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SCALING DIGITAL VALUE

Are CIOs ready to lead the charge?
pg. 12

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The Role of Culture

Five years back I did a story on digital transformation in Indian enterprises. The story was done by studying multiple companies in 3 of India's largest conglomerates: the Tata group, the Mahindra group and Vedanta/Sterlite. The story, an effort to understand the digitisation initiatives in Indian businesses, went on to win the pole star award in technology journalism. It was an open-ended exploration of what digital transformation looked like and draw some conclusions.

After reading Jatinder's cover story this month, I get a sense of deja vu. The more things change, the more they remain the same. After 5 years and a pandemic that changed the course of digitisation in businesses, some of those questions and issues still remain relevant.

Digitisation is not new. What is new about digital transformation in businesses is the intent to create business value at organization level. As many leaders emphasized at that time, it is not technology or even business decision that are tough to make. The success of any such initiative depends, they revealed, to a large extent, on will, culture shift and governance - in that order.

While some might have tasted success in indi-

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vidual digital initiatives, the lack of priority on culture and governance is coming back to hit them, when they're looking for that elusive value, let alone scaling it.

Scaling anything from pilot to enterprise-wide has the always been a challenge in Indian enterprises. Many new initiatives provide excellent results in a sandboxed environment with a lot of attention from top executives. Without the shift of mindset (culture), and proper mechanism of governance in place, they fail to scale.

Scaling digital value should start and end with culture. Business and technology decisions come in between ∎

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9.9 GROUP

around thetech

98% of enterprises are using or plan to use at least two cloud infrastructure providers

Open Internet in India surpass 600 mn users

The open internet in India has surpassed 600 million users. The open internet encompasses various categories such as news and general websites, over-the-top (OTT) and connected TV (CTV), music streaming, and online gaming. The report, conducted by global advertising technology leader The Trade Desk and Kantar, shows that the open internet has experienced rapid growth in the country, with 80% of consumers increasing their consumption of it in the past year.

Few companies are ready for automation

Bain & Company's latest research reveals that companies across various industries are failing to harness the full potential of automation capabilities and are not adequately prepared to transition their workers into future jobs. According to the survey findings in Bain's report "Automation's Ultimate Goal: The Augmented Workforce," workforce augmentation has the potential to reduce costs by up to 30% across industries.

Half of cybersecurity leaders will change jobs by 2025

By 2025, nearly half of cybersecurity leaders will change jobs, 25% for different roles entirely due to multiple work-related stressors, according to Gartner, Inc. It says that cybersecurity professionals are facing unsustainable levels of stress which is impacting their decision quality and the performance. By 2025, lack of talent or human failure will be responsible for over half of significant cyber incidents.

Cloud to overtake on-premises storage for 65% of A2000 organizations

IDC's Future of Operations framework predicts that, for 65% of A2000 organizations, the cloud will soon overtake on-premises infrastructure as the primary location for storing, managing, and analyzing operational data. The study also suggests that talent shortages and pressure to improve operational performance will lead organizations to re-evaluate their approach to digital transformation, resulting in increased usage of outside services by 2024.

Indian semiconductor market to reach $55 bn by 2026

Deloitte's 2023 TMT predictions indicate that the Indian semiconductor market is expected to surpass US$55 billion by 2026, driven mainly by three industries: smartphones and wearables, automotive components, and computing and data storage. The industry's demand is increasing and is projected to reach US$85 billion by 2030, generating employment for 600,000 people. The growth of 5G networks and private network deployment is also anticipated, with satellite companies leading innovation in communication technology.

CIOs grapple with software reliability and security complexities.

A report by Dynatrace reveals that CIOs face greater challenges in maintaining software reliability and security due to the demand for frequent release cycles and the growing complexity of cloud-native environments. The report shows that 90% of organizations have accelerated their digital transformation in the past year, with 78% deploying software updates into production every 12 hours or less.

Automotive cybersecurity market to reach $13.9 bn by 2030

The automotive cybersecurity market is expected to grow at a CAGR of 19.9% from 2023-2030, with a projected value of $13.9 billion by 2030, according to a new market research report titled, 'Automotive Cybersecurity Market by Offering (Hardware, Software, Services), Security Type (Network Security, Endpoint Security), Deployment Mode, Application (ADAS & Safety, Telematics, and Infotainment), and Geography - Global Forecast to 2030.' The increasing adoption of telematics, rising cyberattacks, and government mandates for data protection are key drivers. However, high costs of solutions limit market growth.

AI-based tools vital for telcos amid surge in 5G roaming connections

Telecommunication companies are expected to experience substantial growth in AI-based tools, according to a study by Juniper Research. The research also predicts a significant increase in the number of 5G roaming connections, with 53 million connections in 2023 and 526 million by 2027. As 5G connectivity proliferates, there will be a need for new roaming tools to identify these connections independently. AI-based real-time analytics and roaming fraud mitigation services are critical solutions that can help operators protect their networks from an anticipated surge in data traffic from roaming subscribers.

98% of Indian public cloud users employ multicloud infrastructure

A study by 451 Research commissioned by Oracle Cloud Infrastructure shows that almost all Indian businesses (98%) using public cloud have adopted a multicloud strategy. The study collected data from 1,500 executives and decision-makers globally and found that most cloud journeys now involve multiple cloud infrastructure and application providers. For Indian enterprises, data sovereignty and cost optimization are the top drivers of multicloud strategies, while data redundancy is the most anticipated future use case. 96% of those who were surveyed reported they are using or plan to use at least two cloud application providers (Software-as-a-Service), with 51 percent using cloud applications from five or more providers

CIOs strive to balance IT budgets amid growing pressure to cut costs

Despite 93% of CIOs expecting IT budgets to increase in 2023, 83% are feeling pressure to stretch their budgets further, according to a survey report conducted by SoftwareOne Holding AG, a global provider of software and cloud solutions. The focus is on improved cloud cost management and reducing technical debt, with 72% of CIOs admitting to being behind in their digital transformation due to this debt. The survey also identified cloud migration as a major cause of this debt, with 38% saying it was rushed during the pandemic.

Cybersecurity spending in Asia-Pacific set to surge to $36B by 2023

IDC's latest Worldwide Semiannual Security Spending Guide predicts that spending on security hardware, services, and software in Asia/Pacific will surge to USD 36 billion in 2023, marking a 16.7% increase from the previous year. Despite economic slowdowns and uncertain risks, the study shows that security investments will remain robust in 2023 and the coming years. Businesses are responding by ramping up investments in cyber resiliency tools and solutions.

10% of large enterprises will deploy advanced Zero-Trust by 2026

Zero trust is top of mind for most organizations as a critical strategy to reduce risk, but few organizations have actually completed zero-trust implementations. Gartner, Inc. predicts that by 2026, 10% of large enterprises will have a mature and measurable zero-trust program in place, up from less than 1% today. Gartner defines zero trust as a security paradigm that explicitly identifies users and devices and grants them just the right amount of access so the business can operate with minimal friction while risks are reduced.

RBI acknowledges the potential of blockchain technology

The Reserve Bank of India (RBI) has acknowledged the potential of Blockchain Technology (BCT), noting that its usefulness will depend on its adoption and adaptation for various purposes. According to Union Minister of State for Finance Dr. Bhagwat Kisanrao Karad, the RBI has listed BCT as one of the innovative technologies that innovators can apply to test their products in the RBI's sandbox environment.

Govt. of India reiterates its focus on digital expansion

The Government of India is committed to expanding digital opportunities to smaller and newer towns across the country, enabling every young Indian to participate in the Prime Minister and the Government's vision of a one trillion-dollar digital economy. To achieve this goal, the Software Technology Parks of India (STPI), an autonomous society under the Ministry of Electronics and Information Technology (MeitY), is playing a key role in extending the government's initiatives throughout the country, including smaller towns. STPI has set up 63 centers across the country based on proposals received from respective State Governments. In addition, the Government of India has approved 22 new STPI centers to further its efforts in promoting digital opportunities in all corners of the country.

Glitch at AP state data center disrupts digital services

A technical glitch at the Andhra Pradesh state data center (SDC) brought digital services on all government platforms to a halt in the state, causing government departments to struggle to provide services to the people. The AP technology services (APTS), the nodal agency responsible for the management and operation of SDC and other platforms such as AP software-defined wide area network, AP secretariat campus area network, AP cybersecurity operating center, and VC management, deployed a team to manage the situation upon discovering the glitch.

AIIMS to establish India's first robotic surgery training center

AIIMS, located in Delhi, will soon establish the country's inaugural training center for robotic surgery. The Institute intends to invite manufacturers of robotic surgery systems to participate in the development of training facilities across its campuses through an Expression of Interest (EOI). The Director's office, led by Dr. M. Srinivas, has issued an order allocating 500 sqft of space across various campus locations, including the main hospital, academic spaces, cadavers, tissues, and a pool of trained faculty members, for the training facility.

India leads in AI skill penetration and talent concentration

India has topped the charts for AI skill penetration and talent concentration and ranks fifth globally in AI scientific publications, according to a recently published report by NASSCOM. The report indicates that Indian tech talent is three times more likely to possess AI skills than their peers in other countries, highlighting their proficiency in DS&AI. This trend is evident across various industries, including education, finance, hardware and networking, manufacturing, software, and IT services, with India's AI skills penetration factor outperforming all OECD and G20 nations.

