AI-CHIPS: THE NEW MOBILITY-CHOPS | 30

₹75

www.voicendata.com

VOL 28 ISSUE 09 SEPTEMBER 2021

VOICE & DATA

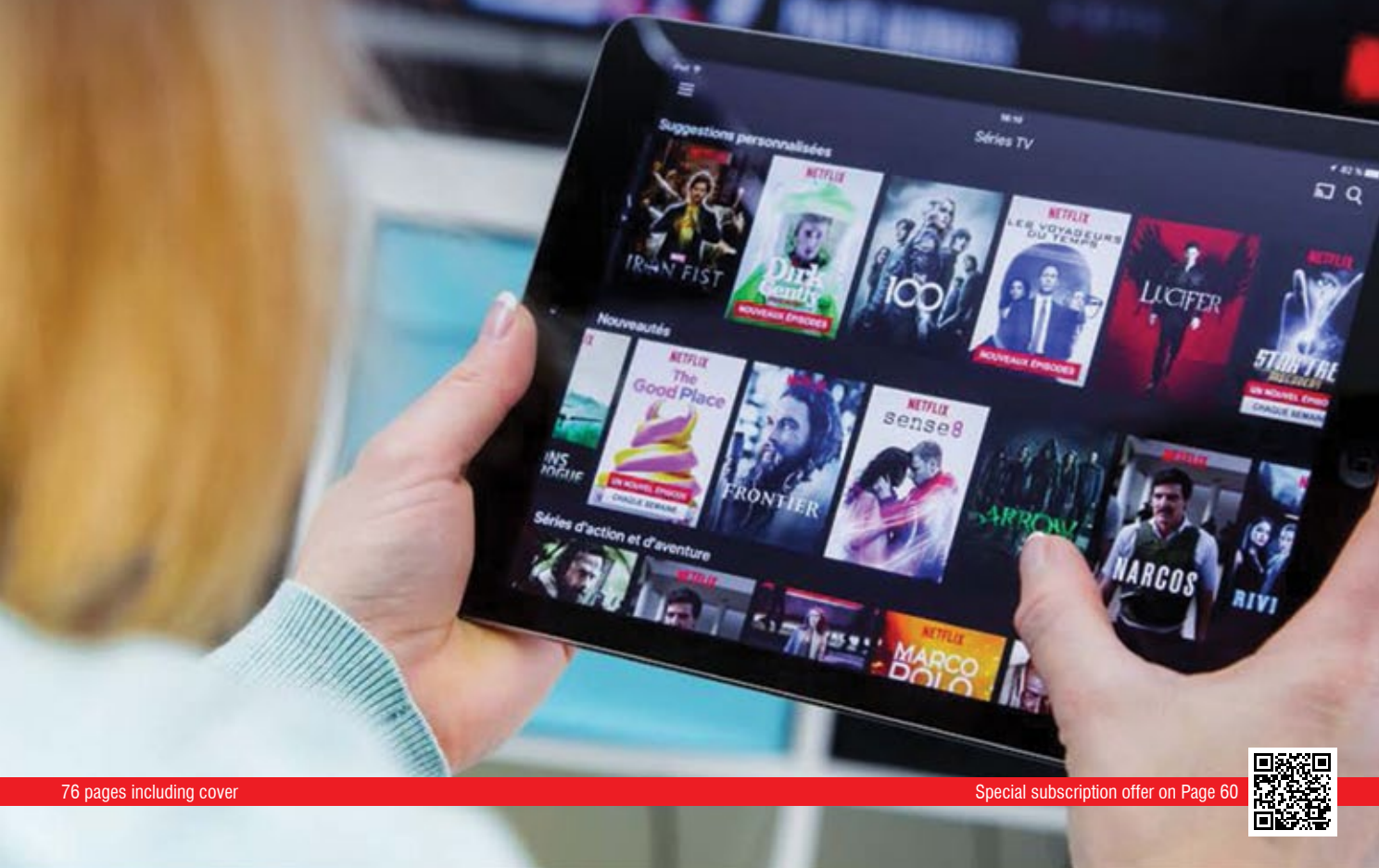
Connecting the Digital World

CyberMedia

V&D 26 YEARS

A BOOSTER DOSE FOR OTT

5G can move the processing ability of handsets to cloud, increasing battery life, and thereby driving OTT audio and video consumption on mobile devices



nixi

SECURE YOUR BUSINESS WITH YOUR OWN IP ADDRESS

KEY BENEFITS

- Only Indian Organization to delegate IP addresses (IPv4/IPv6).
- Only Organization that provide facility for payment in Indian currency.
- *Get IPv6 address free of cost along with IPv4 address.
- Support in local language for better connect.
- Get equipped to choose your peering and upstream providers.
- To upgrade your network to IPv6 please visit: https://ipv6.nixi.in/#/IPV6/expert

***Fees higher of IPv4 or IPv6 as applicable**

Visit www.irinn.in

Call us on 011-48202005, 011-48202030

Email: helpdesk@irinn.in for more details about our offerings.

IRINN
Indian Registry for Internet Names and Numbers

VOICE&DATA
CONNECTING THE DIGITAL WORLD

Website: www.voicendata.com

OUR OFFICES
GURGAON (CORPORATE OFFICE)
Cyber House
B-35 Sector-32, Gurgaon, Haryana – 122 001
Tel: 0124 - 4822222 Fax: 0124 - 2380694

BENGALURU
205-207, Sree Complex (Opposite RBANMS Ground)
73, St John's Road, Bangalore – 560 042
Tel: +91 (80) 4341 2000, Fax: +91 (80) 2350 7971

MUMBAI
404 Trade Square, Mehra Industries, Compound Safed Pool,
Sakinaka, Andheri East, Mumbai – 400072
Mobile: 9969424024

INTERNATIONAL
Huson International Media
President, 1999, South Bascom Avenue, Suit 1000,
Campbell, CA95008, USA
Tel: +1-408-879 6666, Fax: +1-408-879 6669

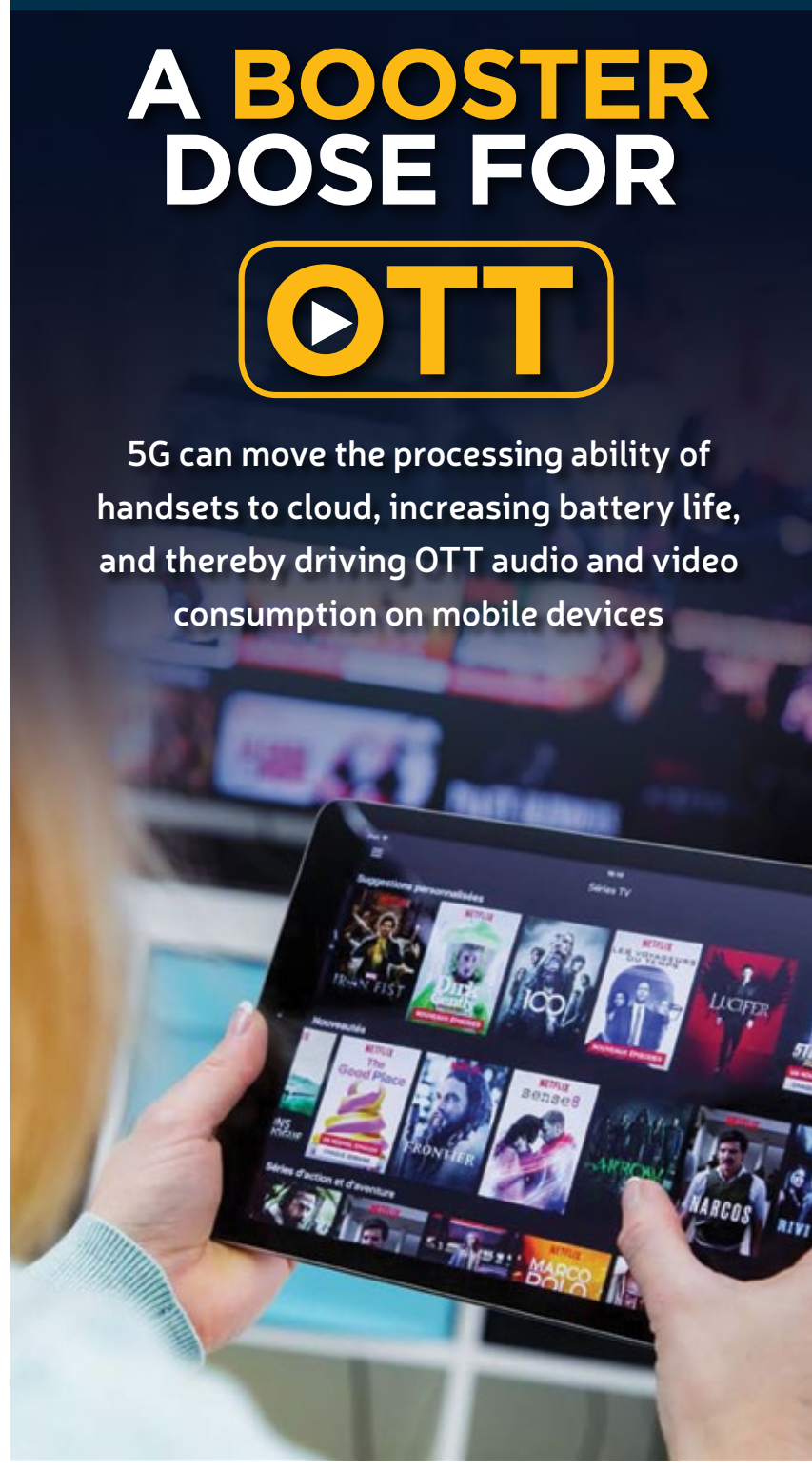
Voice&Data is printed and published by Pradeep Gupta on behalf of Cyber Media (India) Ltd, D-74, Panchsheel Enclave, New Delhi - 110 017, and printed by him at M/s Archna Printers, D-127, Okhla Industrial Area, Phase-1, New Delhi 110020. Editor: Shubhendu Parth

For Subscription queries contact rsevoicendata@cybermedia.co.in

All Payments Favoring: CYBER MEDIA (INDIA) LTD
Distributors in India: IBH Books & Magazines Dist. Pvt. Ltd, Mumbai.

Corporate Website: www.cybermedia.co.in
www.ciol.com (India's #1 IT Portal)

[CONTENTS]



COMMENTARY

TECHNOLOGY

ANALYSIS

BROADBAND BYTES

TV Ramachandran
President, Broadband India Forum

INTERVIEW

TRENDS

REPORT

REGULARS

[NEXT ISSUE]

AUGUST 2021

Subscribe

SEND YOUR FEEDBACK FOR US TO SERVE YOU BETTER...

For **subscription** related issues, contact us at
rsevoicendata@cybermedia.co.in

You can also write to
Reader Service Executive, **VOICE&DATA**,
Cyber House, B-35 Sector 32,
Gurgaon-122 001, Haryana
Tel: 98104 99208

FEEDBACK
From Online Readers

Share your views at vndedit@cybermedia.co.in

NEXT ISSUE

DRONES AND 5G

For any query: rajivp@cybermedia.co.in

SHUBHENDU
PARTH

[OPENING NOTE]

Myopic policy and monopoly menace

The telecom sector in India is facing a crisis that is unheard of elsewhere in the world and is symptomatic of a myopic vision driving the policy in the country. With the subscribers' trust in the public sector BSNL/MTNL already touching the rock bottom and Vodafone Idea (Vi) reeling under a growing debt, India's telecom sector may soon turn into an unhealthy duopoly – even a monopoly.

Experts point out three key reasons for the fall of Vi and the stress for the incumbent telcos, including the public sector players. While the cash crunch in the sector is driven by the difference in the interpretation of Adjusted Gross Revenue (AGR) payments, another big reason has been the government's position in terms of owning the radio spectrum and auctioning it to squeeze maximum revenues. Worse, after it sells the airwaves, it goes on to levy charges for the usage of the radio spectrum that is actually generated by the telcos using their equipment.

Of course, the AGR issue is the doing of the telcos themselves, to an extent. They failed to realize the ramifications when they signed the agreement to migrate from upfront licence fee payment to a revenue-sharing regime. As it happened, the apex court upheld the Department of Telecommunications' (DoT's) interpretation that the revenue share for AGR covered revenues from all sources of the company. Experts and industry veterans like Dr TH Chowdary, founder CMD of VSNL, however, also blame Reliance Jio's "no charge" entry for bringing the sector to its knees, forcing the existing players to offer services at unviable rates and bleeding them to death.

Chowdary, in a recent communication, has suggested that the government must restructure the industry for a long-term solution. "The infrastructure including cell towers, terrestrial microwave radio links and optical fibre cables should be deemed to be competing infrastructures on which different companies can provide various services. This is like the state-owned national highways and airports that can be used by different companies competitively to provide different services," he says. He also suggests that the giant Reliance Jio, with an inexhaustible financial resource from RIL, may be separated into two companies – one for the infrastructure and other for services.

Recent media reports indicate that the Ministry of Finance is evaluating steps proposed by the DoT to contain the crisis and maintain at least a three-player market. The measures it has proposed include a four-year moratorium on AGR and spectrum payments, as well as redefining AGR to exclude 'non-telecom' items and reduction in SUC prospectively.

These may prove good short-term steps, but the bigger question that needs to be asked is what took the government so long to react. It is also important that the government quickly takes steps to ensure the Vi story is not repeated; there is certainly a lesson or two in suggestions from veterans and experts like Chowdary.

shubhendup@cybermedia.co.in

A BOOSTER DOSE FOR OTT

5G can move the processing ability of handsets to cloud, increasing battery life, and thereby driving OTT audio and video consumption on mobile devices

BY PRASHANTH RAO

Connectivity is at the heart of OTT's success. India has witnessed enormous growth in broadband subscribers, from 550 million in February 2019 to 765 million in February 2021. However, the average mobile internet download speeds in India (17.77 Mbps) is far behind the global average of 55.07 Mbps, as of July 2021. Having said that, we all know that 5G data speed is expected to be around 10 Gbps, which will not only make for a rich user experience, but also revolutionize the content available online.

The roll-out of 5G networks would entail heavy investments in the form of Capex and spectrum. Telcos would make their ROI calculations based on use cases, which will thrive using the faster speed, higher bandwidth, and low latency offered by 5G. Over The Top (OTT) services, including streaming video, audio, and gaming, will provide many such use cases. OTT streaming services have grown significantly during the pandemic compared with preceding years. While the sector was riding on the back of strong socio-economic and demographic factors, the pandemic proved to be

> The OTT industry – video and audio – in India is expected to grow nine-fold between 2021 and 2027, making it the fastest-growing OTT market in the world.

> 5G will enable OTT providers to host live virtual events with greater audience interaction, talent shows through digital interventions, and live sporting events.

a catalyst, propelling the sector forward with its paid subscriber base growing 35% since early 2020. The OTT industry – video and audio – in India is expected to grow nine-fold between 2021 and 2027, making it the fastest-growing OTT market in the world.

Further, 5G would enhance the immersive and interactive experience, such as augmented reality (AR) and virtual reality (VR) streaming. Globally, this phenomenon is grabbing attention as several multi-year partnerships are unfolding. One such example is the partnership between the National Basketball Association (NBA), a live VR production partner, and a US telecommunications company, which will integrate VR viewing into the NBA League Pass streaming platform.

5G will enable OTT service providers to host live virtual events with greater audience interaction in game and talent shows through digital interventions and live sporting events with a 360-degree view. Additionally, the combination may open up opportunities to integrate OTT content with e-commerce, offering viewers the ability to navigate to e-commerce sites to purchase apparel featured on their favourite show. Virtual hangouts would allow users to engage virtually, closely replicating the physical medium and enabling the convergence of sectors such as entertainment, audio, and gaming. For example, a renowned pop star held an album launch party within a well-known VR-based video game.

With networks designed for less than one millisecond latency and cloud computing abilities, hyper-targeted advertisements that are customized in real-time for a target group's location or viewing habits can help solve OTT service providers' monetization woes. Low latency speeds coupled with advancement in artificial intelligence (AI) and natural language processing (NLP) can also improve the performance of voice-based virtual assistants in content discovery. AI and NLP can also make quality content available to masses in vernacular languages.

> Hyper-targeted advertisements that are customized in real-time for a target group's location or viewing habits can help solve OTT service providers' monetization woes.

5G technology can move the processing ability of handsets to cloud, increasing battery life, and thereby increasing OTT audio and video consumption on mobile devices.

Currently, OTT providers use a distributed network of web servers – Content Delivery Network (CDN) – to replicate and store content closer to the client for a better user experience; multi-fold increase in bandwidth and reliability could reduce investments in CDN. We can expect an increase in user generated content from smart devices. Cooperative media production could allow various users across multiple locations to work on the content simultaneously.

Stronger network capabilities could support OTT platforms' initiatives, such as 4D/8D audio streaming and 4K/8K video streaming, stimulating the growth of newer media formats, production, and multicasting technologies. Additionally, 5G is expected to enhance the demand for high-end capable equipment, such as 4K/8K-recording mobile devices and televisions.

Technological advancements in the areas of AR, VR, analytics, ML, NLP, encryption, and compression technologies, augmented by a strong 5G mobile network is expected to pave the way for widespread OTT adoption. Adequate reach and appropriate pricing of the 5G network and OTT services would be essential for this combination to achieve significant success. That said, only time will reveal the extent of its success in the Indian market.

Rao is Partner, Deloitte India
feedbackvnd@cybermedia.co.in

APEEJAY EDUCATION

SOARING HIGH IS MY NATURE

Apeejay Stya Advantage (50+ Years of excellence in education)

Quality Education
from pre-nursery to doctoral level

2,500
Faculty

65,000
Strong alumni network

85+
Programmes to choose from

40,000
Students

24
Educational institutions across the country

Some of our Awards and Accolades

'Top Education Brands Award' (Academic Excellence in K–12) by Business World Education in 2020

Awarded as **'Best Education Society for promoting Social Cause in 2019'** by Centre for Education Growth and Research

Apeejay Schools

- Apeejay School, Mahavir Marg, Jalandhar, Punjab
- Apeejay School, Hoshiarpur Road, Jalandhar, Punjab
- Apeejay School, Tanda Road, Jalandhar, Punjab
- Apeejay School, Model Town, Jalandhar, Punjab
- Apeejay School, Panchsheel Park, New Delhi
- Apeejay School International (IB), Panchsheel Park, New Delhi
- Apeejay School, Saket, New Delhi
- Apeejay School, Pitampura, Delhi
- Apeejay School, Noida, U.P., Near Delhi
- Apeejay International School, Greater Noida, U.P.
- Apeejay School, Faridabad, Haryana
- Apeejay Svrán Global School, Faridabad
- Apeejay School, Charkhi Dadri, Haryana
- Apeejay School, Kharghar, Navi Mumbai
- Apeejay School, Nerul, Navi Mumbai
- Apeejay Rhythms Kinderworld, GK–2, New Delhi
- Apeejay Rhythms, Sector–15, Faridabad
- Apeejay Rhythms Kinderworld, Model Town, Jalandhar

W: www.apeejay.edu | E: aes@apeejay.edu

Beginning of the value+ era

As COVID-19 enters endemic phase and in-person entertainment makes a comeback, OTT players must offer more value and personalized service to retain viewers

BY PRABHU RAM

Through the course of the pandemic, India has been living, working and unwinding at home. In an everything-from-home context, Indian consumers have been binge-watching content – on an array of devices, including their smartphones and their TVs. India is currently the world's fastest growing OTT market, and is anticipated to exceed USD3 billion over the course of the next five years.

Consumer insights from CyberMedia Research (CMR) point to an increased content consumption through the course of the pandemic. The lack of avenues for content consumption – whether it be cinema theatres or on TV, led people to explore and embrace OTT. In fact, our most-recent CMR Consumer Snapshot Survey shows Netflix, Amazon PrimeVideo and Disney Hotstar+ being the top three preferred OTT platforms for consumers.

OTT platforms, including Disney Hotstar+, Amazon PrimeVideo and Netflix, are seeking to build on the increased consumption trends. A key factor for OTT platform success depends on its ability to attract and retain viewers. In a multiplatform OTT era, there is a need to cater to evolving consumer needs, aspirations, and preferences, as well as to tailor content as per age, viewing history, time spent, amongst others.

Widen the user base: Responding to the increased content consumption by true digital natives, and to attract new consumer cohorts onto the OTT platforms, there has

There is a need to cater to evolving consumer needs, aspirations, and preferences, as well as to tailor content as per age, viewing history, and time spent.

What are consumers watching?

