

**When Even The Brick
Became Smart**

— Christof Domenig
CEO
Wienerberger Global



**The 6 Essential Rules Of
Being A Business Disruptor**

— Shahid Nizami
MD-APAC
HubSpot



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DATA/CLOUD

The Importance Of
Intelligent Transformation

— Vivek Sharma
MD—India
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DIGITAL ACCELERATION

Top trends for the New Year





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PRESENTS

Accelerating IT Growth with Emerging Technology

Upcoming Markets & New IT Solutions That will Transform Business Leaders' Fortunes

13th of Feb 2020 | India Habitat Centre, Lodhi Road, New Delhi

With the Smart Techs of IoT, AI/ML, AR/VR etc becoming more and more important for IT products, platforms and solutions, there is a need for the entire partner community in the IT world and also the CXOs to understand what new products, platforms and solutions are available now, giving rise to new markets and how to make the best use of this opportunity by understanding these new markets and opportunities ahead of the time in near future when they begin to dominate the entire IT world and will also be used in other sectors such as buildings, smart cities, creative fields such as design and so on. This conference is an attempt to thrash out these opportunities with the channel ecosystem, CXOs and senior market leaders.

Session Theme 1 – On Cloud/Cognitive

Session Theme 2 – On Data storage, migration, analytics, management, security, policy

Session Theme 3 – Hardware, software, solutions and services

Session Theme 4 – System Integration, integrating platforms, IoT/AI-ML/AR-VR enabled products

Target Audience 80-100 in number

- ✓ CXOs (CEOs, COOs, CTOs & Professionals)
- ✓ Products Suppliers, Channel Partners
- ✓ System Integrators / Network Integrators
- ✓ Resellers (Dealers / Distributors / Importers)
- ✓ End users of IT Enterprises

Proposed Composition of the Audience

- Systems Integrators, Software, Cloud Service Providers, Network Infrastructure, Server Storage service and Solution Providers – 20 in number
- Channel Partners for Hardware, Software and solutions – 20 in number
- CEOs, CTOs, CXOs, Technology Decision Makers, Influencers from Enterprises and SMBs, Commercial Organisations – 40 in number

Profiles of Invited Speakers from IT industry and other sectors

- CEOs, CXOs, Decision Makers
- Marketing Directors
- Channel Heads
- Major System Integrators
- Data Analytics experts

Inaugural Session - Cybermedia speakers

- Pradeep Gupta, CMD, Cybermedia
- Ibrahim Ahmad, Group Editor, Cybermedia
- Thomas George, Managing Editor, Cybermedia
- Archana Verma, Editor, DQ Channels

Agenda

- 10-10.30 am – Registration
- 10.30 am – 11.30 am – Inaugural Session
- 11.30 am – 11.45 am – Keynote Address
- 11.45 am – 12.00 – Networking Teabreak
- 12.00 – 1.30 pm – Presentations in Sessions by Sponsoring guests
- 1.30 pm – 2.00 pm – Networking Lunch
- 2.30 pm – 3.30 pm - Presentations in Sessions by Sponsoring guests
- 3.30 pm – Networking Teabreak

Total duration – from 10.30 am to 3.30 pm

We have slots available for Keynote address, speakers and presenters. We offer very good branding packages to our speakers

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The Oscars of Indian ICT

IT Person
of the Year



2018
Ritesh Agarwal



2017
Bhavish Aggarwal



2016
Vijay Shekhar Sharma



2015
Rahul Sharma

27th
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BUSINESS
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“Celebrating the Success
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13 March 2020, New Delhi

ictawards.in

Pathbreaker of the Year



2018
RJio



2017
A P Hota



2016
Sahil Barua



2015
Nandan Nilekani

Lifetime
Achievement
of the Year



2018
Arjun Malhotra



2017
Ashok Soota



2016
Vineet Nayar

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India's top tech schools ranked based on the survey of colleges, students, and employers

KEY TAKEAWAYS

- The supply and demand side of skills and talent
- Showcasing the skills required by the industry
- Looking at the state of tech education in this country
- Best practices in Skills development...and much more...

Contact us to participate in the Survey

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From velocity to acceleration

I listed the top tech trends of 2019 and someone commented: But aren't these the top trends of 2017-18 too? He was right. There is really no new trend anymore, but it's just that all the old trends are picking up pace and converging. In fact talking of Digital Transformation, one CEO quipped: Really? Wasn't IT always about transformation? Isn't everything in IT digital?

In 1982, an American Coke-vending became the first Internet-connected appliance even though the term Internet of Things was coined at the turn of the century. Today there are more IoT devices than there are people. There are wearable IoTs and Industrial IoTs. They are everywhere, but by one upper estimate, there may be 500 billion of them by 2030. That means the current data explosion will be further supersized.

3D printing has been around for ages and can do more and more things with each passing day. When it reaches peak industrial scale, we'll have smart factories all over and usher in Industry 4.0. Add Smart Homes with Smart Schools Homes and cities will get much smarter. Similarly the concept of Artificial Intelligence has been around for ages, but the applications in industry are increasing exponentially. There's still dispute on what exactly AI is and how it is being applied, though Machine Learning and Natural Language Processing are marching forward and there's no doubt about that at least.

Virtual Reality, Augmented Reality and Mixed Reality are getting more widespread and their applications encompassing greater number industries, like gaming, films, architecture, medical industry, training, education etc. Cybersecurity is just the latest term for something that most common consumers associated with the anti-virus industry, though of course there are more nuances to that.

All this is tough on the workforce—We all have to keep updating our skill levels. There's a scare that AI may take away jobs, though it may end up creating many more job types in the end. Professions get redundant, but many more come in their place. The result today is that companies may well pick someone with the wrong degree and right skill over one with the right degree and wrong skill.

Maybe there's only one trend of the last year, current year and next year. Digital Acceleration. The velocity was always there, but things just are really picking up a sizzling pace off late. That's why the number of startups and unicorns are simply mushrooming, growing even more rapidly. It's a great time to be alive as the IT industry is looking at total global domination. With that note, let's see what the 2020s have in store for us.

Sunil Rajguru

“
**Everything is
getting
supersized**
”

TECH RADAR 2020

2019 was ruled by Digital Transformation, Connected Things, AI, RPA, Blockchain, and Immersive Techs. Many of these technologies have started making an impact on our everyday lives. But as the decade unfolds, these technologies will evolve and bring more innovative use cases to the fore. We, at CyberMedia Research (CMR) have identified a list of technology trends that will define 2020 and the decade ahead. These technologies will remain among the top priorities for most tech and business leaders in the next few quarters. Check out the infographic.

CMR Insights





CMR TECHNOLOGY TRENDS DOSSIER: KEY PREDICTIONS FOR 2020

PREDICTION 1: HERALD THE EMERGENCE OF DIGITAL TRANSFORMATION 2.0

In 2020, enterprises will embrace Digital Transformation 2.0, wherein they will look at embracing new transformational tools, including machine learning and automation. Building on the earlier wave of digital transformation that focused on modernizing the legacy infrastructure in the enterprises, close to 30% of the entire IT spend will go into the digital transformation initiatives. Large enterprises will become increasingly digital at the core, and will embrace APIs. From making standalone products, successful enterprises will leap to sell a market platform, or ecosystem on their own.



PREDICTION 2: INDUSTRY 4.0 WILL ENABLE EARLY RISE IN SMART MANUFACTURING

With overall digitization of equipment and processes, Industry 4.0 will contribute to a spike in efficiencies in terms of quality and costs. With the Make in India initiatives bearing initial fruit, there is now a need for robust supply chain frameworks along with smart distribution centres.



PREDICTION 3: DEMOCRATIZATION OF ARTIFICIAL INTELLIGENCE IN ENTERPRISE IT

Artificial Intelligence (AI) adoption is gaining momentum. CMR Insights reveal that enterprises are more focused than before on embracing AI. In the year ahead, AI will be increasingly leveraged in enterprise IT to identify patterns, predict trends, iterate and improve, and deliver with the actionable insights.



PREDICTION 4: MULTICLOUD TO MAINSTREAM, UBIQUITOUS, OMNICLOUD IS THE FUTURE

In 2019, the hybrid multicloud emerged as a viable avenue for enterprises to ensure security and data protection, while ensuring compliance. While multicloud enters a new phase of standardization and maturity, and applications become portable, and vendors stitch cross-platform alliances, the multicloud future looks to transform into a ubiquitous omnicloud in the near future.

PREDICTION 5: SMB ADOPTION OF SAAS WILL SPIKE, BORN-IN-THE-CLOUD PARTNERS WILL STAND TO GAIN

SMB adoption of SaaS applications will grow by 20% over the next three years, driven by the imperative need to automate and improve upon many poorly-automated or un-automated tasks and processes. The born-in-the-cloud partners would stand to gain in honing SMB understanding.

**PREDICTION 7: EDGE WILL BE THE NEW NERVE CENTRE OF ENTERPRISE**

With the rise in machine learning and now, deep learning capabilities in the cloud, data is being processed swiftly, and results provided to end users through APIs and database queries.

Close to 20% of new infrastructure will be housed in critical edge location rather than in the data centres, over the next 3 years.

With the Edge, the predictive capabilities of machine learning models can be leveraged more swiftly, making applications more ambient and frictionless in real-time.

**PREDICTION 9: SMART GOVERNANCE THROUGH DIGITAL INITIATIVES WILL BE FOCUS FOR GOVERNMENT, INCLUDING BLOCKCHAIN EXPERIMENTATION**

Research insights from CMR point to nascent enterprise adoption, and in evolution and advancement of new use cases for Blockchain.

Going forward, Government adoption of blockchain is poised to slowly increase. Alongside, there will be renewed enterprise focus on blockchain fundamentals. This, in turn, will enable in realizing new practical purposes for blockchain uses.

**PREDICTION 6: 5G TO THE FORE, EVEN AS 4G PREVAILS**

5G is undoubtedly the future and will serve as the fulcrum for new technologies of the future to emerge, including advances in connected cars, wearable computing, and smart cities alike. Even as the 5G rollout is in its initial stages, its adoption will remain shallow over the next 24-36 months, and 4G will continue to be dominant. In India, 5G deployments would kickstart in 2022.

**PREDICTION 8: AUGMENTED AND VIRTUAL REALITY WILL ENABLE NEXT-LEVEL PERSONALIZED CX**

The rise of AR/VR will enable new user experiences that are personalized and contextualized to users in consumer and enterprise segments alike and made possible by developments in AI/ML and 5G among others. Questions around privacy, ethics and security will abound with these new technological developments.

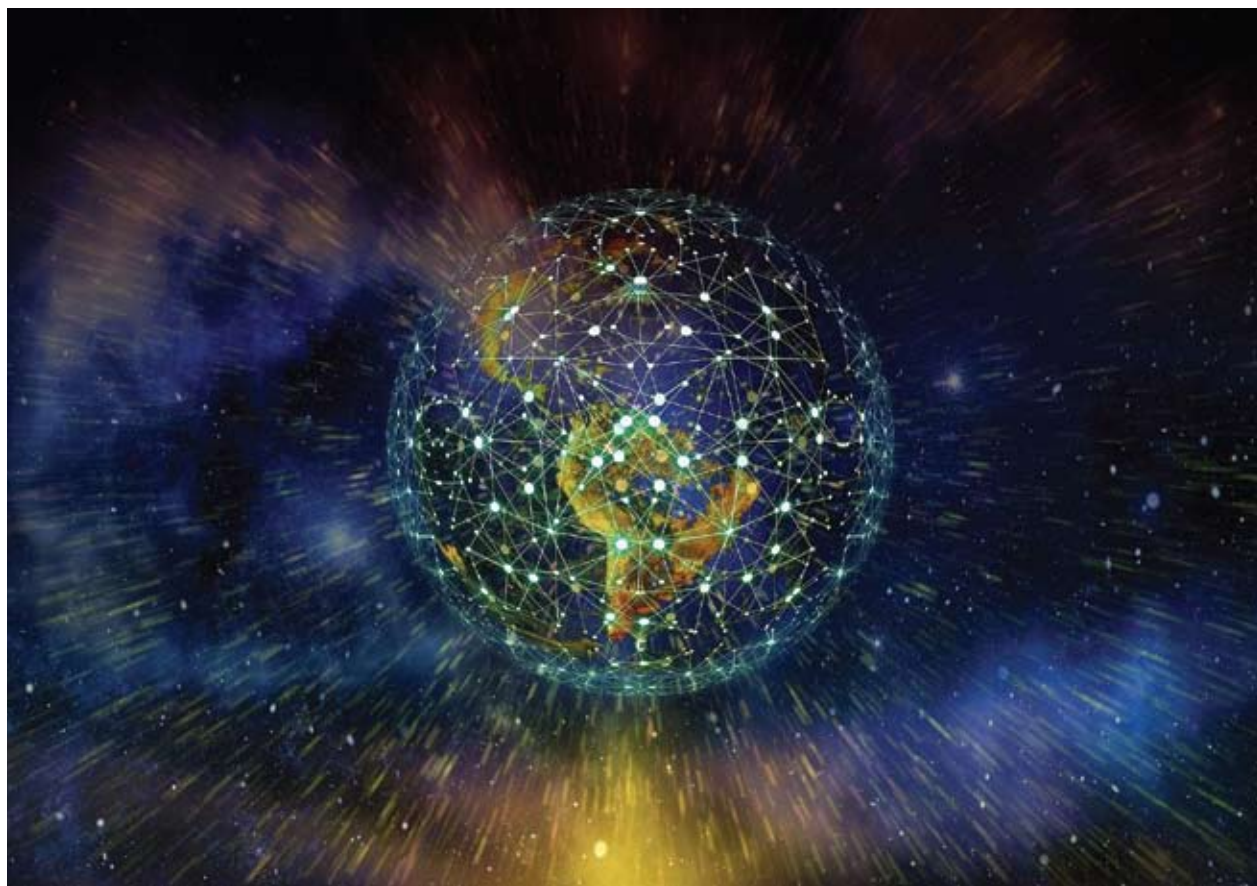
**PREDICTION 10: AUGMENTED ANALYTICS FOR ACTIONABLE DECISION MAKING AND CYBERSECURITY**

As data volumes continue to rise exponentially, and with decreasing clarity on the nature of data, today's enterprises face increased risk from threats, such as data breaches and ransomware. In the year ahead, enterprises will leverage augmented analytics, enabling them to detect signals that could potentially impact their business models.

THE ERA OF DIGITAL ACCELERATION

The 2010s was a decade of rapid digital acceleration with the emergence of new buzz words like Industry 4.0 and Hyper-converged Infrastructure (HCI); the refinement of concepts like DevOps and Robotic Process Automation (RPA) and the mainstreaming of Augmented Reality-Virtual Reality-Mixed Reality. Other things went really big: Consumer Internet, data (a perennial favourite), cloud, Artificial Intelligence, Machine Learning, Internet of Things (IoT), smart everything, cybersecurity, etc. Here, industry experts give their opinions on what they think will happen in 2020 and beyond...

PCQ Bureau



Move from disruption to transformation



The decade is full of possibilities with regard to AI-ML, IoTs, etc. This boom in digital technology adoption has put India on the global map and is enabling corporates to simplify their processes to become future-ready.

According to reports, 20 billion+ devices will be connected to IoT by 2021. This is testament to the fact that IoT is growing at an exponential rate and will make headway into various industries and services. ML-predictive analysis will be adopted by organizations for data analytics, data mining and pattern recognition. The ML market is expected to grow to US\$8.81 billion by 2022. These technologies will create a significant impact with much of the world's business and everyday life. This new wave of innovation will also accelerate the move from disruption to transformation.

—Bhavin Turakhia, Founder & CEO, Flock



Reimagine the way business was done in past



Technology is changing people's lives by enabling ongoing digitalization of business and driving organizations to continually refresh their business models. In this quest towards digitalization, technology is

amplifying continuous change at an ever-increasing velocity. Innovation is advancing quicker than ever and accelerating the pace of the industrial evolution by adopting AI-ML, blockchain, etc. The need of hour is not just transformation and innovation, but to achieve both with much greater speed that can match the rate of change in industry, which should be prepared for significant impact of these trends and fundamentally relook and reimagine the way business was done in past.

—Dharmender Kapoor, Chief Executive Officer, Birlasoft

Emerging tech to redefine possibilities



GPS tracking, online shopping and content contributes to an overwhelming 2.7 Zettabytes of data in the world today. Technologies like AR-VR help people to gain access to optimum information at the opportune time

and place, as they are inundated with that level of data. This emerging tech has the power to redefine various possibilities for customer experience. VR transports people into another digital world/reality and AR layers the world with relevant digital data. Businesses' enormous investments in this tech are indicative of a new era of customer experiences, interactions, insights and intimacy. AR-VR is set to give companies a competitive advantage unlike any before. Immersive experiences will ensure that the consumer is no longer just a brand ambassador but, becomes one with the brand itself.

—Priya Lahe, Lead Consultant, ThoughtWorks India



Industrial Robotics and ERP



Automotive is one of the leading verticals for industrial robotics and recently demand has been driven by Tier 1/2 suppliers. OEMs are pushing suppliers to invest in robotics to ensure better quality and faster production.

Collaborative robots (Co-Bots) allow sharing heavy payloads and improve cycle times achieving an optimal degree of automation. Strong growth of the e-commerce industry in India and of logistics subsequently has pushed automation to keep up with high throughput requirements. ERP could not be better automated without robotics forming part of most manufacturing automations.

—Padmanabhan Iyer, Managing Director and Global CEO, 3i Infotech

Container adoption to be mainstream



In 2020, container adoption will lead to faster software production through more robust DevOps capabilities. Kubernetes will consolidate as de facto container orchestration platform. The popularity of

container adoption or 'containerization' is driven by speed and ease. Containers are abstract data types that isolate an application from an OS. With containers, microservices are packaged with their dependencies and configurations. This makes it faster and easier to develop, ship and deploy services. The trend towards multi cloud means businesses need data to be portable across various clouds — especially major providers — AWS, Microsoft Azure and Google Cloud. 451 Research projects the market size of application container technologies to reach US\$4.3 billion by 2022 and in 2020 more businesses will view containers as a fundamental part of their IT strategy.

—Dave Russell, Vice President of Enterprise Strategy, Veeam Software



Wider adoption of WhatsApp



We foresee for digital lending companies, a lot of action happening on Account Aggregator front helping financial services companies with clean banking data which can enable instant approval of the loan and other financial

services. API ecosystem evolving between non-financial and financial services companies to leverage alternate data for credit and risk assessment leading to newer business models evolving. Deeper NLP based bot technology capabilities being developed and adopted for both multilingual and multi-channel communications; and we see wider adoption of WhatsApp as a default channel for customer communications across entire customer journey including on boarding, processing, and support.