IndOS: A new mobile OS in the works

India is working on creating an indigenous mobile operating system as an alternative to existing options. The project, tentatively named IndOS or BharatOS, has been developed by JandK Operations Limited using the Linux kernel-based OS. Although the government has recently tested the operating system, a launch date has yet to be announced. The development of this OS aligns with the Indian government's push to safeguard its citizens' data, which is often collected by multinational corporations like Google.

Lenskart secures $500M investment

Eyewear startup Lenskart has signed a definitive agreement with Abu Dhabi Investment Authority (ADIA) for a $500 million investment. Most of the sovereign wealth fund's investment will be through a secondary share sale, with a small primary round of growth equity. This funding round comes after reports that ADIA was set to invest up to $400 million in Lenskart and Chrys Capital's intention to inject another $100 million. The deal's completion is subject to statutory and regulatory approvals, with Avendus Capital serving as the exclusive financial advisor to Lenskart and its shareholders.

India's unicorn club houses only 17 profitable startups

According to Tracxn, a market research platform, only 17 out of India's 114 unicorns (startups valued at $1bn or more) are profitable. The financial data of 80 startups is publicly available, and among the profitable companies in the list are Zerodha, Zoho, Billdesk, Diagnostics, and Physicswallah. Startups in recent years have encountered significant hurdles in maintaining profitability due to cut-throat competition and margin pressures.

Edtech unicorn LEAD acquires India biz of Pearson's K-12

LEAD, an ed-tech unicorn, has finalized the acquisition of Pearson's K-12 learning business in India, listed on the London Stock Exchange. The acquisition has helped LEAD expand its reach to five million students across India. According to a statement from the startup, the acquisition of Pearson India's local K-12 learning business will enable LEAD to offer integrated tech solutions to over 60,000 schools in India by 2026. Earlier this year, LEAD announced its intention to acquire Pearson India's K-12 learning business for an undisclosed sum. At the time, the edtech startup stated that it planned to finance the deal through a mix of new fund-raising and internal accruals.

Swiggy integrates Dineout's offering into its app

Swiggy, a major food-tech company, has now integrated Dineout's offering into its food delivery app. As per the food delivery startup, the service is now accessible at over 18,000 restaurants across 24 cities. Previously, the offering was only available to subscribers of the Swiggy One membership program. Dineout, established in 2012 by Ankit Mehrotra, Vivek Kapoor, Nikhil Bakshi, and Sahil Jain, is a platform for reserving tables that enables diners to benefit from discounts and deals when dining out.

FreshToHome raises $104 mn

FreshToHome, a Bengaluru-based online platform for fresh meat, fish, and seafood products, has raised $104 million in a Series D round of funding led by Amazon Smbhav Venture Fund. This marks the first D2C retail brand investment for the $250 million fund, which typically focuses on accelerating small- and medium-sized businesses, as well as investing in agri-tech and healthcare sectors. The funding round also saw participation from returning investors including Iron Pillar, Investcorp, Investment Corporation of Dubai, and Ascent Capital, among others. FreshToHome is now valued at $566 million, according to data research platform Tracxn.

The Good Glamm Group increases its stake in The Moms Co to 90%

The Good Glamm Group, a content-to-commerce unicorn, has reportedly increased its stake in the D2C mother-and-baby care products brand, The Moms Co, from 75% to 90%. This move follows the company's acquisition of The Moms Co for INR 500 Cr in 2021, which is its largest acquisition to date. In the past year, The Good Glamm Group has also acquired several other companies, such as Sirona, a feminine hygiene brand, BabyChakra, a mom-and-baby platform, ScoopWhoop, a digital media platform, St Botanica, a personal care brand, and MissMalini Entertainment, a celebrity talent management platform.

CIO/CISO MOVEMENTS

Kirloskar Management Services has appointed UDIT PAHWA **as their new Group CIO**

Udit Pahwa has joined Kirloskar Management Services as Group CIO. He joins from Huhtamaki India where he served as Head - Information Technology. He was earlier associated with companies such as Polycab Wires, Oracle India, Capgemini, EY among others.

VINAY KUMAR **joins McDonald's North and East Market as the CIO**

Before this role, Kumar was the CIO at MMG for more than 5 years, where he was leading the technology function for the group across different business verticals, including food and beverages (McDonald's, Coca-Cola), oil and gas (Hal Offshore Ltd and Seamec Ltd.).

JAYANT GOYAL **joins Coforge as CIO**

Jayant Goyal has joined Coforge as Chief Information Officer, Global Organisation Head, and Senior Vice President. He joins from iEnergizer where he served as Chief Information Office. He was earlier associated with Amazon and Granada Services

CHANDER KHANDUJA **joins Baxy Group as Group CIDO**

Chander Khanduja has joined Baxy Group as Group CIDO. He joins from Luminous where he served as CIO. He was earlier associated with TIEL, Segram, Becton Dickinson, and Exide Industries.

VINEET JAISWAL **joins Essar Oil (UK) as Chief Information & Digital Officer**

Vineet Jaiswal has joined Essar Oil (UK) Limited as Chief Information & Digital Officer. He joins Vedanta Resources Limited where he served as Group Chief Digital and Technology Officer. He was earlier associated with JSW, GE Digital, GE Energy, GE Power, GE Intelligent Platforms, and GE Consumer & Industrial.

SAMMEER KULKARNI **joins Kotak Mahindra General Insurance as CISO**

Sammeer Kulkarni joins as CISO at Kotak Mahindra General Insurance. Before this, he was VP of Information Security at BNP Paribas. He was earlier associated with IndusInd Bank, IndiaFirst Life Insurance, Polaris Software, Bharti Axa Life Insurance, ICICI Prudential Life Insurance, Centurion Bank of Panjab, ILFS, and SMC System Integrators.

CoinDCX appoints SRIDHAR GOVARDHAN **as Senior Vice President and Head of Information Security**

CoinDCX has appointed Sridhar Govardhan as the Senior Vice President and Head of Information Security. Previously, Sridhar held the position of Vice President and Head of Information Security at Flipkart and had also been associated with Wipro and Infosys.

SWAPNIL JUGADE **joins Revent Engineering as Group CIO**

Jugade joins Revent Engineering after departing from his previous role at Yokohama Off-Highway India. In his new position, Jugade will be responsible for driving the company's information technology and infrastructure roadmap, with a focus on digitizing manufacturing and overall business operations.

KAPIL MEHROTRA **joins Dhanuka Agritech as Group CTO**

Dhanuka Agritech Limited is the umbrella company for the business of agrochemicals, fertilizers, and seeds of Dhanuka Group.
Before joining Dhanuka Kapil was serving as the Group Chief Technical Officer at National Collateral Management Services Limited (NCML) for more than three years.

SATISH MITTAL **joins Chargeup as CDO**

In his new position, Mittal will be responsible for spearheading the technology, digital, and partnership initiatives for the brand. Mittal has previously held several leadership positions with renowned companies such as Reliance Communications, Vodafone Business Services, and Meta by Facebook.

BharatPe appoints AMBUJ BHALLA **as Chief Information Security Officer**

Fintech company BharatPe has appointed Ambuj Bhalla as its CISO. Bhalla will be responsible for the implementation of information technology security and cybersecurity frameworks for the company. Before BharatPe, he was the head of cybersecurity at InterGlobe Aviation and was entrusted with the delivery of end-to-end security operations.

BharatPe Strengthens leadership team with appointment of APARNA KUPPUSWAMY **as CRO**

Aparna Kuppuswamy will be leading the risk portfolio across BharatPe Group, including its merchant and consumer businesses. Before joining BharatPe, Kuppuswamy had been the chief risk officer at GE Capital and SBI Cards. She had also been a part of the leadership team at SBI Cards during its initial public offering (IPO) in 2020.

SILLY POINT

By Akash Jain

Spotlight: Metaverse (Not Yet Another One!)

In this 7th column of the series called Navigator MasterClass on Emerging Technologies, we will find our way through the myths and realities of Metaverse.

■ *The author, Akash Jain, managed large IT organizations for global players like MasterCard and Reliance, as well as lean IT organizations for startups, with experience in financial and retail technologies.*

No one needs any more reading material on Metaverse. After all, the 283-page report ("The Metaverse in 2040") published last year by Pew Research Center opens with "Hope? Hype? Hell? Maybe All 3". And of course, it is difficult to take seriously a concept created by a sci-fi novelist in 1992 ("Snow Crush" by Neil Stephenson). And depending on one's personal point of view, the Pew report could be seen as positive or negative since it includes thoughts from not just eminent technologists, but also journalists, politicians, sociologists, philosophers, intelligentsia, and psychologists. So, in this 7th column of the series called Navigator MasterClass on Emerging Technologies, we will find our way through the myths and realities of Metaverse..

And we start with McKinsey's six myths about Metaverse, and later examine what IEEE, EU Commission, MIT, and Gartner have opined, ending with the challenges facing this technology's emergence.

MYTH 1: No one knows what Metaverse is. It is quite simply the natural next step for the quasi-immersive technology we all already live with.

MYTH 2: It's just a fad. Myth #1's response applies here too.

MYTH 3: It's only for Gamers. It is true that it started there for obvious reasons, but then it would be premature to be dismissive, just as it would have been to dismiss eCommerce and streaming video

as 'merely' inventions for the adult entertainment business (only).

MYTH 4: It is geared to GenZ. Original internet and AI were also initially perceived as geared for younger generation. More later on why Metaverse is different from the promise of other currently Emerging Technologies.

