Median Salary: ₹8, 47,000) will be in-demand across sectors where data and analytics play key roles.
- **Cyber security:** Companies in India and globally are facing a major shortage of skilled cyber security talent to spot vulnerabilities, fend attacks and respond to emergencies during cyber breaches. Enterprises across sectors are expected to hire Cyber Security Architects (median salary of ₹19,80,000), Information Security Managers (Median salary: ₹10,90,000) and Security Auditors (₹9, 81,000).

Based on the tech job roles and skills, some of the emerging courses that are relevant for 2018 are:

- AWS DevOps Architect Training
- Full Stack Web Developer Mean Stack
- Selenium 3.0 Training
- Cloud Solutions Architect
- Machine Learning
- Automation Testing Masters program
- CISSP Certification Training
- Devops Engineer Masters Program
- Cloud Engineer Masters Program
- Digital Marketing Certified Associate

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Looking **Ahead**

Bhaskar Agastya, Country Manager- Ixia, India looks at the key technolgies and its esclation in 2018

THE CONNECTED CAR ISN'T JUST A CAR ANYMORE

IHS Markit forecasts that by 2023, worldwide sales of connected cars will reach 72.5 million units, up from 24 million units in 2015. That means, in just over eight years, almost 69% of passenger vehicles sold will be exchanging data with external sources turning the automobile into an advanced network. In 2018, the car will transition from a mode of transportation to a connected information hub.

In 2018, the phrase attack surface will be applied to the vehicle as connected car system attack fears rise. Catastrophic attack fears of the entire vehicle being taking over will evolve to more basic fears of account attacks like tolls systems, navigation history, and vehicle monitoring system breaches. Continual performance monitoring and system validation will take on new meaning in 2018 as auto vendors clamber to address these mounting risks.

Bhaskar Agastya

IOT RISKS ARE HERE TO STAY

As the reliance on the IoT grows, so will the strain and ultimately the potential danger associated with hundreds or even thousands of connected devices having the potential to be compromised and turned into bots. These growing risks, and a general lack of Wi-Fi protection will create a constant stream of vulnerabilities, which are more likely to be repurposed.

The expansion of the attack surface enables new risks to your enterprise network. If you're working remotely and on an unprotected, public network you put your entire organization at risk from hackers whether it's from your data or unknowingly roping your device to be part of a botnet.

DATA PRIVACY IS THE NEW TECH EMERGENCY

The panic is setting in as today's data-oriented companies fear non-compliance with Europe's upcoming GDPR (General Data Protection Regulation), which will go into effect on May 25, 2018. With this, the focus on data privacy will reach new heights.

It is a complex task to protect personal data when the network is everywhere as a result of the push to the cloud. Using the public cloud takes the data out of your on-premises data center and puts it into the hands of your provider. Breaches and government tampering have brought the consequences of a carefree approach to personal data to light. Years of bad passwords and freehandedness with personal information has guaranteed that we have lost all control over our data. Awareness of this problem has finally reached critical mass. While it is too late to stop our data from leaving our hands, we can still make sure the ones who control it (looking at you, Equifax) do more to keep it safe. 2018 will be the year that we finally make data privacy a serious part of our lives.

BILLY IN SALES IS YOUR BIGGEST RISK

When it comes to security, today's technology tools are not the issue. Significant advancements in firewalls, web application security, and network protection solutions have

taken the industry pretty far, but employee behaviors have not. The assumption still exists that 'IT will take care of things' if I click on a bad link or leave my computer access open on unattended devices.

Cyber criminals are quick to gain access to your network thanks to Billy's lack of attention to the topic of security. Billy still believes the responsibility to recognize and resist cyberattacks and phishing expedition's lies in the hands of back-office security teams. Breaches will continue to rise in 2018 as a result.

EDGE COMPUTING IS THE ICING ON THE CLOUD CAKE

As we close out 2017, the cloud is now a mainstream IT model and organizations are realizing they need better cloud security and performance management solutions. Cloud-washed solutions that were originally designed for the data center just do not cut it. A modern form of distributed, decentralized computing is needed to add value to the cloud and that new model is called edge computing.

Edge computing improves the overall efficiency of the cloud by keeping technology resources like compute, storage, and networking, closer to users. We will see more enterprises use edge design patterns in their infrastructure architectures to better leverage the benefits of the cloud, without sacrificing speed or reliability. Adding the edge computing element will put processing power back in the corporate network for faster results that work, even if the cloud doesn't.

5G WILL CREATE NEW MARKET OPPORTUNITIES, NEW CAPABILITIES, AND NEW BUSINESSES

5G will come faster than predicted and it will cause big disruptions as it becomes the beginning of a new era for connectivity. Even in its early stages, there has been heavy and widespread investment into 5G, with many providers and organizations already committing resources to test the new equipment, technology, and uses for 5G. In fact, in a recent survey conducted by Ixia, it was revealed that 96 percent of large technology companies plan to leverage 5G and 83 percent will have 5G solutions deployed within the next 24 months.

The transition from 4G to 5G will present numerous business opportunities across multiple verticals. It will ultimately make connectivity much easier and will usher in a new wave of technology and growth for many organizations that otherwise would not be possible.

I, FOR ONE, WELCOME OUR NEW BOT OVERLORDS

Apps used to be king. From mobile to web apps, every task had a corresponding "There's an App for that!" Now we have Apple, Amazon, Google and Facebook among the number of companies who have placed their bets on a Bot-driven future.

The underappreciated benefit of this course is that it will make networking simpler. No longer will tasks be sent to hundreds of different apps for simple microtasks. Instead everything will be sent to the Bot. Points of failure for outside connection will be easier to find and IT will better be able to keep their companies online.

PUBLIC IT INFRASTRUCTURE IS GOING TO BECOME YOUR JOB

Data centers do not live in the office closet anymore; they may not even be within 100 miles of the nearest major office, let alone the remote branch offices. At home workers and road warriors make up an increasingly large percentage of the workforce - meaning daily tasks depend on servers and networks that do not belong to you.

We have seen the consequences of that with major incidents like the AWS outage in March 2017, where an outage in a single Amazon cloud data center shut down several major online services including Quora, Business Insider and parts of Slack. Many organizations have bought into the hyperscale cloud model and will be at the mercy of these providers to maintain the availability they need. IT teams need to establish more control over their cloud data traffic to prevent any breach in their security and protect customer experience and employee productivity. They will need to establish greater visibility into their clouds as clouds become the dominant mode of communications and processing.

AI FINALLY RELEASES THE VALUE OF SOFTWARE-DEFINED EVERYTHING

Artificial intelligence (AI) is definitely a contender for the top tech buzzword of the year, and for good reason. It has enabled great strides in how businesses handle data everywhere from their security teams to their HR departments. Adoption and innovation in this space is not going to slow down anytime soon.

The next big area where we will see investment in AI is the networking space. SD-everything, cloud, and globalization have sidelined the hands-on operating practices IT teams have traditionally used to maintain their networks. Innovative providers are now building machine learning and AI into their network platforms, effectively tailoring network performance as needed, to meet the requirements of the services and applications the network carries. As this trend continues, enterprises will need to maintain the same level of visibility into packet-level data they had with hardware-based networking to take advantage of the possibilities.

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Data Technology Trends **That Will Redefine Enterprises in 2018**

In the ever-changing IT landscape, 2017 was no different. This year has witnessed many disruptive technologies emerge and make headlines worldwide. Terms like Artificial Intelligence, Machine Learning, Cloud and Blockchain became the brainstorming topics of discussion for boardrooms across the world. These technologies will continue to impact businesses and will certainly become integral parts of companies' plans to lead in the future

The machine learning market is expected to grow from USD 1.41 billion in 2017 to USD 8.81 billion by 2022, at a CAGR of 44.1% globally. Why? In past years, the rapid increase of large and multidimensional data sets, proliferation towards data-based real-time problem solving and rising demand for sophisticated algorithm platform along with advanced tools contributed to and will keep contributing towards the adoption of machine learning across the globe in the coming years.

By keeping all the hot phenomena in mind, Ashutosh Mehrotra, Business Head, APAC Region at Toovio, shares

three key trends in "data technology" that are likely to dominate discussions and will have an immense impact on how companies will be doing business in 2018.

COMPANIES WILL LOOK FOR AN ADVANCED DECISIONING PLATFORM THAT CAN- "SENSE"-"COMPREHEND"-"ACT"

Data analytics and business intelligence will play crucial role in the overall business strategy to make better and faster business decisions. Companies will continue to leverage the power of data analytics and look for "top line" to be specialized in the field of data science.

Undoubtedly, Machine Learning (ML) has come a long way in the past few years and has changed the way companies look the way they need to do business. From voice-powered personal assistants like Siri and Alexa, to more underlying and fundamental technologies like behavioral algorithms, suggestive searches, network optimization, pattern analysis, fraud detection, customer identification, churn prediction, recommendation engines, etc., these are a few examples and applications of ML in use today.

Technological advancement has made almost everything possible. From accurately predicting Customer Lifetime Value (LTV) to pinpointing a customer's preference and populating the best offering, network operators are truly reaping the benefits of continuous improvement in targeting the right audience at the right time in the right channel and with the right content by implementation machine learning techniques. Since powerful predictive capabilities came into existence, companies are investing heavily on voice assistants, chatbots, and other intelligent business processes.

COMPANIES WILL HEAD TOWARDS "HYBRID MULTI-CLOUD"

Why will companies look forward to it? Moving to a hybrid cloud environment helps organizations save money and become more efficient and agile. It offers multiple level of flexibility, scalability, security, and reduced latency. Most importantly, cloud service providers are incredibly reliable, maintaining up to 99.999% uptime. Another benefit of cloud based infrastructure is that cloud drastically reduces capital expenses and downtime is the rarity. Organizations need not invest in hardware, facilities, utilities, or building out a large data center to grow their business thereby leading to zero capital investment and low maintenance.

Companies have already started moving to "Hybrid Cloud" and will keep leveraging the benefits.Gartner estimated that by 2020, cloud adoption strategies will

influence more than 50 percent of IT outsourcing deals. The largest market will be the SaaS market, which will double to $75 billion by 2020.

That said, this will be a productive year for data technology companies who offer Software as a Service (SaaS) on cloud deployment. Moreover, it will be the year for companies who work on an automated machine learning methodology and provide real time interactive management platform addressing customer behavior through cloud based services for consumer based companies.

PREDICTIVE ANALYSIS TO OFFER RADICAL DISCOVERIES

Data will continue to be the "King" and will play a crucial role in predictive analysis. The way data movement has taken over in a short span, is something C-Suite and technology analysts are embracing. In the last few years, companies have been undergoing data-driven digital transformation and leveraging data as a strategic asset. Data-driven decision making has caught fire as companies find ways to use the vast amounts of data they collect to gain a competitive edge for better service and a better-quality experience for their customers.

According to an estimate by the International Data Corporation, "global data doubles in size every two years and by 2020, it will reach over 44 trillion gigabytes." Witnessing the data explosion at this rate, businesses will look for various ways to stay competitive.

Predictive analytics connects people for greater predictive power and high-impact insights. It enables leaders to make radical discoveries about their companies and dissect and solve complex business challenges. As a result, companies offer better business strategies leading to higher productivity and performance. Several mounting ingredients promise to further spread prediction even more ubiquitously: bigger data, better computers, storage sufficiency, wider familiarity, and advancing science. We'll witness more prediction usage and involvement in time to come. Data-driven businesses are the way of the future for companies competing in today's era of big data.

TIMES NETWORK
NOW OR NOTHING

INDIA UNITES IN CELEBRATING DIGITAL INDIA

Attended by some of the nation's most respected digital experts, the Digital India Summit & Awards 4.0 laid out key imperatives and framework for turning the vision of 'Digital India' into a reality, through a series of panel discussions and deliberations on various themes.

Digital India: Where Do Things Stand? A Real-Time Assessment

Supriya Shrinate, Executive Editor - News, ET NOW; **Mr. Karan Bajwa**, MD, IBM India; **Ms. Aruna Sundarajan**, Secretary, DoT; **Mr. Sri Ranjan**, Chairman, Bain & Company India, **Ms. Debjani Ghosh**, President Designate, NASSCOM and **Mr. Rajkiran Rai**, MD & CEO, Union Bank of India participating in a panel discussion at Digital India Summit and Awards 4.0

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Flipping the IT Department on its Head: **Digital Enterprises move to IT as a Service**

As the pace of technology change accelerates, businesses that want to remain relevant are transforming how they do business. In order to stay competitive in today's ever-changing economic landscape, they are rethinking their old models and processes and reinventing business systems

One area that we are seeing significant transformation is within company IT departments, which are increasingly moving to an IT-as-a-service (ITaaS) model. Just as consumers have a multitude of choices for where they shop, businesses now have numerous options for sourcing IT to help them get their work done the IT landscape has changed dramatically. Put plainly: IT departments now have competition. They can no longer survive as isolated technical gurus standing as the gatekeepers of IT for their organisation.

In the new model, IT becomes standardised, consolidated and virtualised and is offered as a service. IT offers a catalog of software services and hardware con-

figurations designed specifically to meet each business unit's needs and the demands of each application or workload. Instead of working in bureaucratic silos and reacting—often slowly—to various projects on an ad hoc basis, the IT staff is flexible, fast, and focused on the needs of their internal customers.

The premise behind the concept of ITaaS is simple: Offer your internal clients the power of choice, allow them to pay only for what they use, and deliver it speedily. In this model, IT functions less as a tightly controlled function or cost-centre and more as a business. It becomes a broker for its internal clients, finding the best technology or service at the best price and negotiating service-level agreements (SLAs) and orchestrating IT from the initial request to support of the final outcome. With the advent of cloud computing, most companies now function under the hybrid IT model. They use a combination of legacy systems, cloud computing, and internal and external IT. The new role of IT is to act as a broker for all these different choices.

7 THINGS TO CONSIDER WHEN MOVING TO IT AS A SERVICE OR "ITAAS"

Moving to an ITaaS model is no small task, however. It involves more external partners and moving parts and therefore a very different mind-set. As your organisation moves to a service-oriented model, you will need a roadmap.

Having helped hundreds of such companies, HPE offers a few suggestions as you begin your journey. We've identified seven key areas companies should address in their overall strategic plan if they want to see genuine transformation and become a true digital enterprise and get the most out of ITaaS:

Technical infrastructure and architecture: Moving to an IT-as-a-service model means looking at enterprise infrastructure architecture differently. Rather than organising your architecture around projects, you need to organise it around relevant business services. It requires a shift from thinking in terms of hardware assets to thinking instead of the business needs of customers.