Source: CMR Consumer Snapshot Survey 2021

been an increased focus by OTTs for debuting OTT-first exclusive premieres of Bollywood and vernacular movies. And, our insights, point to increased time spent online by not just natives, but digital laggards, comprising an older demographic.

Content > OTT brand: OTT platforms are focused on bolstering their original content programming. While some plan to introduce new original programs, others are focused on debuting new seasons of existing programs. With a focus on original content, Viacom launched Voot Select, and Sony introduced the new SonyLiv.

Dovetailed to the focus on original content bank, is the increasing focus on incorporating vernacular into the program mix. For instance, Amazon Prime Video's Family Man 2 had predominantly Tamil dialogues to suit the milieu. While that may have been necessitated by the milieu, it does make a platform like Prime Video accessible to newer audiences, who may not have experienced it before. Similarly, the success of Malayalam movies, such as Kumbalangi Nights and #Home in recent times, beyond their core intended audiences, also speaks to this trend.

Accessibility matters: In a price-sensitive market such as India, one-size-fits-all pricing does not work. It's a dynamic market, and home to different consumer cohorts, with varying capabilities to pay. In short, freemium is king. To enable consumers to take the leap from free to premium, will require content to be compelling, and for dynamic pricing models, including sachet pricing, to attract and retain new consumers.

Friends forever: Recent consumer insights point to subscribers tending to stick to their service providers in case they have access to their preferred OTT platforms. OTT-bundled offers from telecom operators, Airtel, Jio and Vi for OTT platforms like Amazon Prime Video and Netflix focus on a symbiotic partnership with OTTs to enable accessibility for consumers. For instance, prepaid plans with up to 2GB data per day from these operators offer daily data, calling, SMS coupled with attractive streaming benefits.

As India gets vaccinated, cinema theatres reopen slowly, in-person events make a comeback, and most importantly, India potentially enters an endemic phase of the COVID-19, OTT platforms will have to start competing with other entertainment forms for consumer eyeballs and time spent. This also means that OTT platforms will have to continuously focus on offering value to consumers, to enable increased engagement and retention.

Ram leads the Industry Intelligence Group at CyberMedia Research
feedbackvnd@cybermedia.co.in

[COMMENTARY]
OTT

Time for OTT to go exclusive

Better mobile network, low-cost bandwidth, and pocket-friendly handsets are driving the demand for OTT. Next on block is all-in-one personalized content package

BY RAMAN ABROL

Consumer tastes are dynamic and ever evolving. Nowhere else is this more obvious than in the content they consume. India as a media and entertainment market has been undergoing evolution with viewers' tastes maturing. This, in turn, is leading to rising demand for original and varied content.

The COVID-19 pandemic has only accelerated the pace of change. Lockdowns and restrictions on mobility and socializing have confined people within their homes. In addition, lockdowns also necessitated closing down of cinema theatres and multiplexes. In order to address boredom and find new ways of keeping themselves engaged, people have naturally turned to OTT platforms for consuming good content. Film makers have also pivoted on OTT platforms for launching their new releases.

Other factors supporting the rising popularity of OTT amongst Indian consumers include factors such as better network bandwidth and connectivity as well as emergence of a range of pocket-friendly devices capable of streaming multimedia. A recent KPMG India report estimates that Indian online video subscribers will grow over 500 million by 2023 primarily due to these factors. This is also a reason why tier 1 and tier 2 cities are seeing a growth in the number of new OTT subscribers. This has led the media and entertainment industry to keep a sharp eye on the possibilities represented by OTT. Kenneth Research's OTT (Over-The-Top) Market report for 2021 estimates that the Indian OTT market is set to reach Rs 237.86 billion (USD3.22 billion) by financial year 2025, from Rs 42.50 billion (USD576.73 million) in 2019.

Which content is capturing eyeballs?

The modern viewers' expectations from OTT are undergoing rapid change. One of the biggest trends witnessed is that Indian viewers have gone from passive

> Indian viewers have gone from passive consumption of what is available on their screens to active demand for content that they like and want to watch.

consumption of what is available on their screens to active demand for content that they like and want to watch. Here, factors such as availability of multiple streaming options under one roof and greater emphasis on quality of content are playing an important role. A recent Amdocs survey shows that, on an average, surveyed Indian consumers have two media and entertainment subscriptions to satellite/cable TV, video, and music streaming services and around three-fifth consumers have added a video streaming service (62%) to their household since the start of the pandemic in March 2020.

Moreover, quality of content is a far greater loyalty driver in comparison to attractive prices being offered by different OTT players. In the same survey, consumers were asked what drove their loyalty to a media/entertainment provider of any kind. The most likely top three factors for just under three quarters of the respondents were the quality of content (71%) compared to less than half who said price, or price options (45%).

Another key trend is that there is growing demand for personalization of content selection as well as rising inclination towards vernacular and regional content within domestic territory as well as the global space. In fact, Hotstar India's study of its pan India consumer base clearly points that the regional-language content drove more than 40% video consumption, with Tamil, Telugu and Bengali content leading the demand. And as per FICCI-PwC research, the share of regional language consumption on OTT platforms will cross 50% of the total time spent by 2025, moving past Hindi at 45%.

Given the changing business dynamics and consumer preferences, OTT players need to invest in creating original content that resonates with the viewers. Additionally localizing content in native languages of each country and dialect will allow content owners to further monetize their content even more. The recent success of Spanish series Casa de Papel, which is being localized in numerous languages and rechristened as Money Heist shows the appeal of this strategy. Some of the major players in the OTT market are already making inroads in this aspect. Netflix's CEO, Reed Hastings, had shared the platform's plan to invest approximately Rs 3,000 crore in original content for India, while Amazon Prime Video is also working on doubling its original content offerings.

Customers want all-in-one personalized content package

As we continue to work, engage, collaborate, and socialize from within the confines of our homes, there has been a rise in the number of subscriptions across multiple online services such as e-learning, e-health and wellness, entertainment, and gaming.

The customer of today wants convenience of accessing multiple subscriptions at one place. Therefore, packaged bundle services are becoming an attractive proposition for them – to be able to create and pay for content that they are interested in viewing, instead of paying for the provider's entire library of content they have no interest in. In such a scenario, customers are willing to pay more to include on-demand binge-worthy TV series (56%), all games for one specific sporting team (49%), virtual classes/training (46%) or fitness classes with a "celebrity" trainer (45%).

This changing customer demand offers a unique opportunity to service providers to provide an accessible, centralized, and personalized, all-in-one bundled package that covers video streaming, entertainment, and communication services, all at one place.

The next few years in the OTT space are primed for a lot of action. A large part of this will be a result of the increasing adoption of OTT platforms across smaller cities and beyond large metros. This would be powered by the country's growing internet connectivity and OTT players' original and varied offerings.

The OTT landscape is headed into highly competitive waters with international, national, and regional players, all jockeying for viewers' eyeballs and mindshare. It would be interesting to see how OTT players go about retaining, engaging, and attracting more customers and offering them enhanced experiences.

Abrol is GM & Chief Commercial Officer, Amdocs Media
feedbackvnd@cybermedia.co.in

Entertain, but analyze the risks too

There are multiple factors that make OTT platforms vulnerable to cyber risks. Similarly, there are multiple possible ways to manage these risks

BY JAGDISH MAHAPATRA

In the past few years, over-the-top (OTT) services or digital video and TV streaming services have witnessed a rapidly expanding customer base globally. In India, there was a 30% rise in paid subscribers, from 22.2 million to 29 million in March and July 2020 alone, owing to lockdowns and quarantine measures across the country that led to a temporary closure of multiplexes and entertainment theatres.

However, as OTT service providers continue to grow their customer base, there are some associated challenges to consider. For example, the safety of their customer data stored in their application and the threats lurking in the unmanaged devices used for streaming. The size of the market and multiple endpoints being used provide malicious cyber actors with an opportunity to exploit vulnerabilities in web and mobile-based OTT applications for their financial gain. And there are multiple factors that make OTT platforms vulnerable to cyber risks. Similarly, there are multiple possible ways to manage these risks.

Data privacy

One of the greatest threats to privacy and personally identifiable information (PII) today comes in the form of data breaches. Extremely personal data is often used to hack into financial records. OTT platforms have customers' login credentials like name, email address, phone number along with credit card and bank account information for subscription purposes. The theft of such credentials constitutes a data breach, and the most common outcome of data from these breaches is to sell this personal information or release it in a public domain.

What could make OTT services even more vulnerable is if users access this data through unsecured networks and devices. Passwords can often be shared among multiple users across multiple devices. Once the hackers gain access to login credentials they can use customers' financial data to make fraudulent purchases or sell the information further. Media and entertainment services have always been a prime target for cybercriminals. In 2018, there were 30 billion login attempts using stolen credentials, and streaming media were among the top sectors that were breached.

OTT platforms need to recognize these threats immediately and take steps to safeguard user data as well as educate their user base about how to remain secure. Hackers are always on the lookout to exploit apps where huge volumes of personal user data are being housed including OTT platforms. Since they are growing in popularity, they may well be on the radar of malicious attackers.

> Globally this year, there have been 1,161 Big Game Hunting incidents – ransomware targeting large enterprise-sized businesses – an average of 44.65 targeted attacks per week.

Ransomware

We all know it's been around for years, and we think we might have heard everything there is to know about it, but it remains cyber criminals' weapon of choice. In fact, globally this year, there have been 1,161 Big Game Hunting incidents – ransomware targeting large enterprise-sized businesses – an average of 44.65 targeted ransomware events per week. Besides, there has been an estimated USD164 million in ransom demands with an average cost of USD6.3 million.

Ransom demands along with their accompanying threats to leak victim data if unpaid have been observed by our intelligence team as the most prominent e-Crime trend in 2020. Criminals also launch distributed denial-of-service (DDoS) attacks to disrupt businesses and hold them to ransom. Web servers are easy targets for DDoS attackers. When they take control of the web link they can launch the attack on the streaming service and shut down their services if ransom demands aren't met.

Recently, there has also been an additional shifts and evolution in ransomware. Adversaries are looking for new monetization schemes and ways to increase their returns. They think, they act, and they refine their businesses. E-Crime actors are developing ransomware-as-a-service (RaaS) business models, providing ransomware toolkits to third party threat actors in return for a cut of the ransom. Also, e-Crime actors are beginning to employ double extortion techniques, demanding additional fees on top of a ransom with the threat of either releasing the data publicly or selling it to the highest bidder. This can become a real problem for OTT providers. Ransomware attacks have been steamrolling over industries and hitting organization and there is no doubt they will keep targeting vulnerable businesses offering lucrative rewards.

Content piracy

Recently, a Netflix exclusive film, 'Mimi' was released four days prior to its scheduled release date because its pirated copy was leaked on the web. Once the content is pirated it can be copied and distributed. Users get access to the videos and films easily on social media where download links are shared for free to users who have found the channel.

In such cases the OTT services partner suffers losses as it is no longer the sole source of the exclusive content. On the other hand the websites hosting pirated content end up monetizing it. A Bloomberg report found that pirated entertainment sites make around USD1.3 billion from advertising each year by hosting illegally acquired movies and TV shows.

Another challenge for OTT platforms is live streaming. In the recently held Tokyo Olympics, Sony pictures had to file a petition in the Delhi High Court for removing all unauthorized links from live streaming the event. Stringent security measures are needed to curb piracy as its business impact is significantly high. According to reports, streaming services and sporting event right holders lost nearly USD28.3 billion due to online piracy in 2020.

OTT service providers must practice good cyber hygiene and prevention measures to stay ahead of threats. This includes educating all team members on strong password protection, multi-factor authentication, always connecting to secure Wi-Fi, and ensuring both office and remote applications are fully patched and up-to-date. The introduction of security tools such as endpoint detection and response (EDR) enables organizations to collect all data from endpoints, providing surveillance-like observability to proactively scan for environmental threats.

The 1-10-60 rule must be followed – where cyber attacks are detected in less than one minute, investigated in 10 minutes, and eliminated in 60 minutes. Organizations meeting this framework are more likely to stop the attack from spreading to the entire network as adversaries tend to deploy ransomware laterally.

It is now more pertinent than ever for businesses to invest in preventative measures and cloud-native security solutions. It can provide the scale and simplicity needed to keep pace with evolving OTT services attacks.

Mahapatra is Vice President - Asia, CrowdStrike
feedbackvnd@cybermedia.co.in

TV RAMACHANDRAN

Taking care of a billion pulses

With the country witnessing a steep surge in tele-healthcare consultation, its time India upped its public Wi-Fi and satellite broadband network to meet the growing need

Having to deal with COVID-19 propelled digital health adoption worldwide – far beyond what anyone could have projected, the Government of India introduced admirable initiatives to offer relief and help more Indians access essential rations, aid, and health facilities online. Access to digital health online has been a boon for many, but in particular, it benefits the more vulnerable and mobility-challenged sections of our society. Healthcare in India is one of the fastest-growing sectors, and public demand is high. However, while we are off to a great start, the infrastructure aspect is a great challenge. We need to step on the accelerator and improve our foundational infrastructure to improve the nation's overall health.

According to the digital health start-up Practo and the Telemedicine Society of India, the number of digital consultations tripled in India last year. The Health Ministry's telemedicine service e-Sanjeevani has crossed six million teleconsultations since its launch. While one may assume that demand is concentrated in the metros, the reality is that non-metros saw a huge uptake in online consultations – seven times higher than the previous year. Significantly, there was a 500% increase in senior citizens using online consultations for their medical needs. This is a demographic traditionally considered more technology averse than others. Besides digital health startups like Practo, 1mg, PharmEasy, and more, leading hospital chains disrupted their in-person-based business models to offer digital healthcare services through apps. Apollo's 24*7 app has over five million downloads on Google Play Store. They have facilitated over a million teleconsultations already since launch.

In March 2020, as soon as the COVID-19 pandemic began, it is praiseworthy that the Central Government approved telemedicine services as part of their disaster relief efforts. They issued telemedicine guidelines that permitted registered medical practitioners to treat COVID-19 patients remotely. This helped safeguard the health of patients, the medical practitioners themselves, and the rest of the hospital staff against infection. Further, this helped people locked in their homes during various lockdowns get the help they need.

Another significant initiative is the National Digital Health Mission (NDHM). The NDHM piggybacks on the overall Digital India Mission and the Pradhan Mantri Jan Arogya Yojana (PMJAY). PMJAY intends to provide cashless, contactless, paperless, and digital health insurance to all Indians, focusing on the economically vulnerable sections of our society. Previously known

> While one may assume that demand for teleconsultation is concentrated in the metros, the non-metros saw a huge uptake in online consultation.

> Growing our digital communications network can help more people in rural and remote areas leverage digital health services regardless of where they live.

as the Ayushman Bharat Yojana, the health insurance scheme was introduced pre-COVID in 2018. It will offer beneficiaries a digital health card that allows them to use health services across any "in-network" public or private hospital around the country.

Just like the great telecom revolution of the '90s and 2000s, the NDHM's goals, when fully implemented, will bring people of all levels of means and resources together to collectively improve India's health. NDHM aims to create an interoperable digital health system across the country. Every Indian will have a unique Health ID, similar to the Aadhar number, allowing them access to digital health resources. Benefits include greater transparency regarding health records through the 'One Card, One Health' program. Patients can access health services across the country irrespective of whether they have all their medical records. In case of accidents, emergencies, or disasters, this is a great benefit. Pre-existing conditions, important prescriptions, and other information can be saved on their cards. This vital information can help medical professionals administer the right treatment and therapy.

If India wants to be considered a developed, world-leading economy, the health of the nation is directly related. Healthier families and people are more able and willing to study, work, and contribute to the economy. Our average life expectancy is 69.4 years and is less than the world average of 72.81 years – according to SRS data, Registrar General and Census Commissioner – for rural areas. In urban areas, with greater connectivity and healthcare resources, life expectancy is 72.6 years. On a positive note, our Maternal Mortality Rate (MMR) has dropped. MMR is the number of maternal deaths per 1,00,000 live births. The United Nations aims for a target of an MMR of less than 70 per 1,00,000 live births. As per the SRS, we are at a score of 113 in 2016-2018. Most of these deaths are related to severe bleeding, high blood pressure, post-natal infections, and complications during the birthing process. Many of these issues are preventable with quality and timely medical care and intervention – which access to digital health services can offer.

However, these valuable services are now available only to those with quality wired and wireless internet access and mobile connectivity, mostly in metros. We have much more work to do to help alleviate some of the burdens our health systems face. India has a very low doctor-to-patient ratio, only 0.7 doctors per 1,000 people. The World Health Organization (WHO) average is 2.5 doctors per 1,000. Dr Rajiv Kumar, Vice-Chairman of NITI Aayog stated: "One thing that has come out from the pandemic is strengthening public health infrastructure. That will be one area where extra expenditure should go."

While currently healthcare spending is only 1.2% of the GDP, the government intends to increase healthcare spending to 3% by 2022, which is a good sign. Our population demographics are also changing. According to Ministry of Statistics and Programme Implementation report 'Elderly in India 2021', there are about 138 million elderly persons in India in 2021. This number is expected to increase by 56 million by 2031 and will continue to grow in decades to come. As India's demographic begins skewing towards the elderly, there is even more urgency to make digital health accessibility a greater priority.

The NDHM intends to start a national health registry to monitor, analyze, and improve population health metrics across the country, and increase transparency across public and private health institutions. If our analytics are meant to fuel health programs, then the quality of the underlying data is extremely important. The success of this mission heavily lies in the effectiveness of data collection. After all, the adage, "Garbage in, garbage out," always holds. Our national infrastructure has to improve for data collection to be accurate, comprehensive, and hold any meaning, particularly in tier III and remote hard-to-reach areas.

Let's look at what needs to be done to further the cause of digital health for all. The PM WANI initiative

> India has over 800 million broadband, but the number of unique subscribers would probably be only about 500 million since many users have multiple connections.

is an excellent concept, and implementation has to be accelerated. PM WANI intends to provide affordable, high-speed broadband access to areas across India that needs them. India has over 800 million broadband, but the number of unique subscribers would probably be only about 500 million since many users in urban and semi-urban areas have multiple connections. Therefore, there is still a huge chasm between the haves and the have-nots. Home internet penetration is an extremely low 7%. Unfortunately, most educational and employment-related activities and health access online occur from our homes.

Rapidly increasing the number of PM WANI public Wi-Fi hotspots across the country can help improve this number. Additionally, private entities can apply to become a Public Data Office (PDO). Once registered, these PDOs can work on behalf of the government to offer public Wi-Fi subscriptions in their localities. Leveraging existing grassroots resources to provide public Wi-Fi in rural and remote areas is absolutely the right path forward.

Another landmark moment for India was when the Finance Minister Nirmala Sitharaman unveiled several reforms to deregulate and transform India's space and satellite sectors. Improving the satellite communication network in India is a huge driver for India's progress and digital health initiatives. Great actions/initiatives have been taken by both TRAI and DoT in recent months which will help transform the health-related digital connectivity in rural areas. An extremely conservative estimate is that India needs 2 TB for backhaul capacity. Still, in reality, we need almost 20X times that capacity to meet market demand for connectivity. There are immense opportunities ahead for the satellite communications sector.

Widening our satcom network's reach to every corner can help us get all Indians online to leverage digital health initiatives for their benefit. India currently hasonly one-tenth the number of satcom connections that the rest of Asia does and lags even more behind more developed countries like the United States. To help achieve our overall digital health mission, it is hoped that the Digital Communications Commission, our highest policy-making body for communications, accepts the TRAI's recent sets of pathbreaking recommendations for Indian satellite communications, which can surely transform this sector.

Another reason for prioritizing PM WANI and liberalising satcom in India is because the old-school plan to improve connectivity through fibre optic networks faces issues. BharatNet, the government's plan to bring 2.5 lakh gram panchayats online, is an excellent plan. But 70% of our population is in spread-out rural areas. Laying fibre cable in these areas is hard and fraught with territorial and logistical challenges.

More than 80% of Indians remain to be covered by adequate health insurance (Fitch group report). 75% of the healthcare infrastructure is concentrated in the metros. We have 8.5 hospital beds per 10,000 people – a number that has to grow. Improving our on-ground physical health infrastructure all over the country is important. Meanwhile, growing our digital communications network can help more people in rural and remote areas leverage digital health services regardless of where they live. Telemedicine offers immense potential but is dependent on the reach of not only the fixed and mobile networks, but, importantly, the critical digital infrastructure of public Wi-Fi and satellite-communication-enabled networks.

The COVID-19 pandemic exposed the strengths and weaknesses of our systems – both in healthcare and communications. It is up to us to ensure that we fortify the nation's health against future disasters, crises, and improve our overall health.