—Mukesh Kumar Singh, Chief Technology Officer, Lendingkart

DevOps will drive the digital



Most enterprises have implemented DevOps to achieve tangible business outcomes by improving customer and developer experience. However, DevOps adoption is still siloed. In 2020, we see continued investments to move

towards single-click deployments of infrastructure and apps. Engineering teams are moving from building pipelines to DevOps assembly lines for more complex scenarios. Enterprises are also looking to address security early in their development process. It could be in the area of secure microservices, device security, compliance testing, or testing of their cloud infrastructure for vulnerabilities. Ops teams are applying AI to address predictable events and automate low-value activities. AI models built on operations data are being used for detecting events early, reduce noise levels, and avoid duplicate incidents.

—Ankur Pawa, Senior VP – Digital Services, Sasken Technologies



Acceptance for computer vision models



Computer Vision technology is going to be a really exciting domain to watch out for in 2020. Computer vision models usually combine the advanced camera with deep learning, transfer learning solutions

and advanced image processing to replicate certain functions of human vision, but with better speed and accuracy. We call it providing eyes and mind to the machine. This technology is quickly gaining acceptance in many industrial applications like autonomous vehicles, food, and product delivery bots, medical auto diagnosis based on radiation imaging, food quality assessment, incident detection via CCTV footage, etc. It is essentially the branch of AI. We will continue to deep dive into the domains of AI to effectively incorporate them into the real world applications in 2020.

—Naga Kasu, Director Engineering and Hyderabad Site Lead, Uber

AI: Adaptive intelligence the key

AI, with the growing adoption of cloud and advancements in mobile network technology will lead to further growth of data and the need for solutions to make that data useful and actionable. The

true value of AI can

only be unlocked by combining it with knowledge of the clinical and operational context in which it is used—a people-centred approach that we call ‘adaptive intelligence’. AI will change the way we treat patients by providing personalized treatment plans. Ongoing digitalization and the introduction of new technologies like telehealth are already breaking down boundaries and creating patient-centric healthcare systems. This trend will increase in 2020, as the benefits of shifting care to less intensive care settings or even at home become increasingly recognized.

—Kalavathi GV, Head,
Philips Innovation Campus

**Blockchain in food, manufacturing, pharma**

Use of Blockchain to solve supply chain sustainability and compliance challenges will move from proofs of concept and pilot efforts to full fledge deployments in 2020 driven by large global brands with well-defined supply chains.

The projects that get funded will be those that have proven return like provenance tracking, contract compliance, supplier diversity and ethical sourcing. Separately, these same companies along with others with more fluid supply chains, will begin building out industry consortiums to identify industry wide challenges that blockchain can address. Early movers will be the food, manufacturing and pharma industry.

—Sunu Engineer,
Principal Architect, Icetis

M&A will end the era of “AI-washing”

Everyone wants a hand in AI, and many emerging businesses have been guilty of “AI-washing” rather than delivering true self-learning and operating smart technology. In 2020, the true AI providers will distinguish

themselves from the impostors through capital investments and purchases. As more large telecom companies and enterprises look to utilize advanced AI capabilities for streamlined network operations and connectivity, we will see a spike in M&A deals targeting smaller AI startups in 2020. After all, AI and automation are critical to managing ever increasing network complexity and ensuring fast delivery of services in the 5G era.

—Sally Bament, VP of Service Provider Marketing
Juniper Networks

**Multi-experience platforms in focus**

The blazing pace of digital disruption propelling growth and innovation is pushing strategic ambitions to newer levels. Sales domain with its sharp focus on customer experience is the breeding ground of experimentations with

immersive technologies and heralding development of multi-experience platforms. AI-powered smart interfaces, high volume of advanced analytics and real-time intelligence shall continue to get refined and pervade industries driving business opportunities. Data proliferation shall continue unabated and improvements in data science shall ensure multi-fold surge of whitespace discoveries, new market penetration and net new customer acquisition. Hyper-automation shall pick up pace and continue to disrupt industries. Surely, a transformative 2020 awaits us with more real-world solutions to combat real-world challenges.

—Snehashish Bhattacharjee,
Global CEO, Denave

5G-Edge to change how we interact



With hybrid and multi-cloud going conventional, 2020 is going to be the year where we get to notice enterprises taking up the trend of keeping their option of transitioning to single or

a multi-cloud platform open. This can help enterprises unlock their potential by helping them explore varied benefits that each cloud service provider offers. Another area attracting a lot of investment by major infrastructure players is multi-cloud led by Kubernetes, which may lead to it going mainstream in 2020 and beyond. With 5G, Edge computing can change the way we interact with platforms and IoT. While India still awaits the launch of 5G, this will open doors to innovation disruption in areas like public utilities, farming, industrial IoT among others.

—Varoon Rajani, Co-Founder and CEO.
Blazeclan Technologies



5G-Edge-AI will be unique



What a decade this has been! We moved from technology being an enabler to technology as a differentiator, and today every business is a technology business. Underpinning this digital transformation, we've

seen very strong pillars emerge—5G, Edge, quantum computing and AI. Quantum computing is still evolving and needs more research to go mainstream and blockchain is awaiting favourable ecosystems to emerge. I am positive that in 2020 that 5G, edge and AI will help businesses create unique experiences for customers supported by a combination of connectivity, data and intelligence. I also look forward to the next decade of transformation as we march towards singularity.

—Ashok Balasubramanian, Chief Technology Officer,
Business and Platforms Solutions, Atos



The future is Edge

With the adoption of data intense technologies and devices, the quantity of data we're dealing with continues to increase. While processing data, many organizations realize that there are shortfalls such as latency, cost and bandwidth in cloud computing. To help eliminate these drawbacks, companies are moving towards Edge computing—an alternative approach to the cloud environment. Edge computing can lower the dependency on the cloud and can simultaneously improve the speed of data processing as a result. With numerous applications in smart cities, autonomous vehicles, AR & VR, and the Industrial Internet of Things (IIoT), the future of edge computing looks bright.

—Vikas Bhonsle CEO Crayon Software Experts

5G-IoT set to dominate



5G with emerging technologies like AI and IoT will not just upgrade existing services, but lead to creation of new, improved alternatives. Its impact is expected to be

felt across automotive, defence, education etc. Industrial and consumer infrastructure will materially get impacted with 5G implementation. By 2022, 70% of enterprises will be experimenting with immersive technologies for consumer and enterprise use. 25% will have them deployed in production, according to Gartner. Although technologies will continue to evolve and find application in business processes, the 5G plus IoT can be expected to dominate the foreseeable future. Staying competitive will ultimately mean adapting, and there will be plenty in 2020 and beyond for companies to catch up with. So, it's time to get started.

—Sameer Mahapatra, Country Sales Head-India
and SAARC, Aeris Communications



Dense fiberization the key



The demand for data has only been soaring. 5G will have the maximum disruptive impact as a lot of the other technologies will cascade from the speed, low latency, and high reliability

that 5G can offer. Today, 5G commercial launches are already underway across major markets and there are estimated to be 1.2 billion 5G connections by 2025. A number of key technology implementations are crucial for 5G deployment, dense fiberization being the most important. Currently, there is only about 25-30%, amounting to about 4 billion fkm deployed across the globe, while 5G will require 70% tower fiberization to happen globally.

—Dr Anand Agarwal, Group CEO,
Sterlite Technologies

“DIY” learning will become prominent in future

There is a shift towards personalised learning, making it more engaging and fun for students. According to the our Global Learner's Survey, technology and innovation are giving educators, governments and companies the

greatest opportunity in history to rise to the occasion and improve lives through education. AI is enabling digital assessments to learners, leading to accurate and unbiased outcomes. Tech is enhancing learning experience, accessibility, better teaching and learning pedagogies by influencing the ecosystem. People of all ages are embracing it as the future of education. With ready access to online education, it is believed that, “DIY” learning will become prominent in future as people get older and need more flexible learning mechanisms. Digital transformation will pave the way for education hereon.

—Ramananda SG, Vice President - Sales & Marketing, Pearson India

**Strategic automation to be explored**

Customer expectations will evolve as real-time AI becomes more ubiquitous, and speed and relevancy start to become table stakes. Cutting-edge companies will look to infuse empathy in their customer interactions

to deeply engage with them. Businesses will also have to deal with their customers' personal “bots”, which will call and email on behalf of the customer. While it can greatly reduce friction for consumers, it can also increase the complexity for businesses, as the emotional factor will be missing during service interactions. Finally, businesses struggling with RPA will realize it may never reach the promised scale. Frontiers like strategic automation will be explored. (Forrester says 85% have not yet scaled beyond 10 bots.)

—Suman Reddy, MD, Pega India

AR to reduce dependence on field

In a fast evolving tech ecosystem, AR has emerged as a compelling option to provide premium customer experience, especially in a hardware context. AR allows support agents to view the same thing that a

customer sees and to accurately guide a consumer during troubleshooting. AR also has applications in accelerating agent training. It is important to integrate AR/VR, CRM systems and KBs to create seamless workflows in customer support. Increasing use of smartphones and handheld devices have ensured that technologies like AR can be effectively leveraged, thus reducing dependence on field support. We are gradually moving towards a mixed reality ecosystem merging the virtual world with the real world in real time by harnessing the power of AR/AI.

—Sunil Mittal, EVP & Chief Sales and Marketing Officer, CSS Corp

**Automation to cut across verticals**

Automation has become an integral part of the architectural industry. We have keyless locks, devices working on voice command and HVAC controls and smartphones have replaced switches.

AI is expected to revolutionise home automation and will run devices according to user preferences. Smart homes are expected to rise substantially in Tier 2/3 cities. Automation as an optional package will be offered by developers. In the commercial space, automation will significantly contribute in activities such as monitoring the usage of space, security system, building intelligent management systems for ACs to inculcate energy-efficiency in an effort to fall under gold or platinum categories as per International Green Building Council's terms. In the hospitality sector, the ‘wow’ element created by lighting automation will appeal not only to the hotel chains but also to single hotel owners.

—Alok Hada, Director, Anusha Technovision Pvt. Ltd

Renewed focus on data literacy



2020 will witness a renewed focus on data literacy. Organizations will be on the lookout for professionals who can read and analyze volumes of data to facilitate deeper insights and informed

decisions about the organization's workforce. Reskilling will be a priority for existing employees. Data suggests that there will be 29 million skills in deficit by 2030. The bulk of these missing skills will be soft skills, with two-thirds of the jobs created between now and then expected to be strongly reliant on skills like communication and empathy. To address this skills shortage, recruiters are shifting their focus to hiring professionals with the ability to adapt to changing roles inflexible organizational structures. Since huge numbers of Gen-Z professionals will be entering the workforce over the coming years, the current workforce will have to reskill itself extensively to stay relevant.

—Zairus Master, CEO – Shine.com



Bluetooth Low Energy to power wireless



2019 saw intelligent lighting solutions gain momentum as wireless lighting installations began to be used at larger scales across segments such as street lighting and advanced motion sensors; owing to energy-efficiency, reduced operational cost, longevity and quick deployment. Our automated lighting controls reached out to both commercial and

non-commercial consumer bases. Moving forward, wireless lighting in 2020 is most likely to be powered by BLE (Bluetooth Low Energy) protocols that allow for grid communication possibilities for large-scale light installations. This technology is now more economically viable than before and we expect to see its large-scale emergence in the mainstream lighting projects soon.

—Dhruva Kakar and Udayan Kakar, Partners, LTECH



Domestic appliance ecosystems with IoTs



Existing products like robotic floor vacuum cleaners are now building their own product ecosystems with IoTs. Robotic floor vacuum cleaners are communicating with floor mopping robots without

human intervention. As per Gartner by 2022, 70% of the enterprises will be experimenting with immersive technology for consumer and enterprise use. Domestic smart appliance innovations can be expected in refrigerators, ACs, dishwashers. There will be a push for products like autonomous driving cars, AI products like citizen robots. We already saw the beginning with promo of Sophia in 2019. Automation like cashier-less Amazon go-to store, automated check-in systems at the airport. There is a lot to look forward and everything will be eyeing on end-user making life easy.

—Pulak Satish Kumar, COO, Puresights Systems



RPA will emerge as a complementary technology



Key benefit of RPA is that it plays well with other existing technologies. RPA has the potential to adapt quickly to changing circumstances and learn accordingly. Hence it enhances processes rather than replacing

them. Since it's not always feasible to redesign workflows from the ground up, automating inefficient processes with RPA can greatly improve productivity. Secondly, in 2020, the automation market will see a shift from point solutions to more comprehensive offerings that will address integration challenges and enable best-in-class features that enterprises require. Digital transformation is a journey. RPA implementation shouldn't be treated as a short term project to gain cost efficiency. It must be integrated in the processes from the beginning to avail comprehensive benefits.

—Neelesh Kripalani, Sr. VP and Head Center of Excellence (CoE) of Clover Infotech

Network threats to be bigger



In 2020, the biggest network security threats will be created by the network's continuing proliferation, movement to the cloud and extension to critical infrastructure and industrial control systems. To make

matters worse, the advent of 5G will allow attackers to siphon data out of compromised devices at a speed not imaginable before. All of the above will push the cyber security skills gap beyond a threshold that is acceptable to business operations. Not solving this serious issue will have a deeply profound impact on the business bottom line.

—Klaus Gheri, VP, Network Security, Barracuda Networks



Health data explosion via wearables



Technology advancements are touching every aspect of health care, including solving the cost challenge, improving care delivery and patient experience, collectively providing whole person care. The

advent and rise in the usage of connected wearables and medical devices has increased manifold the amount of health care data being generated, which will continue to grow through 2025. As a result, big data and predictive analytics are expected to play an even bigger role in health care, specifically in the field of disease forecasting, clinical decision support and personalized medicine.

— Sunil Raheja, Head Technology, Optum Global Solutions

Hybrid multi-cloud strategy

Adoption of cloud technologies within Indian organizations will be on the rise in the next few years, with a majority of them moving towards a hybrid multi-cloud strategy starting 2020 onwards. We believe automation using AI to manage hybrid multi-cloud complexities, enhanced focus on security with security command centers becoming mainstream, adoption of Kubernetes and Containerization to modernize infrastructure and accelerate application modernization and lastly modernizing the Information Architecture to create self-service data platforms will be the key trends for 2020.

— Vikas Arora, Vice President, Cloud & Cognitive Software & Services, IBM India/South Asia

Tech and FinTech collaboration



The digital industry observed advent of multiple innovative but niche apps that have contributed to customer convenience. For instance, being able to educate one's child or leveraging RFID to

refuel a vehicle with just a click; this new generation of apps open the possibility of a very different kind of collaborations between Tech and FinTech players in the near future. The next few years will see an increased dependency on smart technologies with improved adoption of mobile payments becoming the norm. Customers will continue to benefit from UPI QR, interoperability will drive digital payments in 2020 and pave the way for financial inclusion in the country."

—Ravi B. Goyal, Chairman & MD, AGS Transact Technologies Ltd



WhatsApp to integrate with CX strategy



In 2020, we will more companies integrating messaging solutions like WhatsApp into their CX strategy. Customers will continue to expect more from businesses, regardless of whether they are digitally native, disrupting, or

transforming their industry. In line with this, more companies will recognize the power of adopting an omnichannel CX strategy to give their customers an increasingly seamless experience. I also expect to see a higher adoption of AI and self-service, particularly amongst millennials and Gen-Zers who, according to our data, are more comfortable finding solutions online via FAQs and help centers."

—KT Prasad, Country Sales Director, Zendesk



Data moves from an analytical to decision-making tool



In 2020, the shift to leveraging data for real-time decision-making will accelerate for a growing number of business functions. In the coming year, many more organizations will start to realize the potential of their data

to intelligently guide business decisions and leverage it to reach even greater levels of success. And looking even further into the future, they will eventually be able to determine whether potential suppliers' policies adhere to international laws and social ethics, and be able to use data to identify, in advance, a host of potential supply chain disruptions, such as a small number of suppliers concentrated in a region vulnerable to weather or manmade disasters.

—Mankiran Chowhan, Managing Director,
SAP Concur, India



Opportunities in cybersecurity



The losses due to certain cybercrimes are expected to reach US\$6 trillion by 2021 according to a report by Cybersecurity Ventures. This is when almost 60% of organizations have unfilled cybersecurity positions

owing to the skill gap and 77% of leaders believe that an infrastructure breach can take place with far-reaching consequences. The need of the hour is to quickly fill this void by adopting next-gentech like as cybersecurity simulation and training platform to equip our nation with the required skillsets and thereby generating over 1 million jobs for India's youth. 2020 could turn out to be a year of unbridled opportunities for India if it is able to successfully align itself in this landscape.

—Rakesh Kharwal, Managing Director - India/South
Asia & ASEAN, Cyberbit

Growth of AI democratization

The biggest opportunities are the growth and



adoption of 5G adoption worldwide, meaning a plethora of opportunities for IoT to thrive and expand. Many solutions that are in ideation phase could see life. The sole reason being 5G is the solution to all challenges posed

by IoT in terms of connectivity. Extended reality mainstream adoption enables new doors towards many new opportunities. Besides, more adoption by industries means a reduction in cost. As more and more providers gives AI-as-a-Service, we will see a massive growth of AI democratization. Hence, the top 3 predictions for 2020 could be that IoT with 5G would be more prevalent; Industries would be more adoptive towards AI, more and more such industries would be data intensive and we will see a rise of extended reality application all over again.

—Sukanya Mandal, IEEE Member and
Data Science Professional



Supply chain innovations in urban mobility



In 2020 we expect supply chain technologies to play a big role in changing the face of the daily office commute market. The supply chain innovations around predictive vehicle positioning,

automated dispatch will be based on a city planning model and will deliver the benefits of better vehicle utilization, city decongestion and reduction of our carbon footprint. We also expect that the daily office commute market will lead the adoption of electric vehicles in the country and this will be made possible by deep learning algorithms which take vehicle dispatch decisions based on range, charging infrastructure availability and expected future demand into the day.

—Surajit Das, CEO,
Routematic

AI will be easier to deploy

Industry-specific templates will make AI easier to use and deploy in 2020. In manufacturing, AI and ML systems will take advantage of templated processes to help enterprises better manage their parts inventories, improve demand forecasting and supply chain efficiency and improve quality control and time-to-delivery. In healthcare, organizations will leverage AI-ML to better integrate data that's segregated in application silos, exchange information with partners across the care continuum, and better use that data to respond to regulatory and compliance requirements. And, in retail, companies will use AI-ML to better predict demand patterns and shipment dates, based on defined rules, and improve their short- and long-term planning processes.

—Rick Rider, Senior Director,
Product Management, Infor



Dark stores will gain greater prominence

Dark stores are essentially retail distribution centers that resemble a typical supermarket but is used primarily to fulfill online orders. While the concept started out as a way to fulfill grocery orders, several brands are testing out the dark store concept for apparel and food deliveries. For several brands, dark stores have become strategically important in matching the ever-shrinking shipping time and superior customer service levels of major retailers like Amazon and Alibaba. The proliferation of dark stores is a direct consequence of the rise of hyperlocal commerce and the rapid growth of the online grocery market. They also fuel the growth of cross-border commerce by making it easier for retailers to expand their operations into new regions and markets.