IT management framework: IT leadership should move the focus away from assets and projects to service architectures. Along with that shift, leaders need to rethink security, network, and risk management policies, because of the increased number of interactions with third parties.

Finance: The as-a-service model completely flips IT's finance model on its head. How do you price on a pay-as-you-go consumption basis, which comes with far more variables than traditional pricing models? For instance, price too low and IT has a budget deficit; price too high and business units will find external providers that are more cost-effective.

Culture/people: Moving to IT as a service can ruffle the feathers of IT specialists. Deeply technical, hands-on types may not have the skills or temperament to move to a cross-functional, service-oriented culture focused on managing IT rather than delivering it. Training helps, but in some cases, even the right training will not equip some employees with the skills needed for a service-oriented culture. Be open to hiring people with different skills or outsourcing some functions.

Process: Business users see IT as an enabler, not as an end goal. To better serve business clients, IT leaders will need to make internal processes more consistent and agile. Determining how they will handle, say, unforeseen incidents such as outages or how they measure success will play a role in customer satisfaction.

Service management: Most IT departments are good at managing systems, figuring out, for example, how many servers are required at what run rate. Because IT professionals will now be acting on behalf of their business clients when negotiating SLAs, they will need to become well versed in the language and logic of business. The technical knowledge is still necessary, but IT professionals now need to add business savvy to their skillset.

Application management: Business units own the applications, but IT tends to have control over them. Getting business units to buy into pricing models and support agreements is key—otherwise, SLAs, no matter how well negotiated, will become a point of contention. IT employees need to clearly understand the business user's end goal and day-to-day requirements in order to successfully manage the company's application landscape.

THE NEW MODEL

IT as a service takes companies from the old model of IT —siloed and slow—to a much more customer-centric one. With internal clients now able to access a multitude of external options and service providers, IT departments need to continue to up their game. IT is on a journey which we expect will keep morphing as the business landscape does. We expect companies with the most flexible, service-oriented IT will emerge the winners.

(The author is Senior Director, Pointnext, Hewlett Packard Enterprise India)

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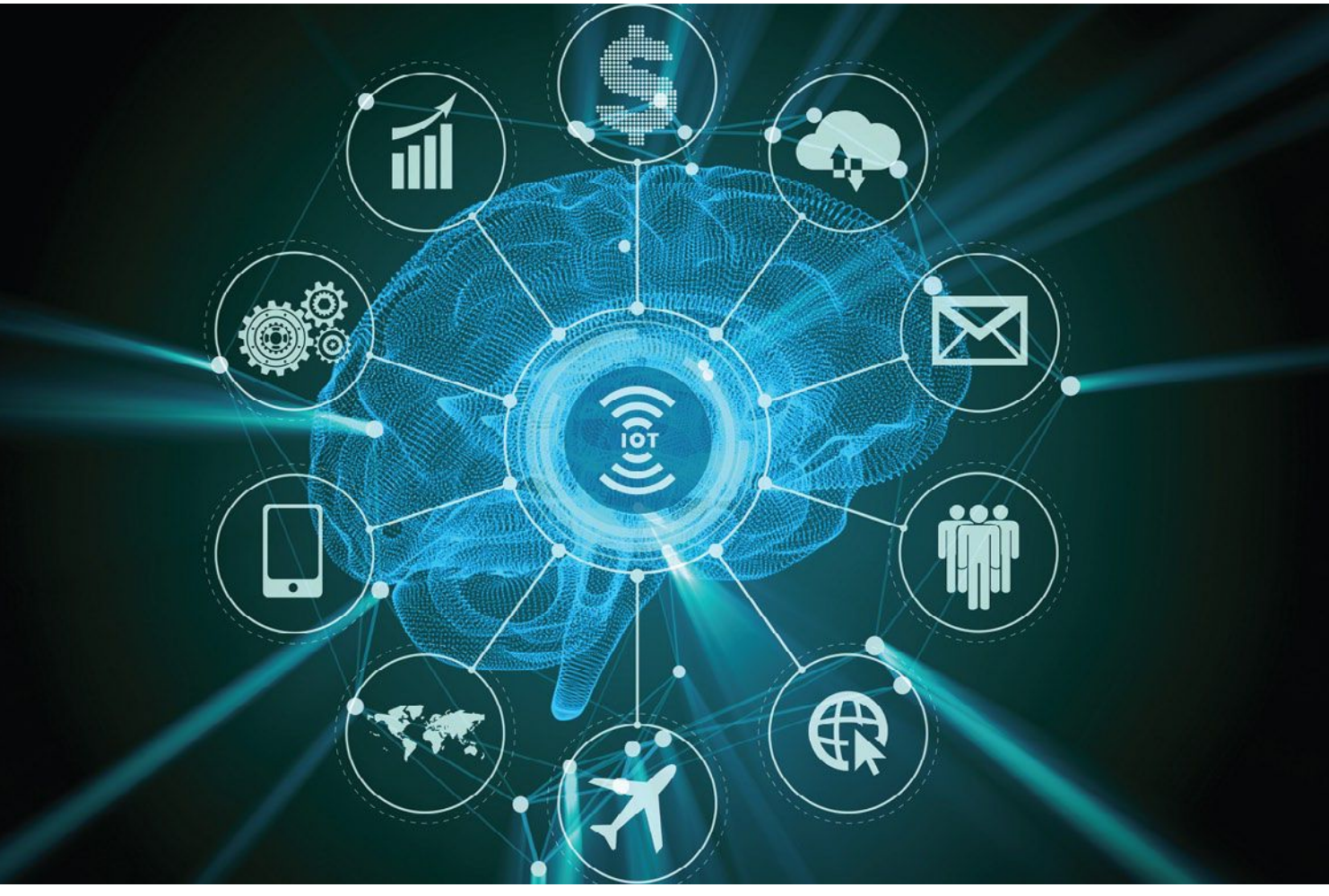
Gartner Highlights 10 Uses **for AI-Powered Smartphones**

Analysts Predict 80% of Smartphones Shipped Will Have On-Device AI Capabilities by 2022



Artificial intelligence (AI) features will become a critical product differentiator for smartphone vendors that will help them to acquire new customers while retaining current users, according to Gartner, Inc. As the smartphone market shifts from selling technology products to delivering compelling and personalized experiences, AI solutions running on the smartphone will become an essential part of vendor roadmaps over the next two years.

Gartner predicts that by 2022, 80 percent of smartphones shipped will have on-device AI capabilities, up from 10 percent in 2017. On-device AI is currently limited

to premium devices and provides better data protection and power management than full cloud-based AI, since data is processed and stored locally.

"With smartphones increasingly becoming a commodity device, vendors are looking for ways to differentiate their products," said CK Lu, research director at Gartner. "Future AI capabilities will allow smartphones to learn, plan and solve problems for users. This isn't just about making the smartphone smarter, but augmenting people by reducing their cognitive load. However, AI capabilities on smartphones are still in very early stages."

10 USES FOR AI-POWERED SMARTPHONES

"Over the next two years, most use cases will still exploit a single AI capability and technology," said Roberta Cozza, research director at Gartner. "Going forward, smartphones will combine two or more AI capabilities and technologies to provide more advanced user experiences."

Gartner has identified 10 high-impact uses for AI-powered smartphones to enable vendors to provide more value to their customers.

1) "DIGITAL ME" SITTING ON THE DEVICE

Smartphones will be an extension of the user, capable of recognizing them and predicting their next move. They will understand who you are, what you want, when you want it, how you want it done and execute tasks upon your authority.

"Your smartphone will track you throughout the day to learn, plan and solve problems for you," said Angie Wang, principle research analyst at Gartner. "It will leverage its sensors, cameras and data to accomplish these tasks automatically. For example, in the connected home, it could order a vacuum bot to clean when the house is empty, or turn a rice cooker on 20 minutes before you arrive."

2) USER AUTHENTICATION

Password-based, simple authentication is becoming too complex and less effective, resulting in weak security, poor user experience, and a high cost of ownership. Security technology combined with machine learning, biometrics and user behavior will improve usability and self-service capabilities. For example, smartphones can capture and learn a user's behavior, such as patterns when they walk, swipe, apply pressure to the phone, scroll and type, without the need for passwords or active authentications.

3) EMOTION RECOGNITION

Emotion sensing systems and affective computing allow smartphones to detect, analyze, process and respond to

people's emotional states and moods. The proliferation of virtual personal assistants and other AI-based technology for conversational systems is driving the need to add emotional intelligence for better context and an enhanced service experience. Car manufacturers, for example, can use a smartphone's front camera to understand a driver's physical condition or gauge fatigue levels to increase safety.

4) NATURAL-LANGUAGE UNDERSTANDING

Continuous training and deep learning on smartphones will improve the accuracy of speech recognition, while better understanding the user's specific intentions. For instance, when a user says "the weather is cold," depending on the context, his or her real intention could be "please order a jacket online" or "please turn up the heat." As an example, natural-language understanding could be

used as a near real-time voice translator on smartphones when traveling abroad.

5) AUGMENTED REALITY (AR) AND AI VISION

With the release of iOS 11, Apple included an ARKit feature that provides new tools to developers to make adding AR to apps easier. Similarly, Google announced its ARCore AR developer tool for Android and plans to enable AR on about 100 million Android devices by the end of next year. Google expects almost every new Android phone will be AR-ready out of the box next year. One example of how AR can be used is in apps that help to collect user data and detect illnesses such as skin cancer or pancreatic cancer.

6) DEVICE MANAGEMENT

Machine learning will improve device performance and standby time. For example, with many sensors, smartphones can better understand and learn user's behavior, such as when to use which app. The smartphone will be able to keep frequently used apps running in the background for quick re-launch, or to shut down unused apps to save memory and battery.

7) PERSONAL PROFILING

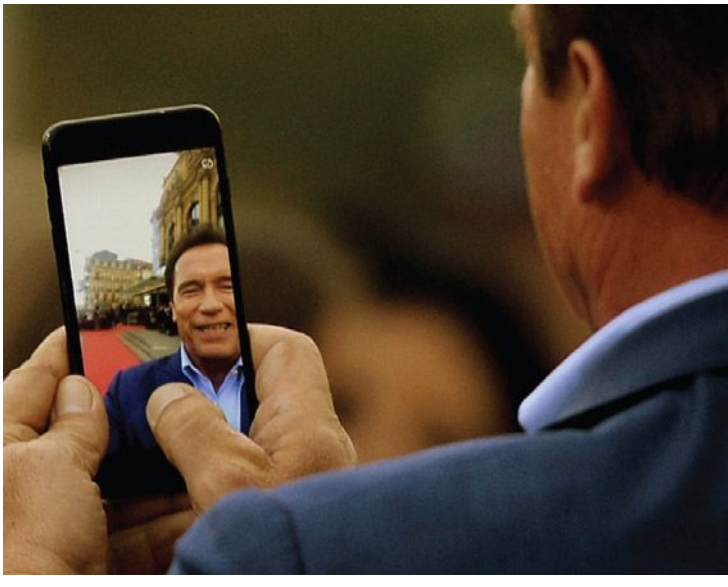
Smartphones are able to collect data for behavioral and personal profiling. Users can receive protection and assistance dynamically, depending on the activity that is being carried out and the environments they are in (e.g., home, vehicle, office, or leisure activities). Service providers such as insurance companies can now focus on users, rather than the assets. For example, they will be able to adjust the car insurance rate based on driving behavior.

8) CONTENT CENSORSHIP/DETECTION

Restricted content can be automatically detected. Objectionable images, videos or text can be flagged and various notification alarms can be enabled. Computer recognition software can detect any content that violates any laws or policies. For example, taking photos in high security facilities or storing highly classified data on company-paid smartphones will notify IT.

9) PERSONAL PHOTOGRAPHING

Personal photographing includes smartphones that are able to automatically produce beautified photos based on a user's individual aesthetic preferences. For example, there are different aesthetic preferences between the East and West — most Chinese people prefer a pale complexion, whereas consumers in the West tend to prefer tan skin tones.



10) AUDIO ANALYTICS

The smartphone's microphone is able to continuously listen to real-world sounds. AI capability on device is able to tell those sounds, and instruct users or trigger events. For example, a smartphone hears a user snoring, then triggers the user's wristband to encourage a change in sleeping positions.

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Intent driven storage – **Beyond the hype and why does it matter?**

Intent driven storage avoids IT administrators to stop walking systems through each step for desired outcomes

There is a lot of buzz these days around intent driven storage or intent based programming. The question is, is this real or another hype years away from reality?

WHAT IS INTENT DRIVEN STORAGE?

At a basic level, you say "what" you want rather than "how" to do it. The details are understood, filled as the intent is instantiated in the storage. Imagine you need to deploy application on storage. Rather than sitting at your console carefully plan capacity, performance needs of application and map the storage hardware on which it is deployed, you interact instead with software that does the work for you. You specify the needs in terms of application objectives - Capacity, Performance, Protection. Behind the scenes the software maps application objectives to storage array technology, finds candidate in the network that meets criteria. Once a suitable storage candidate is located, the software connects two of you.

An illustrative analogy that is well understood is virtual assistant or bots. Imagine you need to plan for a team lunch. Rather than sitting at your computer and scouring the web to find best hotels in the vicinity, you interact instead with a virtual assistant or bots that does the work for you. Behind the scenes, the bot is linked to an API that orchestrates hotel reservation from OpenTable and taxi booking from Uber. Once a suitable hotel is located and taxi reservation is confirmed, the bot connects two of you.

There are three characteristics of intent driven storage:

- Policy – Declarative language captures users intent, a desired goal.
- Automate – Map users goal to actions on systems and automate actions.
- Assurance – Ensure the desired state is maintained.

WHAT ARE THE BENEFITS?

Intent driven storage avoids IT administrators to stop walking systems through each step for desired outcomes. It means mundane operational tasks can be eliminated, allowing IT administrators to work at a higher level. As the level of detailed interaction with storage elements is greatly reduced, the scope for human error is minimized.

WHEN WILL IT GO MAINSTREAM?

Intent driven storage is in early stages. We see some early implementation of intent based storage operational today. With the mounting complexity of system and shrinking talent pool, a paradigm shift is inevitable. We believe the technology will see significant acceleration over the next 3 years. This is the future where the goals are sophisticated, humans choreograph outcomes and storage systems solve their complexity.

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—ANANT MAHESHWARI
President, Microsoft India

Anant Maheshwari, president, Microsoft India, talks about how their new five-pronged strategy is making cloud and digital transformation solutions popular from SMBs to enterprises. Excerpts.