Ramachandran is Hon. Fellow, IET (London) and President, Broadband India Forum

(Research inputs by Chandana Bala)

Views are personal

feedbackvnd@cybermedia.co.in

VOICE&DATA TELECOM LEADERSHIP FORUM

CyberMedia

DELL Technologies intel Intel Innovation Built-in

presents

5G FOR DELIVERING TRANSFORMATION

Platinum Partner JUNIPER NETWORKS | Platinum Partner HUAWEI | Gold Partner ciena | Gold Partner NOKIA | Technology Innovation Partner claerityai | Broadband Partner one

Wednesday, 15th September 2021, 9:30 AM – 5:30 PM

www.tlfindia.in @VnDIndia #TLFIndia5G

3rd edition of Voice&Data TLF 5G Virtual Conference will bring the industry experts, telco leaders, tech enablers, policy makers under one platform.

• 7+ Sessions • 25+ Speakers • 1000+ Audience
• Product Launch • 5000+ Engagements

KEY FOCUSSED SESSIONS

- 5G Infrastructure
- Private Network Investments
- Network Slicing & Private Network
- Mobile First Rural Economy
- Consumer Experiences
- Open Core Network

JOIN THE LARGEST CONGRESSION OF BUSINESS DECISION MAKERS UNDER ONE ROOF

- 400+ minutes of Knowledge Dissemination & Networking
- Networking Lounge
- Experience Zone
- Business Dialogues with Leaders
- Resource Centre

5G is going to be the game changer for the future. Get the experts insights.

Supported by

BIF BROADBAND INDIA FORUM | COAI | CMAI | TEMA | ISPAI

Marketing & Alliances: Rajiv Pathak
rajivp@cybermedia.co.in, +91 80107 57100

For Registrations: Ravi Kant
ravik@cybermedia.co.in, +91 98104 81484

Test-drive your internet of medical things

Effective manufacturing test has an important role to play in ensuring quality of connected medical devices. Here is how it can help

BY SOOK-HUA WONG

The advent of IoT is driving transformation in healthcare. Rising healthcare cost and consumer demands for better healthcare delivery are driving widespread use of IoT in healthcare. This evolution is commonly known as the Internet of Medical Things (IoMT). Today, we can easily find medical devices that are connected, such as ultrasound imaging systems, glucose monitors, bedside monitors, pacemakers, hearing aids, and wearable health monitors. With IoMT devices, non-critical patients can stay at home and be monitored through these devices to decrease hospital admissions and reduce costs. The overall IoMT market is expected to grow from USD72.5 billion in 2020 to USD188.2 billion by 2025, at a compound annual growth rate (CAGR) of 21.0%. We will see the IoT greatly influencing all aspect of healthcare segment, from monitoring, to diagnostic, to surgery and patient care.

Medical device manufacturers face unique challenges when incorporating IoT. Many medical devices are used in mission-critical applications. Therefore, they must be very reliable and long lasting. The wireless connectivity needs to always-on and reliable 24/7 year-round, and it needs to work seamlessly in difficult physical environments. These requirements are pressuring medical device manufacturers to implement reliable, efficient, and cost-effective manufacturing test strategies.

The importance of effective manufacturing test

Many medical devices are subjected to thorough

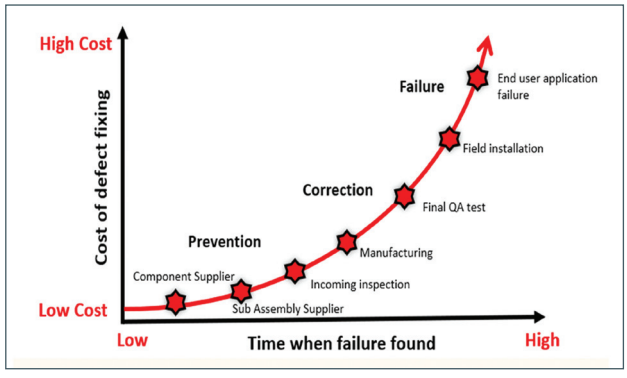
> Medical device manufacturers face unique challenges when incorporating IoT. Since they are mission-critical applications, they must be very reliable and long lasting.

characterization during the design stage to ensure device quality. However, in manufacturing, assembly process variation, supply chain component deviation, test system repeatability, and operator handling errors can introduce failure into the device. Some of these defects may not be detected during manufacturing test due to lack of coverage in the test system. Marginally passed units may cause field failures during actual usage due to degraded performance.

To stay competitive in the market, manufacturing tests are normally optimized to achieve low cost-of-test with fast test time to meet market cost expectation. The device may only be tested under certain minimum conditions deemed sufficient. For instance, a wireless medical device OEM recently faced issues with the effectiveness of their manufacturing test setup. A custom version of the Bluetooth Low Energy (BLE) device managed to pass all manufacturing tests but was later found to have intermittent connection issues. After trouble shooting, it was found that device had a distorted antenna pattern, causing much lower power in some of its BLE channels. In production testing, only a very simple connection test was performed that was not able to catch these intermittent connection issues during actual operation.

Capital equipment cost vs. potential saving

A defect that is detected during initial manufacturing phases may not cost a lot to fix. However, the cost increases exponentially as the detection happens after production test or in the field during end user's applications.



Cost of defect fixing increases over time

Investing in the right test solution is important during the new product introduction (NPI) phase. It may look expensive to invest in an RF tester and the required operators to execute the tests correctly. There are also annual maintenance and calibration costs. However, the potential savings from detecting the failure early during manufacturing saves the direct and indirect or hidden costs of a field failure. The hidden cost due to warranties, failure troubleshooting, handling of replacement units, loss of sales due to bad reputation, or even penalties arising from use of defective products, can potentially total huge amounts of money.

With the correct test strategies implemented in production, manufacturers can easily recoup the initial RF tester investment within the first year. The table below shows an example of potential cost savings. With the right test strategy, the potential cost saving can go up to USD250,000, with savings in warranty cost, and indirect/hidden cost in the event of shipment recall and so forth.

Let us now explore how leading medical device manufacturers are optimizing their manufacturing tests to ensure device quality, increase manufacturing yield, improve test system flexibility, or improve manufacturing throughput.

Potential cost saving analysis		
Example DUT	Patient monitor	
Annual volume	100,000	
Yield rate	99%	
Bad DUTs	1000	
Warranty cost per unit	USD150	
Total warranty cost	USD150,000	
Indirect or hidden cost	USD100,000	Costs associated with shipment recall, RMA process, support, shipping, receiving, tracking, corrective action, change orders, legal, and reputation loss. The cost would be far more than USD100 per failed unit.
Potential cost savings	USD250,000	

> Connected medical devices are on exponential growth trajectory. The success depends on the ability of manufacturers to produce reliable and good quality connected devices.

CASE STUDY 1

Ensure quality of BLE wireless charger

It was the first attempt for a medical device company to incorporate wireless connectivity into their products. This company was developing a BLE enabled wireless charger. By enabling wireless connectivity to the charger, users can easily monitor the charging state and the battery level in order to prolong the battery life. During the design phase, the engineer needed to validate that the antenna and the matching circuits were performing according to the design goals.

As the product was developed using an RF module, the engineer skipped the full parametric testing according to the Bluetooth requirements. The RF performance was guaranteed by the module maker. As the engineer made modifications on the reference design and the antenna to fit into their form factor requirements, the engineer had to run full validation at the end device level to ensure the device was transmitting and receiving BLE signals properly in various end user scenarios. The company used an over-the-air (OTA) wireless tester specifically designed for IoT applications, to perform transmitter output power measurements and receiver packet error rate (PER) and sensitivity measurements.

The engineer used OTA measurements to validate the overall device transmitter and receiver performance including the antenna. The engineer could also choose to test all 40 BLE frequency channels, or selectively test any channels of interest. With this capability, the engineer could validate the performance of the radio covering the entire BLE frequency band.

The manufacturer also uses the same test setup in manufacturing test, as it is cost-effective and simple enough for operator use. The production test is optimized by performing TX power and RX PER test at only three frequency channels – the lowest, middle, and highest frequency channels, to quickly validate the device performance over the entire BLE frequency band. This has helped the medical device manufacturer accelerate production and minimize correlation issues that frequently happened due to different test setups being used in design and manufacturing.

In this case, the manufacturer has saved weeks of test development during the pilot phase, reduced time-to-market, and ensured device quality by adopting an effective test solution that offers the required test coverage.

CASE STUDY 2

Improve yield for wirelessly controlled surgical machine

A manufacturer faced yield issues with their high-end surgical machine, which includes a wireless subsystem for remote control purposes. The wireless subsystem worked properly until failures started to show up. This became a big problem and impacted their shipments, as they only discovered failures after the complete machine was built and tested.

When the subsystem failed, they had to spend a long-time troubleshooting, repairing, and retesting. This caused inventory pileups and shipping errors. To fix this problem, they used a simple and cost effective IoT signaling tester to do a pre-screening test of the wireless modules before they were installed into the wireless subsystem in their machine. Identifying defect modules before they were installed gave the manufacturer tremendous savings in test and repair time. This eventually allowed them to meet their daily output and yield targets.

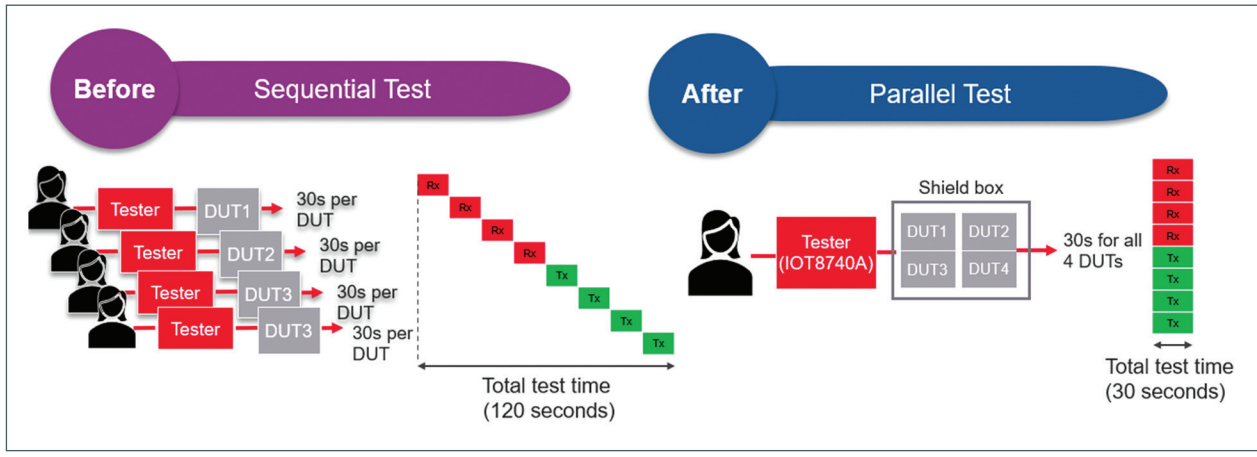
CASE STUDY 3

Improve production flexibility for contract manufacturer of low volume medical wearables

A leading contract manufacturer manufactured medical wearables for many different brands. Their existing test solution was based on a non-signaling one-box-tester. Because the test was conducted in non-signaling mode, special test firmware had to be loaded to the device before testing. Then, it had to be removed and replaced with final production firmware after the test was complete.

The maintenance of these large sets of firmware for different products was painful for the manufacturing

> The potential savings from detecting the failure early during manufacturing saves the direct and indirect or hidden costs of a field failure.



Significant test time savings is possible with an OTA parallel testing solution

team. Operator handling error was also a key risk for them as they manufactured a wide range of devices from different customers. To improve the production flexibility and eliminate operator handling errors, they switched to an IoT wireless tester that enabled signaling OTA testing using final production firmware. This helped them to streamline the test processes and allowed them to easily switch between different product versions or brands. The tester also supported major short-range formats like BLE 4.2, BLE 5, WLAN 2.4-GHz and 5-GHz so they could use the same test setup to test devices with different radio formats. Production flexibility is important for contract manufacturers to cater to volume fluctuations from their customers.

CASE STUDY 4

Increase manufacturing throughput and reduced cost-of-test of high-volume wearables

A leading wearables manufacturer was investigating their next generation test platform. Part of their goal was to achieve higher throughput and reduce cost-of-test without sacrificing test coverage. They understood that there could be no compromise in quality in the medical industry. Their existing test solution was time consuming and operator intensive. It involved manually putting the DUT into the shield box, running the test, removing the DUT from the shield box once the tests completed, inserting a new unit, and repeating the process. It was running in sequential mode. By switching to a test solution that enabled parallel testing of multiple devices, test time was significantly reduced. The operator can put four devices into the same shield box at one time and run the required TX and RX tests simultaneously on all four devices. Once the tests are completed, the operator removed all of them and replaced them with four new units to continue the test. With parallel testing capability, the manufacturer managed to cut test time by more than four times, resulting in significant throughput increases and cost of test reductions.

What it means?

Connected medical devices are on the exponential growth trajectory. Adding wireless connectivity on medical devices brings tremendous conveniences to patients, allowing better healthcare delivery and lowering healthcare costs. The success of this megatrend will depend on the ability of medical device manufacturers to produce reliable and good quality connected medical device that will not fail prematurely in the field. Effective manufacturing tests play a critical role in ensuring the device quality by capturing defective or marginally passed devices that can potentially fail in the end user application. Selecting an effective test strategy will help to minimize this risk without incurring high manufacturing cost.

Wong is Industry Segment Manager, Keysight Technologies
feedbackvnd@cybermedia.co.in

Rohit Braggs
Chief Operating Officer, Orolia

"We are building on the approach to provide affordable resilient PNT"

What has open architecture, laser-sharp navigation through GPS and jamming got do with missiles? ***Rohit Braggs****, Chief Operating Officer of Orolia loads heavy ammunition of information and helps us shoot at just the precise spots where communication technology is intersecting with defence technology. Excerpts from his interaction with* ***Pratima Harigunani****:*

What is your view and experience with open and modular architectures?

Global navigation satellite system (GNSS) itself is an inexpensive technology to implement and is easily scalable, requiring only the appropriate receiver. But adding expensive, complicated technology to ensure the continuity of positioning, navigation and timing (PNT) data when GNSS is compromised can actually undermine the intended benefits for systems. Maintaining a state of military readiness is a top priority for defence agencies. The ideal approach would deliver a consistent solution that is cost-effective across different platforms and provides a compatible, scalable system to all of them. Expensive, inflexible solutions will not solve the total problem. To provide affordable secure PNT for every link in the communications chain, a different approach is needed.

How much gap exists in areas like scalability, configuration, integration, etc. for defense technology solutions?

The ability to design system specifications based on a flexible, building-block architecture is often inhibited by the fact that most contractors only provide one part of the solution. That puts the burden on the defence agency to piece together platforms and systems of systems that are not over-engineered in terms of cost, integration complexity or capabilities. At Orolia, we are building on the approach to provide affordable resilient PNT. Using a collection of complementary, flexible and scalable technologies, we can provide PNT precision and access at a lower cost than traditional navigation solutions that rely on high-cost sensors. We offer a cost-effective, bolt-on – fast and easy to integrate – solution with an open architecture that works well with existing systems and increases security on a flexible scale to suit various risk factors.

Is cyber-warfare the next big turf of international politics and military landscape?

When we think of security around PNT for critical infrastructures in general, including military applications, we reckon that the awareness has finally increased over

> Today's time-sensitive networks rely on available and accurate PNT signals to provide leaders with the information required to make timely and effective decisions.

> Modern state and criminal threat actors have little difficulty gaining access to portable devices that can jam and spoof GPS signals.

the last couple of years. Today's time-sensitive networks rely on available and accurate PNT signals to provide leaders with the information required to make timely and effective decisions. Signals provided by GNSS, such as GPS, represent the gold standard in terms of availability and accuracy. However, the proliferation of GNSS-degrading and denying devices across state and non-state actors put this critical information overmatch capability in jeopardy.

Can you elaborate?

Many of our civil/government infrastructures are reliant on GPS to provide the trusted PNT data that allows their time-sensitive networks to operate accurately and precisely. Financial markets, communications systems, and utilities all trust GPS to provide this information. As GPS and other GNSS signals become ubiquitous in terms of how we operate, threats to the availability and integrity of GPS signals will increase. Modern state and criminal threat actors have little difficulty gaining access to portable devices that can jam and spoof GPS signals. As GPS use spreads into more mobile applications farther afield, even natural and urban terrain must be accounted for when considering PNT availability. To combat threats to GPS signal availability and trust, other techniques and signals of opportunity must be considered as alternate sources of PNT information when GPS is not available. Although GPS will remain the most accurate system for now, correctly integrating combinations of other signals is the recipe for resilient systems that can survive operations for the duration of GPS signal loss.

What else can you tell about GPS and GNSS, things that we can see unfolding next?

Compared to other RF signal levels, GNSS signals are exceptionally weak. The satellites are orbiting at approximately 11,000 miles above the surface of the earth, and the transmission power of a GPS satellite transmitter is in the 10-100W range. By the time the signal reaches

> Protection against jamming and spoofing also falls under the "combatting interference" umbrella, as does testing of GNSS components and PNT systems against jamming and spoofing.

earth, it is weaker than the atmospheric background noise level in its band. This is referred to as a negative signal-to-noise level. In other words, if you tuned a standard RF receiver into the GPS L1 frequency band of 1575.42 MHz, for example, you would hear or see nothing but background noise. A GNSS receiver can extract this weak signal from the noise by utilizing its processing gain because it "knows" the correct signal pattern. After the search pattern correlates with the actual signal pattern and a match has been detected, the decoding of the data stream begins. The positions for the satellites in view can be extracted also as well as their distances from the receiver. As soon as this data is available, the receiver can calculate its position.

That's interesting. How water-tight is this data?

Yes. Although modern multi-GNSS receivers can receive several GNSS constellations simultaneously, therefore offering better coverage in locations with a limited view of the sky line in "urban canyons", a shortcoming of GNSS-based PNT applications remains – the low signal strength, which makes all GNSS signals particularly vulnerable to disruption by either jamming or spoofing. Illegal consumer-grade GPS jammers, referred to as Personal Privacy Devices (PPD), fall under the category of intentional jamming. Spoofing, which is sometimes also referred to as complex jamming or GPS hacking, is the act of broadcasting false signals with the intent of deceiving a GNSS receiver into accepting the false signals as genuine. The tactics and technology used to combat jamming are referred to as interference detection and mitigation (IDM). Protection against jamming and spoofing also falls under the "combatting interference" umbrella, as does testing of GNSS components and PNT systems against jamming and spoofing. A strong and well-coordinated IDM solution into a PNT system makes it resilient against jamming and spoofing.

Can you tell us about your solutions and how do they serve the technology needs in the defence space?

Orolia is a world leader in Resilient PNT solutions that improve the reliability, performance and safety of mission-critical operations, including in remote, harsh and GPS/GNSS denied environments. Orolia has the broadest portfolio of technologies across the Resilient PNT value-chain and designs mission-critical, high-performance hardware, software and systems, including high precision time and frequency reference systems, high-end clocks, GNSS simulators and emergency positioning beacons. Our products and solutions are used in a large variety of applications by large system integrators, governments and blue-chip companies in aerospace, defense, and diverse commercial applications, including industrial technology, telecom, finance, etc.

Any specific examples or use-cases that you want to share here?

Assured PNT is the convergence of PNT technology with non-traditional and emerging technology to improve the reliability, performance and safety of mission-critical applications in the air, on land and in the sea. Orolia's Assured PNT Defense Platform is an innovative turnkey solution that addresses the threats and vulnerabilities of GPS/GNSS, ensuring military forces have the continuity of trusted PNT data needed for mission success.