—Vikram Bhat, Chief Product Officer,
Capillary Technologies



5G enterprise disruption

Moving into 2020, 5G networks will continue to be rolled out in cities across the globe, with devices designed to take advantage of it. This will create more disruption to the enterprise which will have even more difficulty identifying what devices are out there listening to and observing employees via a rogue 5G security camera or smart speaker. We'll have the advent of 5G-only IoT and IIoT devices, which do not require connecting to local network to operate. This will diminish the risk of an IoT device used as an attack vector against the rest of the network. But it will create more disruption for enterprises that already struggle to determine which equipment they have in their digital infrastructure. When their elevators, HVAC, CCTVs and smart speakers start connecting directly to the cloud via 5G, it won't get any easier.

—Renaud Deraison, Co-founder and CTO, Tenable

Breakout year for DARQ tech



For the upcoming decade, while familiar subjects such as cloud computing (including everything-as-a-service, or XaaS) and AI will continue to dominate technology headlines, 2020 could be a breakout year for

“DARQ tech” (the set of new technologies - distributed ledger technology, AI, extended reality and quantum computing). There are also substantial new social and commercial opportunities – such as adult education, care economy, employment services – that make India ripe to be profited and take the leadership spot at the global technology stage. Today, technology can help solve real world problems and provide opportunities for inclusive prosperity. However, in order to accelerate the technological growth, the country needs to attract more foreign investment, offer tailored upskilling programs, retain home-grown talent, as well as create a favorable regulatory environment.

—Sumit Sood, Managing Director, Asia Pacific
(APAC), GlobalLogic



Wealth management becoming easier



Technology has made the financial industry more accessible and comprehensible to regular users. An emerging trend we have observed in the FinTech industry, is how technology is enabling individuals who have

a knack for financial matters, take a step forward to become a Wealth Manager. With just a smartphone, individuals with a good understanding of the sector can be empowered to offer advice and counsel to those in their circle and can also choose to offer their services on a FinTech platform at a professional level. A Wealth Manager's service is key to bridging the trust gap that a customer may face while using a Wealth Management app/platform and also provides the individual with a flexible job with a steady source of income.

—Aditya Agarwal, Co-founder, Wealthy

9 TRENDS FOR 2020

There will be major shifts and transformations in the Internet of Things, data silos, system level design, digital twins and education, among many other things

Sudhir Tangri



1. New realms of measurement will grow in importance in 2020: Measurement based tools of many kinds are key enablers for the technology-based products and solutions we incorporate into our daily lives, and it will transform as disruptive technologies come into play.

- In 2020, advanced applications related to 5G, will explode, using higher frequencies and smaller geometries. To support this growth...

- a) New classes and labs for design and simulation, over the air testing, antenna systems and measurements will be incorporated into the core engineering curriculum.

- b) New measurement science (hardware, software and calibration) will be developed and

made part of mainstream offerings.

- c) Developers of new electronic products and solutions will use different tools, specifications and terminology to specify and validate their designs.

- In 2020, the use of software in implementing technology will remain prevalent, especially in networking and position or navigation-based smartphone applications. As a result, software-on-software measurement will see a strong surge and therefore, so will emphasis on interoperability among software tool chains. New standards and certifications will be created; impacting development processes, as well as the marketing required to ensure consumers are aware of what a software-centric product can and cannot do.

- In 2020 there will be a substantial rise in specialized processors, such as GPUs and chips that implement Artificial Intelligence or AI architectures which determine how a network processes and routes information and maintains security, privacy, and integrity. Quantum computing and engineering will continue to be in an aggressive hype phase in 2020, but the ability to control, measure, and error-correct quantum systems as the number of qubits grows will be important from the start.

- As measurement and operation of the computer blends, those interested in building practical quantum computers will require knowledge about measurement technologies and techniques before the quantum computing goes into the mainstream.

2. Data silos will be connected to extract development insights: Leading companies collect data but typically store it in functional silos: R&D design, pre-production validation, manufacturing, operations and services.

- In 2020, companies will start connecting these silos of data using modern cloud architectures, such as private on-premises clusters, or public sites like AWS or Azure. With the data centrally available, teams will correlate performance through the development process, from early design to manufacturing to field deployment and close the loop back to design. The benefits for these teams include the rapid collection and reformatting of data, faster debugging of new product design, anticipation of manufacturing issues, and improved product quality.

- To achieve these gains, teams will invest in a computing infrastructure, determine how to store the data, including file location and data structure, as well as choose analytic tools to select and process data to identify anomalies and trends. In addition, teams will change the way they work to shift attention to data-driven decisions.

3. 5G and the Data Center: New 5G capabilities in 2020 will put pressure on networks, revealing new data center and network chokepoints.

- Industrial IoT applications will increase access requests and mobile automotive IoT applications will stretch latency demands. Edge computing will become more important to process the increased access requests and meet stringent latency requirements.

- Higher data speeds will place more demands for faster memory, faster data busses, and faster transceivers in the data center. Meeting the speed



SUDHIR TANGRI, Country General Manager & Vice President, Keysight Technologies

and flexibility demands will be one reason, but customer traceability through the network for application monetization will be the main driver to upgrade to the latest standards.

- In 2020 we will see advanced design, test and monitoring capabilities that ensure networks and products deliver the performance and failsafe reliability expected. The industry will experience closer collaborations between chipset and product manufacturers, software companies, network carriers, cloud hosting companies and international standards organizations to build tomorrow's networking infrastructures.

4. Challenges will abound to get 5G to maturity: 5G represents technical evolution and revolution on many fronts creating new technical challenges that span many domains.

- In 2020 the industry will move from a small group of early-movers who have commercialized initial 5G networks, to a global community in which multiple operators in every continent and in many countries will have commercial 5G networks.

- The early adopters will add scale and those who launch in 2020 will quickly resolve issues in their initial deployments. Second-generation devices and base stations will be added to the market, and the standards will have another new release in 3GPP's Rel-16.

- Key technical challenges for the industry in 2020 will be: ensuring performance in mid-band (3.5-5GHz) frequencies, moving mmWave to mobility, transition planning to a full Stand-

Alone (SA) 5G network, and resolving architectural decomposition and standards for centralized RAN and Mobile-Edge computing (MEC).

5. The “Internet of Things” will become the “Interaction of Things”: IoT will rapidly move into the mainstream with widening commercial acceptance, increasing public-sector applications and accelerated industrial deployments

- In 2020 we will see an increased level of “smart” experiences when the “Internet of Things” – a collection of devices connected to the internet – becomes the “Interaction of Things” – a collection of things that are communicating and working effectively and efficiently with each other.

- There will be powerful devices working with other powerful devices to act quickly and efficiently in the background independent of direct human intervention. Mission-critical applications, such as remote robotic surgery in the area of digital healthcare or autonomous driving in the area of smart mobility, will feel the impact of this shift.

- While these applications will benefit from the “Interaction of Things”, new solutions will be developed to ensure they do not suffer from the “Interference of Things”, especially when communication failure and network disturbances can bring about devastating or life-threatening consequences. The same will be true of Industry 4.0 applications and smart city applications. Uptime will not be optional.

6. Digital twins will move to the mainstream: Digital twins, or the concept of complete replicate simulation, are the nirvana of design engineers.

- In 2020, we will see digital twins mature and move to the mainstream as a result of their ability to accelerate innovations. To fully realize the technology’s benefits, companies will look for advanced design and test solutions that can seamlessly validate and optimize their virtual models and real-world siblings to ensure that their behaviours are identical.

7. Active cruise control: 2020 will not be the year of the autonomous vehicle. Active cruise control, yes. Full autonomy, we have a couple years to go. The quantity and sophistication of sensors deployed in vehicles will increase in 2020, but fully autonomous vehicles will require more ubiquitous 5G connectivity and more artificial intelligence. Here is where we see the industry on each of those areas:

- The ratio of fleet sales with EV or HEV powertrain will grow from single-digit percentage

ratio to double-digits in 2020 tripling the shipped units compared to last year.

- The first C-V2X network will hit the streets in China, but they will be operating on an LTE-V network until 5G Release 16 evolves the standard.

- The technical advances for sensors and in-car networks will continue to evolve on a fast pace, needing faster in-vehicle networks. In 2020, Gigabit Ethernet based in-car networks become a reality and significantly improved sensor technology enables AI developers to hit new performance levels.

8. System level design, test & monitoring to experience dramatic transformation:

The connected world will force a shift in how performance, reliability, and integrity are evaluated.

- In 2020, realizing the full potential of sensor systems connected to communication systems connected to mechanical systems will require new ways to test at the system level.

- Today, there are available tests for radar antennas and a radar transceiver module. However, testing a multi-antenna radar system integrated into a car will require a different testing approach. The same is true for data centers, mission critical IoT networks, automobiles, and a wide range of new, complex, 5G-enabled applications.

- In 2020, the electronics industry will emphasize system-level testing as the definitive, final step to assure end-to-end performance, integrity and reliability across the increasingly connected world.

9. Education will shift to prepare the next generation of engineers: Universities will adopt holistic, integrated, and multi-disciplinary curricula for engineering education.

- Academia will tap into industry partnerships to keep up with the accelerating pace of technology and incorporate certification programs, industry-grade instrumentation and automation systems into teaching labs to train students on current, real-world applications.

- To address IoT, universities will combine methodology from basic electronics, networking, design engineering, cybersecurity, and embedded systems, while increasing emphasis on the impact of technology on society and the environment.

- To address AI, automation and robotics, universities will mainstream currently niche topics such as cognitive science and mechatronics into required learning.

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CHALLENGES AND OPPORTUNITIES IN THE NEW YEAR

Falling behind in tech results in loss and decreased exposure in the market. Whether to enhance customer experience or create staunch credibility, keeping up with tech helps businesses in shaping their success

Gaurav Vohra



Technology has been fueling the business realm since its inception. From extending effective services to automating tasks, the evolvement in technology has made it possible for businesses to advance radically in their respective industries. Irrespective of the size, structure, and objectives, every business from small to big is embracing the technology to harness its potential and

extend efficiency in their company.

The rate at which technology is advancing is the evidence that there will be some massive transformations in the coming years as well. In order to remain competitive in such radical technological changes, it is important for businesses to remain updated with the trending technology trend in their industry. Being acquainted with the technology

trend helps in leveraging its worth in the industry to the best and steer the business to optimal productivity.

Why is it necessary to remain updated with tech trends?

Technology is inescapable, whether in personal or professional life. It has become more than necessary to stay updated with the technology. When it comes to businesses, staying updated with the technology trends has become the need of the hour. Falling behind the technology can result in severe loss and decreased exposure in the market. Whether to enhance customer experience or create staunch credibility in the industry, keeping up with the technology only helps businesses in shaping their success.

Technology trends also help businesses in staying relevant in the market. Those who know how to tap into the technology for the betterment of their company are the ones who actually realize the perks of productivity gains. Exposure to technological trends will also help in opening new avenues of opportunities for your business that were missing out earlier. Not keeping up with technology can result in many missed opportunities that might have made a significant difference in your business.

Tech trends to turn the tables in 2020

As we bid adieu to a prosperous year that witnessed some significant technological advancements benefitting the business realm, it's time to make way for future tech trends. 2019 has effectively embraced the wave of tech innovations in the form of social robots, personal assistants and the growth of voice search. With a new year all-set to bring massive transformations, let's take a look at the popular tech trends that the business realm must be acquainted with.

Hyper Automation: Automation has already set its foot in the business world and showcased its prowess and prominence in the industry. It has efficiently automated the tasks and enabled humans to achieve more with less. Hyper Automation is deemed to be the next boom in the industry. It involves the application of advancing technologies like Machine Learning and Artificial Intelligence to improve the automation process and augment humans. This upgrade to automation technology is said to be extended across a range of automated tools for designing,



GAURAV VOHRA, Co-Founder and CEO Jigsaw Academy

monitoring, analyzing, etc. Hyper Automation is an amalgamation of tools such as Robotic Process Automation, AI and intelligent business management software that are focused on encouraging AI-driven decision making. It will result in the development of a digital twin of the organization that will enable businesses to visualize the digital version of their key performance indicators and processes.

Multi Experience: With a motto of replacing technology-literate people with people-literate technology, the multi-experience is the next big step in the customer experience enhancement. In multi-experience, the single point of interaction will be transformed into multi-touchpoint interfaces with the help of smart wearables and sensors. The inception of multi-experience has been already registered as Domino's Pizza has developed an incredible experience that is beyond app-based orders. They have included autonomous vehicles, smart speaker communications, and a pizza tracker as well.

Amalgamating AR, VR, multichannel human-machine interfaces, and sensors, multi-experience

can bring omnipotent changes to the business realm. Customer experience is going to set a new milestone with multi-experience. 2020 will completely embrace multi-experience as more and more growing, and established companies will adopt this technology into their business.

Prescriptive Analysis: Since the inception and steady growth of data analytics products, prescriptive analysis has remained a holy grail. As we know, that these data analysis tools are majorly used for descriptive and predictive analysis only, with the inclusion of prescriptive analysis, businesses will be able to seek advantage of these descriptive and predictive analyses as well. Earlier data analysis tools were only used to arrange and represent data in order to better understand its effect. Now prescriptive analysis will make it possible to make the most of this data.

Prescriptive analysis is nothing but the usage of the tools to look beyond just arranging and distributing data. The main aim of the prescriptive analysis is to make better and productivity-oriented decisions for the business. Some industries have already started the application of prescriptive analysis, such as the oil and gas industry and the healthcare sector. 2020 will witness the extended application of prescriptive analysis.

Human Augmentation: Human augmentation is a big step towards enhancing human cognition and physical experience. Human augmentation is basically the use of technology to enhance the human experience. The physical augmentation is aimed at changing the inherent physical capability of humans with the implantation of technology within the human body. For instance, mining industries have already started a slight application of human augmentation by giving wearable to

enhance the safety of workers. Retail and travel industries use these wearables to increase the productivity of the workers.

Cognitive augmentation will enhance a human's ability to think bigger and better in order to encourage them to make productive decisions. It basically uses information and applications to improve learning experiences. There are different cultural and ethical implementations of human augmentation that needs to be identified accurately.

Distributed Cloud: Cloud computing has been revolutionizing the way businesses accessed and stored important data. Distributed cloud is deemed to bring a new era of cloud computing that will change the conventional centralized public cloud. It will distribute public cloud services to different locations that are generally outside the provider's data center. Your cloud provider will be held responsible for the cloud proceedings, including architecture, operations, delivery, governance, and updates. In a distributed cloud, data centers can be located anywhere, and there is no need to remain closer to the provider's physical data centers.

With the inclusion of distributed cloud issues like latency and data sovereignty will be solved. It will also provide some additional benefits of public cloud service and local private cloud. The mechanism of the distributed cloud is still under process, it is anticipated that 2020 will be the year when the world will witness this new beginning of the cloud computing era.

You cannot certainly escape technology. Everywhere you go, whatever you see is powered by technology. The business realm, in particular, is primarily affected by such technological advancement. In most cases, these transformations work as a boon for companies contributing to the growth of the companies. In order to harness the utmost potential of trending technologies, it is essential for businesses to remain exposed to these trends.

As a new year is about to unveil, there are many technological opportunities that are waiting to leverage businesses and take them to a whole new level of productivity. The above mentioned were some of the tech trends that you must watch out for in 2020 as they are all set to bring a wave of radical advancements in the business realm.

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Cognitive augmentation will enhance a human's ability to think bigger and better in order to encourage them to make productive decisions. It uses information and applications to improve learning experiences

SUBTLE SHIFT AWAY FROM SERVICES

Deloitte's Technology Fast 50 list focuses on the fastest growing tech companies. Conceived in the US in the 1990s, it came to India in 2005. Rajiv Sundar, Program Director—Technology Fast 50 India and Partner, Deloitte India, talks about the 2019 list

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Changing trends of the 2010s...

The Top 50 was dominated till about 2012-13 by software services. There was a shift till say 2016 when you started seeing a lot more consultative technology businesses. 2016 to now the tables have turned. Software services are there, you can't ignore them. But are they featuring prominently in the top 50? No. Now it's a diverse field. You've got a lot of consumer internet, AI, robotic technology, predictive plus pure-play analytics and customer interfacing-management-interaction businesses. You're seeing a slightly shifting pattern towards software products, SaaS and technology being developed to cater to a problem statement which hitherto nobody catered to. That seems to be the flavour if you look at the wider economy. Consumer Internet and analytics dominate. There are also Bio/clinical informatics. In terms of geography, this time Bangalore, NCR and Mumbai dominate the list. Mumbai is doing well because of consumer Internet.

Emerging technologies on the list

As far as blockchain goes, the monetization

capability is still not there. Blockchain as a technology, surprisingly enough, is being developed in house by a lot of the big businesses, who have real applicability. When it comes to Robotic Process Automation (RPA), there are a few here, not many. That's because a lot of them find the utility value of their Intellectual Property to have better value and acceptance in the US than in the Indian market presently. If you're looking at the Indian market, the IP accretion is really going to be from a private equity or a VC investor who's willing to play the bet on your product. A lot of the serious automations folks, they're not entrepreneurs, they're technocrats. Their preference tends to be: Can I go to a market where there will be significant understanding and appreciation and instant applicability of the tech that I'm developing. So I may as well go to the US, where I'm going to have the General Motors of the world at the Fords of the world are going to be liking what I'm doing. In India a lot of the underlying infrastructure is not conducive to absorb the tech that these guys are developing.

Deloitte Technology Fast 50 India 2019 ranking

Rank	Location	Three-year average growth rate	Rank	Location	Three-year average growth rate	Rank	Location	Three-year average growth rate
1	 Mumbai	8,271.1%	19	 Hyderabad	268.2%	37	 Noida	152.1%
2	 Bengaluru	2,849.4%	20	 Kolkata	263.7%	38	 Bengaluru	142.3%
3	 Vadodara	2,290.5%	21	 Bengaluru	259.8%	39	 Mumbai	138.1%
4	 Ahmedabad	1,982.3%	22	 Ahmedabad	254.5%	40	 Mumbai	134.6%
5	 Noida	1,366.8%	23	 Noida	242.5%	41	 Hyderabad	129.2%
6	 Noida	1,105.7%	24	 Gurgaon	242.2%	42	 Chennai	123.5%
7	 Bengaluru	957.0%	25	 Bengaluru	233.4%	43	 Noida	113.2%
8	 Gurugram	952.4%	26	 Indore	232.1%	44	 Noida	104.4%
9	 Bengaluru	916.4%	27	 Mumbai	229.1%	45	 Chennai	102.2%
10	 Gurugram	858.9%	28	 Bengaluru	226.6%	46	 Chennai	100.4%
11	 Gurugram	742.1%	29	 Lucknow	225.0%	47	 Chennai	93.3%
12	 New Delhi	526.8%	30	 Bengaluru	192.8%	48	 Mumbai	93.1%
13	 Hyderabad	521.1%	31	 Mumbai	185.7%	49	 Mumbai	91.9%
14	 Pune	510.9%	32	 Mumbai	178.9%	50	 Kolkata	87.9%
15	 Bengaluru	456.5%	33	 Pune	178.2%			
16	 Mumbai	383.5%	34	 Bengaluru	170.5%			
17	 Bengaluru	337.4%	35	 Hyderabad	160.9%			
18	 Mumbai	332.2%	36	 Pune	159.5%			

Source: Deloitte - Technology Fast 50 | India 2019 winners report

THE IMPORTANCE OF INTELLIGENT TRANSFORMATION

Digital transformation means different things to different people, depending on the vertical industry that they come from. Vivek Sharma, MD—India, Lenovo DCG, talks about what they call intelligent transformation and how they are going about doing it

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Getting into the data centre business

Lenovo has made three major acquisitions in the past: The IBM's PC ThinkPad and System x server divisions, along with the Motorola handset division from Google. Initially the server side was merged with the PC division. After that it was decided to split it all into different entities. That's why we now have the Intelligent Devices Group (IDG) which encompasses the PCSD (PC and smart devices) and mobile business groups. Then you have the Data Centre Group (DCG), which has transformed from a server based entity to full-fledged solution provider and transformation at the data centres.