MICROSOFT CLOUD IS THE LARGEST CLOUD GLOBALLY

Now that it has been over a year since you took charge of Microsoft in India, what are the most important focus areas for you as the leader ?

If you look at the overall transition that Microsoft had in the last 3 years globally, that is getting reflected in India too.

But India obviously has its own opportunities that I am excited about. The first is the digital transformation, where from a products and solutions approach we have moved to become digital transformation solution providers for our customers and partners. And how the intelligent cloud and the intelligent edge strategy is bringing big differences is another exciting story. But this whole digital transformation mindset changes the DNA of the company. The second key area for us is our strategy to address the important verticals with sharper focus. We have identified some including BFSI, manufacturing, retail, Government, healthcare, education. And specially for India, we are also focus on IT/ITeS, unicons, and start-ups. So its a global strategy with an India flavor. The third big focus for us here is Digital India, where the key pieces are healthcare, education, agriculture, skilling and jobs.

These are typical problems of a large and growing country like India the Government wants to address, and we are now fully aligned with that. The fourth thing we are doing in terms of our partners. We have carved out all our partner resources in different parts of the company, and created a commercial partner organization which is just focused on success for our partners and how the partners can ensure the success of the customers. While we have one of the worlds largest partner eco-systems, for digital transformation you need partners who understand what digital is all about. That is why special focus on partner skills and empowerment. The fifth one is our SMB market strategy, that is something very unique to India. For the SMBs our plan is focused around specific solutions for them, and also the broadband revolution India is witnessing where, for instance a small unit can access our solutions on the cloud and pay per use. The entire combination of GST, digital payments, access to broadband, and cloud based solutions has come at a great time, and creating newer and newer opportunities.

What will be special or different in the way you handle the 6 vertical that Microsoft will have special focus on?

The first is the expertise and the breadth of solutions. Though intelligent cloud and intelligent edge have become buzzwords and everybody is offering that today, Microsoft's position is different. With Azure, Office 365, and Dynamics 365 clouds we are offering infrastructure as a service, software as a service, platform as a service today, while others are still trying to put that end to end ecosystem and infrastructure together. The second big difference is because of our partnership strategy, specially the ISV strategy where we are partnering with software players and bringing their solutions on our clouds so that the burden of technology and costs is not passed on to the customer. For instance, with Adobe we are working together by linking our solutions for the customer, wherein Adobe products and Azure or Dynamics work together for the customer. Adobe is just one example, but we have worked out a huge global level ISV ecosystem with leading software players in most areas. So its like the best of both worlds for the customers. We have more than 9000 partners in India, much bigger that any of our competitors; and globally our partner ecosystem is bigger than several our our competitors put together.

How do you or Microsoft understands digital transformation. Today it seems to have become confusing, meaning different things to different people?

Digital transformation can be classified into four things. With digital, you engage with your customers much better. You empower your employees to do a lot more.

You can optimize and improve your operations, and do things differently, and create efficiencies and effectiveness in your operations. Or you transform your business model, and offer new services or products to your customers in a very very different way. Teese are the four things that digital transformation can essentially do. For the verticals we are now focusing on, digital transformation will have some play or the other. For instance in automotive and manufacturing the IoT which will lead to things like the connected cars or process efficiencies respectively becomes the driver; in startups its the need for growth that will drive digital transformation, and so on.

So with Microsoft or its ISV, a customer can take a long term bet, and take up digital transformation for one of the four reasons I talked about. And later on other three things could be the reason for getting into digital transformation. But with the Microsofts' base platform you can do lots of thing with a long term plan.

What is special about Microsoft's cloud and cloud offerings ? Cloud is being offered by everyone today

Our cloud has got four very strong and unique features, which differentiates it from what's available in the market today. For instance Azure cloud is hybrid ready, it is productive, it is intelligent, and it is secure. With hybrid, every CIO can decide what mix of on-premise and on-cloud should he go for, keeping in mind his nature of business and time of requirement. With hybrid we also offer you a more open environment, for instance in terms of choosing what solutions you want to use. We can offer the 'best of breed' option to our customers. Secondly, since there needs to be done development and coding to get going on the cloud, the Microsoft cloud platforms have the best tools for developers to be very productive and very quickly. That is very very important for the cloud users. The third strength is intelligence that comes in our cloud platform because there is so much of artificial intelligence, analytics, machine learning that has gone into building it. The built-in intelligence becomes added power for customers, and they do not have to do it separately. It saves times and provides additional capabilities. And finally the security aspect, which is perhaps the biggest concern of users, and rightly so. We spend more than $1 Bn in R&D and engineering for making our products and services secure, and this investment is way too large than the revenues of many pure play security companies. For India, we have opened a cyber security engagement center for our customers, which keeps them updated on what is happening in India and globally. This is a approach where all the security layers are built within the cloud, and the center provides customer a continuous update on detecting and handling cyber security threats and attacks.

How has been the market response in India so far?

Microsoft cloud is the largest cloud globally, according to independent studies, and in India also we are seeing phenomenal response. For instance, 70 out of the 100 BSE 100 companies are on Microsoft cloud. India's top 20 banks are on Microsoft cloud. In the six verticals that we have been focusing, I can confidently claim that the marquee customers are moving to Microsoft cloud. They all see the advantage and the power of end to end benefits.

Can you shed some light on the SMB opportunity and how is Microsoft addressing that

For the SMBs our plan is focused around offering specific solutions for them through the cloud so that they are saved from handling technology, get everything at one place, have a wider choice and are not locked in, need not invest in technology and can pay per use. Thankfully, our offerings have come in at a time when access to affordable broadband is a reality, and the GST policies, and digital payment options are only catalysing SMB users for technology adoption. We recently undertook a campaign where a bus loaded with our technology solutions alonwith experts visited SMB locations and clusters across the country to give them a touch and feel experience. The response was overwhelming from potential customers as well as our partners who will cater to SMB customers. I believe that SMB adoption of technology will be much faster. For us, SMB is bigger than some of the six verticals that we talked about earlier.

How do you see Microsoft's future in India, specially under the leadership of Satya Nadella?

We are looking at India as one of the key drivers of Microsoft's growth globally. And there are now conditions and opportunities that are being created for India to play a big role in our company's growth. I think Satya says it best in his book 'Hit Refresh' that Microsoft has moved from a 'know it all' to a 'learn it all' company. To me the cultural transformation of Microsoft is the bedrock of everything we are apparently doing well, and will continue to do well as we go forward.

VOICE&DATA

Telecom Sector Skill Council

Telecom Manthan 2018

23rd February 2018 | New Delhi

Voice&Data in association with **Telecom Sector Skill Council** is organising **"Telecom Manthan"** a meeting of Telecom Ecosystem & Talent pool in India. It is set to be a vibrant brainstorming session involving all the Stake holders.

WHO WILL ATTEND:

- Decision Makers from Telecom Industry
- Skill Ecosystem Professionals
- Senior hierarchy of Academia
- Senior HR Professionals and L&D Experts
- Training Partners
- Students/ Employment seekers
- Entrepreneurs

Highlights

- 1 Day Forum & Recognitions
- Power Packed Sessions
- Break-Out Sessions
- 300+ Business Decision Makers
- Keynote Sessions
- Awards & Recognitions*

*Subject to last minute change.

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Transition **Pangs**

IT Transformation Hinges Upon Eliminating Friction Between CIOs and CFOs, Says Forbes Insights Report

Despite the high priority enterprises have placed on IT Transformation during the past few years, many of them still haven't found the secret to gaining significant improvements in customer service and a clear competitive advantage from these efforts. A new study helps explain why. Less than stellar IT Transformation results often center on problems that arise between two pivotal players—CIOs and CFOs—and their struggle to work together as a cohesive team.

A new report by Forbes Insights, in association with Dell EMC, "IT Transformation: Success Hinges on CIO/CFO Collaboration," finds that a stunning 89% of senior executives acknowledge that significant barriers exist—ranging from outdated ideas about the role of CIOs to obsolete reporting structures—that keep CIOs and CFOs from collaborating more closely. The study's data derives from a global survey of 500 CEOs, COOs, CIOs and CFOs conducted by Forbes Insights and Dell EMC. The survey and a series of in-depth interviews with global IT and business executives also highlight other underlying frictions that thwart CIOs and CFOs from forming a united front to capitalize on the benefits of IT Transformation.

But a select group of enterprises that succeed in IT Transformation offers hope for ensuring that IT infrastructure modernization strategies can overcome these barriers and deliver concrete business results. In fact, companies that succeed in IT Transformation report the strongest competitive positions and high growth—with gains in both sales and profits of 7% or more in the past year. This group demonstrates a direct correlation between

business success and transformation maturity, with 68% of leaders rating IT Transformation as an established strategic priority and in many cases a component in overall business strategies. The research and interviews also show what best practices IT Transformation leaders have developed to overcome these barriers and enable them to use their digital prowess to increase the value of their businesses. "Some CFOs still see IT as just a cost center, which doesn't make collaboration easy," said Bruce Rogers, Chief Insights Officer at Forbes Media. "And CIOs need to apply their skills to core business processes like supply chains."

"IT Transformation is quickly moving from a differentiator to a non-negotiable strategy for companies seeking to reduce time to market and pull ahead of the competition," said Gaurav Chand, Senior Vice President of Marketing at Dell EMC. "The CIO/CFO dynamic has significant influence in any business—and collaboration between those roles is the key to tying IT investments to business outcomes. Companies not already moving toward IT Transformation need to start now, or be left behind."

KEY TAKEAWAYS

- 89% of senior executives acknowledge that significant barriers keep CIOs and CFOs from collaborating more closely on IT Transformation
- Companies with the most successful transformation efforts see 7+% gains in sales and profits
- IT transformation leaders are more than 2X as likely to report they are ahead of their competition and 2.5X more likely to report return on investment in 12 months or less.
- 85% of global executives plan to spend up to a quarter of their total enterprise budgets on IT Transformation in 2018
- The top three investment areas in the next year will be big data platforms (77%), cloud services (76%) and social-media activities (72%)
- 75% of global enterprises will invest in IT process reengineering, while 69% will automate IT as a service and 67% will install new server technologies
- The top goals for IT Transformation are reduced IT costs (75%), being first to market with new products and services (73%) and reallocating funds to strategic business projects (67%)
- Leading companies see significantly faster returns on their transformation investments, with a quarter registering paybacks within 12 months

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CDOs Vital to **Digital Reinvention of Companies**

A recent global survey of more than 900 executives across 12 industries by Accenture found only 13% companies are positioned to drive both growth and efficiency with digital. Report further states that 64% of the executives fear for their company's survival if they are unable to deliver on these two imperatives with their digital investments

A handbook for Chief Digital Officers summit utilizing data from the global Accenture report and based on interviews with senior digital functionaries across companies was unveiled at the Chief Digital Officer's Summit organized by IAMAI.

Companies no longer perceive digitization as an end state. Instead it is an ongoing process aimed at two objectives: *Greater operating efficiency and New customer experiences*. Realising the potential of digitization, 96 percent of the senior executives surveyed by Ac-

centure globally, say that they are investing in digital to pursue these twin goals. Some of the leading retail companies, interviewed in India for the purpose of the report, for example have started leveraging digital technologies such as virtual reality to enhance in-store customer experiences and drive sales simultaneously adopting digital to optimize operations and achieve higher operational efficiencies.

In an era when over 800 million individuals across the globe are keen to consume hyper- personalized experiences, as many as 84 percent of the executives surveyed in Accenture's global report, believe that delivering differentiated customer experiences will strengthen their competitive advantage. For example, a leading private sector bank in India uses a combination of technologies to create a virtual customer-service assistant which allows customers to carry out transactions and request services by simply typing in a message. This has enabled the company to deliver improved customer experiences.

> "India today has over 400 million internet users, 300 million of them having access to internet on their smartphones. Regardless of which industry you are in today digital transformation is absolutely critical and very important to understand how your consumers are evolving
>
> —**Rajan Anandan,** Chairman, IAMAI & Managing Director, Google India

> "CDOs must use their deep understanding of the business and vast knowledge of the digital tools, to steer the entire organization through the journey of digital reinvention
>
> —**Nachiket Sukhtankar,** Senior Managing Director for Accenture's technology

CDO – THE DRIVER OF DIGITAL REINVENTION

Chief Digital Officer (CDO) is a critical player in the company's success in the digital era. The CDO defines the digital reinvention roadmap and helps lead the organization through the journey. This report further recommends three steps for CDOs to succeed in digital transformation:

Step I: Set a digital-first strategy: Developing a 'digital strategy and roadmap' for the business, rather than simply infusing digital in the strategy of the company.

Step II: Set the agenda in the C-suite: Understand the priorities of the C-Suite and collaborate with them successfully implementing a digital-first strategy and digital reinvention.

Step III: Manage implementation: CDOs should address and meet the six core imperatives, identified through the research, to profitably combine digital technologies, deliver new efficiency gains and create enhanced customer experiences in parallel.

Rajan Anandan, Chairman, IAMAI & Managing Director, Google India, said "India today has over 400 million internet users, 300 million of them having access to internet on their smartphones. Regardless of which industry you are in today digital transformation is absolutely critical and very important to understand how your consumers are evolving, how their behaviours are changing, how their purchasing journeys are changing and then evolve your products and services to be able to delight the consumers. I am very excited about the event that is happening today as well as the CDO handbook that is being launched today and I think it's going to be a must have for every single CXO in the country."

"Rapid changes to technology coupled with falling technology costs and an easier access to capital is leading to never before envisaged technology led innovations. This pace of technology change is unlocking unique digital opportunities for organizations which they can harness to achieve extraordinary gains. Therefore, a Chief Digital Officer (CDO) will play a critical role in defining the digital reinvention roadmap which complements the organization's business journey. CDOs must use their deep understanding of the business and vast knowledge of the digital tools, to steer the entire organization through the journey of digital reinvention," said Nachiket Sukhtankar, Senior Managing Director for Accenture's technology practice in India.

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—VENKATRAMAN SWAMINATHAN
Vice President & Country General Manager,
IT Division, Schneider Electric India

In an exclusive interaction with Dataquest,Venkatraman Swaminathan, Vice President & Country General Manager, IT Division, Schneider Electric India, talks about how data centers and Networks are a high potential market for Schneider in India and how can it play a major role in supporting the IT industry and what are the government-related initiatives in which Schneider is heavily focusing on. Excerpts:

SCHNEIDER ELECTRIC'S SOLUTION FOR DATA CENTER AND NETWORKS ENSURES THAT IT SYSTEMS ARE EFFICIENT

What is so special about your offerings and how does it help your clients?