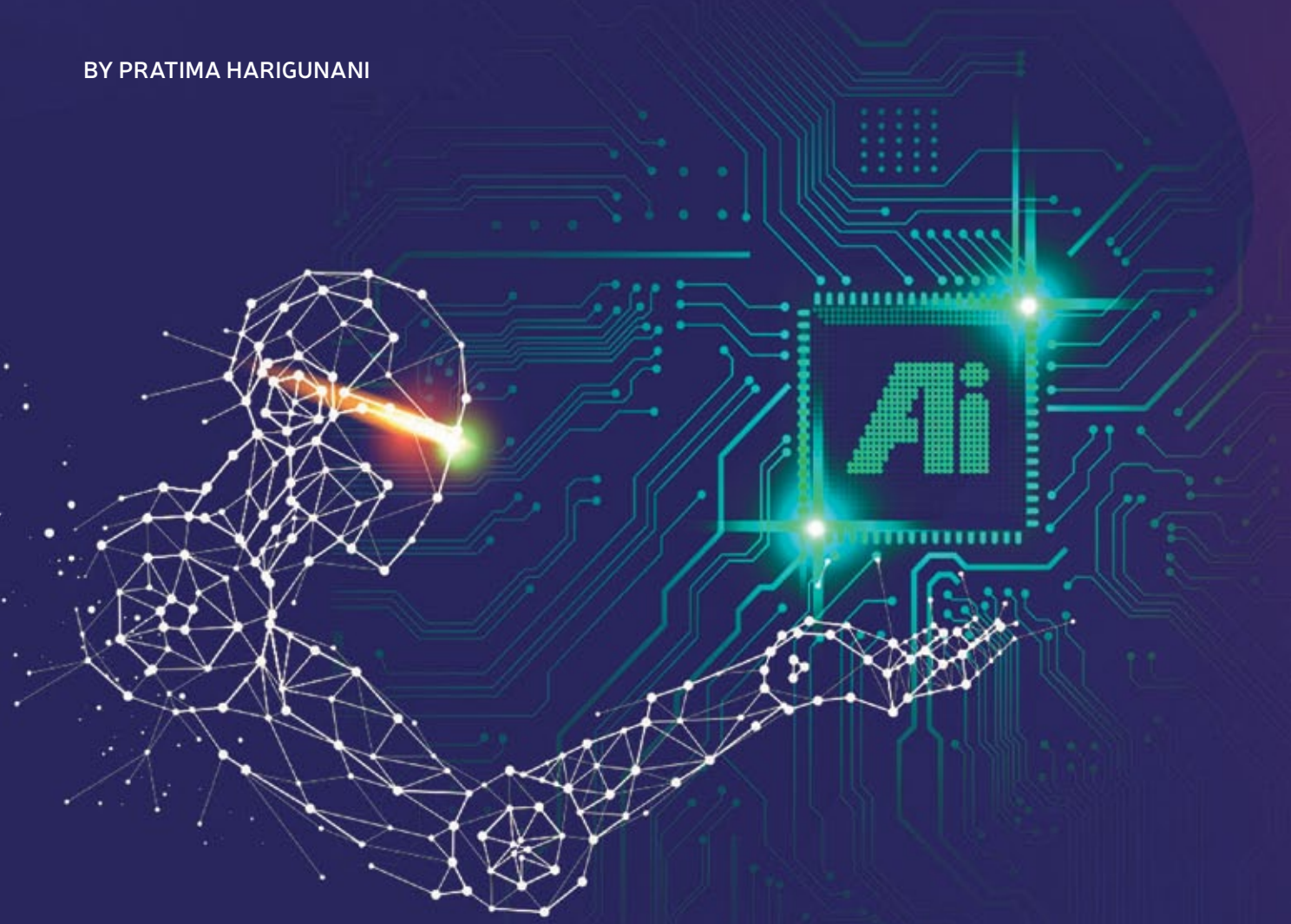
Orolia was asked to provide the Navy with a very specific and precise Assured Timing system for a critical air and missile defense radar platform. This advanced timing system had to be extremely rugged to withstand the shock and vibration of the harsh environment of a ship. It had to not only withstand this harsh environment but also output very accurate timing signals as well. In addition, both the hardware and software had to offer Open Architecture (OA) Compliance for performance and technology enhancements throughout the life of the program. Orolia was able to meet all the above low phase noise and ruggedization requirements through simple modifications to our flagship COTS SecureSync time and reference platform – while meeting or exceeding all scheduled program timelines. The SecureSync platform is particularly well-suited for radar applications like this because it is highly flexible, scalable, and easy to modify.

pratimah@cybermedia.co.in

AI-chips: The new mobility-chops

We know what AI is synonymous with. Here is how its core advantage of speeding up a process and adding precision to it translates into the realm of mobility

BY PRATIMA HARIGUNANI



It cannot be a co-incidence. One after another, a slew of top technology majors in the mobility space have started putting their weight and lab-aprons behind artificial intelligence (AI)-backed processing. There is Samsung that has begun using AI for automating computer chip design. Reportedly, it is using AI features in new software from Synopsys, and heading close to commercial processor design with AI. It could be a core part of its Exynos chips, which are used in smartphones.

Running with the AI jersey on this track are Google and Nvidia too – as we have noticed in their research papers and AI-directed initiatives. Google has been exploring it for its next generation TPU Chip and possibly for architectural optimization. For instance, we saw in a paper how it is using AI to arrange the components on the Tensor chips – they are used to train and run AI programs in its data centers. NVIDIA is also trying to use it for floor-planning. Then there is Cadence Design Systems that is jumping in this pool with an AI-based optimization platform.

Why AI?

A big difference that AI brings in chip-design and semiconductor space for smartphones and communication is on its ability to redefine space aspects. AI can bring in the much-loved autonomous advantage for identifying optimal ways to arrange silicon components (layouts) on a chip. This can help in reduction of area as well as in arresting power consumption. Plus, with reinforcement learning, it can check out a number of alternatives for design and knock-out the ones that don't fit design goals; this matters a lot when there can be a gazillion ways to just place the components on a chip. And the difference between a chosen path and a better path can be humongous in terms of power savings and chip-efficiency.

AI can help in chip-design on all salient levels, as experts have pointed out. From the Behavioural level where architects define the chip's purpose to the Structural level where chip organization is spelt out, to the Geometry level where chip lay-out is defined – AI can address many constraints of erstwhile methods – and also the Moore's Law. Machine learning can help tremendously in improving the work on clock-trees which is a chip engineer's, and a designer's, area of interest.

What better than AI to arrange billions of transistors across a chip and address the complexity of chip-design! Algorithms can be trained well to handle many permutations and combinations of multiple components. Without AI, this process takes weeks and a lot of manual or computational time. From placing the components to wiring them, to using simulation for finding out efficacy of a given design to the use of reinforcement learning for multi-pronged chip-goals; AI can really change the way chips are baked. AI can help a lot in improving economies of scale which were not so hard to achieve in traditional chips. As we see chips being directed for newer and more radical applications – this factor is becoming quite a huge one. Smartphones, cloud and 5G are putting new imperatives and innovations in the chip design space.

In an AI chip, you can see the usual stuff - Graphics Processing Units (GPUs), Field-Programmable Gate Arrays (FPGAs), and Application-Specific Integrated Circuits (ASICs) specialized for AI. Then there is another ingredient – AI-optimized design features which take care of calculations needed by AI algorithms. They also have programming languages built specifically for conversion of AI computer code for execution on an AI chip. GPUs are used for training. FPGAs are put in for inference – i.e. to apply trained AI algorithms to real-world data inputs and ASICs are used either or both – training or inference. AI chips steal an edge over traditional CPUs in both design and inference.

How the market stacks up?

As per Omdia's AI processors for Cloud and Data Center Forecast, as per the last count, a GPU major is ruling the space of AI processors. Nvidia Corp. has maintained its dominant position in the global market for AI processors used in the cloud and in data centers in 2020. This means an 80.6% share of global revenue. The market for AI processors is attracting a lot of suppliers – the report adds. The global market revenue for cloud and data

> A big difference that AI brings in chip-design and semiconductor space for smartphones and communication is its ability to redefine space aspects.

> Apple puts AI into cell phones to help tidy up your photographs. A lot of people want tinier AI processors in things like personal fitness monitors and home thermostats.

center AI processors climbed 79% to reach USD4 billion in 2020. And revenue is expected to rise by a factor of nine to reach USD37.6 billion in 2026.

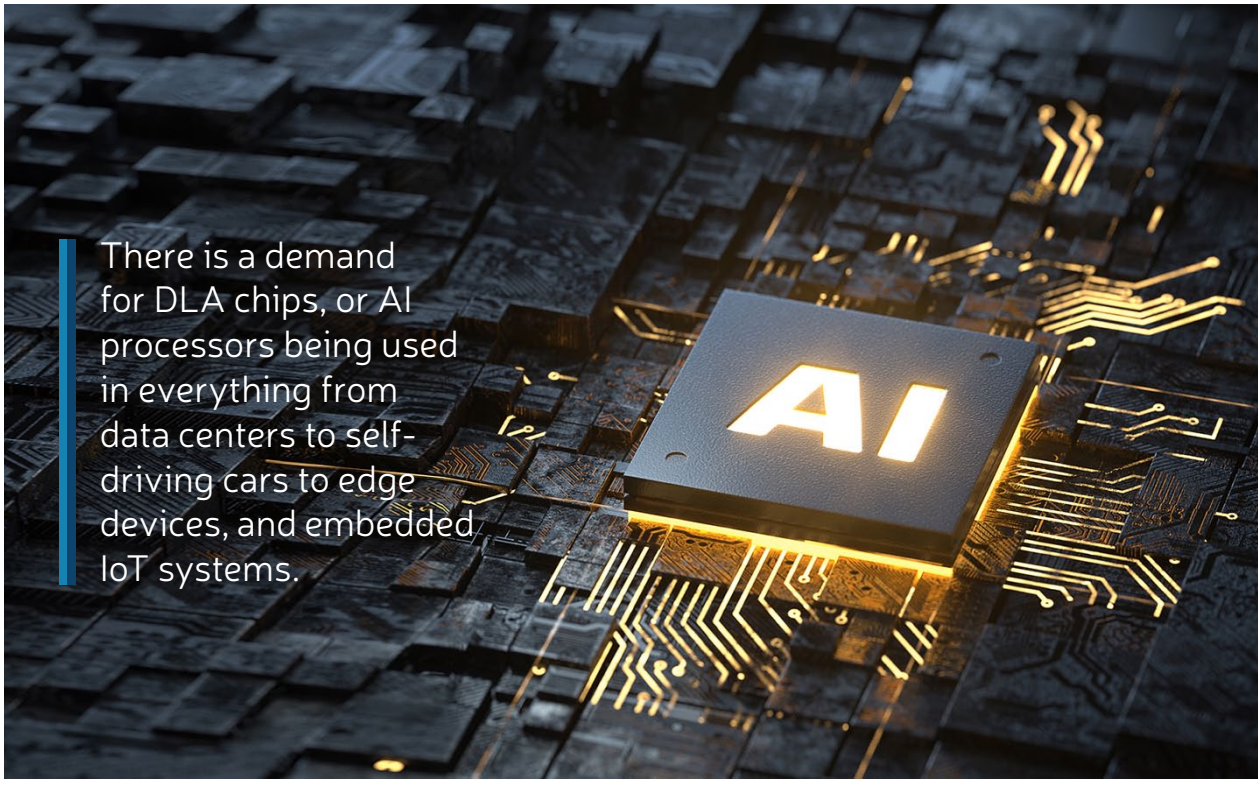
From competitive suppliers to small startups to major semiconductor vendors – many players have entered the AI processor market with a number of different chips. They can be GPU-based chips, programmable devices, and new varieties of semiconductors specifically designed to accelerate deep learning.

This comes from its supremacy in the market for GPU-derived chips, and Nvidiain 2020 continued to capitalize on its strong incumbent position in GPU-derived chips as explained by Jonathan Cassell, principal analyst, advanced computing, at Omdia as he shared the report. The lead of GPU-based semiconductors here comes from their capability to accelerate deep-learning applications. There is also the demand for deep-learning accelerator (DLA) chips, or AI processors being used in everything from data centers to self-driving cars to edge devices, and embedded internet of things (IoT) systems. Now new entrants are challenging large chip vendor incumbents in a market that has now topped USD7 billion, and growing 58% over 2019.

As a report from The Linley Group explains, AI acceleration is visible in many deep-learning applications. When we look at client devices; its use is palpable in smart speakers, high-end smartphones, voice assistants, smart doorbells, and smart cameras. Interestingly, edge devices manifest the highest-volume application for AI-enhanced processors.

Speed-dial AI please

We have seen how chip-shortages and supply-chain issues affected the smartphone industry during the pandemic. The aspect of power management chips also became pronounced during this phase. Also many chip majors are moving from 5nm to 3nm node size already. It



> There is a demand for DLA chips, or AI processors being used in everything from data centers to self-driving cars to edge devices, and embedded IoT systems.

From competitive suppliers to small startups to major semiconductor vendors – many players have entered the AI processor market with a number of different chips.

is a relevant shift as the size of the semiconductor die on which a logic circuit is fabricated consequentially defines the efficiency, speed and power that chips deliver. Taking care of intricate design of transistors and resistors onto an nm-small size of silicon is not easy or time-effective. Add the complex and huge wiring and interconnects on the chip to this mix; and you are staring at a problem that guzzles both power and time.

If an AI chip can reduce the time taken in hardware development and make the entire pipeline agile and autonomous, it can mean some precious dollars and hours for any mobility player. It is all about speed, efficiency, margins and application-oriented design – at the end of the day. A smartphone maker or an edge-device player that can squeeze these advantages, thanks to AI chips, gets a real head-start – from time-to-market cycles to first-mover products and services in the market.

Aakash Jani, Senior Analyst, The Linley Group, weighs in that this generation of flagship smartphone processors (Qualcomm Snapdragon 888, Samsung Exynos 2100, Huawei Kirin 9000, Apple A14, MediaTek Dimensity 1200) experienced sizeable jumps in AI performance, captured by AIMark and AI-Benchmark. "The gain in AI performance allowed for more AI features to move to the edge, which decreases latency and improves security. Additionally, the improvement in AI hardware and software empowers OEMs to accelerate existing features, such as computational photography, or add new features to flagship phones."

Jim Handy, veteran analyst from Objective Analysis, Semiconductor Market Research observes that the AI market is still immature. "It's like a new toy for programmers and engineers, and they are playing with it trying to figure out how to use it." Handy assesses the pecking order with a new lens. "Google has big racks of AI computers to decide which advertisements to send to you. Apple puts tiny amounts of AI into cell phones to help tidy up your photographs. A lot of other people want to use even tinier AI processors in things

What AI does to chip-making?

- Bringing down complexity
- Addressing delays and improving overall productivity
- Fixing the difficulty of handling subtle and delicate design areas
- Unlocking new innovations in chip-design
- Shrinking engineering time
- Enabling floor plans that run at higher frequencies and hog less power - making the floor area more compact
- Elevating PPA – Power, Performance and Area

> AI can bring in the much-loved autonomous advantage for identifying optimal ways to arrange silicon components (layouts) on a chip.

Top players in the cloud and data center AI processor market

- **Nvidia:** AI processors used in the cloud
- **Xilinx:** FPGA products commonly used for AI inferencing in cloud and data center servers
- **Google:** Tensor Processing Unit (TPU) AI ASIC used in its own hyperscale cloud operations
- **Intel:** Habana AI proprietary-core AI ASSPs and its FPGA products for AI cloud and data center servers
- **AMD:** GPU-derived AI ASSPs for cloud and data center servers

Source: Omdia's AI Processors for Cloud and Data Center Forecast Report

like personal fitness monitors and home thermostats. Engineers are trying it out in many more applications than you or I could imagine."

In Jani's assessment, Samsung made sizeable improvements in its smartphone deep learning accelerator, which allowed it to match the throughput of the Kirin 9000 and Snapdragon 888 on certain benchmarks.

Google and Samsung are only two companies out of perhaps as many as 50 who are developing AI chips of some kind, Handy points out. There will be a few business successes and many failures. Again, it is hard to tell who will win.

As always, buying a person some fish would not do the trick. Teaching them to fish would be a better move.

For instance, from a business standpoint, Handy would like to depend on companies that already know how to sell computer chips to the engineers who design those computers. "I would expect for a semiconductor maker to win there – but not just any semiconductor manufacturer. The chip-makers who should do best are the ones who win designs with the engineers, rather than to compete to sell commodity chips into an existing design at the buyer's desk. Samsung doesn't do this. It takes a completely different kind of business organization. Companies like Intel, NXP, NVIDIA, Qualcomm, Renesas, ST Microelectronics, and Infineon are organized this way and are good at winning designs. This kind of company is the kind that I would expect to do best."

The way he sees it all shaping is reminder for players to set their alarm-clocks right. "Ten years from now we will regard some of these applications as hopelessly naïve, and others we will take for granted since they will have become so deeply integrated into our lives. It's too early today to tell which is which."

No matter what, there will be much more AI in our lives over time, but it will slip into our lives largely in ways that we won't really notice, he remarks.

That's good news. For players who know how to put fish and chips together.

pratimah@cybermedia.co.in

Focused Digital Campaigns...

PCQUEST

VOICE&DATA

DATAQUEST

DQ Channels

CIOL

"IN THE MIDDLE OF DIFFICULTY LIES OPPORTUNITY"

Enable your business in this challenging time with CyberMedia digital offering...

We ENGAGE with your AUDIENCE

Large Enterprise / Medium Enterprise / Small And Medium / Channel Eco-System / Start-up / Developer / End Cosumers / Gaming Community

HOW TO BETTER A DIGITAL BRAND STRATEGY

Branding

Response Generation

Webinar

Virtual Round Table

Custom Program

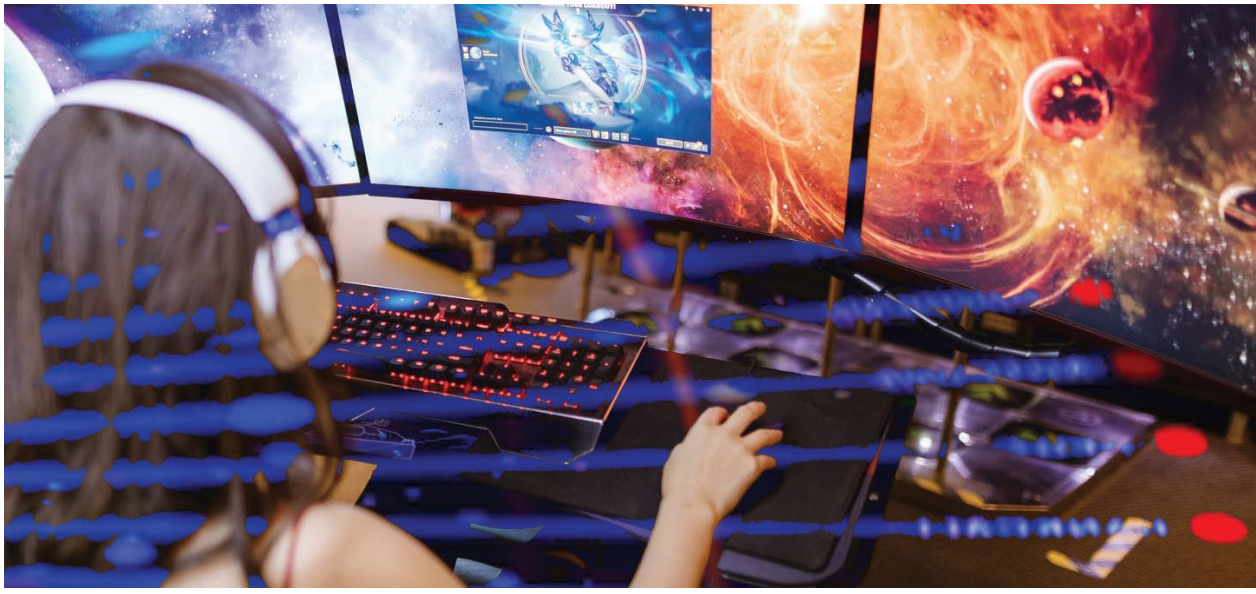
Virtual Event

Create a successful brand focused campaigns with :

Harminder Singh, Associate Vice President - Online Expert, harminders@cybermedia.co.in

Let the (online) games begin – at the Edge

As consumers play to win, edge cloud helps to deliver gaming experiences faster and with higher performance to ensure lively and fulfilling digital experiences



BY JATINDER KHURANA

When milliseconds mean the difference between victory and defeat to millions of gamers, it's no longer just a battle for bandwidth – it's a competition for the 'fittest and fastest' network. With the rise of advanced multi-player online gaming coupled with the arrival of cloud gaming and surge of gamers simultaneously live-streaming every day, it's time for networks to level-up. This has been further accelerated by the pandemic forcing indoor stays with limited alternative sources of entertainment, giving online games an even faster rise to popularity. From Fortnite to PUBG's Battleground Mobile India to Grand Theft Auto, the experiences young gamers have depends on a network that can adapt.

India's online gaming will grow at a CAGR of 40% to reach a multi-billion-dollar market by next year, with 85% of online gaming on mobile devices and rest on gaming laptop/PCs or fixed gaming consoles like PlayStation, Xbox, Nintendo, according to Deloitte.