If you look at the data centres today, they're transforming workload by workload. Earlier you would do a rip and replace either on hardware or software and that's how you would expand. Now with the advent of things like software-defined, hyper converged, virtualization, hybrid cloud... a lot of these things are now moving workload by workload. From a

customer perspective, they're now looking at partners who can give them service oriented consumption based models maybe spread over a three-year period up to 10 years and they would want to pay as they go.

We introduced ThinkSystem, from the traditional data centre infrastructure with our HPC (High Performance Computing) brands. ThinkAgile is for our software-defined appliances. We have our own private cloud offering called ThinkAgile CP. TruScale is a consumption based model for data centres. We see a moment of balance between public and private. So there's a hybrid cloud model which is very clearly emerging. You have core applications may be behind the customer's firewall, either on the choice of their data centre or their own data centres and there are workloads that they're clearly working on currently.

Digital or intelligent transformation?

There's transformation and you can add digital

in front of it. But digital means different things to different people depending on the vertical industry that you come from. We call it intelligent transformation. There are three drivers for it. Number one is data, which they call the new fuel. Second is the connecting part, the computing part. You have to be at the Edge and you have to be at the core. Third are the algorithms which you will run on top of it to make sense of the whole thing.

We break down it down further. The first is smart IoT (Internet of Things). We can address this end to end because we have a mobility division which will take advantage of 5G. We've introduced a whole new set of IoT devices like cameras, televisions, ruggedized servers and PCs on the Edge. It's not only the data at the Edge, a lot of processing will also happen on the Edge, it needs compute power. Smart IoT will come from that perspective.

Compute has reached an interesting stage, that's why you see so much of interest from an AI perspective. The data models, the software, the computing power is all merging along with the availability of manpower. AI is not new. It's had its own cycles in the past. The bedrock for running that is going to be super computing clusters. Finally on top of that, we have the algorithms and the AI engines and analytics. As a consequence, the cloud moves to the Edge.

IoT devices and the Edge

IoT is already spanning the consumer base to small businesses to large businesses. There's immense potential. The Fitbit watch is an IoT device. It tracks your health, so that's from a healthcare perspective. There's the Apple Watch too. It all looks at the health parameters, there's a lot of data which gets collected and then it gets thrown back to you and does an analytics and a prediction. Your heart rate and breathing patterns can be monitored.

If you look at manufacturing, now we have data processing capability at the shop floor itself, because of an IoT device. The nature of these IoT devices will vary. For example, we did the beta testing of a server on the Edge, which slightly than a ThinkPad, with three inbuilt antennas and one for 5G. It has its own processing power. It's ruggedized and you can actually use it on an Indian railway platform and it'll work even in the rain.

Take our partnership for Ducati, for example. They use our Edge devices on the circuit. There's a processing which can be done and then it goes to a core which is again our servers. So it's a marriage of both IoT devices from both a PCSD and server perspective. People will discover more and more



VIVEK SHARMA, MD-India, Lenovo DCG

applications of IoT devices as we go forward.

HCI and SMBs

Hyper Converged Infrastructure (HCI) is one of the fastest growing segments and it is interesting how people have taken to it. The first HCI workload which really took off was VDI (Virtual Desktop Infrastructure). That's how the large enterprises tried it on that basis. The SMBs, if you look at the mid-market, have actually used HCI for their own critical workloads. I think the enterprises are now opening more and more workloads to HCI. There will be proliferation due to ease of use and operational flexibility. It also becomes your bedrock from a hybrid cloud perspective, depending on where you are in your journey. HCI can come from a compute only or a storage only perspective or it could be a combination of both. We have customers like that we have customers in the financial space, who are using it for specific bill payment issues.

Green data centres

Infrastructure has to be invisible to be successful and the data centres and as it is moving towards being software defined. But software still needs something to download. It has to be more predictable with more compute power and not a power guzzler. We are focusing on energy saving green data centres. The Neptune data centre is our largest warm water cooling system running in Germany. Water goes in at room temperature and it comes out so hot that they use it to warm the whole building. The energy saving that comes out of that datacentre can power 4000 households a year.

FINALLY MOVING OUT OF SILOS

Prahalad Thota, Head of Enterprise Analytics & Data Science, Wells Fargo, talks about how the Banking, financial services and insurance (BFSI) industry is adjusting to the latest changes in the data and cloud world

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Financial services dipping a toe in the data lake

In the financial services—data, analytics and insights are very critical to succeed. If you're a broad based financial services company, meaning you have all of the different financial products and deep relationships with your customers, you have a lot of data. Globally a lot of this used to be siloed. Every single product group or department used to collect their own data, store it in their own environments. They all made these decisions locally.

Over the last three to five years people have realised what a tremendous asset data is to be able to deliver products and services in a customised way, to manage risk. Financial services have come to realise that it's really something that can differentiate how you operate. They are trying to organise data in a very systematic manner, understand what data is, define it and also have established governance on it. So not only Wells

Fargo, but all financial services companies have a higher bar on how you manage data.

Secondly there has been somewhat of a limited move to the cloud. Other industries have gone to the cloud much more rapidly than I would say financial services. From a data security data encryption perspective, we want to make sure that our data is protected wherever it is. Financial services companies are starting to toe-dip into the cloud space. The cost of data storage is coming down with like some of the big data platforms like Hadoop. We can use some of this data and build very advanced sophisticated models and we can deploy them real time to make decisions that are good for the customer and good for the bank. We're building the right models. We understand exactly how these models work. We can't have black box models. We can't say, we'll put a model and it said to do XYZ with the customer. We have to see exactly what input are we using and have to be able to explain that.

Thirdly, more and more advanced analytical techniques are being used. Buzzwords Artificial Intelligence and Machine Learning are starting to become a reality. Companies are investing and trying to figure out how they can leverage ML algorithms to look at problems that in the past were solved with traditionally with things like statistical methods. I think in Silicon Valley alone there are thousands of startup companies, which are taking a small part of the problem in the entire data journey. It could be something around how do you combine data from different sources to all the way to applying ML algorithms, making it really automated and more efficient. We are trying to figure out what's the right set of tools and technologies that we need to have to be able to do our work. We want to make sure that whenever we use data and create any analytics

We're building models to predict the probability that a customer has a need for a particular product, feature or conversation. There are some simple algorithms, but in some cases we have to build very sophisticated models

or insights we have the right oversight from legal compliance and risk.

Key ingredients of the technology stack

When you look at any technology, there is the internally developed stuff, some things which are very specific to us. Then we buy enterprise solutions. Finally there's open source. We integrate all of that into our technology stack that all our data scientists have access to.

I think there is actually a really strong set of talent in India when you look at data science. Apart from lateral hiring, we're also targeting universities to bring in talent that has a quant background. A lot of programmes now offer data science almost like a minor in the engineering curriculum. Sometimes they miss some of the trends in the financial services context, which is okay as long as the talent has the quantitative abilities. The business context can be taught. In the US we look at data science, computer science, math, economics, even psychology. We hire the best talent and there's a lot of training. The space is evolving so fast and so rapidly, that we find that we have to constantly look at what's happening and bring additional training.

How do you organise your data? What is the strategy for customer and for businesses? You have to manage the data in the environments and making sure that you have all the processes. Analytics and insights looks at everything from advanced models to business intelligence. We've decided to expand our data science teams significantly and a big part of that will happen out of India.

Making customer experience better

In the bank right now we are aggressively pushing what we call the personalization initiative. We want to personalise our conversations, products and offers to the customers based on who they are, what are their true needs and how they like to interact with the bank. We are gathering a lot of the data about the customer—who the customer is, how long they have been at the bank, general attributes and their interactions over multiple platforms. We already had this information in different places, but we're bringing all of this data together.

We are building models to predict the probability that a customer has a need for a particular product, feature or conversation. There are some simple algorithms to do that, but in some cases we have to build very sophisticated models. There are all these probabilities and preferences that we model and



PRAHALAD THOTA, Head of Enterprise Analytics & Data Science, Wells Fargo

then feed into a decision engine which every day spits out what is the right conversation to have with a customer. Finally we have to actually check whether the customers are happier, more engaged and satisfied? Are we meeting their needs more effectively than in the past? We will roll out version one in June 2020 and that will keep evolving. We are applying AI to look into things like the voice of customer, the way they talk to us in multiple ways, emails, chat messages etc. Our objective is also to build models that will predict fraud as it is happening real time.

We take permission from customers on where we can use what data. They can always opt out. We've organised our data into 19 domains. For each of these, we have a business data owner and data management lead. Anytime anybody needs to use this data, they have to go to a fairly rigorous approval process. We also have our legal risk and compliance teams asking: Are you following all the laws of the land? Any analyst in the first week of joining the bank gets so much training on it. On top of all of this, there's GDPR (General Data Protection Regulation).



MIGRATION OF WORKLOADS A MAJOR CONCERN

Rajesh Awasthi, Associate VP, Managed Hosting & Cloud Services, Tata Communications talks about their foray into the data centre business and types of clouds that customers prefer

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Getting into the data centre business

Around 2008 we got into the data centre business because our customers started saying why don't you also give data centre space for us to host our IT or networking equipment over and above the networks that you are delivering. We have around 44 plus data centres. Our customers can do colocation with us. In 2009 we started IT as a service. That was the formation of managed hosting. In 2010 we started off our first multi-tenant private cloud offering. We deliver our managed services from 17 locations across the globe. We started our cloud nodes in 13 locations.

Around 2013 we did a tech refresh and we termed it Cloud 2.0 from our side called IZO private cloud, which was built on open source. We decided to deliver cloud which had freedom of choice from a hypervisor perspective. We have VMware KVM and Hyper-V. From a security perspective, this was a private cloud, which

was multi-tenant with multiple technology options on the perimeter firewall security side. At a storage level we have NetApp and HP storage and if a customer wanted also EMC. In the last one-and-a-half years, we have seen enterprise customers' propensity to move to public cloud, so we partnered with AWS and Google. We are a digital infrastructure services company. That is, we are more concerned with infrastructure and platform services, rather than Software as a Service.

Concerns of the customers

About three years back the greatest concern of customers was the possibility of data theft because of data leaving their own data centres. Today we see that most of our customers, be it mid-market or even the top end or SMB, their concerns on security are to some extent been taken care of, though ransomware is still a huge concern. But the biggest challenges they have

today when moving to a cloud environment is how to migrate their workloads. Their IT systems normally run 24X7.

Their concern is which cloud environment is best suited for their application workloads. That's where they want a consulting partner to help them with data classification or workload classification to identify what would work best on which kind of environment at an optimal cost. They are open to looking at monthly recurring charges with a capability to scale up on a pay per use basis. They want flexibility to access, not only by the internal employees but also by their partners, or by customers when they are deploying a digital platform.

Public, private or hybrid?

From a requirements perspective, what you get in a public cloud environment is the scale, agility and the latest technology. It gives you the flexibility when you have a transient workload and you need certain things to be deployed very quickly to meet a business requirement. Over a period of time we've seen that the public cloud providers are becoming enterprise centric. Most of their work still comes from what they call digital native business. These are companies which were born in cloud and have requirements which are very transient in nature.

If we talk about the Flipkarts or the Myntras or the Snapdeals of the world, their workloads could be very variant depending on what time of the year, based on which they will come up with new campaigns. What they need is agility and the ability to scale very fast. That's why they want a public cloud. Then there are the startups who do not know whether the business idea they are trying to float will scale up and they want to manage their cash flows. They are open to look at public clouds to launch an idea and see how it goes.

If you come to a specific enterprise or an agnostic customer, they know that their environments are predictable in nature, like say a manufacturing company with an ERP. They know that their workloads are going to be very predictable. They don't have transient requirements. These companies prefer private cloud, which could be multi-tenant. For more complicated solutions, we might customize a hybrid cloud environment. We've seen customers putting in their SAP kind of environments on multi-tenant environments where they create a virtual private cloud on top of a public cloud environment.

There's also Edge, which is going to become relevant in times to come. It would be driven by applications or workloads which are going to be very latency sensitive—the five millisecond or sub



RAJESH AWASTHI, Associate VP, Managed Hosting & Cloud Services, Tata Communications

millisecond kind. Customers would want to deploy Edge nodes closer to where they are sitting. We have large number of Points of Presence, so we are well poised to deploy these Edge nodes. That's because the Point of Presence are nothing but data centres, which are connected to high speed internet or network for bandwidth.

5G and the effect on cloud adoption

I'm not an expert on the network side, but I believe that 5G will help with last mile connectivity. From a cloud adoption perspective, we see that 5G is going to be a big enabler for the SME segment. Your mid-market and enterprise customers will continue using either MPLS network or maybe SD-WAN, which they would deploy. 5G would be a good enabler for the SME customers to adopt cloud environments because connectivity will be taken care of using 5G networks. These networks would have ample bandwidth for them to connect even the enterprise workload which they may deploy on the cloud environment, being accessible by their internal users, as well as by their partner ecosystem.

I believe partner ecosystem is something which would benefit big time for even the mid-market and enterprise customers. When we are talking about SD-WAN, the underlay network could be anything, it could be a P2P link, a data network, it could be an MPLS network, or it could be even a wireless network like 5G giving sufficient bandwidth and latency to the customer. This would give the user experiences they would want for their end users to have.

PLANNING FOR HYBRID IT

Requirements of every enterprise are different and they need a highly customizable solution to design, manage, and scale their model. Hybrid technology offers this flexibility and gives organizations an opportunity to optimize the operations, making them more agile and ready to innovate

Navin Andrade



Every organization needs in house IT infrastructure to keep the precious data safe from prying eyes. While on-premise IT services offer organizations better control of their data, it is not the most economical and flexible solution. Similarly, relying totally on cloud services may help enterprises save a lot in terms of resources, it may not always be the most secure way to keep

critical data.

This is where Hybrid IT solutions come into the picture. This mix-infrastructure technique allows businesses to outsource the low-risk resources to the public and private cloud while keeping the most critical data in-house. This process lets organizations enjoy the best of both the worlds by offering both data security and agility to expand as in when

required. Hence Hybrid IT is fast becoming a go-to model for most companies.

Factors to be considered while opting for it

If, as an enterprise, you're looking to go with the blended or Hybrid IT infrastructure, then security and privacy of your data is of utmost importance. However, here are a few other important factors that must be considered before deciding the computing model...

- **Upfront costs:** Determining the upfront cost in setting up the mix-hybrid environment is important as costs may vary depending on each business case.
- **Integration with on-premises data:** Compatibility of different applications between on-premises servers. Public and private clouds need to be determined to ensure seamless transfer and zero downtime. This will also give the organization information about resources that will be used for the integration by the vendors.
- **Analysis of workload:** It is important to identify which applications will be used remotely. Analysis of workload and execution venues before hand can help in designing a better infrastructure strategy.
- **Uptime:** Downtimes can affect businesses seriously. Service level agreements should be clearly documented including penalty clauses and support mechanisms.
- **Backup and recovery:** Understanding the terms and conditions regarding backups and recovery plans offered by the vendor is important. Since you do not have physical access to the data servers, going with a reliable vendor is a good idea.
- **Scalability:** Make sure that the vendor is future-ready. In case you need to scale up, the vendor should have the relevant infrastructure in place. Planning for the future is the key here.

Challenges of Hybrid IT

Like any other technical process, Hybrid IT infrastructure has a fair share of challenges that need to be understood before making a switch. Few such challenges are...

- **Compliance:** Under the hybrid model, data will be stored on the remote cloud server. This may become a challenge in case the compliance or regulatory policies demand the data be stored locally. Non-compliance with these policies

The mix-infrastructure technique allows businesses to outsource the low-risk resources to the public and private cloud while keeping the most critical data in-house
—Navin Andrade, General Manager—
India, Datacenter Dynamics India



may result in complications.

- **Management:** While cloud servers are meant to reduce expenses and increase efficiency, handling multiple cloud servers is a challenge in itself. Keeping a track of the costs, load on each server, idle time and resource management is a huge task. Cost management in such cases becomes crucial to ensure on-demand servers are not loaded unnecessarily. Hiring a trained cloud expert is a must in such scenarios.
- **Compatibility:** As mentioned earlier, because of multiple cloud instances, applications may not respond as desired which may lead to downtime. There is a chance of important tools becoming incompatible and acquiring new tools means additional cost and wastage of resources.

Why are enterprises opting for this model?

Since the requirements of every enterprise are different, they need a highly customizable solution to design, manage, and scale their model as per their needs. Hybrid technology offers this flexibility and gives organizations an opportunity to optimize the operations, making them more agile and ready to innovate. With the help of future proof technology, it is easy to minimize costs, scale up when required, increases efficiency. Hybrid solutions can now blur the gap between conventional technology and the new age cloud solutions making the infrastructure current and practical.

The author is General Manager—India, Datacenter

SECURITY IN A GREY-OUT – READY FOR THE NEXT CLOUD OUTAGE?

If the year 2019 taught us anything well, it is this--cloud outages can happen to anyone, anywhere. Sometimes the focus is so much on bouncing back that we forget not to fracture a ligament as we pop up. Keep an extra torch/foot handy—like AI or SLAs

Pratima Harigunani



When anyone sputters the words ‘cloud outage’, the first alarms to hit one’s mind are ‘Holy Molly’, ‘downtime’, ‘customer complaints’ and ‘how long’ – may be, not in that particular order.

So when major cloud outages happened this year, we found out how network congestion, domain level controllers, Domain Name System (DNS) connect, faulty database scripts, maintenance misconfigurations and data automation software can play the devil. We also got smarter in the areas of Service Level Agreement (SLA) credits, dependencies of modern computing architectures, details of

service-level downtime from cloud providers (specially from Google’s GCP), the usefulness of granular-level reporting (like the one shown by AWS) – thanks to these very outages.