MYTH 5: There is no money-making opportunity. Two simple responses: Metaverse is already a significant (and growing) portion of digital assets delighting customers; and, GenZ has purchasing power, which will become the majority demographic in a few years.

MYTH 6: Speed of Technology advancement with set the pace of growth here. Let us not get distracted by the glitches and crashes, or the clunkiness of VR equipment; or disheartened by the experience of crypto and NFT.

The reason Metaverse has a strong chance of becoming mainstream quickly is that it is what McKinsey calls a 'combinatorial technology'. It combines the top trends of today, like AI, Spatial Computing (AR and VR to use light, sounds, images, trackers, sensors, and haptics), IoT, Edge Computing, Digital Twins, and Web3.

And it is remarkable that Pew report thinks that VR part of Metaverse might lag the AR part of it. If we take this a good predictor trend, then Metaverse's appeal immediately spans generations, geographies, and genders. Add to it the increasing spend on digital assets, customer delight driving investments, and significant infrastructure investments in Metaverse's backbone; and we might be looking at a significant trend. Gartner thinks that the C-suite must think about Metaverse if it worries about at least one of the following: Digital Humans, Gaming, Virtual Spaces, Shared Experiences, Spatial Computing, and Tokenized Assets. It would be hard for any IT department to ignore ALL of these.

Let us now look at the thoughts of some respectable non-business entities. In IEEE Transactions on Computational Social Systems, F. -Y. Wang, R. Qin, X. Wang and B. Hu, published "MetaSocieties in Metaverse: MetaEconomics and Meta-Management for MetaEnterprises and MetaCities,". They opine that ACP (artificial society, computing experiment, parallel execution) and CPSS (Cyber-Physical-Social Systems) technology provide an important theoretical and technical foundation for the development of MetaEnterprises and MetaCities; regarded as the mapping of real enterprises and cities in the virtual cyberspace. This in turn generates a MetaEconomic system; regarded as the virtual economic system corresponding to the real economic system. With the computational economic experiment approach, small economic data in the real economic system can be converted into large virtual economic data in the MetaEconomic system. And then artificial intelligence algorithms such as machine learning, deep learning, and reinforcement learning can be used to transform virtual economy big data into deep intelligence. It is not a huge leap of faith to see that a new MetaManagement model needs to evolve.

In another IEEE publication, "A Metaverse: Taxonomy, Components, Applications, and Open Challenges", Sang-Min Park and Young-Gab Kim opine that 'With the technological development of deep learning-based high-precision recognition models and natural generation models, Metaverse is being strengthened with various factors, from mobile-based always-on access to connectivity with reality using virtual currency'. They go on to list the components to be hardware (head-mounted, hand-input, haptics, motion), software (scene/ object/ sound/ speech recognition, generation, synthesis, motion rendering), and content (multimodal, persona modelling, entity generation, scenario generation/ population/ evaluation). The approaches will be of User Interactions, Implementations, or Applications. AND they list the applications as Simulation, Gaming, Office Space, Social Identity, Marketing, and Education.

Finally, a brief look at A Thematic Report, prepared by the European Union Blockchain Observatory & Forum for the EU Commission. It lists the use cases to fall in the realm of Recreation- Gaming and Socialisation, Virtual Work and Collaboration, Virtual Learning, Virtual Markets, Advertising/ Marketing/ Sales, Smart Industry/ Smart Manufacturing, and Extended social media.

All the above analyses also highlight the challenges staring the IT departments in the face. Most of them are carry-forward from today's IT challenges: Security, Privacy, Ethics, Regulation, Governance, Misinformation, widening Technology Gap, Distractions, and Negative Interactions. We are not going to dwell on these, but will highlight the fact that the Metaverse has already compounded the social problem of inappropriate behavior.

What we must do is look at what MIT says are derailers for Emerging Technologies, and are compounded in the case of Metaverse:

- **Hoping to Run Before You Walk.**
- **Forgetting your Core Customers of Today.**
- **Avoiding Tough Decisions and Necessary Conflicts.**
- **Revering Only the new Star Talent.**

Only time will reveal the extent of Metaverse utilization and its impact on business and society. But the excitement spurred by the renaming of Facebook has already gone beyond the individual life. The technological advances in the backbone platforms of Metaverse make it a task of INTEGRATION of already advancing and usable technology. And hence more likely to succeed than not. ∎

SCALING DIGITAL VALUE

Instead of just adopting new tech or solutions, the emphasis is on aligning with business objectives and processes for optimal value. Are CIOs ready to take the charge?

By Jatinder Singh

My editor, Shyamanuja Das, and I had an extensive conversation about selecting a cover story for this month that is highly relevant to tech executives in the current business environment, where companies are expected to achieve more with less. We previously discussed how organizations accelerated their digital transformation efforts during the pandemic to survive and keep their business running. Additionally, emerging technologies such as AI, 5G, and IoT gained significant attention. However, in the post-crisis phase, organizations face a new challenge - how to pursue growth. Maximizing the value and return on investment (RoI) from digital initiatives and extending their impact throughout the organization have now become a critical objective for technology leaders, although it has always been a focus area.

In its "The Keys to Scaling Digital Value" report, BCG underscores the importance of effectively scaling digital solutions during times of business volatility or economic turbulence. BCG's analysis, which examined the digital proficiency and maturity of nearly 2,000 global firms, reveals that implementing individual digital solutions can boost revenue by 9% to 25% and reduce costs by 8% to 28% when compared to the relevant baseline. However, scaling multiple solutions can result in an enterprise-wide revenue increase of nearly 17% and a cost reduction of 17%.

Regrettably, only 30% of firms qualify as digital leaders based on BCG's research, denoting the highest score in the digital enablement maturity assessment. These businesses have progressed beyond the pilot stage and can seamlessly integrate and leverage digital solutions across all organizational areas, as well as in their respective markets and regions. Conversely, the remaining 70% of organizations have not been able to scale their digital solutions beyond the pilot phase, or they have been unable to break down organizational silos. As a result, their digital transformations have not been able to realize their full potential across the entire enterprise.

Given this, it is not surprising that CIOs and technology leaders are placing greater emphasis on scaling digital value. Rather

> **"Comprehensive digital adoption involving appropriate investment is crucial for attaining desired benefits, especially as the focus is on IT optimization. Selecting projects and technologies carefully guarantees a path to success, not just a "fail-fast" journey."**

GYAN PANDEY
Head Digital/CDO,
Voltas Limited

> **"It's vital to under–stand the risks, have a collaborative approach, consider the relevance of the product or solution from the customer's perspective, assess business viability, scalability, and resil–iency. At every stage of the transforma–tion journey, the technology should meet industry–grade expectations, from pilot to pro–duction."**

DEEPAK SHARMA
President and Chief
Digital Officer of Kotak
Mahindra Bank

than just implementing new technologies or solutions for business continuity, the focus is on prioritizing alignment with business objectives and processes to achieve maximum value. The question is, how prepared are CIOs to lead this charge?

The key differentiators

In the present highly competitive era, there is no doubt that the rapid expansion of digital solutions can offer immediate benefits such as increased revenue, cost reduction, improved customer experiences, and enhanced long-term resilience.

The ability to quickly scale digital solutions is a crucial differentiator between companies that successfully undergo digital transformation and those that do not. For CIOs, keeping up with the constantly evolving digital landscape can be a significant challenge, as delays in action can lead to missed opportunities for effective scaling.

The question of how to measure the impact and success of digital transformation is a pressing concern for organizations and their boards, according to the majority of CIOs. What are the critical factors that enable companies to effectively scale their digital value and gain a competitive advantage?

Establishing clear metrics and KPIs:
Establishing clear metrics and KPIs is crucial for measuring the success of digital initiatives and tracking progress towards business goals. According to industry experts, creating a metrics of success is a critical step for any transformation initiative. The metrics should measure productivity improvements, cost efficiency, higher customer satisfaction, or additional revenue opportunities. Digital technology enables organizations to drive multiple outcomes, such as customer growth, revenue growth, improved productivity, efficiency, and reduced instances of fraud. It is crucial for organizations to define these outcomes before embarking on digital initiatives to establish accountability and gain organizational buy-in.

Gyan Pandey, Head Digital/CDO of Voltas Limited, emphasizes the importance of thoroughly understanding business operations before utilizing technology for efficient practices. "Comprehensive digital

adoption involving appropriate investment is crucial for attaining desired benefits, especially as IT budgets decrease each year. Selecting projects and technologies carefully guarantees a path to success, not just a "fail-fast" journey."

Pandey adds that data plays a crucial role in achieving business goals, but its full potential has yet to be realized, and it must be curated for meaningful use cases. Data-driven processes accelerate innovation, leading to the creation of new technologies, better products, and enhanced customer experiences.

This helps CIOs identify areas for improvement and adjust strategies accordingly, ensuring that digital initiatives deliver value to the organization and identify new growth opportunities.

"In terms of measuring the impact and success of digital transformation, there are several methods and KPIs that we use to evaluate our progress. We also receive evaluations from external consultants such as McKinsey and BCG. For every initiative, there is a structured process in place where it must be signed off and evaluated by the CFO. Projects may aim to significantly improve cost efficiency, process effectiveness, customer satisfaction, product quality, or demand power, and we define the relevant metrics to measure success. At the end of the year, we conduct a rigorous review to determine where we are and what we have achieved," says Dhiraj Sinha, EVP and Group CIO at JSW.