Let the games begin – at the Edge

Online games involve continuous interaction and almost real-time feedback, which requires low latency. 'The game' responds to the players'actions or commands, which must travel back and forth over the network to be processed quickly by gaming servers at the nearest data center. This sense of real-time immersion is what makes a game engaging while a few milliseconds of additional delay can lead to frustration among players.

A big challenge of streaming a game from the cloud is latency. If a data center is located too far away, as in case

> India's online gaming will grow at a CAGR of 40% to reach a multi-billion-dollar market by next year, with 85% of online gaming on mobile devices.

of traditional network architecture with a few centralized locations, or network connection is patchy, the user experience suffers.

That's why the gaming industry and service providers are shifting to newer architectures with Edge Computing to bring this processing much closer to players for minimum possible distance and lower latency experiences. Edge Computing further enhances multiplayer gaming which is even more latency sensitive and bandwidth intensive. Also, for a consistent and real time gaming experience, networks need to be able to dynamically scale – leveraging artificial intelligence (AI) and automation to reach new levels of agility so the network can instantaneously allocate capacity where and when it's needed most.

With 5G making headway in India, and mobile devices being the primary channel used for gaming, Mobile Edge Computing (MEC) with 5G will provide even lower latency for games and an overall improved mobile gaming experience. In fact, it can be said that online gaming will be one of the key application requiring MEC for 5G in India.

Rise of cloud gaming

Another emerging trend in online gaming is cloud gaming wherein all gaming software along with computing and storage is moved to cloud, making end device very simple (no specialized hardware/gaming console required) with reduced battery strain especially for mobile devices. Cloud gaming with subscription model offers many benefits to users and the ability to play from any location with a broadband/mobile connection; easy access to score of latest games, and no headache of upgrades. Imagine playing Clash Royale while on the bus to work rather than buying an expensive console and downloading the latest version of the game – it's much easier, thanks to the cloud.

Taking games to the next level

Augmented Reality (AR) and Virtual Reality (VR) are increasingly being used for building gaming content to deliver even more high-quality visual and immersive experiences where the user feels they are truly part of the game. Consider Pokémon games or 3-D gaming headsets – AR and VR create exciting images to stimulate a gamer's presence within the game's environment. To make this work, these technologies need even lower latency to avoid motion sickness for the player.

How the network adapts to online gaming

Online gaming is a perfect marriage of content and technology. However, the real-time nature of content places stringent requirements on networks to provide seamless 'on-demand' and a consistent gaming experience with low latency through peaks and troughs of usage. Service providers, globally, are modernizing their networks to overcome this challenge.

By leveraging a highly programmable and scalable network infrastructure with data-driven analytics and intelligent automation software, service providers can respond rapidly to a sudden surge in traffic. This avoids network congestion by dynamically scaling network resources to deliver the best possible online gaming experience. An automated network allows service providers to enhance operational efficiency and agility.

Further, edge cloud can help service providers in addressing the growing demand for new services, applications and content, without compromising on network quality experience. As consumers play to win, edge cloud helps to deliver gaming experiences faster and with higher performance to ensure lively and fulfilling digital experiences. By overcoming the technical challenges of cloud gaming, by leveraging analytics and network intelligence to identify network congestion and latency during peak periods, one can ensure that the edge cloud gaming model can scale to meet the demand of India's booming gaming market.

Edge computing is what makes the future of online gaming possible. As millions of data-hungry Indians compete in virtual tournaments, matches and playoffs, service providers have an incredible opportunity to transform their networks and deliver winning digital experiences.

Khurana is Director, Regional Sales, Ciena
feedbackvnd@cybermedia.co.in

Network automation: driving the future of connectivity

Driven by the need to deliver more capacity and bandwidth, the networking industry is well on the way with network automation. Here is a look at how it is shaping up

BY GUY MATTHEWS

Network operators are under more pressure than ever to reduce their costs and improve their margins. They must also work harder to deliver the experiences that their customers seek. The increased automation of the network would appear to be an essential part of meeting these challenges. It might even be the only way they can stay viable in the long term.

Network automation is the process of taking the human element out of the configuring, managing, testing, deploying and operation of physical and virtual devices within a network. With everyday tasks and functions automated and repetitive processes managed automatically, network service availability should in theory improve exponentially.

Automation empowers operations teams, freeing up their time for other tasks. It can also empower the service provider's customer, allowing for greater self-determination and more effective self-service. It gives better visibility and clarity into what is happening in the network, helping solve problems before they impact services. It's about a more agile and smooth-running network. And at the end of the day it's about transforming the service provider business, leading to a healthier bottom line and more secure future.

So where are we on the journey to a more autonomous network? And what are the technologies that will get us there?

"When it comes to network automation, I really think we are in what I call the 'muddy middle'," believes Tim Doiron, Senior Director of Solution Marketing with networking vendor Infinera. "We are clearly not at the beginning, but we also have not realized a completely closed-loop fully automated network either. The good news though is that as an industry we are aligning around common data models and open interfaces that facilitate wide adoption of network automation."

However, admits Doiron, each automation project is a journey in itself and progress can only come with vendor and service provider collaboration to automate specific areas and functions of the network over time. With an incremental approach and a clear destination, he believes the industry can look forward to slowly improving specific aspects of the network and moving toward a fully automated future.

In terms of the technologies that will get us there, Doiron divides them between three key ingredients: abstraction, telemetry and programmability: "Abstraction is where common data models like YANG are used to describe the attributes of a physical element in the network, like an optical transponder or a ROADM," he explains. "Telemetry tells us what the network is experiencing in terms of performance or capacity, and programmability enables the software to adjust settings or behaviours of the network."

Refining data model and interface definitions, and the utilization of common approaches across vendors are also part of the jigsaw, he believes. "And technologies like machine learning, which benefits from telemetry data, will complete the picture as software and algorithms analyze the data instead of humans to make determinations about what is happening and how best to adapt the network to certain conditions and events," he adds.

As for what is driving the push towards more automated connectivity, Joachim Mason, Head of Data Centres for UK & Ireland at Cisco, is in no doubt that reducing cost is central: "As corporate networks expand

"Telemetry tells us what the network is experiencing in terms of performance or capacity, and programmability enables the software to adjust settings or behaviours of the network."

Tim Doiron, Senior Director, Solution Marketing, Infinera

"Many of the network changes and adjustments that are required in day-to-day operations could be automated, but as many as 95% are still performed manually."

Joachim Mason, Head, Data Centers, UK & Ireland, Cisco

and move out beyond the office, one of the biggest issues for network managers is an accompanying growth in costs simply managing these networks, and updating and securing the devices involved," he believes. "Workloads are found across different cloud platforms, locations and applications. We found that 83% of CIOs and IT leaders, for instance, are using at least one multi-cloud and on-premises solution. Many of the network changes and adjustments that are required in day-to-day operations could be automated, but as many as 95% are still performed manually. Aside from the time and attention required, this can also cause inconsistencies when it comes to provisioning and policy between different areas of a given network."

As the amount of data and devices continues to grow, says Mason, the logic of semi-autonomous solutions like intent-based networking is growing: "This aims to bridge the gap between IT and the rest of the business, adapting to new application and service requirements and adjusting network policies and security to suit," he adds.

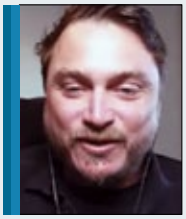
Post-pandemic, believes Mason, the shift to remote and hybrid working has made the question of networking and the automation of networking even more pressing: "Many of the changes that we have seen will have lasting effects," he notes. "Cisco's Global Workforce Survey found as many as 58% of office workers anticipating they'll work eight or more days each month from home. Groups will work one set of days from home, while others head to the office – and vice versa. From a network perspective, that means there is no longer a traditional perimeter where a corporate network starts and ends, and so any management tools must recognise that fact."

The deployment of multi-cloud environments, and the accompanying applications that run in them, have added to the complexity. Getting on top of managing and automating multi-cloud requires full-stack observability, because the more you can see, the more you can solve, which then makes automation and the resulting increase in business resiliency and agility possible.

It would be wrong however to understand network automation as a recent phenomenon, driven by post-COVID imperatives. Kailem Anderson, Vice President of Portfolio and Engineering, Blue Planet, a division of Ciena, points out that the telecommunications industry has gone through several network advancements over the years that have got us where we are today: "It was almost a decade ago that data center concepts like SDN, service orchestration and NFV started being discussed in the telecommunications network," he says. "We have long seen the need for automation, however with the telecommunications network being far more complex than the data centre network, these concepts failed to

"CSPs must leverage AI to predict network pattern, scale up and down capacity as and when needed, and self-identify faults, all without human intervention."

Kailem Anderson, Vice President, Portfolio & Engineering, Blue Planet



"You need IaaS as a base layer, but now you need networking at a different layer as well. Moving up the stack unlocks a lot of interesting functionality."

Jacob Rapp, Director & Lead Technologist, Networking & Security, VMware

take hold. However, if we fast forward to today, we have reached a stage in the industry where we are seeing software deployed that can drive much needed end-to-end automation, deep analytics and machine learning to create a network that can evolve and thrive. It is important that solutions solve the problem of end-to-end service lifecycle automation – from service order management to orchestration to assurance."

CSPs, he says, must now leverage AI to predict network patterns, scale up and down capacity as and when needed and self-identify faults, all without human intervention: "Automation wouldn't be possible without AI," he concludes. "CSPs can drive stronger business outcomes by eliminating silos, decrease Opex by eliminating manual tasks, and improve speed and accuracy in identifying failures and network issues by using AI in their networks."

He says Ciena's Blue Planet team set out to create a more holistic approach to AI-driven analytics and automation three years ago: "We acquired Packet Design to bring layer 3 route optimization and assurance capabilities into the software suite," he explains. "We then acquired DonRiver to enable unified OSS inventory federation. Further, we continue to evolve our portfolio to provide real-time control and visibility from end-to-end, so customers can accelerate digital transformation and deploy the on-demand services that customers require."

But pitfalls remain and the automation road remains rocky. One problem with automating a network is that, given the fluidity of the network edge added to the rapidly evolving nature of technology, it offers something of a moving target, claims Jacob Rapp, Director and Lead Technologist, Networking and Security with software vendor VMware: "Partial automation is like building a bridge but stopping midway through," he explains. "But of course you can build the bridge all the way to the other side, automating everything you think needed automating, and find a flood has washed away your destination. Will we ever be at a final destination with automation? At least if we define things in software then we have some ability to move with the destination."

A sign of progress, believes Rapp, is that applications are now defining what a network needs: "You need IaaS as a base layer, but now you need networking at a different layer as well. Moving up the stack unlocks a lot of interesting functionality. Added to that, you have a dissolving perimeter, especially after the last year of pandemic. It's a challenge to connect all these different micro-perimeters securely and provide a really good user experience. This was easy when you owned and controlled the infrastructure."

So can we ever be fully autonomous to the point where a network will operate and fix itself? "As much as you try to automate and outsource, bugs will creep in and outages will happen," concludes Rapp. "We're trying to work towards self-healing networks driven by service level objectives, combined with service level indicators. Can we define all that in software, with Kubernetes as a base layer and a service mesh as a way to interconnect? I think so."

In conclusion, one can say that the networking industry is well on the way with network automation. Today's digital economy depends heavily on the speed and reliability of networks. It comes as no surprise that networks are under increasing pressure to deliver more capacity and bandwidth – all of which is driving the need for automation. It may take longer to get there than we had hoped, but automation is ultimately inevitable rather than a possibility.

Matthews is Editor, NetReporter
feedbackvnd@cybermedia.co.in

Scale it with software

While a carrier network is confined by device, phone numbers, and the coverage area, software-driven real time network can enable better content delivery

BY RANGANATH JAGANNATH

The public internet as we know it has been evolving and growing exponentially in the past three decades. From the days of dial-up modem connection and small internet cafes in the early '90s to the social media-driven mobile networks of the late 2000s, public internet has become a critical part of our daily lives. Despite its significant growth and many innovations, the public Internet still has many limitations today that prevent it from fulfilling the high demands of live audio and video streaming.

The internet has been designed as a best effort system. In short, this means that while the public internet prioritizes connectivity and scalability, there is no guarantee on delivery or quality of service. Public internet is designed with best efforts for good reason. As of January 2019, there were an estimated 1.94 billion websites on the internet, which is eight times more than the number of websites measured in 2008 (Netcraft). Therefore, the top priority of the public internet has been to sustain the hypergrowth rate and to ensure that each and every website on the internet is both searchable and accessible. As a result, user experience, reliability, and latency – all of which are key quality elements for live audio and video streaming – are not priorities of the public internet.

The Software Defined Real Time Network (SD-RTN) was built with the philosophy that someday advancement in technology would allow us to deliver good or better experience quality as traditional carrier networks. The advantage of SD-RTN versus a traditional carrier network is that it is not confined by device, phone numbers, or a telecommunication provider's coverage area.

SD-RTN and CDN

First, let us establish how a basic content delivery network (CDN) works. A CDN replicates content from a central origination source to local distribution centers. Then content is delivered from local distribution centers to each user in the local area based on the location proximities.

The SD-RTN architecture uses a similar design as CDN to support one million-plus users in large broadcast sessions. Starting from the broadcast source, the broadcast video stream is replicated to various continental network nodes. From the continental level, the broadcast video stream is sent further to various local internet data centers (IDCs) and then finally to each individual connected audience.

However, this is where the similarities between SD-

> The top priority of the public internet has been to sustain the hypergrowth rate and to ensure that each and every website on the internet is both searchable and accessible.

RTN and CDN end. Here is how real time internet scores over traditional CDN.

Low latency: The key to the 'real-time' element of live interaction streaming is very low latency. Software Defined Real Time Network incorporates many network logic and algorithm enhancements to deliver the real-time experience needed in a live interactive video streaming session. In the case of a traditional CDN, ultra-low latency is not required because a CDN is basically about sending content to an end user in the highest quality possible. Usually this means CDN within its workflow builds in seconds of buffer and delays to achieve smooth high resolution video streaming. Large-scale events can be especially difficult to personalize with low latency, but a customized and interactive live streaming software development kits make it easy to build apps with audio and video streaming that encourage real-time exchanges and create deeper connections.

Beyond undirectional streaming: CDN does not consider the millions of end users communicating back and forth with each other in real time or make each of its end users discoverable by others in real time in the case of content delivery. CDN looks at delivering video content to each end user in the shortest amount of time possible and achieves this with local cache content node. What traditional CDN architecture does not need to take into consideration is the 'relationship' and bi-directional streaming between participants. For example, if we are broadcasting a music concert globally, CDN only needs to cache a local copy of the music concert throughout its local content nodes.

The SD-RTN, on the other hand uses an 'access point' design. What this means is that rather than depending on a fixed DNS list, the backend customizes a list of best access points for each connecting client upon each access request. In other words, its network logic is dynamic and always looking for the best connection route based on actual network conditions in real-time.

Large channels: To further achieve the lowest possible latency during a large audience broadcast session, real time engagement service providers incorporate a 'large channel' concept into SD-RTN's smart routing logic. To minimize data packet loss, SD-RTN by default sends redundant data through the three most optimized network paths possible.

The large channel builds upon the above concept that in a multi-participant live interactive video streaming session, SD-RTN will try to establish optimized routing paths that are shared by as many common participants as possible. A large channel approach achieves a fine balance between ultra-low-latency and audio/video experience synchronization between all participants during a live interactive video streaming session.

Scalability: The SD-RTN design is highly scalable. The network architecture design allows us to quickly add server capacity at the local data center or connect more data centers at the continent level. Besides being able to accommodate business demand growth rapidly and flexibly across all the global regions from a traditional hardware capacity ramping perspective, SD-RTN also delivers the same level of low latency live interactive video and audio streaming experience whether there are a few or a million participants in the session. In other words, not only is the network capacity highly scalable, the quality of experience (QoE) is also highly scalable.

This is no small feat considering most of users today are on mobile devices and wireless phone networks are spread across long distances rather than dedicated high-speed broadband localized in a few physical locations.

The best network design is useless if the service is not available or accessible. Anyone who has tried making a Skype or similar product call from a country outside of the service provider's primary network coverage knows the pain of waiting to connect just to get a 'Failure to Connect' error at the end of a 15-20 second connection attempt. To provide best in class network availability and accessibility, SD-RTN goes beyond standard disaster recovery and hardware redundancy practices. More importantly, it also gives scope to leverage AI-powered algorithms to create rich digital experiences.

Jagannath is Director, Agora
feedbackvnd@cybermedia.co.in

Vijay Kumar Mahalingam
Vice President – Technical Services, Rahi Systems

"There is a shift from hardware-based solutions to software-defined technologies"

There is something big changing as we witness the rise of co-location data centers, modular solutions and pop-up centers. Is it due to Capex, due to hyper-scalers or due to the way data is being leveraged? Rahi Systems Vice President – Technical Services ***Vijay Kumar Mahalingam*** *in an interaction with* ***Pratima Harigunani*** *helps us with some answers. Excerpts:*

How much has the data center changed over the last ten years? What are the big ones, in your observation?

Data centers have witnessed some major changes in the past years. It has been moving from captive to co-location centers to cloud. There is a rapid growth of power density per rack – 3kVA per rack to 3kVA plus power density. There is also a shift from 1G/10G to 100G/400G and switch from copper to fibre, while there is a shift from hardware-based solutions to software-defined technologies. Data center cooling trends are also changing – switching from perimeter cooling to in-rack cooling. Besides, there is now a complete remote deployment of applications through embedded remote management solutions.

Have they reflected anywhere in any specific customer needs/demands too?

Adoption of third-party data centers such as co-location centers and hyper-scalers have driven the majority of the change. These players have grown by expansion and acquisitions of several regional players. They are also early adopters of latest technologies in terms of implementing high density and scalable infrastructure solutions in areas like space, power, cooling and connectivity.

Is internet of things (IoT) going to have a big impact here?

With ever increasing number of connected devices powered by IoT, there is a huge surge of data resulting in localized processing of information since these data requisitions are local and because of immediate need in case of smart car, smart appliances, etc. Therefore, storage, backup and redundancy of data are going to further escalate the need for more data centers.

So the real estate of data centers is considerably different now?

The actual real estate of captive data centers is decreasing. More customers are moving toward co-location centers. These latest technologies are transforming data centers in terms of quick access to data, do more with less, less operational costs, agility to move between hardware platforms, higher Capex with lesser Opex, etc. At the same time trending technologies such as artificial intelligence (AI), machine learning (ML), trading, security, compliance, and proprietary information are pushing customers to adapt to a newer hybrid model which entails having local data on premise and rest on cloud.

What about forces like virtual machines (VMs), cloud workloads, modularisation, and localisation?

Yes, VMs, clouds, modular systems are the main drivers of the change since they help in utilizing full resources on the hardware platform. Modularization helps based on pay as you use concepts offering lesser Capex costs and simplified upgrade and maintenance. Given the global outcry on greenhouse effect and carbon footprints and given that the price of grid power are only rising with no sign of any reduction in the near future, it is time to relook at renewable energy sources as an alternative option for these data centers. Solar and wind power offer a safer, cleaner and abundantly-available alternative and this is expected to be the most sought-after option. Localization of data is again resulting in more pop-sites across the board.

How serious are challenges like data sovereignty here?

These are really critical issues in their own aspects and much discussed. Data sovereignty and localization is creating more data centers and more complexity in managing multiple data centers.

pratimah@cybermedia.co.in

Playing the balancing act

It is important to redistribute workload in a distributed system to ensure that no computing machine is overloaded or sitting idle. Here is how to handle the task

BY RAJ DARJI

With a drastic change in the work-life of all management and firms, irrespective of the volume, cloud system has emerged as the most magnified trend among all of the technologies by a larger margin. With this system at stake, as the most prominent market in the upcoming days, the advancement of the system has been increasing multifold. Observing this on the broader picture, the cloud system is just an abstraction to a much bigger phenomenon going on the backdrops.

The cloud infrastructure serves as the basic block of the much bigger chain. This block consists of several hardware and software components, which include servers, storage, networking, virtualization software, services, and management tools that support the computing requirements of a cloud computing model. There is also an abstraction layer for both the software and hardware ensuring that the process doesn't mess with the working protocol of the subsystems and enhances proper flow in the algorithm. The greatest advantage of cloud computing is that a single-user physical machine is transformed into a multiuser virtual machine that can be inter-connected from any part of the globe based on the server establishment.

Balancing the excess load with modern solutions

As the number of users grew, one of the major issues that organizations face is cloud load unbalancing. This exists because of the excess traffic of user tasks which leads to degradation of performance and efficacy of the system. There is an utmost necessity to migrate tasks to another resource on other virtual machines. This is where the load balancing comes into the picture. This process easily redistributes workload in a distributed system, thereby ensuring no servers or computing machines are overloaded or idle.