Our core philosophy is to innovate in a sustainable manner. More than 20 mn people have benefited from our Access to Energy offers/ Our Planet & Society barometer reached 8.48/10, outpacing the year-end 2016 target (7.5/10).

For the first time since inception in 2001, we joined the FTSE4Good Global and Europe indices. We support and challenge partners to reduce their own energy consumption by 30% through active energy efficiency solutions. Schneider Electric aims to change lives of people at the base of the pyramid by providing access to clean energy or by helping to alleviate fuel poverty. We do so by delivering connected energy and efficiency solutions in more than 100 countries. As the global specialist in energy management and automation, Schneider electric is at the forefront to leverage opportunities from today's megatrends of industrialisation, ubranisation, and digitisation.

Our Six strategy pillars guide our efforts:

1. Energy Efficiency everywhere: We strive to answer the world's new energy challenges by boosting energy efficiency everywhere, in our homes, buildings and cities, industries, the grid and throughout remote communities

2. Improved, productivity, precision and efficiency: We serve the increasing need for automation as a proven way to help customers thrive. Customers have asked for improved productivity, precision and efficiency. We are answering those needs.

3. Digital transformation of customers: We innovate at the convergence of operational technology (OT) and information technology (IT) to deliver 'Innovation At Every Level'. We create new opportunities that create customer's lives easier, increase productivity and create new business models.

4. Expanded presence in new economies: We are expanding ourseleves in new econoies to leverage opportunities, to respond to ever-growing energy, infrastructure and industrialization needs through dedicated efforts.

5. Two complementary business models: We continue to advance both product and solution business models to create new opportunities for customers, distributors, and direct partners as we work together to improve efficiency everywhere.

6. Responsible, sustainable growth: We care about profit but only within the hand-in-hand context of responsible sustainable growth that nurtures concrete efficiency improvements based on our trusted research and development.

Coming back to our digital architecture EcoStruxure. It is an open, interoperable, IoT-enabled system platform that delivers enhanced value around safety, reliability,

efficiency, sustainability, and connectivity. It leverages advancements in IoT, mobility, sensing, cloud, analytics and cyber security to deliver Innovation at Every Level. This includes Connected Products, Edge Control, and Apps, Analytics & Services. EcoStruxure for Data Center and Networks offer Solutions and services for data centers to ensure IT systems are highly available and efficient.

What are the key verticals that you believe can yield great returns for the company?

Schneider electric's IT Division offers span across different technologies, environments and segments, both in the IT application area and Industrial application areas. These environments span from Home and Business networks, Server room/IT room, Edge computing, Datacentres, Industries with critical process automation application areas, for example healthcare, Semiconductor, Oil and Gas, Food and beverages, Smart Buildings and Smart cities too. The next wave of data center improvement will be driven by the need for connectivity and using technology to enable our customers to effectively manage inherently complex environments.

While in the past we focused on improving the management of one facility, the emerging ecosystem of hybrid cloud computing has shifted the management of your infrastructure into an exercise of managing multiple facilities with virtualized environments. Hence, we are moving beyond just providing the software tools and architectures, but are embarking on what we believe is a new integrated system between IT and OT. This will include the underlying digitalised services to simplify the ecosystem and ensure the industry is being responsible with its use of energy.

> "We think the biggest opportunity for the industry has to do with utilizing the vast quantities of data enabled by IoT combined with Big Data analytics as a catalyst for the next wave of innovation"

A consumers' appetite for information is insatiable and exponential, yet our resources are limited and precious. Our moral obligation is to ensure Schneider plays a role as a leader to bridge this gap. We are one of the only company with the portfolio to play this role. With this philosophy, we think the biggest opportunity for the industry has to do with utilizing the vast quantities of data enabled by IoT combined with Big Data analytics as a catalyst for the next wave of innovation. With the emerging technologies we are introducing, we can go beyond just instrumenting a data center and providing data to the data center operator. We can now consolidate millions of data points every minute from multiple data centers and use sophisticated data mining tools to spot trends. Not just in one data center, but in the hybrid ecosystem as whole.

Why Data Centers and Networks are a high potential market for Schneider in India and how can it play a major role in supporting the IT industry.

Increasing reliance on data by organisations, emphasis on optimization of business processes and Digital India initiative of the Government are anticipated to increase demand for data centers and networks in India. Added to that, is the rise in data usage due to smartphones, social networking platforms, e-commerce platforms, and government projects.

India's co-location and hosting market will generate almost $2 bn in annual revenue by 2019, up from just $1.3 bn in 2016, with most of the growth focused on the metropolitan centers of Mumbai, Chennai, New Delhi and Bangalore. As per 451 Research, 84% of the country's data center supply is presently concentrated across its five largest markets: Mumbai, Chennai, New Delhi, Bangalore and Pune. Also, almost a third of all existing white space in the country is located in Mumbai, due to its status as a major financial hub, its population of 21 mn and coastal location, in close proximity to submarine cable landing stations. The report estimates a strong growth for the Indian public cloud market, which is expected to increase by a quarter every year through to 2021, reaching $1.02 bn in annual revenue. This is where Schneider Electric has a key role to play and can help in sustaining growth of data centers through its critical power solutions. By implementing integrated energy management solutions, one can potentially save up to 30% of the power requirement of data centers. Schneider Electric's solution – EcoStruxure for Data Center and Networks ensures that IT systems are highly available and efficient.

According to you, what are the steps required to reduce carbon footprint of IT industry in India with reference to data centers?

Let us look at the numbers. Data centers of today are major energy guzzlers. To put things in perspective, a typical data center consumes 3% of the global electricity supply and account for 2% of total greenhouse gas emission – which is almost equal to the carbon footprint of the entire airline industry put together. Inspite of several innovations in hardware that enormously increase storage data capacity, the amount of energy consumed by data centres is doubling every four years. It is projected that data centres will consume roughly triple the amount of electricity in the next decade.

Since the highest percentage of energy guzzler in a DC is the HVAC, proper monitoring, management with a lifecycle approach is the best strategy to not just reduce carbon footprint but also increase the functionality, operational efficiency and uptime of the Data Center.

Data center life cycle – Data centers are dynamic and constantly evolving and hence, it requires complete service solution to optimize its functionality from planning to operations, regardless of where it is in the life cycle. Understanding the bigger picture – what occurs in each of the phases, what the key management tasks are, what pitfalls exist, and how one phase impacts the next – can help organizations achieve their data center cost, speed of deployment, availability and efficiency goals.

Our expertise is gained from commissioning thousands of data centers across the globe. We provide on-site and remote resources to maintain and optimize your data center infrastructure for every component in the rack, row and room. Schneider Electric provides more maintenance, operation, monitoring and optimization services than any other company.

Maintain: A comprehensive services portfolio is available to ensure your critical applications receive proper care and maintenance, to operate at optimal levels at all times.

Operate: Schneider Electric provides multiple offerings based upon our proven methodologies and comprehensive procedures.

Monitor: A continuous on-site or remote data center enables you to anticipate, identify and resolve issues faster, and with greater accuracy, while retaining visibility and control.

Optimize: Ensure your data center is optimized for the highest-possible performance.

> “We provide on-site and remote resources to maintain and optimize your data center infrastructure for every component in the rack, row and room”

What are the government-related initiatives in which Schneider is heavily focusing, especially in the context of Digital India?

Digitization is something we are focussing on bullishly. Digital transformation is at the core of our strategy, and we are committed to catapult this journey through our customers and partners. Internet and Digitisation are changing the way we work and play and are also creating opportunities for new services. Businesses are increasingly digitizing their operations and expect a complete digital experience from their suppliers, from ordering to customer service.

There are multiple factors that are prompting the growth of the Indian IT segment and vis-a vis the data centers in the country. The avalanche of data with technological advancements, government initiatives like Digital India, Startup India, Stand Up India, adoption of JAM (Janardhan, AADHAR, Mobile), and the roll out of the national optic fiber network are providing a fertile ground for data center business in the country. Also, new technologies such as Big Data, Analytics, Software-Defined Everything and Internet of Things (IoT) have led to accelerating demand of data center consolidation and virtualization.

In the wake of burgeoning interest in the Internet of Things (IoT) and digital business transformation, new opportunities are set to emerge and associated risks will need to be dealt with. Doing so will involve high levels of cooperation between IT and the groups managing the operational technology (OT) monitoring or controlling the physical devices and processes in the enterprise. With IT/OT convergence, products will now be connected and can be remotely controlled to optimize operations. This will result in the feasibility of implementing active energy efficiency which in turn will create new business models and new opportunities in the domain of smart products, systems and services such as smart grids and smart factories.

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Payment Frauds During **ATM And Digital Transactions**

While ATMs have revolutionized banking, but at the same time, it is prone to hacking by criminals. Here we look at how ATMs fall prey to hackers and ways of securing it

An ATM is an electronic banking outlet, which allows customers to complete transactions without the aid of a branch representative or teller.On most modern ATMs, the customer is identified by inserting a plastic ATM card with a magnetic stripe or a plastic smart card with a chip that contains a unique card number which is linked to the customer's bank account and some security information such as an expiration date or CVVC (CVV).

Authentication is provided by the customer entering a Personal Identification Number (PIN) which must match the PIN stored in the chip on the card (if the card is so equipped) or in the issuing financial institution's database. Cardholder's data continues to be a target for criminals. The technological advances have boosted the growth of ATM users exponentially, but at the same time, the number of attacks/frauds has also increased. These attacks could be counted as a security risk

in the form of card cloning, ATM skimming or PIN release etc.

TECHNIQUES/ TOOLS USED IN ATM FRAUD

Physical obstruction

The fraudsters insert a folded piece of plastic film into the ATM card slot which holds the card and does not allow it to be expelled by the machine. The victim believes his card to be caught in the machine and doesn't notice the card slot has been tampered with. Once an inserted card is struck, a fraudster pretending as a genuine cardholder will suggest to re-enter his or her security code, at this moment the fraudster reads that PIN code. When the cardholder leaves the cabin in frustration, fraudster takes the card and makes transaction using the captured information.

ATM Skimming

It is a method used by criminals to capture data from magnetic stripes on the block of an ATM card. Devices used for skimming are smaller than deck of card and they are put very close to or over the top of ATM's card reader.

(A) Normal card entry interface (B) Skimming device at card entry interface (C) Skimming device 'Piggy Backed' onto card reader

Figure (A) above shows normal interface in which flashing card indicator can be easily seen. Most skimming devices will obscure the flashing card entry indicator. This detail serves as a vital clue in identifying suspect tampering. In Figure (B) skimming device is attached to card entry slot. Figure (C) shows how a skimming device piggy backed onto card reader and the shape of snout is different form Figure (A).

Keypad Overlays

It is a new technique- designed to go unnoticed and blend in with the standard ATM keypad. It captures keystroke (i.e. steals customer PIN) when the customer enters his/ her PIN into the dummy keypad placed over the existing ATM keypad. At the same time the ATM card slot overlay facsimiles/records the confidential data from magnetic strip of ATM cards. Hackers/fraudsters assemble information in their computer to clone the ATM card by using blank card stock.

ATM Cloning

It is a process of making a duplicate card using the data captured from the original card. Fraudsters attach a skimming device on POS (Point of sale) holder/ ATM machine. Whenever a user swipes his/her card, the information from magnetic stripes goes to the skimming device, which can capture all details such as subscriber name, account details and other security details etc. After this, the user is asked to enter the PIN, which is read by the fraudster either through camera or manually. The fraudsters use this information to make a duplicate card.

Phishing/Vishing Attack

Phishing scams are designed to attract the user to provide the card number and PIN.

(a) Using Mobile: Attacker pretends himself as bank representative and claims victim's account/ card is being blocked citing security reasons and to avoid it, the user is asked to give the card and bank account details such as bank account number, card number, CVV, PIN etc. Using these details attacker makes an online transaction and then user is asked to tell the One-Time Password (OTP) received on his/her mobile. As soon as the user reveals the OTP, the transaction is carried out using user's banking credentials.

(b) Using E-mail: The user is asked to click on a link and follow the directions provided. The link however is a fraudulent one and directs the user to a site set up by

the attacker and designed to look like the user's bank's website. The site directs the user to input sensitive information such as card numbers and PINs. The information is collected by the thieves/criminals/hackers and used to create fraudulent cards.

Way forward: Methods to increase security:

- Lack of education AND awareness around payment security, poor implementation and maintenance of the

Payment Card Industry – Data Security Standards (PCI - DSS) and Payment Application-Data Security Standard (PA-DSS) leads to many of the security breaches happening today. So, the banking institutions must adopt the latest PCI -DSS and PA-DSS to ensure the security of card holder's data as this is a shared responsbility.

- For ensuring CIA Triad compliance in digital transactions, we can make use of concept of 5 y's:

Something you know – e.g. PIN and Passwords for online login

Something you have – e.g. OTP which we receive on our mobile device or in email

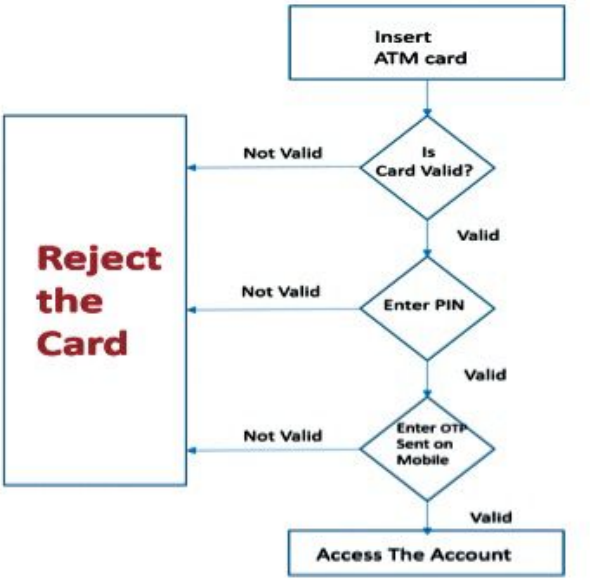
Something you are – e.g. your physical attributes or Biometrics which have been used in Aadhar cards

Somewhere you are – e.g. Location based services, can be used for very secure transactions

Something you do – the way you use keyboard or touch screen of your smartphone for entering your details, the speed and style can never be copied.

We can select any 2 or more authentication factors for ensuring confidentiality and authenticity during digital transactions.

For example, one such method to increase security of ATM transactions is by linking mobile number with Bank account. Whenever any transaction is done using an ATM, a one time password (OTP) should be sent to the customer's registered mobile number and transaction to be completed whenever this two-step



Two- factor authentication for accessing ATM

authentication with the help of PIN as well as OTP is completed.