Manish Grover, Executive Director (Strategic IS & IS) at Indian Oil Corporation Limited, emphasizes the importance of starting small with a proof of concept and expanding horizontally. "In the upcoming year, the focus will be on expanding competencies to improve efficiency and socializing developed initiatives. The team will continue to adopt new technologies such as RPAs and core tools to drive automation across all divisions. Net Zero will be a significant focus, and the goal is to enable young minds to come up with game-changing initiatives in the transition phase of energies," Grover adds.

India's flagship Maharatna national oil company has already created a central data management platform, RPA platform, and a discounting platform using blockchain

"The main challenge organizations face is aligning ideas and helping business leaders understand what is the right fit in terms of scalability, security, and future-proofing. Bringing these three elements together and effectively communicating them to business leaders can be a challenging task."

CHARU BHARGAVA
VP-IT
Sheela Foam

"In my opinion, the most significant challenge that organizations face [to scale digital value] today is the availability and continuity of skilled personnel. It is crucial to have individuals with a passion for the work and a long-term commitment to the organization."

EDSEL PEREIRA
Group Vice President – IT, Glenmark Pharmaceuticals

to drive better customer understanding, efficiency, oversight, better service delivery, profitability, and safer operations. Grover emphasizes the importance of providing top management with real-time KPIs affecting the company and their own performance.

To allow employees to work better and make data-driven decisions with accuracy and digital documentation, its focus is on creating digital twins and using PDMS during interruptions in pipelines.

Aligning IT investments with organizational goals: Deepak Sharma, President and Chief Digital Officer of Kotak Mahindra Bank, emphasizes the importance of keeping a strong eye on every stage of a digital transformation journey to ensure it is in the right direction and aligned with organizational goals. He believes technology plays a critical role in building and scaling up core digital capabilities to drive transformation, build new business models, and create future-ready initiatives. "Everything created for customers, whether it's an experience, product, or channel, has a dependency on how data is leveraged, privacy and security frameworks are built, and technology is used to deliver outcomes."

BCG highlights the significance of C-Suite alignment, emphasizing that it's crucial for the entire C-Suite to agree on a common vision, strategy, and roadmap to stimulate action and facilitate execution throughout the organization. The study cautions that siloed CXOs will only hinder digital transformation by either being slow to digitize or not scaling digital solutions, resulting in finger-pointing and blame-shifting among executives.

Regarding financial services, Sharma emphasizes the importance of avoiding moving too quickly and risking accidents or clashes. It's vital to understand the risks, have a collaborative approach, consider the relevance of the product or solution from the customer's perspective, assess business viability, scalability, and resiliency. At every stage of the transformation journey, the technology should meet industry-grade expectations, from pilot to production. Keeping these factors in mind, Sharma suggests taking measurements and determining how to run at scale and full

production based on the outcomes.

"We have implemented a key strategy of establishing a set of metrics to measure the success of our transformation initiatives. These metrics include improvements in productivity, cost efficiency, higher customer satisfaction measured through net promoter score, and increased revenue opportunities. Digital solutions enable us to drive multiple outcomes such as growth in customers, revenue, productivity, efficiency, and reduction in fraud instances. Defining these outcomes early on is crucial for creating accountability and organization-wide support for these initiatives," Sharma explains.

As organizations strive to drive efficiencies and provide the best possible employee experience, they need to incorporate technology into every touchpoint that employees interact with to enhance their efficiency and experience.

Harnath Babu, the Partner and CIO at KPMG, explains that digital transformation is usually a gradual process for organizations, where automation is initially introduced in specific areas such as sales, operations, and finance. However, KPMG's goal is to leverage technology to transform the entire organization. To achieve this, KPMG has modernized its infrastructure to be cloud-native and scalable, built on microservices and APIs. This allows the company to efficiently provide services to clients, including compliance and statutory evaluation services.

"We have heavily invested in cloud technology, metaverse, and infrastructure modernization, as well as platformization, cybersecurity, and data management to ensure security and privacy for our clients. We have also introduced common data models, low-code/no-code platforms, and workflows to ensure seamless and integrated operations," Babu explains.

Being a large organization with over 40,000 employees, KPMG places a huge focus on improving processes. The consulting firm has experimented with chatbots, including models that can go through all documents and provide clear write-ups for employees. It has also implemented chatbots for self-service, offering around 17 different services. These efforts have resulted in increased

> **"We have prioritized digitization to address revenue concerns, leveraging AI and ML extensively. Our aim is to increase revenue and automate processes within the organization. These are critical priorities for the year ahead, as the market is becoming increasingly challenging due to the emergence of new technologies."**

HEMANT VERMA
Chief General Manager,
CIO & CTO, PNB

> **"We have seen a significant return on investment of at least 10 to 12 times as a result of our transformation efforts. We have integrated all processes that touch the customer or vendor partner and established global KPIs to enhance internal processes while keeping customers and partners at the core."**

DHIRAJ SINHA
EVP and Group CIO
JSW

employee and process efficiency, as well as improved customer satisfaction with the services provided using technology.

Ensuring right governance: The traditional approach for digital projects involves selecting a use case, deploying it, and then scaling it back. However, in large organizations with thousands of employees and multiple facets, scaling up presents a challenge due to the numerous processes, each with up to 20 variants, and the many exceptions that arise in the business.

Dhiraj Sinha, EVP and Group CIO at JSW, explains that in addition to the challenges posed by complex processes and variants, ensuring proper governance for long-term digital projects and staying on course can also be challenging. These projects cannot be completed over a short term and require ongoing attention and resources. While funding is not an issue, the ability to maintain the right skills and adapt to the changing environment can be a significant hurdle in achieving successful outcomes.

"Approximately five years ago, we began our digital journey, focusing on cost efficiency, process harmonization, and effectiveness. We have seen a significant return on investment of at least 10 to 12 times as a result of these efforts. Digital technology has proven to enhance efficiency and improve processes, and we are now taking steps to strengthen these processes further. For instance, we are currently in the final stages of a finance transformation project that will go live in April. We have integrated all processes that touch the customer or vendor partner and established global KPIs to enhance internal processes while keeping customers and partners at the core. While some organizations have already made significant progress in this area, it is crucial for every organization to focus on improving processes in today's environment, where customer expectations are high," Sinha explains.

Identifying solutions that can scale: Although building digital solutions may seem like a straightforward task, ensuring their optimal usage presents a challenge for organizations. Proof of Concept (POC)

solutions may appear promising but the actual outcome in production may differ significantly. Pristyn Care, a data-driven organization based in Gurugram, relies heavily on digitally-driven solutions to optimize costs.

According to Gaurav Bagga, the CTO at Pristyn Care, building solutions is less challenging than ensuring their optimal usage and achieving a good return on investment (ROI).

"One of the main challenges of using digital solutions is ensuring they can scale effectively. Solutions that work well in a POC may not be as successful in production. We experiment with different solutions, but we believe that it's better to fail fast and learn from it, rather than sticking to safe options," Bagga adds.

While emerging technologies such as blockchain, automation, and AI have a promising roadmap, Pristyn Care is currently focused on IoT and AI in health tech. Pristyn Care is currently using AI for price prediction and OCR for various types of documentation while exploring IoT. The organization prioritizes cloud security and cost control while using these technologies. Going forward, Pristyn Care aims to use all the available technology optimally and ensure the actual ROI of the different tools they use. They are building different categories and businesses, including a D2C brand that has grown significantly, thanks to technology. Bagga believes in learning from others and building new businesses, making the most of the opportunities presented by technology.

Charu Bhargava, VP-IT at Sheela Foam, emphasizes the critical role of data in making informed decisions. The organization does not merely use data for dashboarding or reporting purposes; they integrate it with AI and ML to gain deeper insights. By combining AI and analytics with their data, they can make informed decisions that align with their overall business strategy.

It is worth noting that Sheela Foam is not solely focused on manufacturing, but also has a retail division under the brand name of Sleepwell. This diversification enables them to leverage data across different sectors, ultimately aiding in making better-informed decisions.

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HARNATH BABU
Partner and CIO
KPMG

Key challenges

While some companies are still in the process of exploring technology and tools to improve their digital solutions, others are encountering challenges such as cybersecurity concerns, governance issues, and resource constraints that hinder the expansion of their digital offerings.

Cybersecurity risks: The growing reliance on data as the primary driving force behind organizational growth in recent years has made it increasingly challenging for enterprises to protect themselves against a rising number of cyber-attacks.

Furthermore, as businesses adopt digital technologies to pursue new business models and improve customer experiences, it has exposed specific vulnerabilities. The surge in digital transformation initiatives across organizations of all sizes has further exacerbated these vulnerabilities.

"Over the past year, we have prioritized digitization to address revenue concerns, leveraging AI and ML extensively. Our aim is to increase revenue and automate processes within the organization. These are critical priorities for the year ahead, as the market is becoming increasingly challenging due to the emergence of new technologies.

We have initiated several projects, and PNB is now on a different path. However, my concern is to ensure that we keep up with the curve and remain on par with our peers by adopting new and major technologies. We have a robust data warehouse system and offer segregation of duties. We are investing heavily in cybersecurity to strengthen our systems as any failure can cause a significant reputational loss," says Hemant Verma - Chief General Manager, CIO & CTO, PNB.