Load balancing paces up the response time, execution time, and system stability, thereby improving the performance of the cloud. In order to efficiently implement this, we do need to provide a top-class upgraded infrastructure, which not just prepares the computing machines for workload or huge processes and also boosts up the virtual machine's performances as well.

The whole load balancing procedure involves a multitude of abstract processes. To begin with, it identifies the users' requirements for execution. It later identifies the details of the virtual machine from which the information is generated. The tasks or the user requirements are then scheduled and sorted as per the machine protocol, and later the resources are allocated for the speeding up of the execution and for resource management. Finally, the resources are migrated either to a different virtual machine or for a different task list on a different server.

The next-gen solution

With generation of huge equipment for computing

> Computing Offloading Procedure enhances the applications performances by altering the necessary changes in the operating system of the device.

diminishing constantly, there is a rise in mobile applications and technology ruling the industry. This standard transformation not just enhanced the processes of information, but also made it more compact and durable. Mobile Cloud Computing stands out as the next step to the rise in cloud technology. The infrastructure to this peripheral has been drafted in such a way that it doesn't disrupt the implementation of multiple users or task overload as well. The cloud services are usually based on utility computing, virtualization, and service-oriented infrastructure as the process for these compact devices is slightly complicated comparatively.

On observing the infrastructure for mobile cloud services, a major factor that enhances the performance on mobile is the Computing Offloading Procedure. This process enhances the applications performances by altering the necessary changes in the operating system of the device which includes reducing battery usage and executing applications that are unable to execute due to insufficient resources on the smartphone of the user. In short, the cloud protocol adapts and tunes itself as per the device's specification to deliver effective performance. This infrastructure works on the principle of migration, where the resources are migrated from a mobile device to a resource's rich server or nearby infrastructure which provides more space for the users to perform their desired task without any hindrance from the infrastructural chain.

Hypervisor and cloud security enhancement

Talking about sharing and migrating, another important concept that acts as an underestimated part is the Hypervisor, the software that is capable of running several virtual machines (VMs), each with a separate operating system. Though the cloud provides several benefits, there are several loopholes through which the host computer and all the interconnected virtual machines can be compromised and this is called hyper jacking. Therefore, securing the hypervisor is the basic step that can maintain cloud security effectively.

Cloud security is the existential question that pops in the minds of both existing and new users who have hopped on this terrain. On observing some of the surveys and reports which talk about various issues caused due to inefficient cloud security, we see several identity theft and unauthorized accesses, insecure interfaces, and many more. This sounds small but this wave leads to greater consequences. According to a survey, 98% of the companies had witnessed at least one cloud data breach in the past 18 months, as compared to 79% in 2020.

There are multiple benefits that we obtain from cloud security solutions, which are not acknowledged much. For example, DDoS protection – the distributed denial of service protection – helps protect from attacks that usually flood the machine with random requests and spam data, which not just decreases the performance of the system but invites unwanted threats such as viruses and malware into the system. Thereby, DDoS protection stops this bulk traffic that targets servers. The security solutions also offer threat detection software that enhances the security of devices that are accessing the network or the servers as well.

The cloud infrastructure is complicated, as it is not just a single entity, but a collection of multiple entities, and thereby, the security concerns can be initialized with any of those entities being compromised. It is of utmost importance to secure each and every component that is being accessed. This includes accounts, servers, and storage as well. The cloud infrastructure does provide several amenities such as Encryption Protocols, Hashing, and Single Sign On (SSO) as well to safeguard their network and servers. There are other features such as control inbound and outbound communication that allows the servers to connect only to known network and IP addresses and identity and access management tools which provides the foundation for securing access to sensitive resources. This protects the servers and the users' host systems from cyberattacks.

Cloud infrastructure and its applications opened a new portal in the world of tech. With more and more innovations and advancements in line, cloud technology is setting the bar high for the upcoming future prospects to achieve.

Darji is Founder and CEO, Aarav Solutions
feedbackvnd@cybermedia.co.in

Get the 3C benefits of cloud, cost and containers

Cloud transformation and the evolution of ICT will enable growth of innovative business models, new products and services, and eventually, foster economic growth

BY SHRIKANT NAVELKAR

A confluence of existing factors driving cloud adoption has been further accelerated by the COVID-19 pandemic. According to Synergy Research, the spending on cloud rose 37% to USD29 billion during the pandemic. This trend is likely to continue, as the transition to virtual work underscores the urgency for remote, scalable, secure, and cost-effective off-premises technology services. Cloud OEMs and providers have understood the threats, opportunities and events that occur as a result of the pandemic. And they have demonstrated how prepared they are to handle unexpected demand spikes with recent cloud services and trends.

Scale and agility at will

As technology continues to advance relentlessly, industries must leverage it to transform their existing infrastructure to keep pace with time. Cloud-based

> Cloud-based architectures are faster to upgrade than traditional systems, making it easier for manufacturers to keep up with new developments.

> Containerization has become the basic requirement to run workloads across physical machines as well as multiple cloud environments.

architectures are faster to upgrade than traditional systems, making it easier for manufacturers to keep up with new developments.

No wonder then, most manufacturers are turning to cloud solutions for their supply chain as it is easier to monitor and scale based on demands and future predictions.

The evolving cloud

Cloud providers build plethora of options when it comes to providing the right cloud solution. Irrespective of the variants, cloud services have been growing at all levels. Let us take a look at the recent trends.

- **Infrastructure as a Service (IaaS):** It gives access to virtual computing resources such as servers and storage. According to IDC, IaaS is the fastest-growing cloud service with a five-year CAGR of 33.7%.

- **Platform as a Service (PaaS):** It provides resources for software development and the pandemic has seen the adoption of PaaS jump 56%, making it the fastest-growing segment in cloud platforms.

- **Software as a Service (SaaS):** It includes software hosted, managed and maintained by the third-party cloud providers. According to a Cisco report, 75% of all cloud workloads and compute instances will be a part of SaaS.

- **Hybrid cloud infrastructures:** It includes the environment hosted on public as well as private cloud and administered by the organization.

- **Multi-cloud Environment:** Multiple public clouds from multiple providers are present and it can be accessed through a single software-defined network. According to a Flexera report, 82% of enterprises have implemented a hybrid cloud strategy, while 92% are using a multi-cloud approach.

The best cost model

Organizations are increasingly seeking a variable-cost model for their core computing, storage and networking requirements. Variable cloud offerings with 'pay-as-you-go' models have been the primary preference. The pandemic has only accelerated this preference for Opex over Capex solutions.

According to a research by consulting firm PwC, almost 75% of finance leaders said they were planning for a more agile and cost-effective business environment; with 83% of CFOs planning to reduce their capital expenses.

Its containerization all the way

In the recent years, organizations have embraced a range of innovations in cloud computing such as virtualization and containerization. Products such as Docker and Kubernetes have made running business applications much cheaper and cost effective. Containerization has become the basic requirement to run workloads across physical machines as well as multiple cloud environments, and Kubernetes have replaced traditional virtual machine managers. These trends have become the standards to manage containers, virtual machines, legacy workloads, and modern applications.

Desktop-as-a-Service (DaaS) and Virtual Desktop Infrastructure (VDI) have helped by virtualizing workstations, providing them the required mobility and flexibility with cost-effective solutions. According to Spiceworks, 32% of the organizations have adopted VDI, and 12% have planned to adopt. VDI is utilized by 50% of enterprises and 24% of SMEs.

Today, cloud computing is industry agnostic. In fact, sectors from manufacturing, retail, and transport, to healthcare are fast adopting hybrid and multi-cloud solutions to optimize their infrastructure and enhance their revenue.

It is also growing exponentially and has proved to be intrinsic to innovation. Cloud transformation and the evolution of ICT landscape will enable growth of innovative business models, new products and services, and eventually, foster economic growth.

Navelkar is Director, Clover Infotech
feedbackvnd@cybermedia.co.in

Tailored to meet evolving customer expectations

The role of contact centers is evolving with technology and process automation. Here is how to select the most-suited Contact Center as a Service solution

BY MILIND PATHAK

Contact centers are at the frontline of customer service for businesses and their functional efficiency can make or break business-customer relationships. From financial services, IT, retail, energy to public services, contact centers are a much-needed part of all the industries, worldwide.

As more and more businesses that were once a traditional on-premise infrastructure are now going through a digital makeover using cloud, they are aiming to enhance their digital capabilities. The nature and role of contact centers are also evolving with technology and process automation. Therefore, enterprises are opting for well-integrated and cost-effective Contact Center as a Service (CCaaS) model with solutions tailored to their goals and environment. CCaaS is the answer to many problems, not least adapting to changing customer expectations and boosting agent performance. But not any solution will do; choosing the right one to fit the needs of the organization is necessary.

Enhance customer support with CCaaS

CCaaS enables automated customer support and

> CCaaS enables automated customer support and service, enabling multi-channel customer interactions with supported technological frameworks.

> Having a clear understanding of what is being implemented and how it is going to impact the business is crucial to achieve the desired results.

service, enabling multi-channel customer interactions with supported technological frameworks. Ideal CCaaS solutions encompass customer service, telemarketing centers, employee service, support centers, help desks or other integrated communications operations. Since the entire framework is based on cloud, enterprises have the flexible pay for the service as they use a subscription-based model.

Several elements contribute to the effectiveness of CCaaS enabled contact centers. Some of the most significant ones are as follows.

- Agnostic designs independent of connectivity, ensuring smooth customer service journeys, building intelligent self-service framework
- Orchestration of support processes while engaging in complex and personalized customer communication
- Trained and developed contact center staff driven towards engaging customer experience
- Reporting and analysis of customer insights with suggested actions across all functional groups

Parameters to consider before integration

Having a clear understanding of what is being implemented and how it is going to impact the business is crucial to achieve the desired results. Businesses, not the providers are accountable for any assumptions made without any signed contract. Here are five primary considerations to factor in while going for a well aligned CCaaS solution.

#1

Optimize Total Cost of Ownership (TCO): TCO helps businesses assess costs beyond the installation. Enterprises have to carefully consider the monthly recurring charges, headcount evaluation in case of seasonal variations and the cost associated with the flexibility to change the number of agents in times of need.

#2

AI/ML integrations for amazing CX: Contact centers are the face of businesses. Advances in global AI, Machine Learning (ML) and Customer Data Platforms are impacting various dimensions of the contact center. A contiguous experience across various channels will be the key to superlative CX. AI and ML interventions in self-service or quality and security of interactions will be integral to contact centers of the future.

#3

WFH demands advanced capabilities: Unprecedented times have pushed businesses to work from home. Ensuring extension of the work desktop to agents, contextual information and monitoring of interactions becomes all the more critical due to remote work.

#4

Security and compliance is of prime importance: CCaaS providers need to implement stringent security levels as sensitive customer data exchange takes place through the system. The solutions before implementation must satisfy CCPA, GDPR and state privacy regulations. Especially, at a time when data is accessed from one's own home, providers must put in place a safety net and ensure all liabilities are covered.

#5

Reliability will be a key enabler: Contact centers are the backbone to remarkable customer support. Traditional on-premise systems are rapidly being replaced by cloudbased systems. Regulations are shifting towards promoting a cloud-first shared services model. These models come with amazing availability and scalability. Enterprises would do well to evaluate the direct dollarbenefits of system reliability for cloud contact centers.

Contact center support will only evolve with changing customer expectations. Evaluating the technical and business parameters help in achieving a balance to accomplish business goals. Stress will be inherent and take a toll on the agents. Hence, training employees along with AI process automation ascertains success in customer experience.

Pathak is Chief Business Officer, Route Mobile Limited
feedbackvnd@cybermedia.co.in

Getting onboard the 5G era

As energy and utility companies move towards Industry 4.0 era, they need to quickly adopt industry standards for cloud platforms, 5G and IoT-based systems

BY PIYALI GUHA

With the emergence of digital era and increasing uptake of disruptive technologies like artificial intelligence (AI), blockchain, data analytics, cloud, internet of things (IoT), machine learning (ML), robotic process automation (RPA) among others, organizations across sectors are undergoing major business transformations globally. The energy and utility sector too is rapidly realizing the disruptive roles these new age technologies can play in enabling business growth and process efficiency, and how they have become the key accelerator of this transformation story.

For the energy and utility sector, service continuity and operational efficiency are paramount. Fueled by digitization and automation, industries across the globe are witnessing massive shift in consumer bahaviour, and the way businesses are functioning to cater to the changing market dynamics and demands. With enterprise digital competency becoming the core of an organization, emergence of new operational and business models that are leading to transformational delivery capabilities and improved performance, is becoming the new norm. Recognizing the need of the hour, the energy industry in India is also rapidly adopting automation and digital technologies and is going though massive transformation and redesign.

Digitization for the changing business needs

While a combination of socio-economic factors and technology innovation is driving the energy and utility organizations to transform into digital enterprises, it is important to evaluate the emerging technology trends

and implement an effective digital transformation roadmap that is reliable, scalable, secure, and can enable the utilities to deliver enhanced customer experience and improve performance. These solutions are also expected to achieve desired business objectives, gain competitive advantage, as well as, meet regulatory compliances. This is not an easy task!

As the digital journey of the energy and utility sector advances, the companies need to device and execute an effective and innovative digital business platform that will help to deliver operational excellence while ensuring a smooth transition from legacy technologies. "Since many utilities still use legacy applications with proprietary standards, it becomes a challenge to enforce integration of different solution components. This has to be addressed by upgrading certain solutions to conform to open standards," explains Bragadesh Damodaran, Director, Energy and Utility Industry Hub, Capgemini.

> A combination of socio-economic factors and technology innovation is driving the energy and utility organizations to transform into digital enterprises.

"Since utilities use legacy applications with proprietary standards, integrating different solution components is challenging. This can be achieved by upgrading certain solutions to open standards."

Bragadesh Damodaran, Director, Energy and Utility Industry Hub, Capgemini

Today technology is driving the way energy is sourced, delivered and consumed. In addition, factors like increased adoption of renewable energy, battery storage, distributed grid edge generation (prosumers), rise of electric vehicles, decarbonization and decentralization are disrupting the energy and utility landscape like never before. "The ongoing COVID-19 pandemic has further stressed the need for digitization and business continuity through strengthening IT infrastructure and deploying innovative solutions that will result in optimized business processes, differentiated delivery models and create new business capabilities."

Keeping in pace with this global trend, India too is rapidly adapting itself to be a frontrunner in this digital transformation story. Adoption of new age technologies like AI, advanced analytics, cloud, IIoT is witnessing great traction and is likely to gain momentum as companies are transmuting their business processes. Chatbots and voice assistance, RPA and blockchain too are evolving as strong technology growth drivers in near future.

"India is very much in the forefront of this global transformation. Aligning to its Paris agreement commitments, the country has set an ambitious target of renewable energy (RE) generation of 450GW by 2030, a substantial reduction in fossil fuel dependence by 2030, a Go-Electric campaign, and incentives for faster EV adoption," highlights Martin Hauske, Energy Segment Leader for Asia Pacific and Japan, Nokia Solutions & Networks.

While there is a fast-emerging market for IoT in the Indian power sector for applications like planning and forecasting, utility asset monitoring and predictive maintenance, opportunities are rising in mobile computing front to enhance digital experience, workforce management, SaaS, and technology-on-the-go. A growing market is also foreseen in India for hyper-personalization solutions, using real-time communication systems and RPA to enhance the user experience.

"Indian power sector is contemplating different solutions to meet the energy demands in the most sustainable way, with focus on long-term energy security and sustainability," points out Damodaran, adding that, "The need is to ensure adoption of industry standards for smooth migration to new platform on cloud, 5G compatibility and IoT-based systems."

Emerging trends, and technologies too

The combined impact of energy transition and the pandemic have set the stage ripe for this digital reform for the energy and utility sector and it is pushing them to think afresh and innovate. Advent of new technologies, both at grid and utility levels are not only forcing organizations to restructure business models but address the changing consumer behaviour and consumption patterns effectively. On the other hand, by leveraging new technologies, the companies can monitor and distribute assets in a more efficient and cost-effective way and gain competitive advantage.

If digital technologies were crucial for modernizing extractive industries, their role is now getting redefined for above-the-ground energy production, transmission and distribution. As energy companies are moving towards adopting Industry 4.0, the role of network and communication technologies has become more important. Moreover, trend towards electric cars and subsequent recharging infrastructure creation accentuates the need for network technologies aligning with smart grid and EV info ecosystem.

Experts also point out that renewable energy technologies, that were till recently considered threat to conventional oil and gas (O&G) companies have now become a

"Private LTE and 5G will play crucial role in management of future grids by enabling grid edge automation and real time asset management through drone, VR/AR, and teleprotection."

Martin Hauske, Energy Segment Leader, Asia Pacific & Japan, Nokia Solutions & Networks

part of their own portfolio. The industry as a whole is re-focused on carbon management, making the goal of de-carbonization part of their fundamental strategy.

Radical changes in the energy mix is leading to several challenges for utilities, central transmission grids and the state transmission/distribution grids – from managing the intermittency and variability of generation, to maintaining grid stability, and responding to new and surging demands from moving electric loads (EVs).

"Potential revenue erosion with growing prosumer generation and energy-aware and energy-efficient consumers is forcing many utilities to redefine their business models for survival and growth. This is driving higher levels of instrumentation using industrial IoT or IIoT for primary distribution grids. This provides utilities with the ability to sense, respond, and react in real time to manage the supply and demand balance and stability challenges of the future grid. Digitalization and automation will be an essential imperative in managing grid operations and market transactions among grid participants," states Hauske.

There are several players that are engaged with utilities globally in enabling their future grid transformation with end-to-end communication network technologies like private LTE, 5G, optical, IIoT platforms and digital automation cloud. Besides, there are also technologies that helps utilities plot a path to Industry 4.0, by providing a framework for controlling and managing assets and field resources everywhere; and the adoption of digital value platforms to manage and control the generation, distribution, and operation of energy services.

Exploring new energy sources and fuel alternatives are high on the agenda for the Indian market as well. This includes solar-thermal, solar-wind hybrid, smart battery storage, green hydrogen and carbon sequestration, as well as use of AI/ML to manage the distributed energy resources to optimize generation is the new norm.

There is also a growing trend in India to add more intelligence and improve communication and security in the humongous rollout of smart metering in India. The need for creation of robust and secure communications (e.g., 5G), smart bots and energy data analytics (using AI/ML), and solutions like load management, energy efficiency management, network health monitoring, predictive analytics and customer services are on the rise too.

The Indian energy and utility sector is also looking to use the new age technologies and solutions to measure asset performance and enhance its life while obtaining better overview of the diverse assets, and take "retain or retire" decisions of its enormous burden of ageing infrastructure. These needs are pushing the adoption of cloud-based services on software-as-a-service (SaaS) model in the Indian power sector. The solution will further boost the demand for enabling technologies like 5G, edge analytics, cloud computing and cybersecurity. Use of AR/VR and digital twins are other technologies which will dominate the Indian market space in the future.

As many leading Indian power distribution companies are setting up the infrastructure to develop EVs as potential source of clean energy powering the grid, India is also witnessing growing demand for EV infrastructure solutions that tracks grid parameters, energy demand,

There is a growing trend in India to add more intelligence and improve communication and security in the humongous rollout of smart metering.

"As traditional energy companies add renewable to their portfolio, network and communication technologies will need to keep pace with the phenomenon."

Dr. Pramod Paliwal, Professor & Dean, School of Petroleum Management, PDEU

pricing and weather predictions, using AI/ML, to enable EV owners to take informed decisions on charging their vehicles and exporting power to the grid. "Manufacturing of EVs in large numbers and gradual phase-out of petrol and diesel vehicles will spur the demand of charging infrastructure, which is essential for a healthy growth of EVs in the Indian market," says Damodaran.

The new road ahead

The energy sector in India is expected to reform in multiple ways as it's looking up positively to far-reaching transformation, and progress the sustainability agenda to achieve near net-zero targets by 2050. As the country continues to adopt clean technologies, there will be a growing penetration of renewable energy into the grid, and more independent microgrids – solar, wind, biomass, battery energy storage, waste-to-energy, will continue to power communities.

It is estimated that by the middle of the century, India can expect four times as much of renewable energy generation than what the country has today. "The scenario in India presents a very interesting case-study. As the world strives towards cleaner energy, the country's hunger for energy is set to overtake EU by 2030, making it third largest energy consumer of world," informs Dr. Pramod Paliwal, Professor and Dean, School of Petroleum Management, PDEU.