When that eerie silence strikes

Sure, downtime costs – and hurts! In fact, the average hourly cost of enterprise server downtime (2017-18 as per Statista) was recorded at over US\$5 million for 14 per cent companies, and between US\$2m-5m for seven per cent while 12 per cent suffered it in the bracket of US\$1m to \$2m. According to Alinean, on average outage risk has even

accounted for as much as US\$2.5m a month. A glance at an Uptime Institute report helps to see that amidst publicly reported outages 2018-19, major failures are not just common despite the advancement of critical systems, but they are also rife with heavy consequences – thanks to the increased reliance on IT systems in all aspects of life. The report hints at evidence on availability not matching marketing claims (service level promises).

Interestingly, it notes that ‘major publicly recorded outages are now more likely to be caused by IT and network problems than a year or two years ago, when power problems were a bigger cause.’ Public cloud-based services came up as areas for a significant number of reported service outages. The report tells that ‘Although the reliability/availability of their services is generally good, their scale and complexity mean that their outages are likely to have a highly visible, clear and well-recorded impact.’

So what about the not-so-loud dent of this downtime – the one which leaves (and exploits) cracks in security? Most users rush for the elevators when an outage hits them or while they pad up for anticipated downtime. Isn't that against the golden rule of ‘taking the stairs’? Does security really take a back-seat in the messy ride of an outage escape? If yes, who is sitting at the wheel?

Smoke and Noise – The Perfect Panic Attack

In cloud deployments, security is a shared responsibility between the cloud provider and the organisation, argues Maninder Bharadwaj, Partner, Deloitte India. “Most cloud platforms come with robust data security processes in their areas of responsibility. But during outages all this data stored

in the cloud is at risk of being available for business operations but also from loss. In addition there is a risk of operations getting disrupted leading to loss of revenue and a poor customer experience.”

It is possible that the scenario plays out a little differently or more/less alarmingly when a certain type of cloud holds the fire-drill alarm. “In Private clouds, organisations can set specific controls as per company policy or organisational requirements. Also back and recovery measures can also be employed promptly. Healthcare organisations are good examples of how to use private cloud in this regard. Public cloud with a hybrid on-premise or private cloud will also be good alternatives to protect data during an outage.” This is how Bharadwaj sees it.

Vaidyanathan Iyer, Security Software Leader, IBM India South/Asia differs a tad saying that any outage is similar in impact whether its deployed on-prem, public or hybrid - and with cloud deployments being resilient by design, reputed cloud service providers would be expected to provide resilience to any outage. “The key factor is that best practices around resiliency cannot be ignored; but having said that however it's not uncommon to have outages either due to denial-of-service attacks or for any software glitch.”

He adds that the same applies for Data Security aspects during an outage; considering that best practices are in place, during any outage the control of ‘security keys’ will be with the data owner and as such outages should not impose any security risk.

Bharadwaj swiftly points at the importance of a back-up and recovery plan. “All critical data has to be backed up and confidential information has to be encrypted to protect against any loss.”

Data is, after all, what everything hinges upon. As Manav Sehgal, Head of Solutions Architecture, Amazon Internet Services Private Limited explains, in a highly scalable architecture like AWS's, databases can be orchestrated well between hot and cold availability zones so as to address minimum latency between two availability zones, “These zones are as far apart as possible and yet in proximity so that helps a lot in fault-tolerance and resilience.” He also cites the significance of points-of-presence with dark fibre and the speed and heterogeneity of database migration (open source as well as commercial systems) here. “AWS migration service can work on minimal downtime and while it is running.”

Migration of data and the speed at which the lights pop back seem to be big answers when one worries about an outage. New ideas can complement

“The primary security controls that companies should consider are around Identity and Data Security that helps in establishing a digital trust around usage of the cloud services. More basic than those is hygiene maintenance.”

these answers a lot, if they are added to the outage-tool-kit well. Like Artificial Intelligence (AI).

Faster-Smarter Emergency Doors

It is important to create clean data-sets that can be used to train AI and Machine Learning systems to execute on recovery plans and protect critical data, contends Bharadwaj as he highlights the issues that can pull pack the power of AI in blunting an outage's cut. "While the technology is available, the processes to create the data and processes to train these systems have to be created and maintained and that's the biggest challenge. AI without training and test data would not help and we find ourselves in the situation across various industries especially when it comes to risk processes.

"AI could help in suggesting the right configuration - e.g. while deploying policies on mobile devices AI is used to suggest the right policies but the decision to apply the policies remains with the administrator." Adds Iyer but he also argues about hygiene maintenance when it comes to bolstering cloud of any stripe. "The primary security controls that companies should consider are around Identity and Data Security that helps in establishing a digital trust around usage of the cloud services. However - even more basic than those is hygiene maintenance i.e. configuring the cloud services as per best practices as required by the business. It is the responsibility of the companies to ensure that the Access Control Lists are properly configured, identities are monitored, and data is identified and used in a responsible manner."

Perhaps that's why, the weight and fine-print of Service Level Agreements (SLAs) come into a new spotlight when we think of cloud investments in a post-outage-scarred era.

Bharadwaj avers strongly. "Absolutely. It is very critical to deploy the right controls in place to ensure SLAs are in place to protect the organisation during an outage. It is important to keep detailed records of past incidents, as this helps us refine the SLAs. While SLAs and controls are important, their application to the cloud environment has to be monitored and modified."

But Iyer brings in a different perspective shifting the way we pick throats to choke in a cloud-outage incident. "While cloud security needs to handle a landscape that is not necessarily in the customer's control, it is also true that cloud providers offer a good number of security controls that have to be configured and managed by the organisations - this accountability cannot be transferred to the cloud

providers and hence the responsibility of customers becomes greater while adopting the cloud."

He explains how SLAs around the availability, scalability and operationalisation of these controls can be mandated/demanded by customers but will not be helpful unless the best practices are in place and being followed. "For e.g. Identity Access Management of all users accessing the cloud, Distributed Denial of Service (DDoS) protection, Firewall etc. can be mandated but if the cloud user does a wrong configuration neither AI nor SLA can help."

Wait!! Don't Jump!

Not from a twenty-storey high floor and definitely not on any conclusion. Cloud still makes a lot of sense and economics. But it's equally important to discuss security while buying those amazing opex numbers and cost-control fairylands.

As Bharadwaj underlines, Cloud is a great platform. "But it is important to have the right controls in place. Often these controls exist as part of global controls and governance teams. Controls need to be modified and applied to the cloud. Additionally, implementation of security and controls is a shared responsibility of the cloud provider and the organisation. The assumption that the cloud provider will take care of all the security requirements and controls is a myth."

Iyer strongly reminds that adhering to best practices and ensuring basic hygiene is sacrosanct whether for security on the cloud or on-prem; cloud adoption also introduces some additional controls that has to be implemented."

Cloud, no Cloud, Public Cloud, Private Cloud, Hybrid Cloud – in any environment, there is no room to ignore the gravity of resilience quotient.

As Bharadwaj stresses, it is important to have robust plans in place for data security and business continuity. "Without these, it is very difficult to work with emerging technologies like cloud. Cloud has a huge potential but the key is to identify the risks, put in adequate controls and keep scanning the environment to make it an evolving, robust and resilient system."

It will never be an all-white, all-fluffy and all-dreamy wonder. Clouds will always have some black-outs and a lot of grey spots. It's all about how well we can smell the smoke in time. And how soon we can find our shoes.

The next time someone says the word 'outage', hope you are able to say 'I am prepared'.

WHEN EVEN THE BRICK BECAME SMART

The Wienerberger brick factory in Kunigal (Karnataka) makes the Porothersm smart brick, which is roughly 9 times the size of an average brick. It has a hollow form factor that helps pass air and is lightweight. The factory is fully automated, with robotic arms handling every stage of the process, leading to minimum wastage. Even the kiln is computerized, using coal dust. The factory can work 24X7 365. Wienerberger Global CEO Christof Domenig talks about the technology involved

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Robots and digital tools

We don't say we have to digitise everything or do Artificial Intelligence. Certain things work for us, we have to find those which have certain scalability. More than Industry 4.0, we have to concentrate on 2.0. Of course there's automatization. Everything that handles heavy loads is robotized in Europe and no new factory is built with mechanical or physical labour, plants are retrofitted accordingly. In prefabrication, it's a much faster and forward thinking technology thanks to brick robots. You come with a truck on site, you feed the bricks in and if there's cut needed to do, that is done. They take brick by brick and glue them together. It's an amazing story and it's so fast more precise. You take out a lot of manual labour and come out with affordable walling solutions.

The factory doesn't just have robots. The sensors are all connected. With all the incoming data points there is a certain self-learning and steering which is more precise and better than before. It helps us in maintaining the exact moisture content required and the right amount of energy during a drying process. In these cases, even being off 2%, which doesn't sound much, may have a huge impact.

It is important for us to connect the logistics chain from production planning out to delivery on site in time and here digital tools help us. We also do a lot of digital prototyping and 3D printing for spare parts and modelling. What is interesting is what we do with digital tooling. We do the whole training process and manuals of machines with glasses and Virtual Reality which help you repair machines. We use Google Maps and take drone shots of a roof that has to be tiled and

A solution to pollution?



Wienerberger has come out with a Dryfix that can join bricks without cement and hence no need for sand, water and manual labourers. They claim stronger adhesive bond between bricks and enhanced thermal protection. It has been in use in Europe for more than a decade and could greatly reduce dust at building sites. Cities like New Delhi suffer greatly from air pollution due to construction dust, among other things.



CHRISTOF DOMENIG, CEO, Wienerberger Global

other work. This is translated into an offer with all the details connected to the merchants for shipping. This streamlines the process and saves a lot of time.

Hackathons and digital twins

We work with startups. We do hackathons. A new way of repair maintenance that came out of one of these hackathons. We do innovation days. We constantly look at new materials and new composition of raw materials. A startup from Vietnam used biomass palm leaves with an enzyme to make a new type of brick. We fine-tuned our robotic brick layers also through these processes. It came from the shipping industry. They basically load and unload from the ship to the harbour. We used that to that in the brick process by miniaturising it.

We build digital models of factories and try out certain processes before we go into the real world. We use digital twins for the process simulation. We understand potential weaknesses and it helps out how to take out excessive weight and so on. Digital twins help us in checking how to maintain the factory over its lifetime. There are interesting learnings. We immediately see where certain things might go wrong. We are at the beginning of such things but the learnings are quite stunning.

THE ROLE OF BLOCKCHAIN, BIG DATA AND IOT IN THE FINTECH SECTOR

Decentralized, consensus-based blockchain can insulate transactions, improving customer experience and cut costs. Big Data generates new revenue streams through data-driven offers and offers improved services supported by superior security. An example of IoT-enabled lending is just-in-time financing solution for logistics providers

Nirav Choksi



In his book, *Darkness By Design: The Hidden Power In Global Capital Markets*, Oxford professor Walter Mattli paints a vivid picture of how algorithmic trading has disrupted stock market operations the world over with a few nanoseconds making the difference between eye-popping gains or crippling losses.

Mattli's arguments, of course, dwells on the darker, greed-driven side of disruption, characterized by

massive investments in supercomputers that a motley set of corporations has been using to foster opaque transactions involving split-second buying and selling of securities. But there is a benign side to this disruption as well, driven by new-age technologies such as blockchain, Big Data and the Internet of Things, and going beyond the stock market to embrace banking, insurance, and practically every other segment of the financial services industry.

Blockchain in financial services

The term captured popular imagination for its association with crypto-currencies, more specifically, Bitcoin but its applications go far beyond today, and a large number of organizations in the realm of financial services are adopting blockchain technology to improve transparency and operational efficiency.

The financial sector is typically characterized by an astoundingly large number of transactions running into trillions of dollars that are transferred across geographies. The primary function of the financial enterprise is to safeguard the client's money which is invariably supported by a host of mediators. It does not take an expert to imagine the crippling effect of hacking information and fraudulent activities on the global financial system. This is precisely where blockchain comes in. The decentralized, consensus-based mechanism insulates transactions, improving customer experience and saving substantial costs.

The technology is, in fact, capturing the imagination of financial executives across the globe, with one report asserting that 77 per cent of FinTech set-ups are likely to adopt it by 2020. In fact Harvard Business Review claims that blockchain will do to banks what the Internet did to the media industry.

Areas blockchain works in financial services...

Checking fraud: Where there is a will, there are relatives! This is a popular saying in jest. Similarly where there is big money thereby lurks financial frauds. Ergo, the need to secure the flow of money arises as practically every component of the financial services sector is vulnerable to massive losses caused by financial crimes.

A key reason for this is that the sector has traditionally been leaning on centralized databases that are highly susceptible to cyber-attacks and fall prey easily to hackers. Once a cyber-thief weans his way into a system, it will take him less than a fraction of a second to clean out the last dime.

This is where blockchain assumes significance for the security and impregnable technology it offers on a distributed database system. Since all the blocks are linked to each other, if one block is broken into, all the others on the chain immediately flag the disturbance, helping track the breach in real time and virtually stonewalling the hacker from tampering with the larger system. With this feature, cyber-crimes and attacks of this kind prevalent in the financial sector can be effectively eliminated.

Know Your Customer (KYC): Banks, mutual funds and other service providers have had to bear huge



NIRAV CHOKSI, Co-Founder and CEO, CredAble

costs in complying with the know-your-customer of KYC norms mandated by the Reserve Bank of India in order to check money laundering and terror financing. The KYC process is cumbersome, time consuming, and had to be followed individually by the various components of the financial services industry.

At present, banks upload their customers' KYC data onto a central pool which is used for checking the antecedents of existing and new customers. Blockchain makes the entire process simpler, allowing for the independent verification of each client by one service provider to be accessed by other thereby eliminating the need for duplicating the entire KYC process each time a customer chooses a new fund house, insurer or bank. And since blockchain delivers quasi real-time information, there would be a huge saving in cost and efforts for compliance departments.

Documentation: In today's complex commercial world, where goods and services are exchanged rapidly both within and across boundaries, it becomes essential to record each transaction with a clear date and time stamp. The infinitesimal volume of transactions that takes place by the second and given the huge volume of documentation that it involves, is a clear indication of how expensive and time-consuming such a system can be.

Blockchain can hold these records digitally and get them updated in real-time. The technology can also be extended to smart contracts in the financial services space. A smart contract is a self-executable piece of code that runs when certain conditions written on it are completed.

When used for financial transactions, they are

helpful in increasing the speed and simplifying complex processes, ensuring the transfer of accurate information as the transaction will be approved only if all the written conditions of the code are met. Moreover, as these terms are visible to all the parties involved in the transactions, the chances of error at the time of execution are dropped drastically.

Big data, the petabyte cruncher

Gigabytes and terabytes are passé. In today's commercial world, information is stored in a complex maze of data running into terabytes and petabytes. For information 1,024 gigabytes (GB) make one terabyte and as many terabytes make a petabyte—which essentially means that it takes a million GB to make a petabyte. The math doesn't stop there. It takes a staggering one billion GB to make an Exabyte.

That's the size of data large corporations are dealing with today. And 'Big Data', a technology that helps analyse and extract information from such complex data sets that conventional applications simply can't handle is useful in a variety of ways such as data capturing, data storage and analysis, search, sharing, transfer, visualization, updating and information privacy.

The financial services industry has been using Big Data to generate new revenue streams through data-driven offers, stay relevant by offering improved services supported by superior security in a space that FinTech companies seem to have begun dominating, and pare operational costs. FinTechs have, in fact, stolen a march over conventional financial service providers, using big data to offer unmatched levels of convenience, nibbling into the huge slice of the revenue pie by eradicating the pain points for customers in transacting. Mobile wallets such as PayTM and MobiKwik, for instance, have revolutionized the concept of payments-on-the-go, obviating the need for the customer to visit the bank, or even log on to the laptop to transfer money.

Internet of Things

One of the simplest, though not necessarily apt, ways to understand the Internet of Things is to gaze at your smartphone and just imagine stepping into a time-machine and seeing your device morph into a 2G handset that allows you to do little else than make calls and send text messages as you revisit an era gone by. No videos, little or no stored music...and no WhatsApp.

Wikipedia offers a technical definition of the term: IoT is a system of interrelated computing devices,

mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. But here is something simpler: IoT involves connecting all home appliances such as refrigerators, air-conditioners and lighting systems, and other gadgets and gizmos such as mobile phones, and automobiles, and everything else under the sun to the Internet.

Connection to the Internet is what makes the device smart as it has the ability to both, send and receive information, without actually having to store it. The smartphone is just a rudimentary example of the power of IoT. The concept has opened up a floodgate of possibilities in logistics, financial services, automobiles and even agriculture. In fact, NASSCOM estimates that the IoT market in India is estimated to reach US\$15 billion next year and will account for about five per cent of the global.

The concept has been widely used across sectors in India. Financial services is one area where IoT has had a huge impact, creating new avenues for borrowers looking for funds and for financing agencies looking for lower-risk lending opportunities.

A notable example of IoT-enabled lending is just-in-time financing solution for logistics providers, in which a cab or truck operator is funded, based on its real-time GPS information tracked either through a GPS device or a mobile application. A trip in real-time is captured and once completed, it is funded instantly even before an invoice is generated by the operator.

In the auto-ancillary space, several tyre companies have come up with tyre financing schemes, called 'Tyres-as-a-Service' for heavy motor vehicles, under which the vehicle owner does not pay a large initial capital at the point of procuring tyres. Instead, the sensors on the tyre continuously report the ageing data and the owner is charged periodically based on the consumption information.

IoT finds a place in agriculture as well, with crop insurance companies using data such as humidity/temperature sensors along with drone imaging to process claims and calculate future premiums.

Back home, it is a slew of government initiatives, such as Digital India, Make-in-India and Smart Cities that are fuelling the IoT drive. They are perhaps providing the biggest push as it involves the use of IoT devices to manage crime, traffic, logistics, power and water supplies, health care and practically every aspect of the public welfare system.

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AR-VR CAN BE THE HEALTHCARE GAME CHANGER

Augmented and Virtual Realities can help bridge distances between patients and doctors by virtually replicating real life scenarios. 360-degree video-capability headsets go far beyond textbooks and videos in providing a life-like learning environment

Piyush Gupta and Ninad Sathaye



In the television serial *The Good Doctor*, there's an interesting scene, where surgical residents practice surgery on body part models connected to simulators—a wrong move and the computer beeps an alarm. This cannot be completely attributed to the screenwriter's imagination—it is a scene that is actually being played out in hospitals and medical colleges in the developed world, where doctors use

cutting edge technology not just as diagnostic aids but also in learning and training.

New age tech offers tremendous potential to strengthen healthcare systems and no better example can be found than AR-VR—Augmented and Virtual reality. AR-VR are technologies that use a wearable headset to provide an immersive experience where the user can interact with virtual objects. The

difference between the two is that VR takes the user into a full computer-generated virtual environment, whereas AR augments the real world scene by overlaying virtual objects. Together they form the world of Mixed Reality (called MR or, sometimes, XR).