PNB, serving 180 million customers, recognizes the need to enhance security across its platforms to provide top-notch customer service. To achieve this goal, the bank has created a digital banking transformation division led by three General Manager level officers. These sections are dedicated to fintech, digital journey, and digital products and platforms. In the last quarter, the bank has rolled out 20 new products, and plans to give a new look to its banking platform apps by 2023.

Availability of talent and skillsets: A recent report by IDC highlights that a significant portion of Asia Pacific organizations, ranging from 60% to 80%, face challenges in filling IT positions such as security, developer, and data professional roles. This shortage of skilled professionals has far-reaching consequences, including increased workload for existing employees, higher security risks, reduced customer satisfaction, and the loss of crucial knowledge.

While large technology companies' layoff announcements have garnered attention, they do not reflect the broader skills shortage prevalent in the job market. The difficulty in finding qualified candidates remains a top challenge for organizations across various industries, particularly those that rely on labour-intensive roles.

"In my opinion, the most significant challenge that organizations face today is the availability and continuity of skilled personnel. It is crucial to have individuals with a passion for the work and a long-term commitment to the organization. However, finding the right resource with the required drive and expertise is a significant challenge. It is essential to sustain the projects that we are building to ensure long-term investments' success. Therefore, we need people who have the vision and passion with the right technological skillsets across different technology platforms," says Edsel Pereira, Group Vice President - IT, Glenmark Pharmaceuticals

Resistance to change: Often, employees are not receptive to changes required for expanding data capabilities. To overcome this, technology leaders must ensure that employees are trained on new tools and technologies and understand how they can help deliver value, improve customer experience, and accelerate time-to-market. An effective change management strategy is crucial and requires strong collaboration across teams and functions. Designated change managers must work closely with IT and process management teams to inculcate a culture that supports change, identify potential challenges, address grievances, and ensure that digital processes are fully implemented.

"It is important to start small with a proof of concept and expand horizontally. In the upcoming year, the focus will be on expanding competencies to improve efficiency and socializing developed initiatives. The team will continue to adopt new technologies such as RPAs and core tools to drive automation across all divisions."

MANISH GROVER
Executive Director
(Strategic IS & IS)
Indian Oil Corporation
Limited

"Our business solutions are highly focused on delivering ROI. However, in today's landscape, technology has become ubiquitous, and everyone is a technology leader in some way or another. As a result, technology-driven initiatives are becoming increasingly common across various business domains. The main challenge organizations face is aligning these ideas and helping business leaders understand what is the right fit in terms of scalability, security, and future-proofing. Bringing these three elements together and effectively communicating them to business leaders can be a challenging task," says Charu Bhargava of Sheela Foam.

The way forward

Without a doubt, the rapid expansion of digital solutions is highly significant as it provides immediate benefits, including increased revenue, reduced costs, improved customer experiences, and greater long-term resilience. While many organizations have already embraced digital transformation, others face unique challenges.

Looking ahead, digital transformation continues to be a top priority for organizations, with CIOs focusing on implementing tools that enhance employee engagement, efficiency, and meet customer expectations. A key factor that most CIOs agree on is the need for a comprehensive approach that involves alignment with business goals, the entire C-Suite, and functional leaders. Additionally, there will be a growing emphasis on utilizing analytics and intelligent data-driven decision-making to gain insights that inform strategic decisions and drive continuous improvement.

To effectively manage digital transformation initiatives, there will be a strong focus on establishing a centralized change management team with a thorough understanding of technology implementation, long-term benefits, outcomes, and challenges. While cost reduction is crucial, organizations also face challenges in finding the right talent to support their transformation efforts. Ultimately, those who prioritize building a strong foundation will have an advantage in realizing greater value from their technology investments ∎

IN FOCUS: AI

AI's Influence On Telecom: A New Era Of Innovation And Efficiency

The telecom industry is poised to experience increased growth with the introduction of AI.

By Sandeep Sudarshan

The Telecom industry has seen disruptive changes in the last decade from being a basic telephony and SMS provider to a quad play operator under intense competition for media and hyperscale's and OTT innovators. As the market is gearing itself for 5G high speed low latency networks, it has created multiple opportunities and revenue streams for Telcos, Enterprises, NEPs and SIs.

The telecom industry, which has historically been slower in adopting emerging technologies compared to some of its peers in the tech industry, is poised to experience increased growth with the introduction of these innovative technologies.

As an example, 5G is expected to be the strongest enabler for private networks and IOT industry using concepts of Network slicing.

According to analysts, the telecom sector with a current market size of USD 2000 billion in 2022 is expected to grow to USD 2500 billion by 2028. 5G subscriptions grew by 110 million during 3Q22 to around 870 million, and will likely to reach 1 billion subscriptions by the end of 2022. By the end of 2028, global 5G subscriptions are expected to reach 5 billion, accounting for 55 percent of all mobile subscriptions

Digital transformation redefining CX

The telecom operators have a huge urge to bring digital transforma-tion and redefine the user journeys and improve the CX. One of the key enablers as a sub set of digital transformation has been drawing insights from massive amounts of data flowing in the networks and make telcos data driven. The adoption of AI across few telcos has been beneficial at proof-of-concept stage but yet to see it happening at a scale with AI ops and realising the CBA (Cost benefit analysis on the use case) for business.

The telecom sector is an industry where the dataset is large and can be harnessed in many possible ways. Huge and varied amount of data in Telco industry makes the use of AI even more interesting from networks, devices, IoT sensors, billing data, customer usage patterns and profiles. This surely makes Telco industry suitable to adopt AI. Telcos have started their journey on streamlining data governance, implementation of data lakes, store, process and analyse these massive volumes of data to draw actionable insights for a much better customer experience and reduce subscriber churn.

IDC predicts that by 2024, 60% of enterprises will have operationalized their ML workflows using MLOps. It is the scaling catalyst of AI for Telcos. Today, fewer than 5% of decisions in a Telco are driven by algorithms, but that will eventually change. With MLOps, 20 to 25% of decisions will be driven by algorithms in the next five years.

According to a recent Gartner survey, the average time it takes to take a model from proof of concept to production has dropped from 9 to 7.3 months. But 7.3 months is still high, so there are many opportunities for Telco CXOs to take advantage of MLOps. MLOps can be highly beneficial for CXOs, data scientists, and data engineers alike. C-suite leaders require fast, accurate, and unbiased predictions. They are also looking for an AI solution that can provide them with a clear return on investment. That has been challenging for years, but MLOps changes that forever by making it simple to highlight ROI on AI investments. By putting MLOps in place, CXOs can therefore utilize their energies into scaling AI capabilities throughout the organization while focusing on tracking KPIs that matter to each team and department.

Key challenges
Now let us understand some of the challenges faced by the telcos across departments:

CTOs today are facing challenges around the following areas as they upgrade their networks, devices and services.
- **Network availability**
- **Network growth**
- **ROI on Network investments**
- **Network security & compliance**
- **Network assets management and optimisation**
- **Digital twin mapping of Networks**
- **Network assurance and fault management**
- **Network slicing monetisation**

On the other hand, CIOs are planning or already implemented large IT transformation programs and face following challenges by business stakeholders and to innovate of different way of working:
- **Information Security**
- **Data privacy protection and regulatory compliance**
- **Enterprise analytics and insights**
- **Application availability, support, and maintenance**
- **IT Infrastructure availability, support, and maintenance**
- **IT infra-assets mgmt. and optimization**
- **License costs optimization**
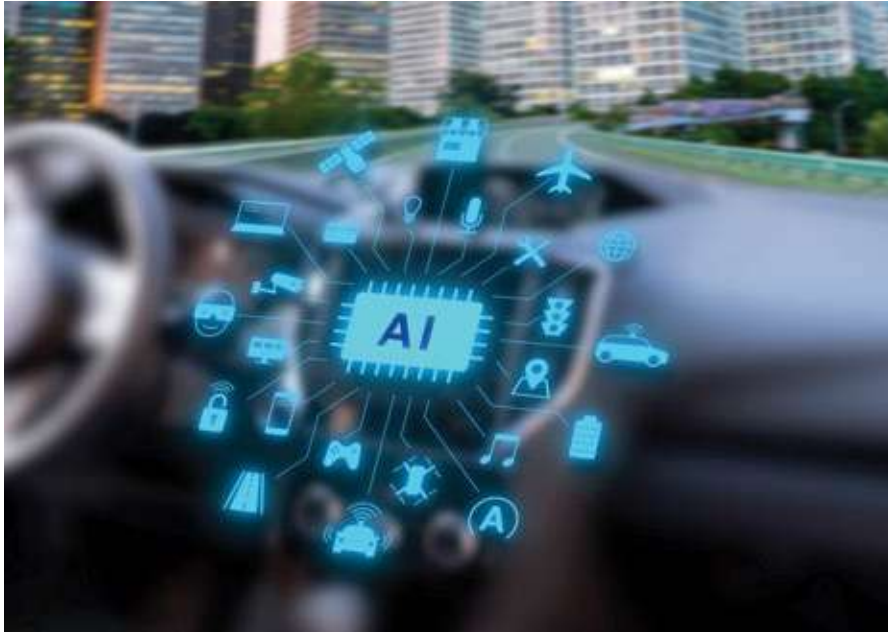
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- **Architecture consistency and modernization**

CMOs are under pressure to redefine the Customer experience and bring in more innovative and differentiated yet simplified products to consumers and enterprises (B2C/B2B):

- **Subscriber growth**
- **ARPU growth**
- **Competitive differentiation**
- **Customer Experience enhancement**
- **Brand building**
- **Product planning, design, and execution**
- **Churn Management**

CFOs are working very closely now with technology and business stakeholders to address the following headwinds around:

- **Revenue assurance**
- **Cost optimization**
- **Cashflow mgmt.**
- **Financial and accounting regulatory compliance**
- **Fraud Management**
- **Investor confidence management**
- **Business Intelligence**
- **Product profitability analysis**

To address the above challenges, the industry requires intervention from all three angles namely People, Process and Technology and business KPI can be achieved by Telcos on key parameters around agility, costs, control and CX.