"The country will continue to see three times increase in import by 2040. It is fair to argue that India finds itself in an unusual position of having to pioneer a new low-carbon economy while also striving for growth. If India is able to achieve this, it will be a role model for other developing economies, especially in the African continent," he says, stressing that as traditional energy companies add renewable to their portfolio, network and communication technologies will need to keep pace with the phenomenon.

"If digital technologies were earlier crucial for modernizing extractive industries, their role is now getting redefined for above-the-ground energy production, transmission and distribution."

"Going ahead, private LTE and 5G will play crucial role in management of future grids by enabling grid edge automation, real time asset management through drone-based line inspection, VR/AR, and teleprotection," says Hauske. These technologies will enable energy companies to convert into a distribution service operator (DSO) with multiple types of energy service (and potentially adjacent types of smart city services) offerings to consumers, and help build smarter communities. Since energy efficiency will continue to be a focus for these companies, the role of ICT in sharing real time information, analyzing and taking corrective actions will become more critical.

By 2050, more bioenergy will be added to the energy landscape. It is estimated that liquid biofuels will surpass petroleum products in fuelling the industry and transport sector, before mid-century. Also, there will be big push for green hydrogen as fuel for the industry and transport, as well as, in carbon sequestration technologies.

Driven by actions to reverse climate change, India will continue to invest in processes, technologies, end-use energy efficiency, and carbon footprint reduction. Besides, market-driven mechanisms, such as peer-to-peer energy trading, carbon pricing, congestion-based pricing and green certificate trading will become more innovative with AI/ML, which will stimulate reallocation of capital and resources to fund these opportunities.

However, as these trends and opportunities grow bigger, so will the competition. Players, nimble enough to develop new business capabilities and customer centric products and services delivery models who can continuing to offer improved and cost-effective traditional producer-centric commodity products will have the edge for sure.

feedbackvnd@cybermedia.co.in

16TH EDITION
DATAQUEST
T
SCHOOL
2021

RANKING OF 100 ENGINEERING COLLEGES

CMR
Insights powered by research

T-SCHOOL HIGHLIGHTS

- 16 years of undisputed leadership in T-School Survey & Ranking [March edition]
- Publishes Digital Index [December edition] & Employability Index [September edition]
- Connect with 1000+ colleges, 1000+ HR & Tech Leaders, 10,000+ Students, 1000+ CXO's

LEADER IN ADVOCACY FOR HIGH IMPACT

- Digital Infrastructure of the engineering colleges
- Digital Quotient
- Tech Adoption
- Skill & Development
- Digital Environment & Culture, Curriculum & Teaching Methods
- Employability Index

Educate, nurture and build higher education ecosystem.

Follow us:
@Dataquest_India

LEVERAGE DATAQUEST PLATFORMS

- [PRINT]
- [ONLINE]
- [CONFERENCE & AWARDS]
- [WEBINARS]
- [DIALOGUE SERIES]
- [SOCIAL MEDIA]
- [EMAILERS]
- [NEWSLETTERS CAMPAIGN]

Write to us for customised programmes
Rajiv Pathak I Manager, Marketing I rajivp@cybermedia.co.in I +91 8010757100

Big or small – let's all go social

It is pivotal for brands to pace up their social media presence to grow and increase their business, irrespective of the size

BY NANDINI SHAH KHERA

The recent Hootsuite report on the latest global trends in social media "Social Trend 2021" reflects on what would social media be like in 2021, given the changing dynamics and behaviour of consumer during and post the COVID era.

As the audience behaviour shifts towards online and is more digitally driven, brands in 2021 need to align themselves with the same to continue building stronger relations with their consumers. The current social media users are more than four billion, with a good increase of 9% as compared to last year's growth. It is pivotal for brands to pace up their social media presence to grow and increase their business. Here are a few trends that may be a game-changer this year.

Video Content: Social media video content is the fastest mode to increase your outreach. People are more likely to open an engaging video over liking a static post. 74% of marketers believe that video has a better ROI than static imagery. Insta reels, are one way to ensure your audience reaches the brand page even if they don't follow you. If your brand specifically caters to GenZ, or has young target audience, now is the right time to jump on the bandwagon. Instagram reels is the best platform to start your video content marketing. Wherein, your content is not restricted to only followers, which itself is to be taken advantage of. The content appears in the format of home screen navigation, explore page, individual profile reel tab, and scroll down search bar.

Social Media Shopping: What if we tell you that social media is the new e-commerce? Well, it is! While e-commerce takes the centre stage, social media is the new age shopping platform. Small businesses prefer to create a brand page on Instagram first before launching a professional website. That is where the consumer journey starts from and ends on your website page, which is much shorter. If you are an e-commerce business, now is the time to set up your digital store. In the present scenario, one can easily shop on social media. Brands can tag the product in its stories, reels, or static image posts. That helps the consumer to shop the look they are seeing in the creative. Which itself is a great way of creating excitement, especially for Fashion and Lifestyle brands. Using advanced technology to set up 3D stores is a new game-changer, and is a big hit among real estate and home decor. We are in a great time to optimize and leverage social media platforms.

Have a Purpose: What do you want out of social media? Where do you want to reach? Make your goals SMART and align them with your marketing objectives. If you don't know what you want as a brand, how will you serve it to your consumer? 2020 brought in a long-overdue change in how the brand uses the social space. Brands that have a purpose and show responsibility towards social, environmental, or are ethically responsible connect more with their audience. Be more diverse, open to ideas and suggestions from your audience, seek online feedback, share social responsibility. Whatever your business or service model is, now is the time to plan your content and services around your audience behaviour. Define your purpose!

Educate, engage, entertain: Educating your audience is proven to be more engaging than static post. For example, brands that include Instagram carousel posts are a perfect hack to increase the time spend on your social media page, as well as convey the message in educational posts. Your audience should understand your message. Share tips, did you know, swipe right to know or

Social media video content is the fastest mode to increase your outreach. People are more likely to open an engaging video over liking a static post.

> Small businesses prefer to create a brand page on Instagram first before launching a professional website. That is where the consumer journey starts from.

product launch are some of the great ways to keep your engagement rate high. A newly discovered Instagram Guide is a great example to share your content with the extensive list or in-depth guide to a product. Initially, the feature was enabled as a healthcare and wellness effort to provide a resource for people during the pandemic. But now anyone can use this by curating lists, offer additional information, a step-by-step guide and more that will help your followers or users to share it further with people as a tip. Brands that are into product services, it is a great versatile feature for your audience.

Stories are here to stay: 500 million people use stories every day. Let alone 150 million Instagram users are actively consuming Insta stories, every day. The interaction rate of Instagram stories increased up to 7.2%. A feature that was launched by Snapchat has been adopted by all the social media platforms, including Linked.in. Repurpose your content for stories. Brands today are re-sharing their customers' posts, tagging them in stories to engage and build a connection with their audience. Instagram offers a highlight feature to add these stories as a highlight to your profile to save it forever on your profile as well. So share, throwback pictures, put BTS and real-time videos over stories are a great use of the feature to engage your audience.

Influencer marketing: We have all known this mode of marketing ever since social media users started influencing people with their choice, brands and promotion. Many brands are investing heavily into their influencer marketing program. A social media influencer with a great outreach will create more awareness about your brand and product than your single page posts. Influencer marketing is estimated to have grown to reach $13.8 billion in 2021 and is a must-have for every brand from SMEs to a multinational brand.

A key channel for communication that was brought in by the TikTok trend is now a growing space across social media platforms. The industry has grown into a more diverse portfolio from Micro-influencer to big celebrities to endorse your brand. Providing the various budget, direct communication with the influencer and even barter and collaboration is a great fit for brands at every level. Build up your relationship with influencers and create a win-win situation for both the influencer and the brand.

How to go social

- Re-share your tagged posts to encourage your audience
- Make it as personal as you can
- Schedule your posts
- Be animated, meme is here to stay
- Diversify your channels and content accordingly

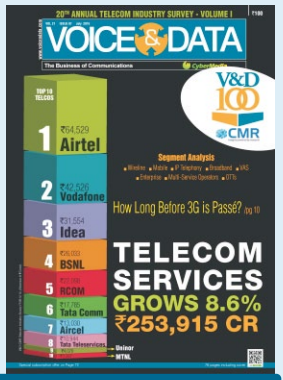
Last but not the least, go Live

Ever wondered why going live is more important than posting a post? It builds a real-time connection with your audience. It is direct communication with your consumer. Brands have successfully run live sales, QnA, contests and various other promotional activities to leverage this feature. For example, a baker doing a live bake-off is a proven hit over him posting a recipe. Going live is not restricted to your followers. It sends a notification to people who are following and their followers as a chain of communication increasing your traffic on social media. It is a unique way to bring in communities together and connect with an audience without any geographic barriers. Considering the current phase of online preference by the consumer or the lifestyle there is a lot that brands can plan and host live for their audience.

The icing on the cake is that one does not need to have a certain amount of followers to go live. Go with a ten or thousands, it's a perfect bridge between audience and the brand. It doesn't matter if your brand is small, or a well-established business, social media is an ocean of opportunity for all. 😍

Nandini is Director, Marketing and Brand Communications, Ikokas Digital Technologies
feedbackvnd@cybermedia.co.in

Yes! I want to subscribe to Voice&Data



Subscribe to Digital Edition @ ₹700/-

	Period	Issues	Print Subscription Rate		Digital Subscription Rate
			New	Renewal	
☐	1 year	12	₹900/-	₹810/-	₹700/-
☐	2 years	24	₹1,800/-	₹1,620/-	₹1260/- save 10%
☐	3 years	36	₹2,700/-	₹2,430/-	₹1680/- save 20%

or Subscribe online: subscriptions.cybermedia.co.in/voicendata

Please tick your subscription choice above, fill the form below in CAPITAL LETTERS and mail it to us at rse@cybermedia.co.in

☐ I want to avail premium service of receiving your copy by courier. Tick which ever is applicable.

☐ ₹ 500/- 1 year ☐ ₹ 950/- 2 years ☐ ₹1400/- 3 years

Name [•]: Mr/ Ms _____ **Date of Birth:** M M Y Y Y Y

Organisation: _____ **Designation:** _____

Delivery Addess: _____

_____

City: _____ **State:** _____ **Postal Code:** _____

Mob [•]: _____ **Tel:** _____ **Email [•]:** _____

☐ **I am paying ₹** _____ **by DD/Cheque No.:** _____ **Dated:** M M Y Y Y Y

Payable at (specify bank and city) _____

OR

☐ **Please Remit for ₹** _____ **Through RTGS/NEFT to our A/C details given below:**

Bank Name: ICICI Bank Limited, A/c no. 017705000132, Branch & IFS Code: Gurgaon, ICIC0000177

[•] Essential fields

Signature _____ **Date:** M M Y Y Y Y **Subscription No. (for renewal)** _____

Order form can be mailed with payment (cheque/DD) to:

Sarita Shridhar, Cyber Media (India) Ltd, Cyber House, B-35, Sector 32, Gurgaon - 122001 Tel: 0124 - 4822222, 91+9810499208

Terms & Conditions:

• This offer is valid for a limited period. • Rates and offer valid only in India. • Please allow 4-6 weeks for delivery of your first copy of the magazine by post. • Send crossed Cheques in favour of Cyber Media (India) Ltd. • Please write your name and address on the reverse side of the cheque or DD. All outstation cheques should be payable at par. • Cyber Media (India) Ltd. will not be responsible for postal delays, transit losses or mutilation of subscription form. • Cyber Media (India) Ltd. reserves the right to terminate or extend this offer or any part thereof. The decision to accept or reject any or all forms received is at the absolute discretion of the publishing company without assigning any reason. • Please include pin code for prompt delivery of your copy. • In case payment is through credit card, date of birth must be mentioned. • All disputes shall be subjected to Delhi jurisdiction only.

Sandesh Kaup
Country Manager, India & SAARC region,
Milestone Systems

"Video technology will enable the next normal"

An expert with over two decades of experience in enterprise software and networking industry, Milestone Systems has been a part of his DNA since 2011. He was running the local business until 2016 driving India sales growth by 40% YoY before moving on to Allied Telesis, a network infrastructure and telecommunications company. ***Sandesh Kaup*** *returned to Milestone recently, taking over as its Country Manager for India and SAARC region. In an interview with Voice&Data, he talks about the evolving role of video technologies in the post-pandemic normal. Excerpt:*

How will video technology play a key role in the next normal?

As the world and economic activities begin to reopen, we are seeing faster demand and adoption of video technology, especially video security. According to 6Wresearch, India Video Surveillance Market is likely to grow at a CAGR of 16.6% by 2026.

In fact, with the pandemic taking center stage, video has evolved and taken on a bigger role in the fight. Hence, we expect a higher demand coming in from the healthcare sector. For example, last year, the Maharashtra government had made CCTV mandatory in all the COVID-19 wards and the Delhi government instructed its Public Works Department (PWD) to equip CCTV cameras in COVID-19 wards of all Corona virus-designated hospitals in New Delhi.

An open video management system (VMS) allows easy integration with new technologies such as thermal imaging cameras, fall and sound detection analytics so frontline workers can respond quickly without having to physically be near the patients all the time. Besides, the importance of video will be accentuated cross all sectors, when social distancing becomes a thing we learn to live with. As measures are relaxed, public safety is becoming paramount. Workplaces will need to have safe distancing measures in place as in common public areas such as cafes, entertainment zones and retail malls. This is where the power of video can be utilized and integrated with tech solutions such as people counting and access control systems.

> Video technology with advanced analytics is one of the most efficient tools to ensure business continuity and help companies prepare for future challenges.

> By combining video with audio, health workers can be informed of a cry of distress and respond quickly. This relieves manpower from an already strained healthcare system.

There is no doubt that video technology will enable the next normal.

How can video technology aid in pandemic response? Which sectors will see adoption?
Video technology with advanced analytics is one of the most efficient tools to ensure business continuity and help companies prepare for future challenges. The key sectors that will see adoption include healthcare, retail, education, and transportation. It will also play an important role in making cities safer.

When the risk of contagious transmission is high, video can be integrated with AI to send analytic notifications, for example, if a patient has had a fall or is experiencing breathing difficulties. Also, by combining video with audio, health workers can be informed of a cry of distress and respond quickly. This relieves manpower from an already strained healthcare system and can help keep a continuous eye on patients. To maintain patient privacy, video can also be combined with privacy masking.

As more physical stores re-open, adherence to social distancing is critical to reduce the likelihood of viral transmissions in the retail sector. Through video, crowd control can be better managed when combined with frontline security. With a proper video strategy, video can help businesses control queues, and even manage better distribution of products by measuring footfalls.

Video can also be used to connect various remote sites together for video management purposes. Coupled with intelligent analytics, video can be applied to flood detection, manage traffic control, and as mentioned previously, crowd detection and safety.

On the education front the Government of India and organizations have put together policy frameworks to sensitize and educate the educational sector regarding the importance of security and safety measures. Cameras can be placed in common areas such as cafeterias, libraries, outside washrooms connected to audio systems that provide alerts or announcements to avoid any crowding by students.

While lockdown measures have started to ease, governments must still ensure that citizens do not breach non-essential travel restrictions outside of their local or approved regions. Video technologies such as Automatic Number Plate Recognition (ANPR) capabilities help to ensure that errant travellers can be identified when required and the same technology can be used to control traffic flow on roads. It can play a major role in the transportation sector.

How will innovation and integration lead to business growth?
Milestone's video solutions are sold through our channel partners, providing us with great scalability and we are continuously adapting the way we do business to fit market conditions and customer needs. Our focus on open platform VMS connects our channel and technology partners to each other so they can build best-of-breed video solutions. This is done through Milestone's Marketplace, which is developed around the idea of growing together with our partners.

Cloud solutions are also an integrated part of our offering and business model. Our hybrid cloud solution offers more deployment options, supporting our end-customers' preferences and empowering our partners to deliver solutions that directly addresses a need.

> AI will continue to augment security cameras – equipping them with digital brains to match their eyes and enabling systems to analyze live and recorded video.

> Video technology with VMS will be integral to the Smart City mission and can be invaluable to governments that are looking to control and mitigate the detrimental effects of the pandemic.

In addition to innovation, we also believe that companies who use technology responsibly will enjoy good business growth. As an industry player, we take the responsible use of technology very seriously as stated in the Copenhagen Letter. We encourage all our partners and end-users to respect local law regarding data protection and data privacy. It is for this reason that we added the Copenhagen Clause to our software licensing agreements to encourage those that use its software do so responsibly.

How is video technology helping government authorities in monitoring and managing cities in the times of pandemic?

Video technology with VMS will be integral to the Government of India's Smart City mission and can be invaluable to governments that are looking to control and mitigate the detrimental effects of the pandemic. In the capital city of Bulgaria, Sofia, for example, the authorities made it a point to upgrade their video network by integrating it with a video management software platform that had an open architecture. It allowed them to integrate sensors from different manufacturers. This drastically cut down the incident response times and provided post-event investigations, crucial during a pandemic as well as a security situation.

Similarly, in Calgary, Canada, the authorities decided to use a video management software platform to replace their legacy video systems, which had 1,800 cameras and 300 Network Video Recorders (NVRs) in many locations that were not connected to a centralized operation. This allowed them to have a unified proactive solution to deal with incidents at multiple sites.

Similarly, Government of India is concentrating on safeguarding people and is keen on safe cities. All critical infrastructure that the government is currently undertaking, for example the new Parliament building, is seeing huge investments for security. Going forward, building a video network platform with open-source architecture can pay huge dividends in a country with 1.3 billion people.

How are AI, IoT, analytics and other cutting-edge technologies getting integrated in video? What is the real advantage?

As cameras and sensors become more advanced and emerging technologies such as the internet of things (IoT) become comprehensively integrated with video management systems, video technology is no longer confined to the security sector, but is being used to add value right across enterprises and public sectors.

Artificial intelligence (AI) will continue to augment security cameras – equipping them with digital brains to match their eyes and enabling systems to analyze live and recorded video in greater volumes, but with less human intervention. Behaviour analysis and proactive insights are already turning passive cameras into active assets, adding value in areas such as retail, crime prevention and workspace management. With an increasing number of connected IoT devices and the large number of datasets being produced, video analytics will accelerate the automation of large volumes of unstructured data to generate actionable insights and unlock business value.

With reference to the pandemic, in open spaces, for example, cameras operating on an advanced VMS can pick up patterns of people's movement in a hot zone or near a hospital or camp that is a containment zone. It can track anyone entering or exiting via alerts. Airports can deploy thermal cameras to scan crowds for people who are running a temperature, which then alerts the authorities on-site through their audio systems. It can ensure safe distancing is maintained while check-in or ticketing and ensure people are always wearing their masks.

While the advantages of VMS are immense, key benefits include better crowd management, social distancing, reduction of theft, and prevention of losses. It also helps in increasing staff safety, efficient daily operations, better RoI, lower costs, higher scalability and providing increased support to security personnel.

feedbackvnd@cybermedia.co.in

[REPORT]
WEBINAR

The next-gen network is here and it's changing the world

5G, cloud and artificial intelligence are paving way for evolution of the "killer network" that will drive the next wave of disruptions and trends

BY HEMANT KASHYAP

At the thought leadership webinar on "Evolving the Network for the Next Decade" organized by Voice&Data, Vali Sunesara, Systems Engineering Senior Manager, Juniper Networks India, talked about how 5G, cloud and artificial intelligence (AI) will drive the networks of the future.

Sunesera noted that the next decade belongs to the enterprises, as demand for data surges. He said that enterprise segment represented USD3.4 Trillion in 5G-enabled revenues by 2026. Out of these, energy, manufacturing and public safety will account for 55%. Other use cases include healthcare, public transport, media and entertainment.

The customer segment also will remain an important driver for network-generated revenues, he added. According to Juniper's estimates, mobile data traffic will grow by over four times between 2019 and 2023. Sunesara also said that by 2023, private enterprise network

> Network virtualization brings better "operational economies" by allowing companies the freedom to pay for scalability as and when required.

> Till now, telcos have been deploying ground-based network functions. One major shortcoming of this is its rigidity; telcos have to physically relocate it to shift the network function.

market will amount to USD120 billion; this stresses the importance of enterprises for network service providers. For them, this opens a B2B opportunity which had been limited at best.

This rapidly increasing demand for data, driven by 5G, will result in the next wave of disruptions in the networking space. Sunesara said that while consumer and government use cases continue to diversify and grow, no other can match the tremendous data demand being generated by enterprises. He envisioned that for the next decade 5G will power the rapid digitization that will usher in the era of Industry 4.0.

The paradigm shift

Sunesera said that it was virtually impossible for network service providers to offer low level latency without deploying the network on the cloud. A centralized network just can't do it, because of its inherent architecture; the key network functions reside far from the customers, thus generating latencies in double digits.