(The authors are Officers of Indian Telecommunication Service and presently working in Department of Telecommunications, Ministry of communications, Government of India)

PRODUCT REVIEWS

A Powerful Marketing Vehicle

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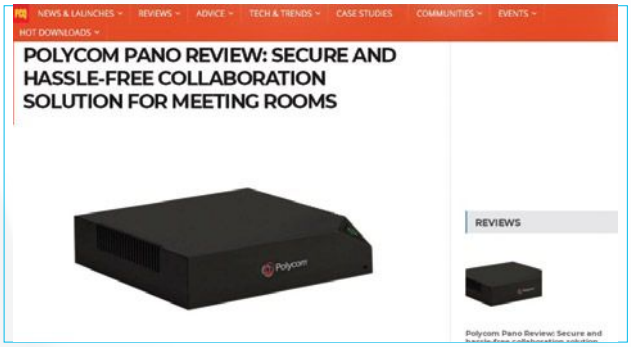

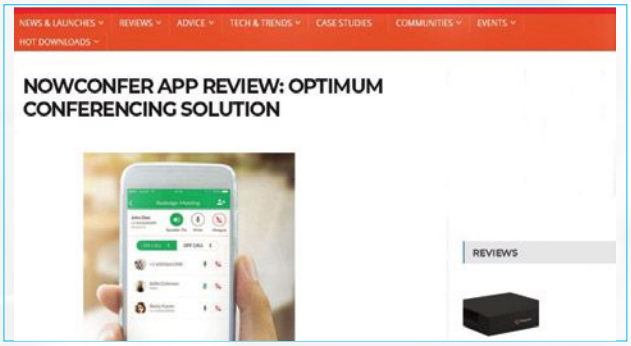

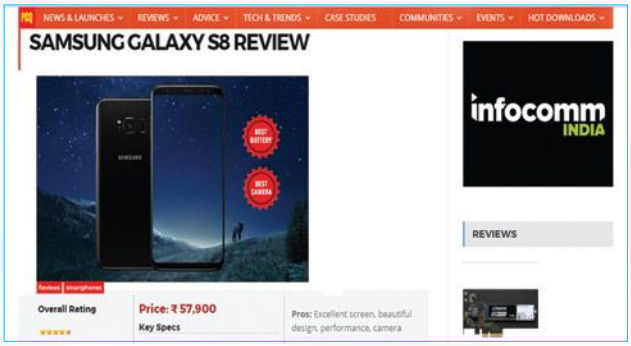

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Cyber Analytics Driven Threat Hunting: **The Next Step for Data Security Management**

Threat Hunting is an analyst-centric process which requires a significant investment of personnel, equipment, and time

The barrage of technology in the 21st century is pushing organizations to keep up with the pace of innovations for delivering expanded and more efficient services to their customers. The disruptive technologies like Cloud Computing, IT Mobility, Internet of Things, Industry 4.0 etc. are reshaping the world faster than ever before and have paved the way for digital transformation. But embracing these technologies necessitates the enterprise to connect with external stakeholders including customers, service providers, vendors, and regulators. And such integrations can expose organizations to a host of malicious attacks & breaches. In addition to this, the emergence of lethal threats like ransomware has rendered Security Operations Centers which rely primarily on preventive technologies, and rule & signature-based detection mechanisms ineffective. This evidently emphasizes the need for organizations to adopt smarter ways to tackle the ever changing threat scenario.

As organizations do not have the key information to contextualize and lack the trained resources for performing the risk analysis, the primary challenge it faces in threat detection and risk mitigation, is gaining visibility into their environment. In the wake of this stumbling block and the ever-intensifying threat scenario, CISOs now want to know the answers to pertinent questions like the real-time risk posture of the company? Any Misbehaving users or Machine on the network? Indicators in case the networks are compromised after making a

transition to cloud services? The intensity of a potential malicious breach?

SIGNIFICANCE OF THREAT HUNTING

This is where Threat Hunting can play a key part. Threat Hunting is a proactive and iterative approach to security and enables the company to answer the questions above. In essence, it is the process of looking for the traces of attackers (past and present) in your IT environment. The process helps find those traces before any alerts of their activities are generated by security devices. Threat Hunting enables the company to consistently address the following:

- Maintain a continuous threat awareness
- Hunt for unknown behavioral based anomalies
- Analyze threat intelligence feeds and convert it into actionable tasks
- Aid in providing input to monitoring team

KEY CHARACTERISTICS OF THREAT HUNTING

Threat Hunting is an analyst-centric process which requires a significant investment of personnel, equipment, and time. The advanced knowledge a hunter possesses of the Enterprise Threat Landscape and his Data Analysis skills are the primary two aspects of threat hunting. It is not about waiting for an alert or another signal; rather, it's about going and looking for an intruder before any alerts are generated. Most experts agree that hunting is not about following the rules, but about a creative process and a loose methodology focused on outsmarting a skilled human attacker on the other side.

VALUE PROPOSITION OF THREAT HUNTING FOR AN ORGANIZATION

Immeasurable sums of money, manpower and time has been invested in developing a resilient security infrastructure. However, organizations still struggle to identify and respond to cyber intrusions in a timely manner. Threat Hunting has recently emerged as a proactive defense asset capable of methodically detecting and responding to advanced security threats that bypass the traditional rule or signature-based security solutions. An Organization equipped with Threat Hunting is better enabled to uncover hidden and entrenched threats as it reduces the attack surface resulting from discovered and removed weaknesses. Threat Hunting allows for sweeping systems clean before a critical mission or business transaction. It paves the way to validate that the controls, - both preventative and detective are actually working, and no threats are entrenched in the environment.

Threat Hunting is a way to flip the age-old security maxim, "the defender needs to close all holes, but the attacker needs to just find one hole to get in." Specifically, with hunting, an attacker's sole mistake is likely to lead to their discovery and removal, while the defender can cast its net many times to find the mistake.

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10 Strategies to Modernize **Customer Support Operations**

While it's certainly been overused, the old saying is still very true – the customer truly is king. Most organizations struggle with multiple time-consuming customer service manual processes and functions in siloes that collaborate little with each other

According to Salesforce research, 92% of senior executives believe that customer experience is a key competitive differentiator and that they view customer service as the primary vehicle for improving the customer experience.

Today's demanding customers want instant gratification. Many organizations are grappling to cope with all the advancements, while they are still stuck with the traditional customer engagement model that is primarily centered around telephonic interactions and emails. No wonder, customer support is looked upon by many organizations as a separate cost center.

The quality of support extended to customers directly impacts the brand value in the market. No longer can an organization afford to be a customer support laggard. According to Forrester, 72% of businesses say that improving the customer experience is their top priority.

Unlike the traditional customer engagement model that focuses on revenue creation, the modern customer engagement model is focused on value creation and that

offers an excellent end-to-end customer experience and real-time customer support.

Here are the 10 best strategies to modernize customer support operations and transform it into a growth engine.

DIGITAL - ANALYTICS TO PREDICT BEHAVIOR AND JOURNEY MAPPING

To deliver a superior-quality customer experience continuously, businesses must embrace Journey Analytics that combines big data, advanced analytics and functional expertise. This helps them leverage multiple data points across customers, channels and touch points, and empowers CX experts to predict their future behavior. Using the journey map, CX professionals can formulate the roadmap to engage customers via their preferred channels and offer personalized customer experience.

ROBOTIC PROCESS AUTOMATION

Robotic Process Automation (RPA) is one of the most recent frontiers in customer support. Regulated industries with high volume and transactional business processes can employ RPA to build more cost-effective, compliant and optimized business processes, while driving customer experience. However before incorporating the robotic technology, it's imperative for businesses to do thoughtful due diligence and identify the opportunities, risks and needs for effective delivery.

OMNI-CHANNEL SUPPORT

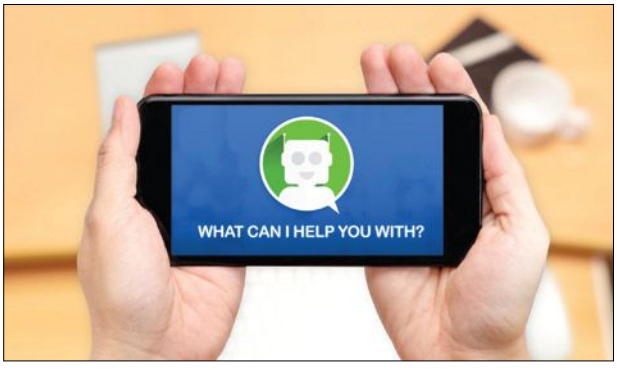
Channel choices have empowered customers of today. Conversational commerce has revolutionized the way brands interact with customers. Mobile experiences are more optimized than ever. Omni-channel customer support is a fundamental component of customer experience today. It's critical to delivering personalized customer experience. We live in an always-on world. A Forrester Research report states that only 36% of contact centers have implemented multichannel integration to provide consistent experiences; 70% do not train agents to support multiple channels. Being an omni-channel brand makes it accessible to customers 24/7 in today's highly connected modern world.

MOBILE BASED CUSTOMER SUPPORT

Frantic use of mobile devices for everything has urged organizations to rethink their customer support strategy. Customers prefer to contact brands on their mobile de-

vices. Businesses need to adopt a mobile-first mindset and align it with their customers' journey to stay competitive. A mobile-based customer support approach added to the corporate website makes it more user friendly and the brand accessible to customers round the clock. "By 2020 40% of sales organizations will rely primarily on mobile digital technology for their sales force automation initiatives." Source – Gartner

CONVERSATIONAL INTERFACES



Conversational interfaces blend voice recognition and NLP technologies with AI that understands a user's intent and context. These interfaces can disrupt the customer support department. CS representatives can optimize the chatbot experience and interact directly with customers only when required. SMBs with limited bandwidth, in particular, can leverage conversational interfaces for customer engagement, without dedicating additional human capital. This conversational intelligence can help organizations establish customer trust, driven by contextual conversations.

SELF-HELP AND DIY

Many customers report a dip in satisfaction post sale about slow response times, no resolve product issues or questions, issues related to product use, etc. Today, customers are increasingly choosing self-service over contacting a CS representative. Self-help and DIY is the quickest and one of the most effective ways to rev up the customer support function. An analysis by Gartner predicts 50% of online customer self-search activities will happen through a virtual assistant for at least 1,500 large enterprises.

INNOVATIVE PRICING MODELS - OUTCOME BASED AND GIG ECONOMY

We live in a gig economy, a unique environment in which it's difficult to command a monopoly. In this context service providers are responsible for delivering outcome driven services based on SLAs. Forward-thinking organizations are plugging in innovative business models around their services that prompts them to offer transparent, dynamic pricing model that ensures that all customers are aware of its dynamic rates, offers, company policies, etc. Such initiatives establish customer trust and bring in new revenues opportunities.

VIRTUAL PERSONAL ASSISTANTS

Virtual personal assistants will be the leading theme for customer support in 2020 and beyond. These work well within budget; can do multi-tasking; help an organization stay connected with customers 24/7; empower businesses to delegate; and eventually grow as your company grows. More so, these are intelligent and effortless

customer support channels that help customers find the information they need, anytime, anywhere.

AI LED WORKFLOW OPTIMIZATION AND PROCESS MODERNIZATION

Unlike traditional customer support function, AI-fueled

workflow optimization involves using pattern recognition and algorithms to make data predictions. AI collates the knowledge of subject matter experts and makes that available to support agents, who use this information to optimize workflows or processes and hence, cut down on customer resolution windows. AI tools also help collaboration processes.

SOCIAL MEDIA

Customers are increasingly flocking to social media platforms to provide feedback to brands, make pre-sales enquiries and also throw their complaints at brands. Organizations can assign social media responsibilities to marketing and product teams, who can offer a great support to customer support function in solving customers' questions or problems at a faster rate.

CONCLUDING THOUGHTS

The new pressures emerging due to the ever-changing customer and technology environment have led to innovation and disruption in the customer support function across industries. By improving customers' experience and problem-solving facet of the customer support function through multimedia and online support, a business can build customer relationships, customer loyalty, and increased revenues.

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VP & GM – India, Hitachi Vantara

WE HAVE CUSTOMERS WHO TELL US THAT THEY ARE DATA RICH, BUT INSIGHT POOR

What led to the inception of Hitachi Vantara? Can you shed some light on that?

If you look at the development in today's marketplace, data has become the new currency. Some even refer to it as 'the new oil'. But data on its own does not add enough value. If you look at today's problem statement, it is very clearly focused on the usage and monetization of data. We have customers who tell us that they are data rich, but insight poor. In fact, if you look at various statistics from analysts, there is a proliferation of data, but only 5% of it is analyzed, and only 0.5%of that data is operationalized. That is a huge amount of data that is locked in silos, which is why customers are not able to derive enough value from their data.

If you look at our individual businesses - Hitachi Data Systems was focused on providing the best-in-class enterprise data management and infrastructure for customers, Pentaho was focused on providing data integration and business analytics, and thirdly, Hitachi Insight Group was focused on providing IoT solutions for customers. When we looked at it through the lens of the customer, we realized that data proliferates across - business data, human-generated data, as well as machine-generated data. So, there was a need for the creation of a new digital entity. Hitachi Vantara, which unifies all the 3 companies, provides us with a unique proposition of being a data company. Today, we are being viewed as a data management and analytics company and an industry expert in technology and business outcomes that entirely sums up as a great software and solutions company.

What is the kind of a milestone you have set in terms of addressing all those digital transformation demands?

We are positive about the accomplishments and success that we can achieve for our customers and partners. If you look at the Indian market today, there is no clear leader in the IoT space. Given our differentiation, we aim to lead the IoT market. We are already servicing 85% of the top 300 customers for data management and infrastructure. These include customers from the banking, telecom,

manufacturing, ITeS, healthcare and government sectors. Our proposition aligns very clearly with the outcomes that customers want to achieve. The 3 big initiatives in India namely, 'Smart Cities', 'Digital India' and 'Make in India' provide the scale and complexity to comprehend, interpret and achieve the desired results. We see a huge opportunity for Hitachi Vantara as we help our customers transform today and prepare them for tomorrow's problems and challenges. These opportunities present the greatest problems that Hitachi Vantara can solve. Such initiatives are at scale in India, unlike the other parts of the world.

Can you talk about the digital transformation adoption dynamics?