Let us explore the areas where Telcos can potentially use AI to their advantage and draw insights to stay competitive in terms of their products and offerings

Network related issues

As telcos upgrade their networks and services the complexity and cost of running the NOC starts increasing. It therefore becomes extremely critical to monitor every aspect of the network and nodes. The legacy ways of running the NOCs are probably outdated and do not provide real time monitoring experience and corrective actions. Also, it does not have ways to predict failures and correct them. This is an area where AI-ML can be harnessed processing the network data and performing analytics. Network data can be monitored in real time for traffic analysis, performance and latency issues across locations, time zones, devices and AI algorithms can be used to study and help in removing network congestion. Proactive alarm monitoring systems can supersede traditional ways of alarm generation for better network efficiency and optimisation. Anomaly detection on network data can also be potentially used to pre-empt any network related failures by using historical data. There are some innovative tools and technologies that are being used by Telcos from Network equipment providers for solving network issues.

Total global mobile data traffic (FWA) reached around 115 EB per month by the end of 2022, and is expected to reach 453 EB per month by the end of 2028. 5G will account for 17% of mobile data traffic by the end of 2022, and this share is forecast to grow to 69% in 2028. Video constitutes around largest share (70 percent) of all global mobile network traffic in 2022, followed by social networking & software download and updates. Video streaming from the top 4 social media platforms (YouTube, TikTok, Facebook, Instagram) makes up the largest part of video traffic in 4G/5G networks with 40–95 percent across Europe, Asia and the Americas. Global streaming video-on-demand traffic (Netflix, HBO max, Disney+, Viaplay) is in the 10–30 percent range.

AI has a huge role to play in the Net

zero sustainability initiatives of Telcos by reducing carbon footprints and adopting energy savings measures.

Digital transformation, apps modernisation

In fact the CIO office of telcos can also potentially use the same concepts to understand better their application portfolio rationalisation and modernisation. AI plays a huge role there in modernising legacy applications and increasing its adoption and organisational level change management. Most of the telcos today are on a massive digital transformation journey led by chief digital officers who mainly come from the business side. Picking the right use case becomes very important to realise AI cost benefit analysis at scale as at times AI based implementations are expensive given the scale, tools and technologies involved and highly skilled data engineers and scientists.

AI can potentially be harnessed across business functions to make massive transformations in any business workflow in a Telco IT environment from Multi channel subscriber acquisitions, to billing provisioning and activation journeys.

Telcos can simplify their products and services based on past data on consumer segments and which rate plans, demographics etc. This is another area with AI can be used to create accurate data models and provide more insights from IT to business to help create differentiated converged offerings (Fixed line, mobile broadband video)

Differentiated and competitive products and services

Customer relationship management (CRM) is of utmost importance for any Telco. The CMO team has opportunities with the growing subscriber base, dynamic usage patterns and constant pressure to bring converged services as Telcos consolidate in the industry

and there are growing numbers of M&A deals happening.

As and when the telcos release new products, the simplification of these so that they are better recommended and targeted at the right customer segments becomes very critical. There are options in which AI/ML algorithms can help the marketing team to develop Customer Relationship Management (CRM) strategies targeted towards specific segments.

Another area for application of AI is in the call centres. High wait time for a call in the call centre and lack of proper resolution leads to massive customer churns. It also adds to operational expenses to involve human operators for each call.

With the proper integration of AI-based chatbots, Telcos can guarantee 24*7 availability and quicker resolution to a query from customers. It has also helped reduce TCO for running call centres. It is important to link the chat bots integration with the back end business workflows so that end to end support can be provided and wherever human intervention is needed the chat bot is able to route the call based on underlying NLP capabilities.

Streamlining financial processes

The finance function is sitting on a goldmine of tightly governed data from ERP and other financial systems which is integrated well with other functions of the organisation.

AI can help automate many of the mundane financial processes and help in bringing better efficiencies. It can also help in forecasting costs by looking at past historical data, revenue forecasting, Sales forecasting and help in better financial management.

Data Models can be built around Revenue assurance, fraud management which are huge issues today for CFOs on revenue loss.

By proper cleansing of data CFOs can also do a per subscriber-based

profitability analysis and bring in tighter controls for effective asset management as they do their financial planning and accounting exercise.

The Business intelligence function which requires huge amount of reporting at the end of the month can be further streamlines by building proper AI models and automating the whole process with less dependence on IT. Self-service and visualisation and reporting can be achieved by proper selection of tools and AI-ML ops.

Conclusion

AI can be potentially used across towers in a Telco with data governance to bring in more agility, reduce costs and enhance customer experience. By the right selection of tools/ technologies, process improvements and talent management AI has the full potential to achieve respective business KPIs. The best way to do is to start small with a prototype and achieve the proof of value and then incrementally do it "at scale" using ML ops.

Around 80% of data scientists' time goes into creating, training, and testing data. Therefore, Data governance is of utmost importance before Telcos undertake the AI journey. It should be the essence of an digital transformation journey. At times we tent to confuse digital transformation with AI transformation. In my view, digital transformation is needed to clean and govern your people , process and technology spectrum before you undertake the AI transformation to achieve the Cost benefit analysis and ROI on AI investments. In another POV I have tried to provide my views on how AI centre of excellence can potentially convert into Centre of Monetisation for the CXOs ∎

—The author is CTO & Lead Telco Architect, Business Technology Services, Capgemini UK

AI In Agriculture

Indian farms going the AI way?

By Pramita Bose

From farm to fork, food is being processed not only organically but also using technology to attain better quality. While eyebrows are often raised at the addition of preservatives to extend the shelf life of packaged, canned and tinned food, the ingress of agritech via integration of artificial intelligence is a welcome advancement for agriculture. Since India's backbone is still its farmers, AI holds the key to revolutionizing the lives of farmers in India.

AI: The New Farming Tool
Agritech players introduce advanced technology to the traditional methods of farming and cultivation for higher yield, efficiency, sustainability, and profitability. Quite frequently employed in horticulture and agriculture, this cutting-edge technology is also applied to forestry, aquaculture, and viticulture.

State-of-the-art AI can detect plant diseases, pests, insects, locusts, and chemical fertilizers, zoom in on malnourished farms, recognize plots of land thirsty of irrigation and ascertain the urgency of treatment with fertilizers or pesticides. It can also incorporate innovation through vertical agriculture to ramp up output, reduce the use of exhaustive

natural resources, predict seasons compatible with sowing and harvesting, and more.

Hi-tech in Agritech

AI takes away the mundane and clerical work of statistical gathering and parsing of data, not just throwing up prettified and human-readable data, but also suggesting solutions and giving advice! "Leveraging AI in the agricultural sector can unfurl a slew of benefits," highlights Rashi Gupta, Chief Data Scientist and co-founder of REZO.AI, an AI-powered contact center, aids crop breeders in more ways than one. The company's AI-driven CX cloud is conversant with vernaculars, thus providing customized assistance to planters by conveying relevant information to them on crucial factors like temperature, probability of rain, the best time to sow seeds, and the wind speed.

Speaking of the AI utility in agriculture, Rajesh Aggarwal, Managing Director, Insecticides India Ltd, one of India's leading agrochemicals manufacturing companies, says "Artificial Intelligence is the future of agriculture. Technologies, such as Machine Learning (ML), deep learning and computer vision are reinventing every sector, boosting productivity and efficiency, and agriculture is undoubtedly an integral part of this nucleus."

AI drones are the latest trend adopted by the agricultural sector and agro-industries worldwide, and they're being used to spray insecticides with far superior precision than before, without needing the farmers to be in their fields. AI also reduces many other forms of manual labor, including keeping vigil on their crops, locating weeds, and also monitoring conditions. "There are several open source solutions, such as the GIS software suite GRASS with useful algorithms for AI farming applications," says senior solutions architect Mallory Dodd of iMerit Technology,

a leading technology, and artificial intelligence (AI) data solutions firm.

Robots farmers?

Every industry that AI enters in a big way is also wary about how good the AI is. If it gets too good, it could just replace farmers. So is the inevitable future of farming just AI and robots doing it all? Maybe someday, however, for now, it's focused on aiding the farmer and making his business more efficient and more profitable.

"AI sensors can effectively ascertain the possibility of weed growth in the farms and also suggest the best herbicide as a solution. Many mechanical companies fashioned robots with spray guns to correctly watch out for weeds by using computer vision. These robots can slash the number of pesticides sprayed on crops by 80% and the cost of herbicides by 90%. By substantially curtailing the number of pesticides required in the fields, these discreet AI sprayers can uplift the quality of agricultural output, while also bolstering economic efficiency," elaborates Saurabh Agarwal, founder and director of GROWiT India Pvt Ltd, India's first Direct-to-Farmer (D2F) protective farming agritech entity. The firm specializes in creating high-quality and cost-effective protective farming materials and manufacturing products, plus sets an optimal standard for the Indian agri-

State-of-the-art AI can detect plant diseases, pests, insects, locusts and chemical fertilizers, zoom in on malnourished farms, recognise plots of lands thirsty of irrigation and ascertain the urgency of treatment with fertilizers or pesticides.

cultural and farming industry, ensuring heavier yields and a lower carbon footprint.