Rising demand across all verticals

The most prominent use of AR-VR can be found in the entertainment and gaming sectors but the applications in healthcare, tourism, retail etc. are burgeoning. A recent Gartner report suggests that 100 million consumers will leverage AR for purchases by 2020. The estimated market for VR alone is expected to touch US\$ 30 billion by 2020. Another report values the potential of AR-VR even higher, estimating a 73.3% CAGR over the next six years that will take the market to over US\$ 60-70 billion by 2025. India is very much a player in the mixed reality market—estimated at US\$ 0.55 billion currently. The Indian immersive market is expected to grow to US\$ 6.5 billion in the next three years.

Transformative potential in healthcare

AR-VR applications are particularly apt for healthcare as they enable an immersive, true-to-reality environment that can provide a transformative impact on the fields of medical diagnostics, therapeutic treatments and training. Headsets that provide 360-degree videos go far beyond textbooks and videos in providing a life-like learning environment. AR-VR can even help bridge distances between patients and doctors by virtually replicating real life scenarios.

Thus, AR-VR can be a health industry gamechanger in two crucial areas—improving quality and enabling access. These technologies have the potential to play a transformative role in a country like India, where access to quality healthcare can be challenging. India's remote rural areas are typically plagued with lack of facilities and trained personnel.

Risk-free life-like learning experiences

Three to four years ago, surgeons at the Royal London Hospital used VR to live stream a surgery, giving viewers a virtual place at the surgeon table with live inputs from the surgeon himself. VR based programs take medical training to another level. One of the advantages is that multiple real-life scenarios can be simulated to give realistic learning experiences that are also risk-free. Students are able to learn under the safest and yet most life-like learning environment. Second, it offers better skilling



PIYUSH GUPTA, distinguished engineer

facilities to a wider range of healthcare personnel such as nurses, paramedics, healthcare equipment, technicians etc.

VR based training can simulate diverse patient conditions and environments. For this reason, VR-based training can also prove to be cost effective in the long term by improving patient care as well as clinical outcomes. In India, Kerala-based Tiltlabs builds VR-based training modules. For the healthcare sector, the company makes Magnetic Resonance Imaging (MRI) scanning demonstration videos. Chennai based start-up TNQ InGage is developing immersive for the healthcare sector in the training and rehabilitation domain.

Holoportation: A boon for rural patients

One of India's biggest healthcare challenges is that rural patients residing in rural areas often have to travel long distances to reach a specialized or tertiary health facility. Several players have tried mobile units and telemedicine to bridge this gap. AR-VR tech can help efface the geographical gap by enabling medical professionals to virtually interact with patients. A head mounted device worn by the patient allows the doctor to have a virtual 'face-to-face' consultation. Another high tech application is 'holoportation' that allows doctors to 'virtually visit' a patient's home. A live example of this is Silver Chain Group, which has worked with Saab, Australia to develop a solution for remote consultation with the doctor using 'holoportation'.

Helping with phobias and dealing with PTSD

Not surprisingly, AR-VR can have an impact in treatment and counselling for psychological disorders. It has been used to help children with autism to gradually deal with and overcome fears

of the external world. It can also help treat phobias by giving the patient systematic exposure to the environment that triggers anxiety. Patients who resist the real world can use AR-VR for a controlled exposure. According to a 2018 study, addition of VR-based personalized cognitive behavioral therapy can significantly reduce momentary anxiety in patients with a psychotic disorder. AR-VR has also proved effective in treating depression and PTSD (Post-Traumatic Stress Disorder).

Distraction therapies for pain management

An interesting use of AR-VR solutions is in pain management. AR-VR environments can offer a high degree of distraction as compared to classical solutions, such as music. VR-based distraction therapies have shown that patients experience reduced pain levels by as much as half. The real life scenarios that beam through the headset can affect the brain's neural pathways much like real-life experiences. This can have an impact almost equal to pain medication and is a great solution to mitigate dependence on opioids and other addictive medications.

Transitioning to assisted-living facilities

AR-VR can play a strong role in elderly care management. The developed world offers assisted living facilities, but senior citizens often face anxiety about moving out of their homes into a new environment. This transition can be made smoother through AR-VR solutions. For example, US-based startup Rendeavor provides personalized experiences to senior citizens by combining VR with reminiscence therapy. The platform allows seniors to virtually visit places that they have wanted to. VR-enabled assisted living homes have been able to significantly improve the resident happiness levels.

Tech biggies already on the bandwagon

With the vast potential of the virtual world, it's no wonder that most of the big tech players have come up with AR-VR platforms. Microsoft, Sony Corporation, HTC, Samsung and Amazon are leading the pack but other big players include Unity 3D, OpenVR, Unreal, Vuforia, Google VR, Amazon Sumerian, ARCore and Apple's ARKit. Many of the top performing AR-VR solutions are based on open source software, making them more affordable as well as easier and faster to adapt to different uses.

Many AR-VR companies have developed healthcare specific applications, such as healthcare IT



NINAD SATHAYE, Engineer with Optum Global Solutions

and imaging solutions company Novarad's OpenSight AR system for use in pre-operative surgical planning. This system is based on the Microsoft HoloLens platform. EcoPixel is another company that provides a mixed reality platform for surgical imaging.

Training to prevent data breaches

With healthcare going digital, the issues of data security and privacy arise in the AR-VR space as well. Companies offering AR-VR solutions need to ensure that there is no leak of sensitive data such as behavioral information, body measurements, and so on. Data that can be used to breach facial recognition or retinal scan security is especially at risk. There is also a physical risk that comes from patients wearing headsets and experiencing an unfamiliar immersive experience. It is vital to prevent any incidents or injuries that arise out of AR-VR solutions. This calls for rigorous training of personnel and proper operating procedures to be followed.

Level playing field for healthcare access

There is much that AR-VR brings to the field of healthcare. It is perhaps the ideal training tool—it can simulate real life situations, stimulate learning behaviors and provide experiential upskilling. It can create a level playing field for healthcare access, by bridging geographic distances and providing an accurate touchpoint between doctor and patient. In diagnostics and clinical treatment, it is a tool that can address some of India's biggest constraints in healthcare. Clearly, with its virtual world solutions, AR-VR can take India several steps ahead in offering better healthcare.

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THE 6 ESSENTIAL RULES OF BEING A BUSINESS DISRUPTOR

This is an abridged version of the keynote given by HubSpot Managing Director—APAC Shahid Nizami for their event Grow Singapore 2019

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I want to tell you about a small story about a business trip. I was speaking at an event in Bangkok. I left on Monday evening. Sunday evening, sitting down with my son, (He's almost seven years old) I pull out a Blu-ray player. My son goes: What is that? I said this is like a device which I had about seven years ago where, if I wanted to watch a movie at anytime, I would put some round thing inside. I would hit the play button. My son gave me this blank look and says, "Oh Netflix!"

Think about it. Seven years ago, Blu-ray was the

coolest technology. All of us were trying to get the best players. Now it's difficult to get them in stores. There's so much disruption happening. I got to work the next day. On Monday morning, the folks from Odyssey deliver the laundry to me. Amazing experience! You use the Google App or just the web to book.

In the afternoon, I pulled up my phone, booked a Grab taxi. It was a pretty seamless experience. I was taking a no frills airline, so no entertainment. So I downloaded a movie on the phone called *Badla*. It's

an Indian movie starring Amitabh Bachchan. It was a really nice murder mystery. Then I landed in Bangkok. There again I had to just pull out my phone and use the same Grab app, which works in Thailand as well.

I got to my Airbnb and ordered food using the Foodpanda app. I had my favourite Thai green curry chicken and mango sticky rice and a good night's sleep. If you think about it, I've been doing business travel for the last 15 odd years. The whole experience has totally changed in the last few years.

Earlier I had to ensure that I delivered the laundry to the laundry folks, got it picked up on time. When I was going to the airport I got down a little few minutes early so that I could flag down a taxi or just stand in the queue. When I reach the airport, I'm fairly social so I want to sit with someone, a co-passenger who's going to be chatty. I was hoping that my co-passengers isn't a grumpy one. When I reached the hotel, I wanted to ensure that I got good food, but then there were only limited choices in the interim dining menu.

All this has changed. The New Age companies are taking over from the incumbents and providing great experience. It's not just me—I'm sure all of you feel it too. All these examples are primarily B2C. How about B2B? Is there disruption happening there? I let you decide. But just continuing with my business trip to Bangkok, the next day I get up, I go to a JustCo and decide to work there for a few hours. I put my laptop, I build the slides for the day using Camera, amazing app there. I'm on Slack with some of my colleagues, trying to get some data points for the slides. It's all good. Then I have to jump on a very important meeting with my colleagues in the marketing team, so I use Zoom.

I head to the event where I was speaking and wrap up the talk. If you've been to Bangkok you know the traffic can be so unpredictable. So I was really struggling to get to the airport in time to catch my flight. Somehow I managed to get it just in time. I rushed to the plane and when I was sitting down, I realized: Oh my god! I made one big mistake. I forgot something. I have a pact with my son, where every time I'm going on a business trip, I need to buy a gift for him. He calls it the "Get out of jail free card"!

So, I forgot to get his gift. I'm in the plane, the doors are closed and I quickly took out my phone and using the Amazon Prime app, which has the same day delivery here in Singapore, I order. I reach Singapore. I was getting into the elevator in my house and the Amazon delivery guy was right there. Good timing! I just picked up the gift and I gave it to my son. I'm still



SHAHID NIZAMI, Managing Director-APAC, HubSpot

holding up to be a super dad because I always keep my promises. I have to hide the fact. But it worked out pretty well. He still feels he got the gift from Bangkok!

Disruption was used in that context in 1995 by Harvard business professor Clay Christensen. It's highly overused and under understood. On disruption, we typically think of the browser and Google, Intel, Apple and iPhone and maybe Tesla in a few years. But if you look at these companies' DNA, they're primarily deeply technical expertise companies. Together they have more than 50,000 patents registered.

Now compare them to previous examples. These companies put together have about thousand odd patents. They're not really deep technology disruptors. But they do something different to disrupt the market. So for about four months, our senior executives including our CEO and Co-founder Brian Halligan got in touch with a few of these companies. We spoke to their founders, long time senior executives and investors. We used most of their products to try to understand what makes them stand apart. One thing we realized was that they are not necessarily "technology disruptors", but we call them "experience disruptors".

We realized that they didn't use lingo like: We use blockchain or Artificial Intelligence or Machine Learning. No jargon. They told us one simple thing and that's pretty much the theme:— A new species of disruptor: How you sell is why you'll win! Here are the six companies that symbolize that...

Circles.Life: Incumbents are obsessed about

a product market fit. Experience disruptors are obsessed about an experience market. One such example is CirclesLife, which has no stores in Singapore. You can sign up for their contract online anytime of the day in under five minutes. They only have a single plan with add ons. They have an intuitive app and you can do everything without talking to a single human being. It's a beautiful experience. When people lose their mobile, they panic and don't know what to do. In CirclesLife, you can just log in and order a new SIM seamlessly, no need for an OTP because you lost your phone already! They don't even own any of the infrastructure like towers and all.

Atlassian: Incumbents' business model is friction filled. Experience disruptors' business model is fairly frictionless. A great example of that is this is Atlassian, an Australia based company. They created some amazing B2B software like Jira, Confluence and Trello. Their marketing team is more like a B2C marketing team than a B2B one. It is less obsessed about generating leads, more about generating active users. It is less obsessed about selling to the CIO, but more about getting the CIO to buy from them. They do multi-million dollar deals and they have no commission based salesforce. To reduce further friction, they do zero discounting. It's just automated if it needs to be. They want to keep that trust and goodwill amongst the customers

Netflix: Incumbents' interaction with their customers is anonymous. Experience disruptors deliver a highly personalized experience for their customers and prospects. There is no one better than the big daddy of personalization, Netflix. Netflix has moves from person as to a segment of one. All of us are different segments of one and all of us have fingerprint in the Netflix database today. The more Netflix you watch, the deeper that impression becomes. Another company doing a really good job of personalization is Spotify. They've moved from personas to use cases, which is primarily this amazing intuitive playlist. So the world is going from handcrafted personas to data driven personalization.

Fashion Valet: Incumbents sell to their customers. Experience disruptors don't just sell to their customers, they sell through them. There's a Malaysian company Fashion Valet. It's an online clothing store. They have a few physical stores in Malaysia, but they cater to the Southeast Asian market. They came out with a hashtag on Instagram, #fvoott or Fashion Valet outfit of the day. They get their consumers to take a picture of a Fashion Valet

These are the rules ...

1. Be obsessed about the experience market.
2. Build a frictionless business model.
3. Deliver a highly personalized experience.
4. Sell through your customers.
5. Be business model busters.
6. Obsess how to iterate the product for ease of use.

clothing they're wearing and put it on Instagram with that hashtag. They've got more than 53,000 posts on the retailer's account with that hashtag, most of them generated by average consumers. They have about 600,000 followers or users on Instagram.

Haylee Mattress: Incumbents are obsessed about just following the business model. Experience disruptors are business model busters. A beautiful example of that is from a company here in Singapore called Haylee Mattress. You can order a mattress online and get it delivered on the same day. They have 100 night sleep trial. You can use the mattress how you want. On the hundredth day if you feel it's just not working out, you can return it for free, no questions asked. Returned mattresses are not resold. They are cleaned up, refurbished and given to charity. These companies focus on adding value to their customers and not extracting value on their customers.

Canva: The last one is important too. Incumbents make their solutions more easy to use for a period of time. Experience disruptors obsess about how they can keep on iterating on their product and solution to make it easier to use. One such company is Canva. One of the co-founders used to teach students on InDesign and Photoshop. She realized that it wasn't very easy for people to learn these and even more difficult for it to be used by average folks. That was the idea behind Canva. It's a three-tier solution: Robust, free and accessible.

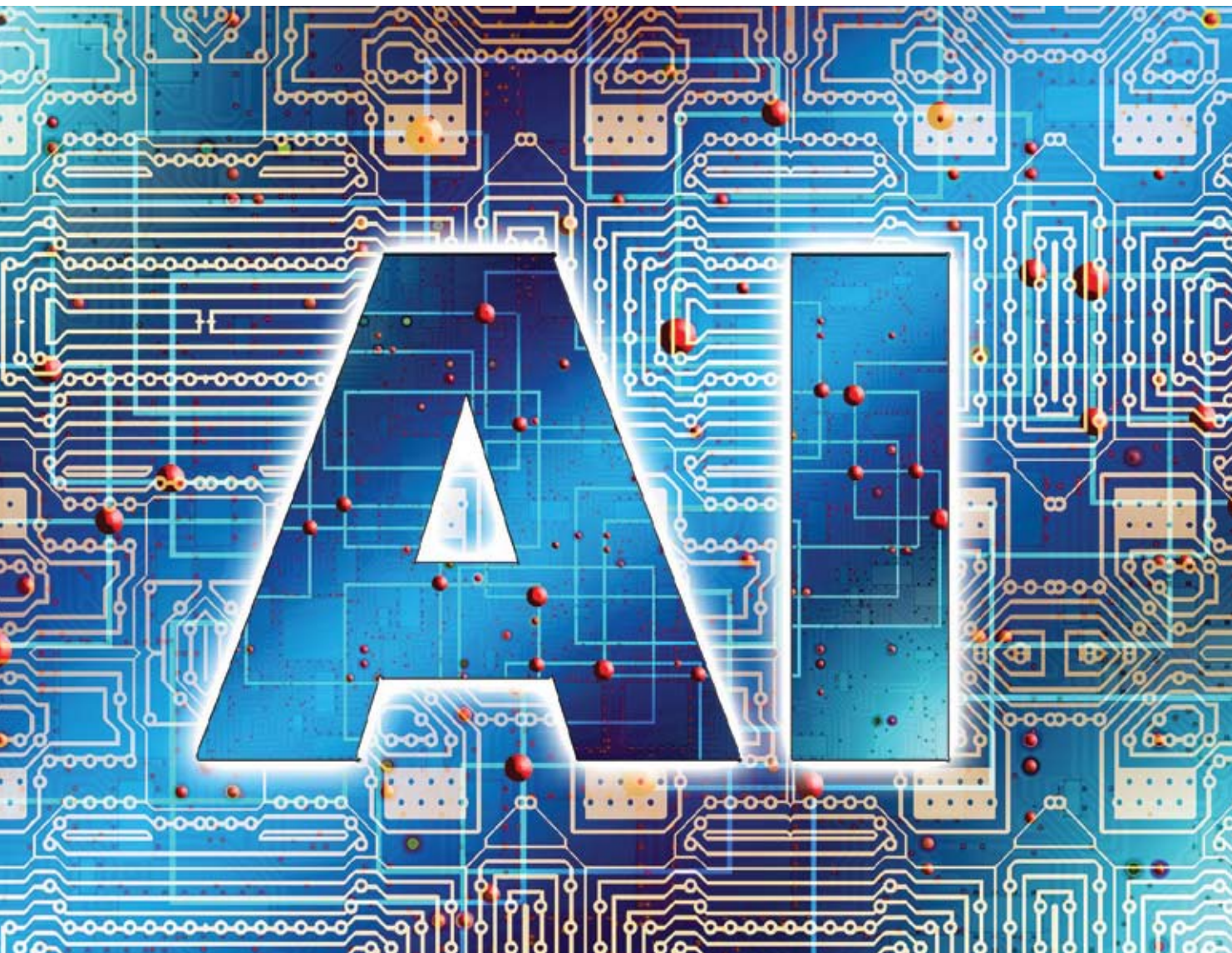
At times routines hold you back and stop you from trying out new things. It's very important for us to break through these routines. If we do that, we can try out new things and be an experience disruptor!

The author was hosted by software developer and marketer HubSpot for their event Grow Singapore 2019

HOW IS AI REGENERATING THE CONSUMER ELECTRONICS INDUSTRY?

AI in consumer electronics opens up growth avenues and opportunities for attracting the ever-evolving customers. Manufacturers are adopting groundbreaking technologies to appeal to the customers and cater to their needs and requirements

Gaurav Dabas



"Success in creating AI would be the biggest event in human history. Unfortunately, it might also be the last, unless we learn how to avoid the risks."

—**Stephen Hawking.**

With increased awareness about the transformative intensity of AI, its adoption is presently being seen across numerous enterprises. This is expected to be the next most prominent change in the world. This progression can improve the performance of the machines and help them to make informed choices. Some people connect AI with a hostile takeover by robots. Another genuine fear faced by employees is that machines might replace them. Though some people are sceptical about this technology, advancement is slowly rising.

The impact of this machine intelligence is seen in various industries. The technology is infused in all division right from market analysis to gathering of consumer feedback. It has enhanced the role of machines in the consumer's life. It has been instrumental in helping the companies to build better connectivity with their consumers. It has enabled them to lead a secure, comfortable and better way of life. The technology is implemented in different segments to improve the consumer experience. The consumer electronics industry has been an inevitable segment of our lives. This is inclusive of smartphones, games, consoles, cameras, entertainment system, car accessories, etc.

The application of AI into the industry of consumer electronics opens up many growth avenues and opportunities. For attracting the ever-evolving customers, the manufacturers are adopting the latest groundbreaking technologies, which specifically appeal to the customers and cater to their needs and requirements. The role of these devices is felt and need no explanation. AI technology is slowly infused into these devices and machines. Here are few notable AI trends that are reinventing the Consumer Electronics segment...