If you were to look at statistics, 40% of customers in India have already embarked on various digital transformation initiatives. Over the last 12 months, we have been collaborating with these customers who have already embarked on their digital initiatives to provide various solutions to achieve significant outcomes. For example, in the banking sector, we are helping customers unify data from disparate applications and infrastructure to create a data link that helps them have a single view of their customers, as well as a 360-degree view of their customers. This helps them make important decisions in terms of how they can automate and create an omnipresent channel to service a particular customer or create new products and solutions personalized for that customer or service.

We are already helping government establishments achieve real-time governance by integrating IT, OT and human-generated data, to derive valuable insights and understand the consumption of citizen services to deliver effective and efficient outcomes. We have already started to deliver these solutions in the Indian market 6 to 12 months back, and the results have started to show. Prior to FY '17, we had 50% of software and services, today, it has jumped up to 62% of software and services.

The second part of our business result includes new technologies around analytics and object storage. Object storage is becoming the new data lake, and metadata is becoming the new data. That business is already growing more than 50 % year-on-year. The analytics part of our business is already growing 100% year-on-year, so we see significant traction in the Indian market. The bigger part of the equation is about how we are now enabling digital integrators to create new solutions and services, and cater to new markets with these partnerships and the expertise and technologies that Hitachi Vantara brings.

You mentioned about data being underleveraged. Is it due to the inefficiency of the current BI toolsets, or what are the core reasons that are leading to that?

The first reason is the need to get the right kind of data insight. Data is either tied to an application, infrastructure, organization, or a cloud provider. Therefore, data silos are the number one reason why monetization has not yet happened. The second reason is that there are silos of organizations that exist in the enterprise, because of which data cannot be democratized for usage and monetization. The third reason is the fixed mindsets in organizations. A fixed mindset involves people playing the game to not lose. And then, you have the growth mindset, wherein; it involves people who believe they play the game to win. Both are completely different. In addition, fixed mindsets do not allow the segregation of data, making it independent to be monetized. The fourth reason why digital transformation initiatives have failed in the past is due to the lack of leadership.

Our belief is that if you want to drive successful digital transformation initiatives, you have to first believe that data is the new currency. The second is the need to have control over your data and not for it to be with the cloud provider, app vendor, infrastructure provider, middleware nor the network provider. The third belief is that the outcomes must be very clearly articulated in business terms so that it can be measured and sponsored by the right leadership. These are the 3 reasons that we have understood from our customers.

With data being the new currency, is it going to jumpstart IOT? Also, can you also talk about your new IoT platform – Lumada?

I completely agree with the statement that data is really going to jumpstart IoT. If you look at IoT, there are 3 important principles. The first is that you should be able to measure all the data to analyze it. The second principle is the management of data to give it the right structure, security, and analysis mechanism. Lastly, the third principle is the improvement cycle, which must be measured or benchmarked against the best quality of a device, product or a service –and that is where the industry expertise comes in.

We have leveraged these 3 important capabilities to design our IoT platform. I refer it to as the 'IoT Platform'

because this industry is going through a rapid transformation and acceleration. Therefore, designing a product to help customers address the IoT marketplace would not be the right approach because of the rapid rate at which technologies change. The second approach is to put together a service. One does not need to have the industry expertise and experience to record measurement and improvement. What we did was that we came up with a platform approach, called IoT Lumada. Lumada in Japanese means 'illumination with data'. This platform, which consists of 5 pillars, helps our customers bring different types of data together to achieve business outcomes.

The first pillar is the Lumada Foundry. It is the foundation for preparing a customer to achieve the desired business outcomes. It could be a decision around on-premise deployment, cloud deployment or a hybrid deployment, and with that comes the need for appropriate security architecture. The second pillar is what we call as the Lumada Edge Analytics, which focuses on identifying the asset, collecting data from the asset, processing that asset, securing it and moving it to the third pillar, which is the Lumada Core. This pillar prepares the digital twin of that physical asset. For example, if I am servicing a train, I can create a digital entity of the train and various sub-components of the train in Lumada Core. This helps me execute asset management and undertake asset utilization that blends edge data, business data, and human data. The fourth pillar is called Lumada Analytics which applies the appropriate analytics algorithm, whether it be business analytics, data processing, artificial intelligence, machine learning algorithms, cognitive analytics or even a form of augmented reality.

Once the required analytics is done, we can benchmark it with the various solution cores that are essentially industry templates that we built over the last 107 years. When you have a benchmark, descriptive, predictive, and prescriptive analytics is possible and all at the same time in the fourth pillar, which is the Analytics pillar.

The fifth pillar is the Lumada Studio. It is nothing but a beautiful set of widgets which help you visualize data at the point of decision making. With the Lumada Studio, we let businesses dictate how they want to visualize data of the physical asset through a digital avatar. So, they can see and visualize the motto in various parameters and the insights that have been derived. For example, I earlier referred to the train as an IoT entity. But for me to successfully execute the outcome in terms of improved safety and improved revenue, I need different people in the organization to view that data. Be it an operation manager who would be interested in predictive maintenance and eliminating control, or the Chief Strategy Officer who would be interested in looking at patterns of the past and any alignment to the current trajectory that they are doing. The CFO would be focused on how much traffic is coming and going out, as well as in understanding the revenue metrics. That is why Lumada Studio helps you visualize data in the form that you need during the decision-making process.

Overall, that is what the Lumada platform is all about and it is how we can go ahead and help customers accelerate their business outcomes.

So, to finally look at it, in order to leverage Hitachi Vantara as a brand, are you recalibrating your processes and competencies?

Well, this was a journey that was well planned. We already had that journey traverse very efficiently before we started out. It has been a couple of years since we started to make decisions around our revenue portfolio and decided to go beyond storage and IT.

Therefore, our revenue composition went beyond storage to include IT technologies and solutions. We started to engage with various other constituents outside of IT especially around the lives of business, operational resources, finance department and most importantly the CEO himself. Therefore, that journey has already been initiated and accelerated over the last 36 months. If you look at our approach today, the revenue has moved to business functions that are looking at how they can reduce money, how they can go ahead and find new revenue streams and how they can find new markets faster than their competitors. Although IT is a part of our conversations, the focus has shifted to business outcomes.

What would be your top priorities for the next 12 months for India?

The priorities are very clearly going to be on enhancing the acceleration of our software and services. We have already executed that very successful. As I said we moved from 50% to 62% of software and services. That has started to reflect in the results that we have shown, for both object storage, which is growing more than 50%, and analytics which is growing more than 100%.

The third priority is to understand how we can take these solutions, co-create it with our digital integration partners and enhance their existing portfolio to go to new markets or start to co-create new solutions by leveraging our Lumada Platform. Those would be the top 3 priorities for us.

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Hyperconverged Infrastructure Eases **IT Transformation for Hybrid Cloud**

Deploying HCI solutions reduces costs, simplifies deployment, improves operational efficiencies and eases scaling for organizations of all types and sizes

While "the cloud" is often considered a place, the reality is cloud is an operating model that leverages modern technology to implement it. Adapting to this new model requires transformation of both technology and IT operations. A 2016 State of IT Transformation survey conducted by Dell EMC and VMware found that, although the majority of respondents have been considering moving to a cloud model since 2010, 90% are still in evaluation or proof of concept mode for hybrid cloud six years later. Why is it taking so long?

When I talk with customers about why their hybrid cloud initiatives are slowed, they tell me IT transformation requires a great deal of planning, evaluation, re-organization and modernization of infrastructure technologies and applications. Every organization approaches IT transformation at a different pace, and not every organization will want to deploy a full cloud service delivery model now or even in the future. Multiple factors, including costs, skill sets, drive to innovate and willingness to transform, contribute to an organization's approach and will determine if and when IT management teams move from traditional siloed organizational structures to infrastructure management and then cloud services management teams.

HCI SYSTEMS ACCELERATE IT TRANSFORMATION

One of the first steps toward an organization's transformation journey – and their journey to a hybrid cloud operating model - is to simplify infrastructure deployment and management by introducing hyper-converged infrastructure (HCI) into the environment. HCI solutions that collapse traditional three-tier infrastructure by natively integrating compute, storage, networking, virtualization, management and data services significantly reduce IT administrative tasks and create the foundation for a modern IT infrastructure.

Adoption of HCI solutions has increased rapidly over the past few years. According to 451 Research, more

than 60 percent of surveyed customers already have or are looking to deploy HCI. IDC predicts the market for HCI solutions will surpass $7.6 billion by 2021, as the fastest growing converged infrastructure systems market segment hands down.

Deploying HCI solutions reduces costs, simplifies deployment, improves operational efficiencies and eases scaling for organizations of all types and sizes. There is no one particular application or operating model that is driving adoption, rather it is being deployed for a wide variety of workloads across organizations of various sizes.

Regardless of vertical, workload or business driver, the ability to modernize the underlying infrastructure is not wholly related to technology; it is also an issue of organizational readiness.

MAPPING HCI DEPLOYMENTS TO TRANSFORMATION GOALS

As with many strategic decisions, there are multiple factors to consider when transforming with HCI. Customers that have or plan to adopt HCI have said that cost reduction, accelerated deployment, improved operational efficiencies, improved ability to scale and reduction in infrastructure tasks are the top benefits they expect to realize when implementing it.

The key factors that should determine which HCI deployment is best are the desired end state and the operational readiness to realize that end state. This can be referred to as the desired "destination" defined by both the degree of infrastructure and operational transformations.

For example, a vendor can supply a turnkey private or hybrid cloud infrastructure; however, if the organization has not transitioned to developing cloud services teams that know how to manage a self-service catalog and a fully automated infrastructure, the desired end state likely will not be realized.

Fortunately, organizations can transform at a pace that makes sense for their business model, and each HCI destination provides different levels of the desired benefits along the way. If organizations choose to gradually adopt HCI, each operational change they make along the way applies to the next destination, further accelerating their transformation.

For organizations that are just beginning their IT transformation, consolidation of compute and storage virtualization infrastructure and operational management is a natural place to start. HCI appliances enable them to start small and scale out as the IT organization transforms and adapts to managing converged infrastructure versus previous silos. Automated provisioning, integrated QoS, ability to mix hybrid and all flash nodes makes consolidation of new and legacy applications onto a single HCI cluster simple and cost effective. As organizations continue to transform to a cloud model, integration with software, such as the VMware vRealize Suite, enables full cloud automation and service delivery capabilities.

For enterprise customers looking to fully automate the provisioning of the entire IT infrastructure stack, including networking, rack-scale HCI is a good infrastructure deployment option. A turnkey rack-scale approach, addressing larger initial deployments, further collapses operational infrastructure silos, beyond the approach of HCI appliances, by integrating switches and network virtualization capability into the HCI architecture.

Just as there may be many different starting or end points for HCI infrastructure implementation, organizations may be in different states of readiness for change or have varying long-term transformation goals. How quickly IT organizations transform will be influenced by business priorities, customer expectations, market drivers and budget realities.

HCI SIMPLIFIES CLOUD ADOPTION AND IT TRANSFORMATION

HCI has become a simple infrastructure for the move towards hybrid clouds. For example, when IT organizations are ready for full cloud automation, VxRack SDDC, rack-scale HCI, integrates with VMware vRealize Automation and vRealize Business for Cloud, enabling the VxRack SDDC to be the foundational pooled and elastic infrastructure for private or hybrid clouds.

To successfully transform their IT infrastructure, it's imperative for organizations to assess cloud-as-a-model more realistically and leave behind the thought that cloud is a destination.

Organizations need flexibility to choose an HCI solution that best meets their current state of IT transformation while ensuring IT certainty, continuous innovation and predictable evolution as customers move toward hybrid cloud implementations. While organizations have the option to assemble their own HCI, or purchase completely turnkey HCI systems, it's important that the appropriate steps are taken to transform to become more agile in the face of competition.

Implementing HCI as the foundation for hybrid cloud operating models will prove to be that step in the right direction to resolve infrastructure and application problems faster and be a catalyst for desired business outcomes.

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ERP (Adoption, Benefits, Challenges – **ABC Mantra) in Digital Era**

In digital space, more and more organizations are looking greater benefits and vertical and horizontal growth by adopting ERP, but the key challenges are still remain, which are not technological limitations as they grown manifold and are ready to deliver services at the door-step of the end-users

The challenges today lies with ERP Fitment, Communication, User's Acceptance coupled with setting realistic organization goals are the key for Successful Rollout of ERP in Modern Era. Enterprise resource planning (ERP) system has been one of the most popular business management systems, providing benefits of real-time capabilities and seamless communication for business in large organizations. However, not all ERP implementations have been successful. Since ERP implementation affects entire organizations such as process, people, and culture, there are a number of challenges that companies may encounter in implementing ERP systems. In spite of ERP's significant growth from the late 1990s to the present day, there are a number of challenges that companies may encounter when implementing ERP in earlier days. As ERP matures over a period of time, the number challenges the organization faced has been greatly reduced to three broad areas like ERP fitment, User Acceptance, Communication.

ADOPTION DYNAMICS

ERP adoption is buzz word and the organization looks it

as heroic tasks over a period of time and its implementation across the enterprise. However, well defined organization with clear set of processes, the adoption rate of ERP is much better than the organization with less process oriented. 75% of the ERP project failures attributed to the facts that the choosing and evaluation of the right ERP for its internal use than the product itself. In sizeable organizations, they seem to be disregarding ERP systems as answer to their business complexity. Unexpectedly, SMEs disregard financial constraints as the main cause for ERP system non-adoption, suggesting structural and organizational reasons as major ones. This is directly different from what is observed in large organizations where the first reason for not adopting an ERP system is organizational. Moreover, the decision process regarding the adoption of ERP systems within SMEs is still more affected by factors influencing the outside the organization and then business-related factors, contrary to large companies that are more interested in managing process integration and data redundancy / inconsistency through ERP implementation.