With expertise in products like mulch films, crop cover, fruit cover, shade nets, etc., protective farming has proved to be one of the finest agricultural rituals over time. Concepts like Taluka Mapping (agricultural region mapping) of India and AI-backed smart tools to calculate the ROI (Return on Investment), all benefit farmers.

When asked whether smart tractors and robots can replace farmers in the fields, Rashi Gupta feels that technology will primarily heighten human capability.

"Smart equipment can ideally support farmers instead of removing them from the farmlands. It can definitely share the manual workload, but a bulk of operations will still depend on the farmers only," concurs Rajesh Aggarwal. AI-propelled harvesting robots and driverless or smart tractors, he thinks, may address the issue of the farm labor crisis. Nonetheless, these technologies remain in the initial stages of their implementation. Their large-scale use is yet to be seen in India.

The AI weatherman

Climate change is an important factor that makes weather predictions or monitoring critical to farmers. "The rise in erratic weather patterns and food insecurity challenges makes the modernization of agriculture imperative. We must also factor in the sharp spike in demand for food, thanks to the bulging global population bursting at the seams," reasons Navneet Ravikar, chairman and managing director, Leads Connect Services Pvt. Ltd., an agriculture and farm risk management company. Farmers are often dependent on monsoons for sowing crops. Can sporadic weather be predicted by AI to alert farmers to stay well-prepared for the most favorable season? "Yes, there has been

substantial development and accomplishment so far in the predictive analytics for construing the dynamics of weather behaviour. Space tech, backed by AI platforms, is now in a stage of issuing advisory warnings to farmers for bracing up against any untoward situation," reveals Ravikar.

Registering noticeable developments in the last few years in all aspects of the farming process, the agriculture sector in India exhibited immense growth. Realizing this, the Government of India unveiled a number of projects to obliterate the challenges associated with cultivation. "However, what lingered as a big woe for the farmers is the hostile weather. It massively affects soil moisture, essential for the quality production of crops," says Mallory Dodd. She adds, "Using software solutions to model weather data against commonly-used AgTech algorithms could be beneficial to making short-term predictions in particular. That said, seasonal forecasts are much more complicated and would require not only the baseline data and AI technologies but also human expertise to make perfect predictions."

The most crucial aspect of AI in agriculture is that it is capable of interpreting weather conditions, allowing farmers to gear up in advance for planting crop seeds or saplings. "We also need to comprehend that AI can only provide trends and predictions. Everyone is aware that farmers are quite dependent on the monsoons for their crop yields. In that case, if farmers will be able to retrieve information about the rains precisely, it will then not only prevent damage to the crops but also save their time and efforts. Weather-predicting technology piloted by AI will help farmers explore and plan when the crops can be sown or harvested," shares Aggarwal.

Economics

"The global agricultural market size is estimated to touch an astronomical figure of USD 7.22 billion by 2026," says Ravikar. Food is a huge industry in India. Agriculture alone is an important part of the Indian economy, contributing about 17% to the total GDP (Gross Domestic Product) and generating employment for over 60% of the population! "Agriculture in India displayed impressive growth, specifically in the area of advanced technology in recent years," adds Saurabh Agarwal.

Artificial intelligence and digital technologies are contributing to the agricultural economy by helping farmers tide over a spate of difficulties. To ensure a rapid adoption rate of these technologies in the farming fraternity across India, significant measures have been taken by the government. "AI possesses the potential to bring about a sea change by bettering food management and decreasing losses along the entire agricultural value chain, i.e., from the farm to the final consumer. Per recent statistics, the penetration of AI injected a surplus of approximately `92,651 crore into the agriculture sector," volunteers Saurabh Agarwal.

Aggarwal also adds that the global market size of specifically the AI-driven agricultural sector was valued at 1.1 billion US dollars in 2021, witnessing a CAGR of 25.1% to reach 4.2 billion US dollars by 2028.

Against the backdrop of its agro-based social fabric, India is gradually waking up to embrace the AI-aided ploughing methods. Having seen a green revolution, the nation is now dashing towards artificial intelligence to add another feather in its cap. Fusing established farming practices with new-age technology to gain maximum productivity, Kisan Drones are already being put to use for crop assessments, land records and insecticide spraying, promising to usher in a new dawn of technology in agriculture and farming. Drones with AI, ML and remote-discerning capabilities

The most crucial aspect of AI in agriculture is that it is capable of interpreting weather conditions, allowing farmers to gear up in advance for planting crop seeds or saplings.

are becoming increasingly popular.

Artificial intelligence is certainly spreading its tentacles to research and development, and consistently foraying into both private and public sectors. "Feeding of funds, and patronage from government stables

and global partners gave rise to agri-tech startups. However, end-to-end enforcement of AI-led interventions in agricultural network is yet to come in full force," says Navneet Ravikar.

India's Gen-Z is pro AI

Young India comprising millennials and the next-gen represents a pool of brainy talents. This bracket of entre-preneurs and software whizkids is floating start-ups and their fledgling businesses are participating in AI-based agriculture by offering sophis-ticated technologies to solve complex agricultural problems. "Rezo.ai has already collaborated with one of the top agritech companies in impart-ing farmers with relevant facts and figures. Our AI-triggered bots enable farmers to gain knowledge that can be exploited for better harvests," reports Rashi Gupta.

Farmers across the board in India

are trying to warm up to the AI uptake in traditional farming but things take time to happen in phases, admits Aggarwal. "Most farmers are not tech-savvy and therefore, will slowly resort to hi-tech changes in agricul-tural practices. However, the new-age progeny that turned to agriculture as its principal occupation is quickly endorsing various technologies and converting the same into profitable businesses," he emphasizes.

The Government

Shedding light on the Government of India's initiatives for automa-tion objectives, Aggarwal confirms that the administration is actively boosting digital agriculture. and says "Recently, the ruling regime released SOPs (standard operating protocols) on drone applications in the agricul-tural sector. This will enable farmers to use drones for applying agro-

chemicals, thus declining the risk of susceptibility to harmful chemicals. The Digital Agriculture Mission of 2021-2025 by the Union Government launched in 2021, focuses on accel-erating projects based on advanced technologies like AI, blockchain, remote sensing, and the use of drones and robots in agriculture."

Bearing in mind that most Indian farmers hail from a humble eco-nomic background and many in the community still remain unbanked, will it take ages to make the agrarian society absorb this innovative tech-nology? From a universal perspective, technology has always shown the two sides of the same coin as in cost-intensive products (like smart trac-tors and devices) and cost-effective solutions (AI bots), opines Gupta. She is optimistic and adds, "The national government is doling out a host of agricultural grants to farmers via concessions on equipment and infra-structural sops, thereby smoothening the swing to the smart agricultural fold. We perceive that the joint efforts from the government and startups should engineer this modification and put more money in the farmers' pockets."

Cold Chain: A Strong Link in Supply Chain

"With the swelling world population hitting the 8-billion mark, a quarter of which is dependent on small-holder farmers, a threat to food security becomes a prevailing obstacle. The use of artificial intelligence in agricul-ture impels better resource efficiency. This is particularly true for climate-smart deep tech-enabled solutions like Ecotron and Ecofrost," states Vivek Pandey, co-founder and CTO of Ecozen Solutions, a Pune-based climate-smart deep tech startup that develops solutions and core technol-ogy stacks to deliver a sustainable future, including motor controls, IoT and energy storage. Allocating these technology stacks to the agricultural

sector, the company revolutionized cold chains (Ecofrost) and the irrigation industry (Ecotron), thus enormously improving the income of 100,000 plus farmers and generating more than 1 billion units of clean energy (kWh).

Ecozen's solutions reformed the irrigation and cold-chain industries with Ecotron (smart AI and IoT-assisted solar-pumping solution) and Ecofrost (smart AI and IoT-aided solar-powered cold room). With Ecofrost, farmers are empowered to reduce food waste by 15-20%, increase earnings by up to 50% and allow their produce to reach markets valued at more than 10X. This is done by ensuring effective pre-cooling and cold storage of produce at the optimum temperature (4° and above) and relative humidity (65% to 95%) levels, with up to 30 hours of batteryless backup.

Ecotron provides farmers with stable and efficient irrigation, especially in areas with inconsistent or no electricity supply. It helps increase farm yield, reduces operating costs and supplements farmer earnings.

Global AI Mission in Agriculture

Overseas, several countries are clinging to digital tools to springboard the concept of modernized farming. "The AI treatment of agriculture is a tailwind to the whole global economy. According to the United Nations' prediction data on population and hunger, the world's population will increase by two billion within 2050, requiring a 60 per cent jump in food production to feed the total headcount. AI and ML can help narrow this gulf between food stock and the anticipated demand for sustenance to feed additional mouths," says Srijan Pal Singh, founder and CEO, Homi Lab. An IIM Ahmedabad alumnus and the co-author of the title Reignited With Dr. Kalam, Singh was the former advisor on policy and technology to Dr. A.P.J. Abdul Kalam, the 11th President of India.