Intelligent Homes: Smart homes have become the hype of the hour that has garnered attention from the homeowners. AI has provided the opportunity to control household appliances with ease. This simplifies many processes and enhances the experience of the consumers. These devices can manage the performance of the various devices through voice recognition or smartphones. It can also monitor the power consumption; help devices make



GAURAV DABAS, Director, WK Life

informed decisions and even power on/off the device remotely.

In addition to this feature, the smart home devices have an inbuilt entertainment system and an assistant feature. These aspects can be utilised to entertain the guests, hear the news, read stories, check weather reports and even get traffic updates. They can adjust the temperature and other factors of devices using their smart sense technology. One of the primary advantages of these products is that they are available in various forms and can be customised to fit the individual requirements. Major companies have launched products that are quite popular and well perceived by consumers.

Independent Vehicles: Self-driven cars are no longer a distant dream. Major companies have already begun testing of the vehicles in the factory and live road conditions. These latest vehicles are sleeker and smarter to provide a better travel experience. This invention would be a boon as it reduces stress during travel. It would allow people to spend more time with their families during long

drives. One of the most crucial advantages of smart vehicles is that it reduces the risk of accidents.

Most accidents are caused by oversight and irresponsibility of the drivers. The machines function through a series of well-defined instructions, and it brings order in the road during driving. Leading automobile companies have taken this progression to the next level through self-driven vehicles. They can analyse the situation and make ideal decisions to navigate the car. They can also monitor the condition of the vehicle and remind the owners regarding the periodic checks.

Enhanced Entertainment System: Various movie and music applications provide the daily dose of entertainment to the consumers. Some software have utilised the AI technology to understand customer preference. Every customer has a unique interest, and it is sometimes confusing to identify the right movie from the thousands of material available on these portals. It becomes a daunting task when the viewers do not know the name or concept of their favourite movie. AI scrutinises and segregates the data based on their viewing history. This feature is available in all leading entertainment portals inclusive of Amazon, Netflix and YouTube. The advancement is also used to analyse the music notes and to improve the styles.

Mobile Assistant: We spend a significant amount of time speaking and connecting with the world through the phone. This connectivity would be further enhanced through the mobile assistant. High end phones currently contain this technology. The phone responds and reacts to the voice of the owner. It can place a call to a specific person, type and save notes, play music and perform other tasks when the person is driving or busy.

For attracting the ever-evolving customers, the manufacturers are adopting the latest groundbreaking technologies, which specifically appeal to the customers

All for autonomous vehicles

It is estimated that more than 40 companies are working on driverless cars, including giants like Tesla, Alphabet (Google), Amazon, Apple and other car makers. Right now legislation is the biggest roadblock, not necessarily technology.

Advancement in marketing strategies: All companies strive hard to overcome a primary challenge. They attempt to understand customer perception and expectation. AI has the ideal solution for this issue by monitoring consumer behaviour and creating customised campaigns to match them. This is also inclusive of programmed machines that can support customer queries and doubts. There are considerable advancements in this field that has helped companies to enhance their brand visibility. AI plays a crucial role in sorting the consumer information. This approach increases the success rate of marketing campaigns.

Health and Wellness Devices: Smartwatches are highly effective in tracking the movement and other vital statistics of the individuals. The latest devices do not just follow the data but also can take the necessary steps in case of emergencies. They are highly beneficial for elders and patients who need constant monitoring of vitals. The smart wellness devices can be programmed to call an ambulance or the family when there is a drastic change in these stats.

These advancements are just the tip of the iceberg. The experts are doing continuous analysis on the segment to improve their utility in different mediums. Various processes are still in the testing phase. Multiple concepts are yet to be developed. Some technologies are already implemented in real-life applications. This has garnered a significant response from the consumers. This progression can pave the way for more diversification in all the industry. This helps the companies to reduce their production cost, understand consumer expectations and build more effective marketing strategies. It also enhances the lifestyle of consumers through the development of advanced devices and consumer electronics.

The author is Director, WK Life

2 KEYS TO MAKING AI MORE HUMAN-CENTERED

AI-first products can help in delivering an exceptional user experience by providing hyper personalization which in turn leads to highly efficient and satisfying digital interactions

Hemal Gathani



With the advent of smart personalization, Artificial Intelligence, Virtual Reality, Internet of Things and blockchain, digital solutions are becoming more intelligent and personalized. Digital interfaces are rapidly evolving from navigational containers and content boxes to conversations. Users are now craving a new, seamless, on-demand, digital experience: One clad in a conversational interface, ready to serve, and capable of complex actions.

AI-first products (if done well) help in delivering an exceptional user experience by providing hyper personalization which in turn leads to highly efficient and satisfying digital interactions. But for all this to happen, developers and data scientists must work together with UX designers to ensure that the end interaction is human centered and helps achieve real outcome for the users. There are two key factors that must be considered for AI-driven digital experiences...

1. Control: The true power of AI is leveraged when it makes smart decisions on the user's behalf. But how do you still make the user feel in control? Latest research on self-driving cars has demonstrated that users feel extremely anxious and fearful sitting in a self-driven car that gives them no feedback on how it is making driving decisions. So, the key to making humans feel comfortable with AI will lie in achieving the right balance between automation and control.

2. Context: AI has no moral understanding on its own of what is right or wrong. So, on what basis will it make decisions where the answer is not clear? For example, the "Trolley problem"—Should the self-driving car save the grandmother or the baby if it could only save one of them? The researchers found that the countries' preference differ widely. Participants from collectivist cultures (China and Japan prefer saving the grandmother because of a

Users are now craving a new, seamless, on-demand, digital experience: One clad in a conversational interface, ready to serve, and capable of complex actions



HEMAL GATHANI, Co-founder of Zeux Innovation

greater emphasis on respecting the elderly). For now, AI researchers feel that cultural context holds the key to helping AI make the right decisions. However, this is a question that will continue to be the topic of much debate in AI circles in the years to come.

We have always believed in pushing the boundaries of user experience towards the ultimate goal of completely humanizing technology. To that end, we keep a very close watch on technology advancements and trends and ensure that our solutions and processes are constantly aligned and adapted to the evolving digital landscape. As thought leaders, we often take the lead in defining UX standards and putting frameworks in place for new technological paradigms. Most importantly, we understand that creating exceptional user experiences often require cutting through the hype of the latest technological trend and distilling down to relevant use cases that will ultimately make life better for the user.

The author is Co-founder of Zeux Innovation

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AI-ML TRANSFORMING IT SUPPORT TO “SMART IT SUPPORT”

Predictive Support has become the sweet spot for AI-ML to foray into IT Support. The innovation continued and the possibilities have become countless for AI-ML as these techniques also crept onto other traditional layers of support

Rajesh Darisipudi



IT Support is mostly about either fixing an IT issue or fulfilling an IT request. Like in any other domain, Artificial Intelligence (AI) and Machine Learning (ML) are making faster inroads into both these aspects and the possibilities seem to be countless. Capabilities that AI-ML are delivering, and the way IT support is evolving with AI-ML is far from our imagination. These technologies are transforming support organizations to “SMART Support” organizations and in turn playing a pivotal role in improving reliability of the IT systems and transforming user experience.

IT Support Evolution and Challenges

Traditionally, IT support organizations have support tiers or levels – L1 (Service Desk or user front ending teams), L2 (support SMEs), L3 (Development SMEs), L4 (Vendors etc.). The tickets created by users pass through one or more of these levels before they get resolved. Every IT ticket directly or indirectly impacts user productivity and the dollars spent in IT Support are cost to the company. One of my ex bosses used to say that “best ticket is NO ticket”. Such thought processes have challenged IT support organizations to innovate and reduce the support costs while enhancing customer experience.

Over the last decade automaton and level zero (L0) support have become very popular. L0 offers self-help (knowledge base articles) and self-service (automated provisioning) options. That said, over time it has become a nightmare for IT organizations to maintain these KB articles and automation scripts. In addition, tickets hopping through the support levels have left the users in dark. This results in frustrated users, productivity loss and in turn directly impacts organization's performance.

Over the past couple of years, to deal with these situations new thought processes have emerged and IT organizations started thinking about increasing the user experience and productivity of their users by getting more proactive and predictive. IT teams are trying to get in front of the issues or requests and resolve them even before the users experience them. This is where new tiers/levels of support have emerged, L minus1 (L-1) Proactive Support and L minus2 (L -2) Predictive Support, which has become the sweet spot for AI-ML to foray into IT Support. The innovation continued and the possibilities have become countless for AI-ML as these techniques also crept onto other traditional layers of support, i.e., L0 to L4

Over the past couple of years, new thought processes have emerged and IT organizations started thinking about increasing the user experience & productivity of users

Possibilities of AI-ML in the new age IT Support

L-2, Predictive Support – IT organizations are creating data models and algorithms that can get trained with the historical information so that these models understand the patterns of events across times, seasons, user behaviors etc and can predict an IT disruption before it happens. Neural network models are more popular in these predictive models. Some popular use cases in these areas are:

- Predicting an IT outage and sending early warning signals to IT teams to prevent the outage.
- Predicting the success of a change that is getting introduced into the IT ecosystem.
- Predicting capacity requirements of the IT infrastructure – especially in compute and storage

L-1, Proactive Support – This support level is more dominated by the monitoring tools, which mostly work based on threshold levels that are setup in monitoring the IT assets so that technicians can resolve issues either manually or through self-healing scripts when these thresholds are breached. Data produced by the monitoring tools is one of the best inputs for building the AI-ML predictive models. Some of the popular use cases for AI-ML in L1 space are:

- Prediction of monitoring events
- Correlation and prediction of events at an application level rather than at a component level
- Predictive dashboards for L1 teams

L0, Self-help and Self-Service – AI-ML has big use cases in this space. Text analytics, Natural Language

Processing engines are mostly leveraged here. Some of the top use cases in this space are:

- AI based recommendation engines enhance the search capabilities of the knowledge base and can recommend most appropriate IT solution or KB article to the user.
 - Highlight the gaps in the knowledge base for the support staff to populate with right knowledge
 - Support through 'Chat' medium is very popular where an AI based self-help engine can be plugged in that can chat with the users and offer solutions, rather than a human
 - Self-Service – knowing when the requested item will get delivered and the ability to track the status of the item during its journey provides a great user experience. Not only AI-ML help in predicting an accurate ETA to users but also help IT organizations to get early warning signals in case of any delays
 - Service Request data can be leveraged by the AI-ML models to predict the request volumes and type of products/services that users may request for.
- L1, Service Desk or user facing IT support teams–Neural Networks, Natural Language Processing etc., are very popular here. However, some popular areas where we are seeing faster inroads of AI- ML in L1 support:
- Voice assistants incorporated in Call and Chat support channels, offering the users with the most appropriate solutions
 - Dynamically changing the Interactive Voice Response options on a Service Desk phone or chat menu based on the call/chat trends on

AI-ML are being leveraged for intelligent ticket routing--auto route the ticket to the right technician--based on agent's availability, capacity/load, past ticket resolutions

that specific day or time

- Dynamically taking decisions on when a chat support session can be transferred from a bot to a human
- Dynamically routing the call or chat to the best available technician who can resolve the issue in the fastest time
- Helping the Service Desk technicians with the best possible solutions from the earlier ticket resolutions
- Most recently, users' frustration levels are also gauged through AI-ML based on the tone of the user's voice, choice of their words, historical ticket trends, customer satisfaction surveys submitted on their previous incidents etc. thus helping the service desk personnel react or escalate accordingly
- Sentiment Analysis is heavily leveraged (with the text in the ticket notes and the text submitted by users in CSAT surveys) to understand the user sentiment on IT Support organizations
- Bottom line – AI-ML are transforming Service Desks to Smart Service Desks and transforming Service Desk agents to intelligent agents.

L2, L3, L4 SME Support – With the foray of AI-ML in IT Support, the boundaries between these three layers are getting blurred and these layers are more operating as one layer. Here AI-ML are being leveraged for intelligent ticket routing ie., auto route the ticket to the right technician– based on agent's availability, capacity/load, past ticket resolutions etc., so that the ticket reaches the right SME in the least possible time. In addition, these technologies also assist technicians by providing the right knowledge at the right time. Outage prediction models can directly alert SMEs so that the situation gets timely attention.

Conclusion

With a growing dependency on these next gen technologies, AI-ML can make or break a support organizations future. Data is KEY for any AI-ML model to succeed. Like in any other model, garbage-in leads to garbage-out. This principle applies even more to Support Organizations. Strong governance, efficient Configuration Management processes, ticket documentation discipline are must for the Support organizations to reap the benefits of AI-ML and to mature into "SMART SUPPORT" organizations.

The author is Director & Site leader, IT Service Operations, Dell Technologies

THE SCIENCE BEHIND SUCCESSFUL CUSTOMER EXPERIENCE

With Big Data and AI becoming all pervasive today, CX platforms are turning increasingly smart. Today, they are turning into a digital experience platform where experiences are managed and delivered in a seamless manner across digital touch points

Jasal Shah



A little over a decade ago, customer experience was at its nascent stage. A brand reached out to its customers, potential or already existing base, through mass media, flyers, door-to-door campaigns or phone calls. It was through these interactions and in-store experience that a customer's experience with the brand was defined. The communication was often one-way; there were no platforms for the customer to offer feedback. Brands on their part didn't have access to data that would help them tap into a customer's buying journey and enhance loyalty. However, largely, brands dominated the relationship, and had sway over the consumer.

Enter the earliest smartphones and everything changed. Over the last decade, handheld devices, tablets, affordable and easily accessible Internet connectivity have been instrumental in transforming a largely brand-centric relationship to a customer-centric one. Today, it is the customer who is dictating the terms of the relationship. Today's customers are online 24x7, expect brands to reach them on a channel of their choice. They expect seamlessness and intuitiveness from the brand.

Brands today need to think beyond matching customer expectations. They need to predict pain points and be ready to meet the customer at any stage of the journey, be it discovery, research or purchase.

Voice of the customer (VOC)

Also, a major element of today's customer experience strategy is to tap into what the customer is saying (or not) about the brand's offering. Measuring customer experience is an important step and brands would need to use a voice of the customer (VOC) programme. Such a programme collects all feedback, whether unstructured or structured, and offers brands a chance to tweak strategy constantly.

Other metrics

One of the most popularly used measurements is the net promoter score or NPS. The NPS is aimed at asking customers about their likelihood of referring/recommending a brand and its offerings to friends or acquaintances. The responses are categorized into scores, and customers are marked promoters, detractors or passives. The score helps brands assess satisfaction and loyalty levels. Another metric is the customer satisfaction score or CSAT. The CSAT is one score that has the most clarity, as it allows the business to deploy customer satisfaction queries at key points of interaction with customer. These could in-

A customer experience (CX) platform offers a business all the tools to track and measure both behaviour and performance of their customers

clude stages of discovery, consideration or purchase of a customer's journey.

Keeping track of churn or attrition rates helps businesses stay in touch with their performance. Is business doing well enough to retain its customers? Churn rate is the percentage of customers who have chosen to stop using a brand's offerings in a specific time frame.

A CX platform offers a business all the tools to track and measure customer behaviour and performance. There are several points of interaction between a customer and the brand, including the company website, social media, ads and other channels. A CX platform offers tools that help businesses manage these points of interaction. Survey responses are also integrated into the platform, making it a one-stop shop for not just collecting feedback but also managing and closing the feedback loop.

Role of technology in CX

With Big Data and Artificial Intelligence (AI) becoming all pervasive today, CX platforms are turning increasingly smart. Today, they are turning into a digital experience (DX) platform where experiences are managed and delivered in a seamless manner across digital touch points.

Self-serve tools such as chatbots and live chat also enhance customer experience and cut costs. Then there's the Internet of Things (IoT), ensuring a huge cache of data to tap into for insights. The explosion of digital assistants will also turn out to be a win for not just customers but also for brands, owing to the availability of data.

Summing up, successful customer experience involves a comprehensive strategy that takes into account tools and platforms to measure and analyse customer feedback.

The author is CEO and Managing Director of Markelytics and Velocity MR

PERSONALIZED EXPERIENCE THROUGH INTELLIGENT DIGITAL WORKSPACE

Safi Obeidullah, Technology Strategist and Field CTO, APJ, Citrix, talks about the cloud, data protection, Everything-as-a-Service and desktop virtualization

Sunil Rajguru
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How big has the growth of cloud been in India and what are the reasons for that? How are the public-private-hybrid models competing with each other?

India's use of cloud services is rapidly increasing with it likely to explode over the next 3 years with India having the 3rd highest growth rate globally for public cloud services according to Gartner. As seen in other global markets, once organisations define a strategy for the consumption of cloud, they typically move very quickly in adopting them, much like the flick of a switch. SaaS and IaaS services are usually the

most popular cloud services that organisations start their cloud journey with and then from there they go on to building out their own applications leveraging functions and services from the cloud.

The flexibility of cloud services means that organisations do not need to be tied to a single cloud. They can choose to leverage the cloud services that best meets their needs. Equally, depending on factors such as scale, data protection policies or cost, some use cases may best be served through traditional on premise infrastructure or private clouds. For this

reason, we are likely to see a hybrid multi-cloud model as being the dominant approach for most organisations. This model gives organisations the most flexibility in being able to adopt the best fit services from which ever cloud provides them as well as being able to balance the organisations needs around security, delivering the best experience and managing costs.

Each public and private cloud provider will continue to add more and more services and capabilities to attract more utilisation. In other markets we have seen private cloud providers build out services targeting specific needs that a public cloud provider may not be able to meet. The best thing here is that organisations have the choice.

Choice is also one thing we have always focused on giving to our customers. Citrix Cloud services are integrated with all major public cloud providers as well as traditional virtualization platform used in private clouds or data centres. As organisations embrace a hybrid multi-cloud model, our services can deliver the visibility, security and control into applications deployed anywhere, all with a unified and consistent approach instead of having to use a different approach for each cloud.

India recently cleared the Personal Data Protection Bill (PDPB). How will that change the market and is India ready for it?

The draft of the proposed bill is a welcome change for India. The concept of privacy by design will not be an addendum, with this bill. Data privacy will now have to be part of the design for every system and application. What we should be looking for is a balance between data protection, with the need for innovation. With consent now needed each and every time, users also have a right to be forgotten. Since Indian enterprises leverage new-age technologies, one of the challenges would be to understand how anonymised personal and non-personal data can be processed for use in such algorithms. Most firms going to market without considering embedding security in the product or service, is also one of the larger challenges for India. Only time will tell how Indian enterprises adapt to this new change and ensure compliance.

Can you tell us something about the desktop virtualization scene in India and its place in the modern workplace?