However, distributing key network functions on the cloud does the trick by bringing network functions closer to the edge, the telcos can serve two purposes. One, they can provide that hallowed low latency. And, two, they can harness the gargantuan amounts of data which resides at the edge of a network.

Not only that, this also allows network operators to cut Capex and Opex costs significantly; after all, most of the network applications are on the cloud. Therefore, the need of physical network functions greatly reduces. As Sunesara said, network virtualization brings better "operations economies" by allowing companies the freedom to pay for scalability as and when required, NFV can drastically reduce costs.

But, how do they go about accomplishing that?

From boxes to virtualized, cloud native network functions

At the webinar, Sunesara said, "[network] virtualization is the key to moving to cloud and bringing agility to network functions". Till now, telcos have been deploying ground-based network functions. One major shortcoming of this deployment is its rigidity; telcos have to physically relocate it to shift the network function elsewhere on the network.

However, virtualizing network functions brings flexibility to the network. Now, service providers can place a network function anywhere on the network, according to their needs. Network cloudification provides the flexibility and agility to deploy network functions anywhere. This ultimately brings superior performance and better service experience.

Bringing core to the cloud allows for better control on the system; now network administrators can implement changes and introduce and remove features within a few seconds. Similarly, bringing the access to the cloud takes it closer to the edge; this ensures low latency and high QoS.

Juniper Networks has a complete set of "building blocks" that includes the likes of x-haul capacities, VNFs and xNFs, E2E security, open interfaces, AI/ML driven operation and so on. Juniper targets to provide the complete set of tools to anyone who wishes to embark on their network virtualization journey. And as Sunesera said, "Whatever can be virtualized [...], we are enabling that."

From centralized to distributed architecture

Sunesara said that moving network core and RAN to the edge to the edge will improve overall network performance. Moreover, he said that Juniper Networks provides customized hybrid network models for its customers to select from.

He added the future networks will have centralized control layers; this will help the distributed architecture to become lighter and more agile. Incidentally, this distributed architecture includes 5G WWC, MEC and CUPS (Control-User Plane Separation). The telcos won't be required to limit themselves to hosting RAN on cloud; they can easily host the CU and the DU on the cloud as well.

Vali said that this will allow for telcos to tap in the data at the edge, powering analytics, automation and security.

"A dynamic network capacity ensures that the telcos can maintain the ultra-low latency over a variety of scales – from private networks to telco-grade networks."

Vali Sunesara, Systems Engineering Senior Manager, Juniper Networks India

Furthermore, he said that the next logical step will be deploying private telco environment.

Static capacity to dynamic capacity

He talked about how telcos generally deploy their networks on the ground, which requires significant Capex and Opex spends when they need to upgrade the same. However, deploying network functions on the cloud solves this problem by allowing flexible scalability. These days, network vendors can provide over 100x scalability. This will be a game changer in the field as SPs can save a lot of money when upgrading networks.

This dynamic capacity also allows for better network slicing. Since the technique has only rapidly became important, all the SPs need to ensure that their networks are sliced, and each slice has a different QoS associated with it. That only becomes possible with a network deployed on the cloud.

A dynamic network capacity ensures that the telcos can maintain the ultra-low latency over a variety of scales – from private networks to telco-grade networks. As Sunesara said, "5G demands more stringent requirements from the network"; by deploying virtualized networks and the dynamic capacity that comes with it, telcos can tackle the upshot.

From manual to open, automated operations

It is important to move towards automated operations, as consumers demand higher and higher network uptime and QoS. With virtualized networks, and the open interfaces that come with them, SPs can enable that. Having automated operations also involves having Open APIs and interfaces to ensure multi-vendor interoperability.

Basically, this involves artificial intelligence (AI) to collect data at the edge, and machine learning (ML) to take actions according to the data. However, if a network operator does not want to integrate ML in the network, it can take the insights from the AI data and act manually. As Intel has said before, 75% of the data generated will be at the edge; telcos need to ensure that they are as close to the edge as possible to benefit as much as possible.

Automating operations has clear cost-saving benefits. However, it excels at providing the best possible end-to-end user experiences; the network administrator and the end-user.

Time to focus on connected security

With virtualized networks, the traditional means of security become obscure. They take too much time to deploy, and every upscaling exercise takes just as much time. However, with cloud deployment, network operators can now expand and deploy any and all methods of security however they require.

Sunesara said that a cloud-deployed network can have security that can detect threats and issues within seconds; this time can increase to as much as hours in ground-based networks. Therefore, to ensure the maximum uptime and best QoS, telcos need to focus on a connected security solution which is centralized, dynamic, adaptive and scalable.

Cloud is the way to go for telcos

Networks form the core of a telco's operations and the majority of its revenues. Be it a business, consumer or a government application, networks are a telco's most prized asset. As such, the next paradigm shift in the networks holds much promise in that way.

Everyone wants their connections to be fast and agile; telcos need to ensure that they deliver the said speed and agility with a sense of reliability and security so that the user experience does not dip. The future of the networks is in the clouds; it is time for the telcos to virtualize their networks and move closer to the cutting edge of innovation.

hemantka@cybermedia.co.in

PCQUEST 35 YEAR 1987 - 2021
UNDERSTAND • CHOOSE • IMPLEMENT IT

CyberMedia

Enterprise Choice Awards is the industry annual report that voices the change in the tech standpoint and what business entity perceive and demands from the brands.

2000+ enterprise CIO's surveyed, across major verticals as Manufacturing, BFSI, IT/ITeS, Education, Healthcare, Retail, Media, FMCG etc.

Key factors:

• Spontaneous Awareness • Current Usage • Future Consideration and many more.

ENTERPRISE CHOICE AWARD 2021

August 2021	
Commercial PC	DELL
Commercial Laptop	hp
Server	DELL
NAS	NetApp
Software-defined Storage	DELL EMC
Cloud-Based Storage	DELL EMC
Virtualization	vmware
Networking Products	CISCO
Security Solutions	McAfee
Data Centre Service Provider	TATA COMMUNICATIONS

September 2021	
Cloud Computing Service provider	aws
Enterprise Resource Planning	SAP
Finance & Accounting Software	Tally POWER OF SIMPLICITY
Business intelligence / Business Analytics	Microsoft
Artificial Intelligence	IBM
Robotic Process Automation	AUTOMATION ANYWHERE
Email Solution	Microsoft Outlook
Unified Communication	CISCO
Video Conferencing	zoom
Bandwidth Management & Optimization	JUNIPER NETWORKS

Join us to felicitate the winners on PCQuest
the most sought after platform for
the tech adopters, tech implementors, tech influencers, tech visionaries
across enterprise & SMB's.

[Enterprise Choice Awards & Conference] [PCQuest Enterprise Webinars] [Leader's Roundtable] [Reasearch & Market Analysis] [Online] [Print] [Social Media influence]

twitter.com/pcquest facebook.com/pcquest linked.in/pcquest

To know more about the survey:
Rajiv Pathak I Manager Marketing I rajivp@cybermedia.co.in I +91 8010757100

Local players rule the roost

While demand shrunk marginally due to the second wave, the homegrown brands upped their game to register healthy growth in india's wearable market

BY V&D BUREAU

India's wearables market grew 118.2% year-over-year (YoY) in 2Q21, shipping overall 11.2 million units according to the wearable market report by recent International Data Corporation (IDC) India. According to the monthly report, strong shipments from homegrown brands in earwear and watches fueled this growth. Watches continued to be the fastest-growing category accounting for 81.2% share in the wristwear category that includes watches and wristbands, up from 35.0% a year ago. The earwear category also maintained its momentum as the category leader, doubling its shipments in 2Q21.

The IDC report, however, highlights that the second wave of the COVID-19 had a marginal impact on the

India wearables market, product categories, market share, year-over-year growth 2021Q2
(Shipments are in thousands of units)

Product Category	2Q21 Shipments	2Q21 Market Share	2Q20 Shipments	2Q20 Market Share	Year-over-Year Unit Change (2Q21 vs 2Q20)
Earwear	9,233	82.3%	4,333	84.3%	113.1%
Wrist Band	372	3.3%	524	10.2%	-28.9%
Watch	1,608	14.3%	282	5.5%	469.1%
Total	**11,213**	**100%**	**5,139**	**100%**	**118.2%**

Source: India Monthly Wearable Device Tracker, August 2021 release

> The second wave of the COVID-19 had a marginal impact on the sector as the overall wearable shipments declined by 1.3% sequentially in 2Q21.

sector as the overall wearable shipments declined by 1.3% sequentially in 2Q21. Partial lockdowns, weekend curfews, and disrupted supply chains resulted in a skewed slump in the early-quarter shipments. However, unlike last year the market was quick to recover as the vendors stocked the channels to fulfil the pent-up consumer demand in June'21.

In terms of trends, the quarters saw watch form factor gaining more appeal amongst the consumers, and Indian brands were quicker to leverage this and align their device portfolio. While Noise continued lead the overall watch category list for five straight quarters with 28.6% market share in 2Q21, it was closely followed by BoAt with a 26.9% share. Fire-boltt, another homegrown brand, entered the top five list at #4 position in just three quarters of starting its business in this category. Huami and Realme stood at at #3 and #5, respectively. In the wristband category, Xiaomi continued to maintan its formidable lead with 38.9% share, followed by Oneplus and Titan with 21.7% and 21.3% market share, respectively.

"Affordability has been the key for Indian brands, and these brands have been immensely successful in gaining a significant portion ofthe watch market with competitive pricing, aggressive marketing, and faster adoption of new features," IDC India Market Analyst for Client Devices Anisha Dumbre said. "This new generation of homegrown brands are digitally native, aware of their limitations and selectively targeting the gaps. However, they need to be watchful of the China-based brands, who will be aggressive by introducing more sub-brands and leveraging the ecosystem play in the days to come," Dumbre stated.

The earwear category grew by 113.1% YoY in 2Q21, shipping 9.2-million-units. The report indicates that BoAt's aggressive shipments and diverse portfolio helped it gain a dominant 45.5% share in 2Q21. It also led the TWS category with a 39.6% share in the quarter. OnePlus finished second with an 8.5% category share in the second quarter of 2021. "Even in the earwear category, the homegrown brands have a strong dominance as their share has reached 71.5% in 2Q21 from just 31.2% in 2Q20. Ptron, Zebronics, Noise, Portronics, Boult Audio, and Truke were among the key prominent brands that supported the dominance of homegrown brands in this category," the report stated.

Top 5 Watch companies, market share, year-over-year growth 2021Q2
(Shipments are in thousands of units)

Company	2Q21 Market Share	2Q20 Market Share	Year-over-Year Unit Change (2Q21 vs 2Q20)
1. Nexxbase (Noise)	28.6%	25.5%	538.4%
2. ImagineMarketing (BoAt)	26.9%	-	-
3. Huami (Amazfit)	9.3%	25.1%	110.9%
4. Fire-Boltt	5.5%	-	-
5. Realme	4.7%	21.3%	24.7%
Others	25.0%	28.1%	405.9%
Total	**100%**	**100%**	**469.1%**

Source: India Monthly Wearable Device Tracker, August 2021 release

The earwear category grew by 113.1% YoY in 2Q21, shipping 9.2-million-units. BoAt's aggressive shipments and diverse portfolio helped it gain a dominant 45.5% share.

Top 3 Wrist band companies, market share, year-over-year growth 2021Q2
(Shipments are in thousands of units)

Company	2Q21 Market Share	2Q20 Market Share	Year-over-Year Unit Change (2Q21 vs 2Q20)
1. Xiaomi	38.9%	23.0%	20.3%
2. OnePlus	21.7%	-	-
3. Titan	21.3%	2.6%	471.6%
Others	18.1%	74.4%	-82.8%
Total	**100%**	**100%**	**-28.9%**

Source: India Monthly Wearable Device Tracker, August 2021 release

Top 5 earwear companies, market share, year-over-year growth 2021Q2
(Shipments are in thousands of units)

Company	2Q21 Market Share	2Q20 Market Share	Year-over-Year Unit Change (2Q21 vs 2Q20)
1.Imagine Marketing (BoAt)	45.5%	18.5%	424.0%
2. OnePlus	8.5%	5.0	264.2%
3. Samsung	7.9%	30.4%	-44.6%
4. Realme	5.5%	14.3%	-17.9%
5. Palred (Ptron)	5.1%	3.4%	219.7%
Others	27.5%	28.4%	106.0%
Total	**100%**	**100%**	**113.1%**

Source: India Monthly Wearable Device Tracker, August 2021 release

Commenting on the outlookfor the Indian wearables market, IDC India Research Manager for Client Devices Jaipal Singh said,"The robust growth in wearable is attracting brands who have businesses around devices and accessories to expand their presence across all wearable categories. Thus, the influx of new entrants remains a key driver of growth," He further added: "As we approach the festive season, vendors and channel partners are gearing up for record level of demand with the intention of further corrections in the prices. An upside of over 35% seems an easily achievable feat in 2H21 when compared to 2H20. However, vendors will be selective in their channel inventory with focus remains on etailers as concerns around COVID-19 third wave still prevails in the country."

feedbackvnd@cybermedia.co.in

Smartphone production goes south, drops by 11%

With the pandemic raising its head again in Southeast Asia, the number of units shipped in 2Q21 declined to 307 million, down from 344 million in previous quarter

BY V&D BUREAU

The recent surges of COVID-19 cases in India, Vietnam, and other Southeast Asian countries have adversely affected the global smartphone market in terms of production and demand. According to a recent report by TrendForce, the global smartphone production for 2Q21 fell by 11% QoQ to a total of 307 million units. However, a YoY comparison shows an increase of around 10% for the quarter. The global production for 1H21 came to a total of 652 million units, translating to a growth rate of almost 18% compared with the same period in 2020, when the pandemic was in the initial phase.

The report also points out that while fourth-ranked Apple is undergoing a transition between old and new models, and Samsung is experiencing a slight dip in market share, smartphone brands have improved their respective product specifications.

The report indicates that while Samsung's smartphone production in 2Q21 reached 58.5 million units, the highest among all smartphone brands, yet it represented a 23.5% QoQ decrease. Since India and Vietnam account for the majority of its smartphone production capacity, the severe COVID-19 outbreaks in both countries during 2Q21 had a significant impact on production volume. "This year, Samsung will remain as the top smartphone brand by quarterly and annual production. However, it will face increasing difficulty in preserving its steadily shrinking market share in the future. The competition will only intensify as rival brands have become excelled at smartphone design and manufacturing," the report said.

Impact on brands from China

OPPO's smartphone production fell by 6.6% QoQ to 49.5 million units for 2Q21. Its production figure includes devices from sub-brands Realme and OnePlus. Xiaomi's smartphone production also came to 49.5 million units for 2Q21, showing a QoQ drop of 2%. The company's production figure includes devices from sub-brands Redmi, POCO, and Black Shark. On a YoY basis, OPPO posted a growth rate of 80%, whereas Xiaomi posted a growth rate of almost 70%. The high YoY growth rates were attributed to them capturing some market share abandoned by Huawei and the recovery of China's smartphone market.

Both OPPO and Xiaomi claimed second place in the quarterly ranking. Vivo is another Chinese brand that

> The global production for 1H21 came to a total of 652 million units, translating to a growth rate of almost 18% compared with the same period in 2020.

faces a similar situation and its smartphone production, including devices from sub-brand iQoo, dropped by 8.1% QoQ to 34 million units. Vivo took fifth place in the quarterly ranking. Each of the three Chinese brands has made India its second largest base with respect to production and sales operations. Hence, India's recent COVID-19 surge affected the production and sales performances of all three brands in 2Q21.

Regarding future plans, all three Chinese brands corrected down their annual production targets at the end of 2Q21 due to the COVID-19 surge in Southeast Asia and the capacity crunch in the foundry market. Lowering the annual production target is going to alleviate the cash flow pressure by preventing the component gaps from widening and the inventory of whole devices from rising. It should be pointed out that OPPO, Xiaomi, and Vivo have been very proactive in developing innovative products in the high-end segment of the smartphone market.

The high-end models from these three brands are not able to completely assume the market positions that have been held by the flagship models under Huawei's P and Mate series. Nonetheless, all three brands have posted strong results in both the domestic and overseas markets. To capture more market share, Xiaomi and OPPO are leveraging their respective sub-brands Redmi and Realme that both offer high performance for price. TrendForce highlighted that it expects the two brands to be more or less evenly matched in terms of production through 2021.

Apple's woes

The report highlights that Apple's iPhone production reached its lowest point for the year, and its rank fell to fourth place in 2Q21 because the second quarter is the transition period between last year's and this year's iPhone series. The quarterly total iPhone production fell by 22.2% QoQ to around 42 million units. In the aspect of product development, Apple will be releasing four flagship iPhone models in September.

The major upgrades that come with the new series are the improved camera and the next-generation A15 processor that is manufactured with TSMC's 5nm+ process. Other upgrades relate to the optimization of the existing functions. This year's iPhone line-up can be regarded as an extension of the iPhone 12 series that was released in 2020. With regards to pricing, Apple will be maintaining its proactive approach so as to gain more market share. On the other hand, there is the possibility that Apple's device production during 2H21 will be affected by the recent spike of COVID-19 cases in Malaysia. Due to the severity of the outbreak situation, shipments of ICs from that country have experienced delays.

LG calls it a day

With an annual production of 9.4 million units for 2021, LG officially terminated its smartphone manufacturing operations in 2Q21. The company had given early signals of selling or shutting down its mobile phone unit early in 2021, before announcing that it will formally close the mobile phone unit in April. The development of new smartphone models was also suspended. According to the shutdown plan, the production of LG smartphones has ceased since the end of 2Q21. Altogether, LG produced around 9.4 million units this year and is estimated to account for about 1% of the market share.

As for LG's regional markets, the company was focusing on expanding its presence in the respective mid-range segments of the North American and Latin American markets. With LG ceasing its smartphone production, the abandoned market share in North America will be mostly divided among Android phone brands Samsung, Lenovo, and brands owned by local telecom companies. In Latin America, Lenovo and Xiaomi will likely benefit the most from LG's exit.

Keeping in view the existing pandemic condition, TrendForce downgraded its estimation of global smartphone production for the whole 2021 – from the expected 1.36 billion units and a YoY growth rate 8.5% to 1.345 billion units and YoY growth rate of 7.3%. "Going forward, one of the two main focuses of observation will be on whether the pandemic will cause a further decline in smartphone sales. For instance, while Europe and the US are currently experiencing a resurgence of infections, Southeast Asian countries have also been unable to subdue the most recent outbreaks," the report stated, adding that the pandemic also continues to pose a risk to the smartphone supply chain.

feedbackvnd@cybermedia.co.in

CyberMedia

LEADING TECH MEDIA PLATFORM & NETWORK SINCE 1982

6
Brands

3500+
Impact Articles

20+
Webinars &
Virtual Roundtables

9000+
Attendees Across Verticals

90,000+
People Influenced

90+
Industry Leaders
& Tech Experts

COMMUNITIES

Technology Decision Makers - Enterprise and SMB, Telecom, Channel Partners, Start-ups, DeepTech, Functional Heads and many more

MOVED THE NEEDLE DURING COVID-19 CRISIS

CREATING HIGH IMPACT & INFLUENTIAL CONTENT

IN THE LAST 481 DAYS

CMR
- From Survival to Revival
- Proactive Business Recovery
- Changing Customer Expectation in Crisis
- Cyber-Sanitize your business
- Proactive Sales Strategies for faster business recovery
- New IT Priorities 2020

CIOL
- CXO of the Week
- CiOL Live Video Series
- Start-Up Circle
- CiOL Cloud Burst
- CiOL Live Tech News

DQ Channels
- Are There any Make in India IT Products for Us to Use?
- Cloud Adoption in Digital World
- Govt to Harness IT to Empower MSME Sector

DATAQUEST
- DQ Tech Talk Series
- Business Continuity Planning Series
- Dataquest Digital Indexing
- DeepTech (India's largest Virtual Conference)

PCQUEST
- Secure Smart & Intelligent Network
- App Modernisation
- Collaboration in WFH environment
- DevOps
- CyberMedia Labs Product Review

VOICE&DATA
- Business After Covid
- TLF Dialogue Series
- 25 Years of Mobile Telephony India

and many more....

Rajiv Pathak | rajivp@cybermedia.co.in | 8010757100

RNI No. 59233/94. Published on 1st of every month. DL(S)17/3114/2021-23. Licensed to Post WPP. U(SE)62/2020.
Posting Date: 4&5 of every month. Posted at Lodi Road HPO.