Some are attributed to high cost and lack of support from senior management. Adoption in the current digital space is much better than in 1990s as today we have multiple options in ERP products space and technology space. As of date many options are available in the ERP space both in the productized, bespoke, open source, cloud versions. Some of the keys ERP Products that are popular are as follows:

Solution	Company
My SAP ERP (A1, B1)	SAP A.G
Oracle EBS (Business Suite)	Oracle Corporation
PeopleSoft	Oracle Corporation
J D Edwards	Oracle Corporation
BaaN	SSA Global / Infor Solution
Ramco	Ramco Corporation
Navision	Microsoft
ESS	Private
SYMCO	Private
Tally	Tally Corporation

THE DELIVERABLES OF ERP

The likely benefits expected from ERP Cost can be seen depending on the industry and the faster adoption of the organization. In FMCG industry, On-line information of item wise stocks availability vs. Ordering items and forecasting of sales based on planning computations, customer base, segmentation of customers etc are the key to success of the organization. In manufacturing industries the synchronization between resources like manpower and materials, planning the materials versun the market requirements etc. Further dispatches from factory would be complete in quality, quantity & sequence resulting to re-work, re-order, re-sequence and the centralized procurement of material like Fabric would bring down the cost and then continuous monitoring of slow moving stock and defective stocks etc are the key parameters to be monitored and this would help in disposing of stocks & quick realization of money. In marketing organisation, ERP facilitates sales process & customers in his territory faster rate and All India view of sales figures (product wise, Project wise, sales type wise, region etc) and Increase conversion Rate, Reduce Cost of sales, Reduce Lost Sales, avoid late delivery penalties. Track Inventory and material from requirement to delivery

CHALLENGES: ERP PRODUCT FITMENT

In late 2000 to till today, there are lot of ERP products in the market both branded; unbranded, open source & cloud based ERP etc but all are not the right fit everywhere. The small and medium segment has many failure stories and causes of dissatisfaction over successful implementation across these business segments. There are two schools of thought prevailing in this segment of industry ie One school of thought is for big investment for ERP and the other school of thought is not to invest in ERP

However, today organizational success and future growth lies in being able to deliver at the “moment of truth” – i.e., having the right product made available to the customer at the times the consumer wants it. Moreover, as the competition is building up in the market, more and more customization requirements are also increasing and hence need to build flexible systems and processes in order to meet the customer requirements.

Most of ERP systems present on the market offer a large number of features, especially in the case of Open source solutions. However, as the ERP works as a mirror of your business, some customization might still be required as each company has a specific organisation and business model. Before deciding to customise some features or to develop a new module, makes sure with your ERP consultants that these features will really bring some value in your business, in order to not develop an expensive module that your employee will never use.

CHALLANGES: USER ACCEPTANCE

Many companies have realized impressive benefits by implementing ERP systems; however, the success of an ERP implementation is influenced by a great many factors. User involvement is one of the most cited, critical success factors in ERP implementation projects. Generally, when users are involved in the implementation, the end result will deliver a better fit in relation to business processes and acceptance between the end users and the ERP System. In technical terms, the preparation comes in the form of user acceptance testing (UAT). User acceptance testing is often used as a project milestone for contractual reasons; completing UAT signifies that the solution has reached an acceptable level of stability and this in turn can be linked with the issue of who is going to pay for fixing defects. UAT is actually far more important than that — it is your key to project success. It's important to iron out the issues in a safe environment first, and for an ERP implementation the safe environment is UAT. Every issue that is found during UAT is one less issue that will need to be solved after go live, and the thing about go live issues is they can be really dangerous. When an issue occurs in a production system in a go live environment, it needs to be fixed quickly, and there is typically a great deal of stress associated with the issue. Being hurried in a stressful environment does not make for good programming and it certainly doesn't allow for well thought out design.

CHALLENGES: COMMUNICATION

Effective implementation of ERP solutions requires good communication, which is essential across the organization. This need to be explained to the different stakeholders of the project why the old system is not efficient anymore, and what they will get from the new system. The main idea behind communication is to avoid the creation of a group of resistant's to the ERP project, in order to mitigate the risk. Two main risks perceived by end users need to be erased: first the risk the ERP will do the work done by the end user. You need to be clear that the ERP is not integrated to do the job of employees but to help them to be more productive by simplifying the processes. Secondly, some employees can be afraid to not have the abilities to work on this new system because of their limited computer literacy. Hence, need to explain to them that trainings will be done to help them to understand the new ERP system. Building confidence among the all stake-holders through communication channel all along the project, to be sure people will be familiarized with the solution, and will support its integration.

Setting realistic expectations requires an investment of time, resources and money, but the payoff occurs when your organization achieves all its expected benefits and experiences ERP success. ERP solutions are often seen as the magic stick which will solve all the problems of a company, and will enhance all processes instantly. But the reality is a bit different; a high percentage of ERP implementation project fails because they have not been carefully thought upstream in terms of organisational benefits, budget, and timelines of the project. However, one of the most important aspect to ensure the success of an ERP deployment project is the ability to set realistic expectations. Having realistic expectations will allow the company of any size, an ERP is achievable project, which respects the business objectives in the short time to long-time.

SUMMING UP

Though the adoption of ERP are gradually gaining momentum, the failure rate seems to be equally comparable to the challenges stated in this article. Hence organization which is looking for adoption of ERP for achieving organization level benefits, need to evaluate all the challenges before going for selection and finalization of ERP for the implementation. Today there are no ERP product limitations or technological limitations, but fitment of the product, users acceptability and communication to all stake-holders in the project are to be addressed by the senior management for effective ERP roll-out irrespective of the organization size / industry vertical.

(The author is Project Director CMS Computers)

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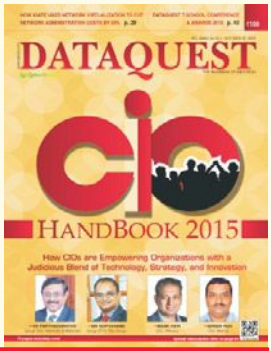

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—PRASANNA SARAMBALE
CEO, Data Center business and Head, Group BD, Sterling and Wilson

COMPANIES ARE LOOKING TO INVEST IN SOLUTIONS THAT ARE ABLE TO REDUCE DATA CENTER COMPLEXITY AND COSTS: STERLING AND WILSON

In conversation with Dataquest, Prasanna Sarambale, CEO – Data Center business and Head – Group BD, Sterling and Wilson, talks about the evolution of data centers, the potential for the data center industry in the country and the company's play in the data center market. Excerpts:

How do you see the evolution of datacenters to what it is today- how has it changed the IT infrastructure market?

The evolution in physical infrastructure requirements and deployment have been in-line with the evolution of IT equipment. Today, Uptime Institute and TIA- 942 are global standards being followed for Data center Design, Build & Operation and maintenance.

Due to introduction of cloud servers and virtualization, the number of servers have reduced in data centers. However, computing power as well as the power consumed by these servers has increased manifold. Few years ago, racks with power densities of 4 KW per rack were used, which has now increased to 14-18 kw per rack.

Due to the high density racks, need for localized cooling (in-row / in-rack) has increased compared to the conventional peripheral cooling.

Customers are scouting for micro-level power, cooling and space monitoring through softwares like DCIM. Taking into consideration the increasing power demand of servers, the future of data centers seems to be localized liquid based direct cooling, where the servers shall be directly dipped into the thermally conductive dielectric liquid.

IT equipment manufacturers have evolved and modified their products to suit higher temperature range in servers. ASHRAE has increased the recommended sever in-let temperature based on the class of the server.

Floor loading has also increased due to high density racks and the facility needs to be designed accordingly.

What are the industry trends and the huge potential for the data center industry in the country?

Today, India is one of the fastest growing economies in the world and the second fastest growing market in the APAC region.

As India's population increases, research indicates monthly data consumption per smartphone to increase by nearly five times. With this number expected to rise further, there is huge potential expected for data usage in the coming years.

- Advancement in digital technologies have also propelled the vision by Government of India towards 'A Digital India.'
- Due to India's increasing need for innovative and practical solutions for policies and best practices, more businesses are looking to IT organizations for real-time data analysis to understand and better meet customer needs and demands
- Additionally, companies are looking to invest in solutions that are able to reduce data center complexity and costs
- As data sensitivity increases, coupled with regulations that are expected to be implemented, most companies will need to set up their data centers in India. This trend is already being seenin high data-sensitive industries like telecom, Government and BFSI sectors

In the near future, data center localization is being seen as a 'game changer' in the industry.

What is the company's role in the datacenter market?

Sterling and Wilson realised early the opportunity for turnkey Data centers, especially as it became categorised as critical infrastructure. We launched our Data Center business in 2015, utilising our existing capabilities to enhance offerings. Combining the existing expertise with next gen technologies, enabled us to become more new age and bring world-class cutting edge offerings to our customers.

Within 3 years, the Data Center business has grown to become the largest EPC player in the segment in India (based on order booking).

We have partnered for some path breaking turnkey Data Center projects for Vodafone, NSE and NSDL. Currently, the company is executing a prestigious data center for The Rajasthan State Government, Department of IT.

Can you please share some of key projects related to data center business?

The company has taken up some of the key projects for data center business which are mentioned as follows:

- **The Vodafone Data Center (MSC) in Chennai:** was recently completed by Sterling and Wilson. A greenfield turnkey MSC project, executed within 12 months on one-acre land, the company was involved with the entire Design and Build of the facility. Acknowledging the complex project management and adherence to timelines and quality in the project, it was recently featured in "India's Best jobs" series by the Discovery Channel
- **National Stock Exchange:** A prestigious project for critical data computing for the bourse, this data center was a turnkey implementation including building construction and civil works. It currently houses 150 racks and has been designed to expand capacity up to 750 racks. The project is consistent with Tier IV requirements and is located in Chennai
- **Passport eSeva Data Center:** a project by the Ministry of External Affairs, the Passport eSeva Data Center was executed by Sterling and Wilson . with a white space area of approx. 4,000 sq ft.The data center was executed within 6 months and is located in New Delhi

On the issues, challenges and solutions

Data Center Integration is a complex process which needs the right pool of vendor eco-system

- It is extremely difficult to rationalize the pricing strategy without the right vendor mix and working relationship
- Without the right mix of partners, the deployment time and quality of delivery might get compromised

Keeping in view the above risks, while evaluating a prospective partner, clients should look out for potential partners with:

- Robust know-how and knowledge as data center design and deployment is a niche capability and requires specific capabilities
- Data Center qualified/certified ATD, CDCP, CDCS & PMP professionals
- A strong team for liaisoning with the authorities and procuring necessary approvals, in the absence of which project timelines get affected
- Simulation softwares like ETAP/ ETAB / CFD / 3D Revit which optimize design and reduce re-work and hence provide savings in time and cost.

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Software Quality Assurance is Much **More Than Quality Control**

Though the terms quality assurance and quality control are often used interchangeably in the context of software testing, they are in fact, completely different. While quality control refers to testing which involves verification and validation, quality assurance encompasses much more

Quality assurance refers to the processes and methods implemented to ensure that the right services are delivered at the right quality to help customers achieve desired results. Providing appropriate training skills to enable technology adoption by using relevant tools and methods is a good example.

WHY DO FINANCIAL SERVICES NEED QUALITY ASSURANCE?

First of all, technology-dependent financial services companies are run by business people, and not technocrats, which leads to unique problems. While bank leaders do realize the importance of technology, their lack of core competence often leads to them leaving the

responsibilities in the hands of their IT teams, who look at it from a purely technological angle, often ignoring business consequences. And here is where the problems start in the multi-year, heavy investment IT adoption process.

Secondly, banks do not develop banking products themselves or from ground-up. They often choose customized Commercial Off-The-Shelf (COTS) products to suit their requirements. Adding to the existing conflict between business and IT teams, a product vendor and an implementation partner are added to the crew, each with their own ideas on how to develop and implement the product.

Thirdly, there are often numerous gaps in the translation of business requirements into the product. Products are often selected on the basis of high-level demonstrations which might, on the whole, appear to contain all the features the bank requires. However, it is only when detailed requirements are discussed, realization sets in that intense customization is required. Once these customizations are in force, the product companies cannot really predict how their product will behave as it is now a complex product placed in a complex environment with multiple surround systems with which it has to work.

Eventually, neither the product company nor the bank are equipped to test the complex product, which is why an independent assurance provider with thorough domain knowledge is necessary. Banks, fatigued with running their usual businesses, often get disenchanted when multiple test runs are essential to ensure product stability. Often, the product company and implementation partners are incentivized to get the product rolling by a certain date, which could result in testing taking a backseat. Familiarity with the product is just not enough. Being unsure about the customer's business lifecycle makes them test the product in certain accustomed paths, often ignoring potential scenarios in reality.

THE NEED FOR INDEPENDENT QUALITY ASSURANCE PROVIDERS

The practice of quality assurance differs from region to region, largely dependent on the software development and IT adoption processes prevalent in the region. In the Middle East and Asia Pacific, banks entrust testing in the hands of independent assurance partners. In Europe, there is low recognition for independent assurance partners, and testing responsibilities are often given to the implementation partner, who lack core competency, often resulting in conflict of interest.

While banks do have their own testing teams, the time, cost and effort required to make their testing teams perform core transformation activities will be tremendous. This is where an independent assurance provider can help, by supporting the bank's internal team testing team with knowledge and expertise either during testing, or by assuming all testing responsibilities.

With product and implementation partners customizing the product, an assurance provider has a solid role to play right from the requirements workshop, by gatekeeping the requirements to ensure comprehensive business and testing sense. Quality assurance from the start prevents delays later during system integration and user acceptance test stages.

CHALLENGES, AND ROAD AHEAD

There are several challenges in quality assurance in banking software. First comes the budget. As assurance is often an afterthought with inadequate provisioning from the beginning, there is a surge of less-tested products with stability issues. While testing should ideally take 25 percent of the total efforts in building the software, in reality, it is only about 10 percent. Secondly, regression issues in testing leads to delayed delivery of functionalities, affecting services. Thirdly, banks do not have appropriate testing strategies in place right from the project's inception. Lack of forethought and clarity on what each stakeholder is accountable for impacts product quality and user experience.

Banks are now waking up, and are more aware of the importance of quality assurance. Banks are now moving towards consolidating vendors, and at the same time, ensuring that development and testing of the same portfolio do not lie with one vendor.

(The author is CEO of Maveric Systems)

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INDIA IS VERY CRITICAL MARKET FOR US

—CHRIS KOZIOL
President at Aspect Software

Aspect Software has been a vendor in the contact center market for more than 40 years, providing on-premise telephony management systems, workforce management and BI systems. Chris Koziol, President at Aspect Software talks about the company's India play. Excerpts.

The trend we are seeing is shifting from voice to omni channel, how Aspect is seeing the migration happening and what are the verticals you are focusing on India per se?

Businesses are now shifting from traditional methods of engagements to new and different level of engagement solutions and its a new form of marketing, which is giving them an edge in how well they engage with their customers seamlessly across channels. And it is directly impacting their business in many different ways.

In my opinion, emerging markets are more prone to adopt latest technologies than compare to mature markets. For example we have deployed our solutions to Facebook Messenger. The reason behind that is that emerging markets do not have historical implementations and they are more keen on adopting newer solutions for their business. Secondly, to get recognition; companies nowadays are competing with each other and here customer engagement comes which gives them boost in customer royalty, customer retention, turnover etc. and is a new form of marketing.