Desktop virtualization in the workplace has rapidly grown into a strategic model to securely



SAFI OBEIDULLAH, Technology Strategist and Field CTO, APJ, Citrix

deliver a desktop while enabling employees to work from anywhere and any device. Historically, the office was the only place that “work” was done and so having fixed desktop PCs in the office made sense. The modern workplace however is much more fluid. More and more organisations need their employees to have the flexibility to work and be productive from anywhere and having the flexibility to access all of the applications and data you need is critical to support this. Importantly, desktop virtualization also provides significant benefits to IT departments allowing them to move away from having to deploy, patch and support physical desktops to a centralised model which provides a more efficient approach to delivering desktops to employees. A vastly simplified approach to managing endpoints can be embraced, with a focus on securing the applications and data. This approach also enables organisations to adopt a zero trust security model allowing employees secure and contextual access to the services they need.

Recently you company talked about Everything-as-a-Service. Can you speak more about that?

The concept of Everything-as-a Service really

relates to two elements. One is the shifting commercial structures for organisations acquiring technology where increasingly the shift is towards more of a consumption model. Organisations no longer want to buy products, they want to buy outcomes and the shift to a service model will see organisations having more options and more flexibility in the adoption of new technology.

Equally, this has a flow on impact to technology, which I see as the second element. Technology vendors need to shift from a product-centric to a service-centric model to align with this shift to a consumption-based model. This requires a greater focus on driving adoption and having vendors support customers and deliver successful outcomes to drive more consumption.

Ultimately, the big winner here will be organisations themselves. Organisations can select best of breed functions from different providers to build their own applications. Consumption models mean that they only pay for what they use which will allow organisations to take a fail fast approach to evaluating different options enabling them to find the solution to deliver the best outcome for the business.

Can you speak about digital workspaces and “people-centric” solutions?

The manner in which people use technology in the workplace has changed significantly over the last decade. Prior to this, the technology employees used in the workplace largely centred around one device, the PC. When we think back to that time, things were pretty straight forward. You had one username/password and once you logged into that PC, all of the applications and data you needed was right there, in one place. The PC, however, was not very flexible. Generally, you had to be in the office to access so that’s where many organisations started to leverage our desktop virtualisation solutions to deliver that desktop remotely.

Fast forward a decade and a lot have changed. While employees are still using traditional Windows apps, more and more organisations are embracing SaaS and Web applications. The location where files are stored is starting to shift from file servers in your data centre to online services like OneDrive. More and more employees are looking to work from different locations and different devices. Whereas before, the PC was a single front door to corporate IT, now employees have to navigate multiple doors as applications and data are so dispersed. Employees

have gone from a simple experience with one place to go, to now having to deal with different ways to access applications and files, multiple username/passwords, and all with different experiences based on the device that they are on.

This fragmented experience is what the Citrix Workspace is focused on addressing. Giving employees a secure and unified digital workspace that brings together all of the different applications they need, all of the different file repositories with single sign-on and a consistent experience regardless of the device that they are in. This approach essentially organises access to all of the tools an employee needs and puts it into one place, with one experience.

But while this is a great way to organise access to applications and data, there is still a bigger problem that employees deal with. Employees today are increasingly dealing with more and more applications and are spending more and more time searching for information to aid a decision or a task. Adding to this is the constant barrage of alerts and notifications employees receive daily from all of the different systems they are using. All of these elements impact the productivity and engagement of the employee.

To start tackling this problem, we have just launched new intelligent capabilities for the Citrix Workspace. This transforms the way employees work by guiding and automating the various workflows and processes. Most employees only use a handful of functions within the applications and so instead of the employee having to waste time launching the application, navigating through the menus to get to that function, the Citrix Workspace will reach into those enterprise applications and bring those workflows or insights directly into the Citrix Workspace as a microapp. These microapps allow employees to get through their tasks, quickly and easily. In addition, the Citrix Workspace uses machine learning to simplify and automate repetitive tasks and workflows so common activities can be performed in a single click.

An intelligent digital workspace gives employees the personalized experience they need to be their most productive and to do the work that matters. It lessens the burden of busy work and dampens distractions that pull them away from what they were hired to do. It takes a user-centric approach that puts people first and enables employees to deliver value to the organization and feel good about the work they do.



RE-IMAGINING BUSINESS THROUGH AI-RPA

According to Rahul Sharma, Managing Director—India & SAARC, LogMeln, AI can help develop a consistent, efficient and transparent operational process offering uniform experiences within an enterprise and for external communications

Sunil Rajguru
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How have both the SaaS and cloud technologies changed over the years? Almost everyone is jumping on to the cloud. What are the benefits and dangers?

If data is the new oil, cloud computing is the rig, the refinery and the pipelines all put together to ensure the oil reaches us. Cloud technologies and Software-as-a-service (SaaS) have become the

backbone for exchange across the world today. The benefit they provide in terms of remote management of voluminous data and ready software solutions for diverse, critical enterprise needs is unmissable. However, with great convenience comes a possibility of loss, and security is a critical concern, especially in the case of public clouds. The essential principle is sharing of resources to achieve economies of scale,

and employing robust security mechanisms can help an individual or an enterprise achieve the best from these technologies without incurring possible risks.

How are technologies like AI and RPA changing remote support and contact centers?

Being limitless is an important objective for businesses today, and these technologies enable that to happen. Artificial Intelligence and Robotic Process Automation has completely reimagined the very being of humans, and business world is not exclusive to the effects of such a watershed transformation. In the case of remote support, the technologies have enabled professionals to work without constraints, by learning how individuals work best, and then developing those conditions to allow best work to happen. Through RPA for instance, mundane tasks can be taken care of to allow a remote resource's time to be best utilized to identify more actionable insights. AI can help develop a consistent, efficient and transparent operational process offering uniform experiences within an enterprise and for external communications.

According to a study by Microsoft and IDC, 77% of business leaders in Asia Pacific believe AI will be instrumental in increasing competitiveness by three times by 2021. It is therefore anticipated that AI is likely to double innovation and employee productivity within companies over the next three years in India. This technology is changing the way we interact with our favourite brands and will play a critical role in the future of customer engagement. LogMeIn is therefore developing technology that accelerates our customer engagement vision and provides a natural path for us to leverage emerging technologies across our entire portfolio. We believe in the ability of AI to unlock the potential of the modern

If data is the new oil, cloud computing is the rig, the refinery and the pipelines all put together to ensure the oil reaches us. Cloud and SaaS have become the backbone for exchange across the world today



RAHUL SHARMA, Managing Director-India, LogMeIn

workforce and deliver solutions that will help our customers achieve the next generation of humanized and personalized customer service.

Can you tell us something about the online meeting and video conferencing market? What are the essential tools for that?

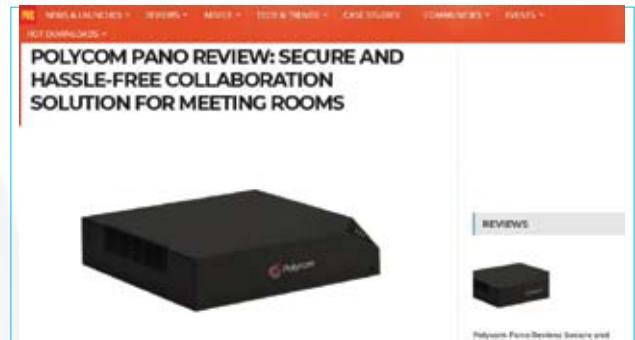
The global video conference market was pegged at a valuation of US\$ 3.4 billion in 2017, and it has growing rapidly since. From being an added feature to being a necessity, online meeting and video conferencing capabilities are a must in enterprises today. Solutions that can make enterprise communication flexible and fluid and put time and space barriers on the backburner are in demand from enterprises across industries and countries. All-encompassing solutions, that can make any basic communication framework into a comprehensive collaboration centers, are in great demand.



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ALL-IN-ONE LASER PRINTER

HP NEVERSTOP LASER MFP 1200A REVIEW

— Ashok Pandey
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HP has innovated a new toner system to reduce downtime and cost. This new system helps to reload laser rapidly plus get awesome print quality every time at an affordable cost. Now no need to refill your toner every-now-and-then, refill the toner with HP quality ink and enjoy tension free printing for up to 5000 pages. What else you can expect from this MFP, let's find out...

Design

In terms of body design, it has an identical HP body design. Most of the body is grey colour and the rest has a combination of dark grey and black. It has a compact body that can easily fit to any office environment. The top part of the printer has the flatbed scanner which is easy to access and quick to scan single or multiple pages, IDs and other documents.

At the left of the scanner, an LCD control panel is placed along with some control button below the screen. The panel lets you operate the MFP easily to perform basic operations. On the right, there is a toner level indicator that helps you to identify when your toner running out and require refilling.

The paper input tray is placed at the bottom of the printer, but it's a bit awkward. The input paper tray has a cover, take the cover off every time you are feeding page to the printer. The good part is – the tray can have up to 150 pages in one go. But you need to struggle a bit often to feed-in papers.

Setup

HP Neverstop Laser MFP 1200a comes one power and USB port at the back. To set up the device with your PC or laptop, simply insert the USB to your PC and power on the printer. PC would diagnose the device and add it to the list. Additionally, you can download the driver from the HP website to get a better printing experience.

Performance

HP claims to offer speed of up to 20 ppm with Neverstop Laser 1200a. In real life, it was able to achieve the same. While printing test pages of various documents, assorted text pages, it was able to print 100 pages in 5 minutes and 30 seconds, near to 20 ppm.

The MFP performed very well in all our tests and would be suitable for most office requirements. In our standard ISO tests with 5% ink coverage, the printer churned out 5 monochrome A4 pages in a just 44 seconds. The text printed was sharp and crisp. The text is well-formed even for



Price: Starts at ₹ 22,057

Overall: **9/10**

SCORE

PRICE: **9/10**PERFORMANCE: **9/10**FEATURES: **9/10**

KEY SPECS: Speed- up to 20 ppm; duty cycle (monthly, A4) - up to 20,000 pages; print technology - laser; print quality black (best) - up to 600 x 600 x 2 dpi; connectivity - USB 2.0; copy resolution (black text) - up to 600 x 600 dpi (flatbed)

PROS: Good print speeds, easy to toner refilling system, compact design, sharp text printing

CONS: Awkward paper tray

small font sizes. We also printed documents and photos.

The flatbed scanner supports up to 600 PPI. It is one of the fastest scanners that can scan a page in about 22 seconds. Also, if you are copying a document of ID card, there is a dedicated button which allows you to quickly copy the ID card from both sides and get the print in one go.

Refilling the printer with toner is quite easy. On the top of the printer, you can see a toner inlet protected by a cover, simply slide away the cover and refill the toner.

Overall, the Neverstop Laser MFP 1200a is a perfect option for offices thanks to its compact design, fast printing and easy refilling options.

Bottomline: HP Neverstop Laser MFP 1200a's innovative toner system let you print without any pause. The compact MFP can fit easily in a tight space and offers good print quality. Neverstop Laser MFP is a perfect device at this budget.

BARCO WEPRESENT WIPG-1600W REVIEW

— Ashok Pandey
ashokpa@cybermedia.co.in

Barco imagined the wireless meeting room experience and they made it a reality with ClickShare. Now, they are taking this to the next level with wePresent WIPG- 1600W. It is a multi-user presentation solution, compatible with both laptop and mobile running on Windows or Mac and Android or iOS.

Let's explore more about wePresent WIPG-1600W...

Easy to install

wePresent looks like a small Wi-Fi router, it comes with two antenna and multiple ports on the front and back. One can easily set up the device with any screen or projector using HDMI or VGA port.

To set up the device, add the antenna and connect it with power. Now either configure the device with Wi-Fi network or add LAN cable to connect it to your office network. Once connected, any device on the same network having MirrorOp software, available for Windows, Mac, Android, iOS and Chromebook, can share the screen wirelessly.

Features

wePresent WIPG-1600W supports Apple AirPlay that enables users to present using Apple's native protocol. The device supports full 1080p resolution as well as on-screen annotation and virtual whiteboard features.

The presenter can highlight key points and elaborate on ideas during the presentation. Using a USB mouse plugged into the unit, presenters can easily annotate on-screen and access conference control features for moderators without a touchscreen display.

WIPG-1600W enables users to share various content without using any PC or other devices. User can connect their USB drive to the device's onboard USB port and share media and video without any PC/Mac/mobile device.

Performance

Setting up the device is quite easy, it takes a few



Price: Starts at ₹ 54,941

SCORE

PRICE: **9/10**

PERFORMANCE: **9/10**

FEATURES: **9/10**

Overall: **9/10**

KEY SPECS: Flexible networking via wired LAN, wireless LAN or both at once, USB connectivity, Full 1080p resolution and low latency video streaming, On-screen annotation for more interactive presentations, Power-over-Ethernet (PoE) for flexible and simple installations

PROS: Easy to set-up, connect with any device, supports 1080p resolution and AirPlay, on-screen annotations

CONS: None

minutes to connect the device with your existing network. The other way is to your device to the wePresent's Wi-Fi hotspot and shares content wirelessly. There are multiple ports for different screens as well as has USB ports for different usage.

MirrorOp has a quite intuitive design, and easy to connect options. Similarly, the mobile app. You can simply connect to the wePresent and share.

The application comes with on-screen annotations enabling the presenter to engage with all the connected members. Using the wePresent, the experience is like casting the device's content to the screen.

Overall, it is a perfect solution for any business to share ideas and engage with multiple users.

Bottomline: Barco wePresent WIPG-1600W is a perfect solution to share ideas wirelessly. It's easy to connect with almost any device and even a guest can easily connect to the device and share his screen.

GREYORANGE OS DRIVEN INTEGRATED MOBILE ROBOTS



GreyOrange announced the latest release of its Fulfillment Operating System, which integrates GreyMatter software with the company's series of mobile robots. GreyOrange integrates software and robots built together specifically to improve order fulfillment throughput, scale, accuracy and economics. This release is for capabilities that optimize fulfillment for companies with omnichannel and e-commerce needs and increases store efficiency by packing replenishment orders according to individual store layouts and preferences. It also expands the orchestration of data and actions across the Company's series of Ranger™ mobile robots. Ranger robots are developed in concert with GreyMatter software and use machine learning to adjust decisions and behavior based on real-time observations.

HOTSTAR INDIA WATCH REPORT 2019



Hotstar released its India Watch Report 2019, a study of online video consumption behaviour and trends. Some key highlights from the report include that Hotstar crossed 400 million downloads, at 555 installs per minute in 2019. Sports streaming reached new heights with a 300 million+ platform reach during VIVO IPL 2019. 25.3 million live concurrent viewers were recorded during the India vs New Zealand semi-final. 63% of the total online entertainment consumption came from non-metros. 41% of Game of Thrones viewers also watched Hindi family dramas. More than 40% video consumption came from regional content.

GURUGRAM-CISCO PARTNERSHIP FOR SMARTER CITY

The Gurugram Metropolitan Development Authority (GMDA) inaugurated an Integrated Command and Control Center (ICCC) that leverages digital technologies to enhance citizen safety, optimize public infrastructure and better manage traffic. The ICCC is part of a series of digital initiatives implemented by the Haryana Government to transform the state into a digitally empowered society and knowledge economy. Powered by Cisco's Smart City digital solutions, the state of the art command centre will be a nodal point for traffic management and city surveillance, and soon bring in other utilities such as waste management, water, lighting, parking, urban mobility, and power distribution.



VIEWSONIC LAUNCHES VIEWBOARD UHD 4K DISPLAYS

ViewSonic Corp launched the the IFP6530 (65-inch) and IFP7530 (75-inch) interactive flat panels with UHD 4K (3840x2160) resolution and 20-point touch screen for collaborative

experiences for boardrooms and classrooms. It's UFT (Ultra-Fine Touch) Technology offers more precise writing and faster processing time than traditional IR panels. It is equipped with 2mm height sensitivity which increases writing accuracy while allowing for dual-pen annotation with both 3mm & 8mm diameter pens. IFP6530 is available for Rs 3 lakh and IFP7530 at Rs 5 lakh.



MCAfee CLOUD SECURITY PLATFORM FOR CONTAINER APPS

McAfee announced McAfee MVISION Cloud for Containers, thereby becoming the first unified cloud security platform to integrate container security with its Cloud Access Security Broker (CASB) and Cloud Security Posture Management (CSPM) security solution. Leveraging NanoSec's zero trust application visibility and control capabilities for container-based deployments in cloud environments, the solution provides customers with the ability to speed up application delivery while enhancing the governance, compliance and security of their container workloads.

WESTERN DIGITAL INTRODUCES 14 TB ENTERPRISE CLASS SATA HDD



Western Digital Corp strengthened its enterprise and data centre storage portfolio by introducing 14 TB WD Gold™ Enterprise Class SATA HDD. With up to 2.5M hours MTBF, WD Gold™ hard-drives is built to deliver enhanced level of dependability and durability within the most demanding storage environments. It comes loaded with vibration protection technology, in order to offer enhanced performance in high-vibration environments. Additionally, thanks to HelioSeal™ technology, WD Gold™ drives with this technology draw low amounts of power and are available in 12TB and above capacities.

SCHNEIDER ELECTRIC LAUNCHES EASY HOMES

Schneider Electric has launched Easy Homes, an easy-to-install Smart Home solution in India. The solution helps convert houses into a



smart home without disruption of existing wiring. It allows connectivity through 4 interfaces–Voice, app, remote and the existing switches. The solution can be bought through an online eShop and can be customized to individual needs. Alexa, Google Home and your smartphone can all be used.

OPERA ADS RELEASES NEW AD UNITS

Online advertising platform Opera Ads announced the addition of new ad units that will help advertisers increase engagement with their target audiences and maximize the performance of their online campaigns. The new ad units in Opera Ads are seamlessly integrated with apps and smartphone functionalities, removing the amount of clicks needed and improving the experience of both the advertiser and the user. This means that people no longer need to remember phone numbers or copy and paste email addresses or annoying codes to get the information or service they need.

FOCUS SOFTNET LAUNCHES QBIXE FOR QUICKBOOKS USERS

Focus Softnet announced the launch of Qbix, its artificial intelligence-driven, voice activated app, designed for small and medium businesses using Intuit's Quickbooks. Qbix offers Amazon Alexa and Tableau features in Quickbooks, while providing the voice and visual interface with strong reporting functionality built in. Qbix works both for Quickbooks on-premise desktop version and for its cloud version.



UBER'S CENTER OF EXCELLENCE IN VISAKHAPATNAM



With the objective of offering rapid, reliable and world class customer support to all its customers, Uber, announced the launch of India's second Center of Excellence (COE) in Visakhapatnam. Set up at a cost of US\$800,000, the new COE will create 500 new jobs. It will provide specialised customer support for critical incidents that require immediate attention, by employing dedicated teams of solution-oriented, trusted experts to support millions of Uber customers in India, South Asia and APAC Regions. The trained COE teams will respond to any urgent issue or incident that is reported to the company and will operate 24/7.

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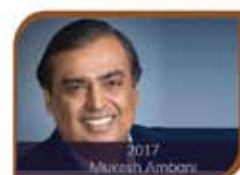
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Aruna Sundarajan



2017
Mukesh Ambani



2016
Gopal Vittal



2015
Dr. Rahul Khullar

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