Also markets in Australia, Europe and North America are way ahead than some of the emerging markets in Asia in terms of adoption of true cloud capabilities and Omni channel. And if we talk about India, here adoption is happening but still there are some of the restrictions and regulations which are slowing the speed. We just need to solve the challenges.

However there is lot of happenings going on in the emerging markets in India. There is a lot of focus on verticals like NBFC, E-Commerce and startups. They are also experimenting and leading the charge in making the transition from Voice to Omni channel services and they are the one which are providing us better business here.

Tell us about Aspect Via, how it is helping customers to transform from siloed center to all cloud customer engagement centre?

With the changing tech scenario Aspect also has changed a lot and we have continuously excelling and rehashing our solutions portfolio according to the ever changing market. The big factor that is driving change is mobile

technology and changing customer need with demand of doing business anywhere and any time. So, we have identified some areas and made some major investments to augment self service technology and agent assisted technology.

With acquisition of Voxeo, we used IVR platform and the asset was mobile platform which we called CXP Pro that enabled self service and omni channel capabilities. This further helped in developing Aspect Via.

Aspect Via addresses the preferences of the digital-first consumer with interactive voice (IVR) and text (ITR) response powered by Natural Language Understanding (NLU) for more conversational, automated exchanges with today's self-reliant, mobile consumer. When live assistance is required, Aspect Via seamlessly connects customers to the best agent, with the right skills. Interaction context is preserved so team members can delight customers with personalized, frictionless customer experiences. This makes the delineation between self-service and live service invisible to the consumer across voice and digital channels.

Aspect Via offers:

- *The only customer engagement center with native interaction management, workforce optimization, IVR and self-service capabilities*
- *Developed as one platform, based on proven technologies from Aspect's marketing-leading portfolio*
- *Common UI for configuration and administration across all capabilities*
- *Shared real-time and historical reporting across all capabilities*
- *Role-based UI provides an easy to use, streamlined UX for agents, team leads, and administrators*
- *Designed exclusively for the cloud*

How the user friendliness of the solutions play a role in success of the portfolio?

User friendliness is the biggest key factor in the success of our solutions not just for the end customers but from the agent perspective also. From the customer standpoint, the solution should be easy to use as he is the one doing conversation via different platforms. They should be able to interact. For this, we have made major investment for capability of natural language understanding which enables us to provide a customer interaction from the digital and self service standpoint in a very conversational manner. That capability has given us profound impact on our ability to really seamlessly engage with a customer.

For our agent ecosystem, about 4 years ago we have changed our agent interface for better performance and to enhance the agent experience. We invested heavily in this and used some outside design firm help to re-factor our agent interface. This has also helped us grow immensely.

How Aspect is following AI trend and chatbot trend, is it also a focus point?

A chatbot is a next step in enhancing customer experience and its a trend that is growing rapidy. Customers today need self-service and easy interface to interact with. Chatbots are providing this. At Aspect, we have started leveraging our CXP Pro application to enable the development of chatbots. Some of the examples are wide ranging- it could be an application like a virtual concierge that we have implemented for a local hotel chain in London.

Do you have R&D facility here in India?

From Go to Market perspective, India is very critical market for us. It also act as port for our activities around the globe. We have at least 25% out of our global workforce based in India. This workforce is responsible for development of solutions, technical services etc. Majority of Indian workforce is based out in Bengaluru, where we have Centre of Excellence. This CoE is not only provides R&D but innovation team present here also develop customer specific integrations for global customers as well. We also have three customer care centre round the globe (Tennessee, London and in Bengaluru), they provide 24*7 customer care to the customers, and is enable to provide and follow the technical support.

Who are your main competitors?

Traditionally if we look at the competition it is Avaya, Genesys and Cisco, as they also deal in Unified Communication infrastructure. We have designed our solutions to coexist in their environments so we can wrap around those investments and add value to customers so they don't have to replace those investments out. In the agent productivity space, our primarily competitors are Nice and Variant. We also have lot of emerging competitors like Point solutions. But our integrated workflow approach and customer engagement centre capabilities gives us strong competitive advantage over them.

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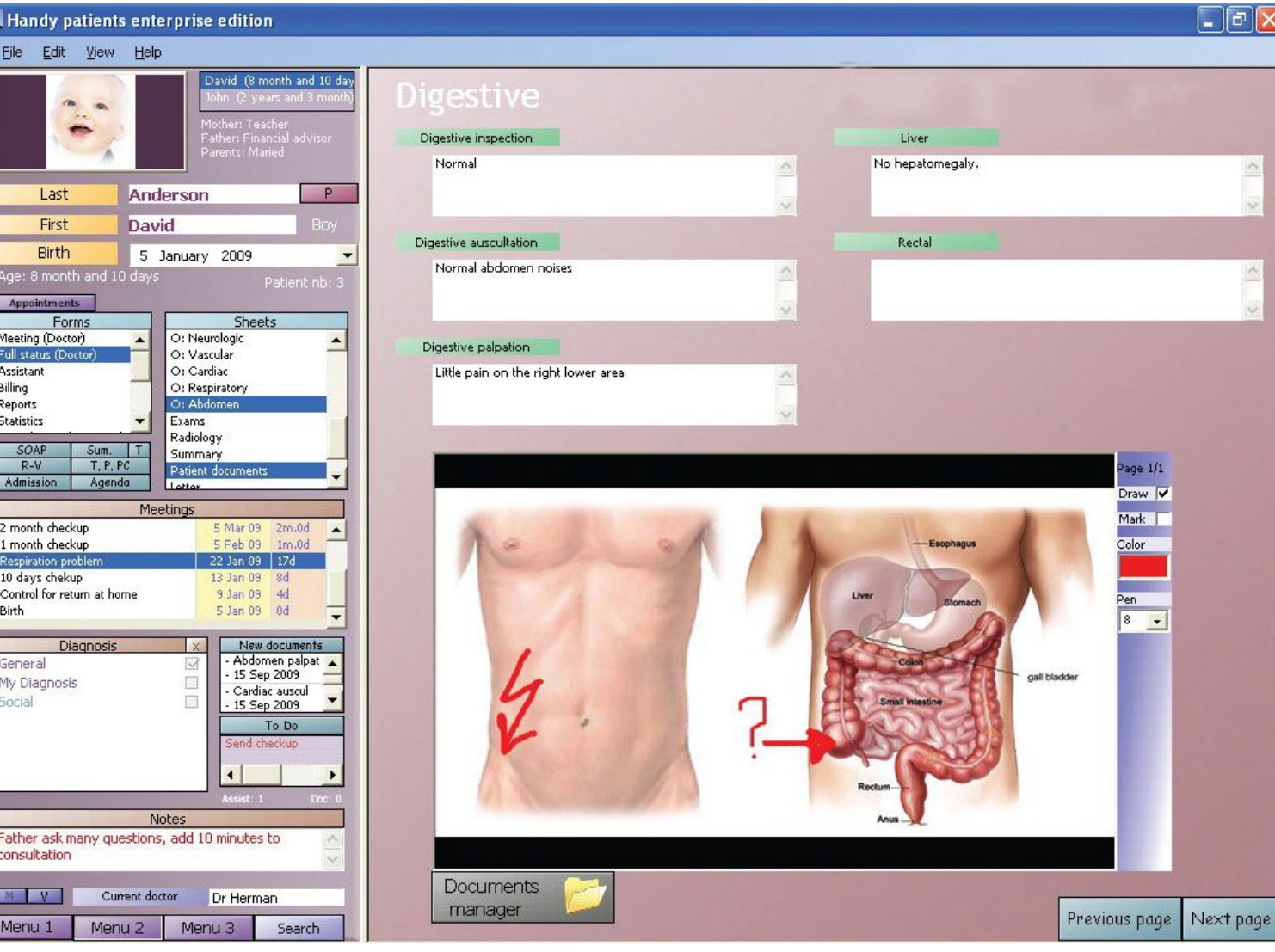
Digitizing **Healthcare**

Digital access to health records will lead to real empowerment in healthcare and will create a new premise



Honorable Prime Minister of India, Narendra Modi says, "I dream of a digital India where every netizen is an empowered citizen."

Digitization is the new wave, making ripples across sectors, crossing geographies worldwide. Healthcare is undoubtedly going to be one of the industries which will see significant disruption as a result of serious digitization, enabling mankind to live longer and healthier lives.

Helping them take ownership of their own healthcare, digital healthcare will elevate patients from their existing state of 'enforced passivenesses'; providing them with appropriate medical assistance, aiding them in making informed decisions. Internet has brought knowledge

right to the fingertips to such an extent that patients are today more aware of their health and wellbeing, making them active contributors in their own healthcare. Digitization has also changed the nature of patient communication with the healthcare providers. It is no more a monologue, where the doctors explain to the patients about their medical condition and guide them on the next steps to be taken. Today, a more informed patient picks up a more proactive conversation with the healthcare provider, disrupting the unidirectional flow of information. This two-way communication also helps the latter develop a strong database of patient information, which could be later utilized to design customized solutions. This is truly the rise of the "smart-patient."

EMPOWERING HEALTHCARE WITH TECHNOLOGY

Technology has facilitated people to keep a track of what's happening within their body through simple gadgets like smart phones. Monitoring the calorie count, keeping track of the medication and even storing medical records in cloud, help the consumer to be fully equipped to handle their personal healthcare, smartly and efficiently.

Electronic Health Records (EHR) is a highly sought after by the patients today in the healthcare sector. Often confused with Electronic Medical Records (EMR), in practical purposes, EHR is different from EMR. While Electronic Medical Records is only a digitalized version of the medical records available at a clinician's place, Electronic Health Records serve a more complex and useful function. EHR serves as the overall/broader health record of a patient, which is primarily prepared to be passed on to all the healthcare providers involved in delivering care. Therefore, EHRs are designed to be accessed by doctors in hospitals, technicians in diagnostic centers and other specialists involved in patient care and most importantly, the patients themselves. These records help in ensuring appropriate care to the patient, irrespective of the healthcare provider he goes to.

EHRs prove to be a real empowering tool for the patients, smoothening the process of taking second opinions, minimizing duplication of tests in laboratories, reducing any confusion or clutter even with the engagement of multiple partners in the care communication. Due to lack of proper medical records, many a times, doctors make wrong prognosis in critical times. A slight delay in diagnosing itself could result in fatal consequences in patient care. EHRs could be accessed from mobile phones itself, thereby carrying health in your hands, helping a provider identify the actual nature of one's health during emergencies.

This innovative approach and the effective digitization of healthcare, is paving way for greater opportunity in a huge country like India. Rising population, inadequate infrastructure and high out of pocket medical expenditure continue to be the major roadblocks of India's healthcare. However, convergence of high-end technology with precision medicine and genomics can help in overcoming these hurdles and digital healthcare will eventually transform the patient care in India. The government's efforts in this regard to drive digital healthcare in India is truly appreciable, however, there are many challenges which needs to be addressed. Our medical infrastructure is limited within the reach of the urban areas, while a substantial section of our population is accumulated in the rural pockets of the country with inadequate access to therapeutic facilities. Mobile technology will help in bridging this gap, by providing them with more accessibility, affordability and access to medical and technological infrastructure.

EMR's could be perhaps one of the small yet significant steps towards achieving this goal of empowering patients through the digital revolution. As healthcare is taking the wellness route, with providers self-disrupting the industry to let patients keep entering 'health,' and a parallel rise of the 'smart patients' , here is a promising, healthy, way to look at healthcare.

(The author is CEO of Zoylo)

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Internet Guru Vijay Mukhi **Passes Away**

India's earliest Internet guru Vijay Mukhi is no more. Vijay Mukhi was an icon in the tech industry, he was a phenomenon through much of the nineties, especially in Mumbai

Vijay was neither a hotshot tech MNC CEO nor a rich tech entrepreneur or a powerful bureaucrat or a famous venture capitalist. Yet his influence and fame during the time was more than any of these entities because of his mass appeal and media savvy.

Vijay taught programming, he wrote books on programming; he was an ace teacher who inspired legions of students, his books were written in a fun-filled unconventional way and it helped students master the C, C++, and Java. His students were overawed by his teaching prowess and his capacity to turn ordinary 'computer career-seekers' into prodigious and prolific programmers.

Internet Guru Vijay Mukhi

Apart from that, Vijay was a technology activist and a technology evangelist. He rallied technology enthusiasts to create and spread popular technology culture, especially after the Internet got launched in India. He co-founded the IUCI (Internet Users Community of India), together with individuals like Shammi Kapoor and Miheer Mafatlal, he gave a social dimension to IT through the BCC (Bombay Computer Club) which was an informal mailing list of individuals comprising senior IT executives from companies and tech media who met once a month on the last Friday of the month, merely to eat, drink, and chatter. Vijay wrote columns on tech in popular media to popularize tech. The IUCI came up with valuable feedback and inputs on the quality of Internet and its usage and it had the ears of even the big guns at VSNL, which was India's primary ISP.

As a young tech journalist in the mid-90s, I had the privilege of seeing Vijay in action. Though I was not a student in any of his programming courses, I was awed by his ardent fan following. I attended few of the many parties he threw at his sprawling Nepean Sea Road residence. These parties used to be a very democratic, informal, diverse gathering of people interested in tech. He brought the Page 3 culture into tech, in Mumbai. He had a distinctive persona to match— salt and pepper hair, neatly combed, chain-smoking Rothmans cigarettes, always in a grey suit so much so that it was rumored that he even wore it to sleep, and a pontificating tone and manner of speaking. Reportedly, he gave up smoking sometime later and he also came out of his grey suit, which even made news in some closed circles.

The tech industry has changed a lot since then. But Vijay kept up with the trends; his latest areas of interest has been in cryptocurrency, bitcoin, AI, and cyber security. He gave interviews (http://bit.ly/2mkIFUw on ATM skimming frauds) on these topics even as recent as December 22, 2017.

Apart from being the President of a body called FIST (Foundation of Information Security and Technology), Vijay is also a Member of High Court/ State Government Committee on Pornography and Cyber Laws. He has been successively designated Co-Chair of the Cyber Safety Week – a joint effort of Mumbai Police and Nasscom, for the last 3 years. Further, he chairs The IT Committee at FICCI and has been designated the post of Chairman for The IT Committee at Indian Merchant Chambers (IMC) since the last 3 years.

His fans of the time continue to adore him. Tributes continue to pour in. Noted cyberlaw expert Prashant Mali tweeted: Sad news. Vijay Mukhi, fondly known as Internet Guru, passed away ……. For me he was the inspiration to master C & C++ programming in 90s. RIP.

Goodbye, Vijay Mukhi. May your soul rest in peace.

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