Understanding these factors, a number of countries around the world took leaps in mingling AI with their agriculture, including developed nations like USA and the Western European countries like UK, Germany, France, Spain, among others. But there are other nations as well in this herd, especially those with huge population bases. While China and Singapore are leading the way in Asia, Iran has plans set for digital agriculture in the next couple of years. Closer home, India too is not lagging in giving a shot at sustainable farming.

Asia Pacific is the fastest-growing belt in the digital agriculture market. Skyrocketing modernization in the agriculture industry renders an impetus to this growth. The region is dominated by agriculture-dependent countries, such as India, China and Bangladesh. China already made significant investments in its agricultural industry using technologies like AI farming, sensors, drones and auto-steering to scale up efficiency and productivity.

Avant-Garde Techniques

Due to space crunch and the rise in pollution levels, experimentation finds its way through the avenues of agriculture. The science of hydroponics is adopted in many urban areas through terrace, balcony, and tank farming on the surface of gravel, sand and liquid (mainly water) with added nutrients and without soil. Plus, vertical gardens are grown on the walls and building facades, while grassy tops are added to the flat roofs of moving cabs for fresh air and adequate green cover. Even veggies are being sprouted at the International Space Station farming lab.

The confluence of mathematical models and nature makes a perfect combo. After all, every plant depends on land, air, light, water and soil or any alternative nourishing medium for growth. Using these major variables and their sub-variables like heat, acidity level, water quality etc., multiple models for predicting the plant traits can be made and managed. The hardware setup used in AI-driven hydroponic vertical gardens typically includes sensors that collect data on the plants' vital parameters, such as pH levels (acidity level) and nutrient supply. These sensors are placed near the plant roots and can also detect light density, temperature and humidity levels.

A visual camera can also be used to monitor the plants for any changes in coloration. The data collected by the sensors is then fed into an AI software tool, which uses machine-learning algorithms to analyze the info and lend insights into the plants' urgent needs.

AI can also prove to be advantageous to hybrid farming by pairing up two ideal plants to produce the best traits in the resultant sapling. Machine learning as part of AI to be specific has been deft to date in identifying different zones in the plant's DNA. It can predict the location of genome crossovers. These are the regions where genetic material is exchanged between the paternal and maternal genomes. "By specifically targeting these areas, new hybrid varieties can be produced with the intended features. For instance, a recent study in Brazil showed that AI can create different varieties of sugarcane and forage, and even predict their performances. In terms of accuracy compared with habitual breeding techniques, the proposed methodology improved predictive powers by more than 50%," says Singh.

AI-powered agriculture is an exciting future for India, and it's going to be surreal to see drones and self-driving tractors in our farmlands. What a sight that will be, right? ∎

–The story appeared first in Digit, a sister publication of CIO&Leader.

ChatGPT Reignites Web-Search Wars

Microsoft and Google are locked in an intense competition to become the market leader in AI-powered search

By Jatinder Singh

T

The new kid on the block, ChatGPT, has swept the internet with its cutting-edge features that allow users to receive answers to almost anything that comes to their mind. The AI-powered tool has reportedly attracted more than 100 million users so far. Many people have seen ChatGPT as the first real threat to the long-standing dominance of Google in the web search market.

The Open-AI project, ChatGPT, has rekindled the web-search battles of the late 1990s and early 2000s, when Yahoo was far ahead of the curve and Microsoft and Google were competing for dominance in the web-search business.

During the last few years, Microsoft has quietly invested billions in OpenAI, the firm that created the ChatGPT. The software behemoth recently announced an improved version of its Bing search engine, powered by ChatGPT technology to help users resolve their complex queries at a breakneck speed.

The ChatGPT can respond to a wide range of queries and can even create an in-depth essay on just about any subject you can think of. The technology leverages the vast amounts of data it was trained on to identify certain patterns and make intelligent interpretations. This data is based on online data and through well-certified data sets.

A new opportunity

ChatGPT is Microsoft's renewed opportunity to improve its search capabilities and exact revenge for the setback in the online search domain. For many years, Google has been dominating the market for online search engines. According to Statista, Google, one of the world's largest companies by market value, has a share of about 84% of the search engine market as of December 2022, with Microsoft's Bing coming in second with a share of just over 9%.

According to analysts, given the potential of AI to mature at a very rapid pace, Microsoft can leverage ChatGPT to secure an advantage that has eluded it so far.

"ChatGPT has certainly evolved into a credible prototype of what may be termed as an interactive search-and-query engine. However, there is still quite a way to go. The ultimate maturity and success will be a function of not just the AI algorithm but also the search algorithm lying underneath. It is therefore a domain that Google is eyeing quite keenly," says Deepak Kumar, Founder Analyst at BMNxt.

Google too has realized the threat and rolled out its answer to ChatGPT this week, called Bard, to further enhance the user experience deliver better results. The conversational chatbot is currently under testing phase and is built using Google's own LaMDA language model.

"While Microsoft is reportedly planning to incorporate ChatGPT functionality into its Bing search engine, Google teams too are working toward fasttracking development of similar AI product," Kumar says.

Competition is intensifying

ChatGPT is undoubtedly a groundbreaking invention, but it is also true that the product is still in its infancy. As a result, Google and likely a number of other companies still have time to outdo ChatGPT by using their expertise to make the game even more engaging. Nevertheless, the market is about to witness some intriguing competition between the two large tech behemoths after a long period of time. Anyone picking one of the two as the winner at this point would be being naive ∎

The Open-AI project, ChatGPT, has rekindled the web-search battles of the late 1990s and early 2000s, when Yahoo was far ahead of the curve and Microsoft and Google were competing for dominance in the web-search business.

INSIGHT

3 Common Myths Of DDoS Protection And Current Best Practices

Legacy protection measures may be inadequate to secure organizations from modern-day DDoS attacks, thereby putting businesses at risk.

By Vinay Sharma

D

Distributed Denial of Service (DDoS) attacks have been around for over 20 years, and due to that, most organizations have some form of protection in place from DDoS attacks. However, legacy protection measures may be inadequate to secure organizations from modern-day DDoS attacks, thereby putting businesses at risk.

The latest DDoS Threat Intelligence Report from NETSCOUT captures several trends such as adaptive DDoS, direct-path TCP-based DDoS, the proliferation of botnets, sociopolitical fallout, and collateral damage. All these trends have a common aspect which is they are designed to evade common DDoS defense measures and cause severe harm. Only a well-designed network with intelligent DDoS mitigation systems can prevent DDoS attacks to succeed. However, for many organizations, common myths can lead to poor choices and overconfidence when it comes to properly architecting a solution.

Myth #1: DDoS cannot be stopped or they don't target all organizations

Many organizations are convinced that DDoS is either impossible to stop or simply isn't going to target them.

This is like the notion that natural disasters either don't exist in your location or can't be mitigated, which simply isn't true.

In places where disasters are common, communities take a more aggressive approach to building more resilient structures and learn from past events how to improve future defenses. In areas rarely affected, they learn and take design cues for improvements. In the same way, the best practices for DDoS defenses are well understood and can be implemented by any organization with the foresight to do so.

Myth #2: Firewalls can effectively mitigate DDOS attacks

Firewalls are an essential part of any security stack. They play a critical role as a traffic cop on the network, stopping unwanted traffic based on predetermined information such as source and destination, port, and protocol. But although firewalls can stop much unknown and unwanted traffic, they cannot easily detect malicious traffic traversing trusted protocols and ports such as HTTP/S, DNS, or IMAP. Furthermore, web application firewalls are commonly deployed to stop application-layer DDoS, but they don't even inspect traffic that isn't web-based and, therefore, can't see the majority of DDoS attack traffic.

Amongst others, one of the common DDOS attacks is state exhaustion. This attack vector targets the state limitation of security devices e.g. connection per second. Stateful Firewalls are

vulnerable to state exhaustion attacks and hence are not ideal for DDOS protection.

While firewalls can mitigate some types of DDoS, they are also often vulnerable targets that contribute to the network outage or failure. As such, they need to be protected by a stateless, purpose-built DDoS solution.

Myth #3: CDNs effectively mitigate DDoS attacks

Content delivery networks (CDNs) are designed to massively distribute (mostly web) content, placing it as close to the end user to improve performance, reliability, and latency, among other benefits. In fact, part of the design is intended to weather these surges, whether benign (such as vendor patch or OS upgrade distributions) or malicious (such as DDoS attack traffic). CDNs can be quite effective at mitigating DDoS when resources within their infrastructure are the target. Unfortunately, they provide only part of the solution. Although many DDoS attacks target web resources and applications, the majority do not, making organizations relying on CDN-based DDoS protection still vulnerable to most DDoS vectors.

Applications and services not delivered via the CDN remain vulnerable and need to be protected by a stateless, purpose-built DDoS solution.

Current Best Practice for DDoS Mitigation

The broadly accepted best practice for DDoS mitigation is a layered, defense-in-depth approach. Another layer of protection can be provided by a real-time feed of highly curated DDoS threat intelligence. This final layer ensures the solution is always ready for the latest evolving threat vectors and enables an automated response to instantly react to DDoS threats ∎

—Vinay Sharma, Regional Director, India and SAARC, NETSCOUT

Only a well-designed network with intelligent DDoS mitigation systems can prevent DDoS attacks to succeed. However, for many organizations, common myths can lead to poor choices and overconfidence when it comes to properly architecting a solution.

Beyond Survival To Thriving In The Post-COVID-19 World
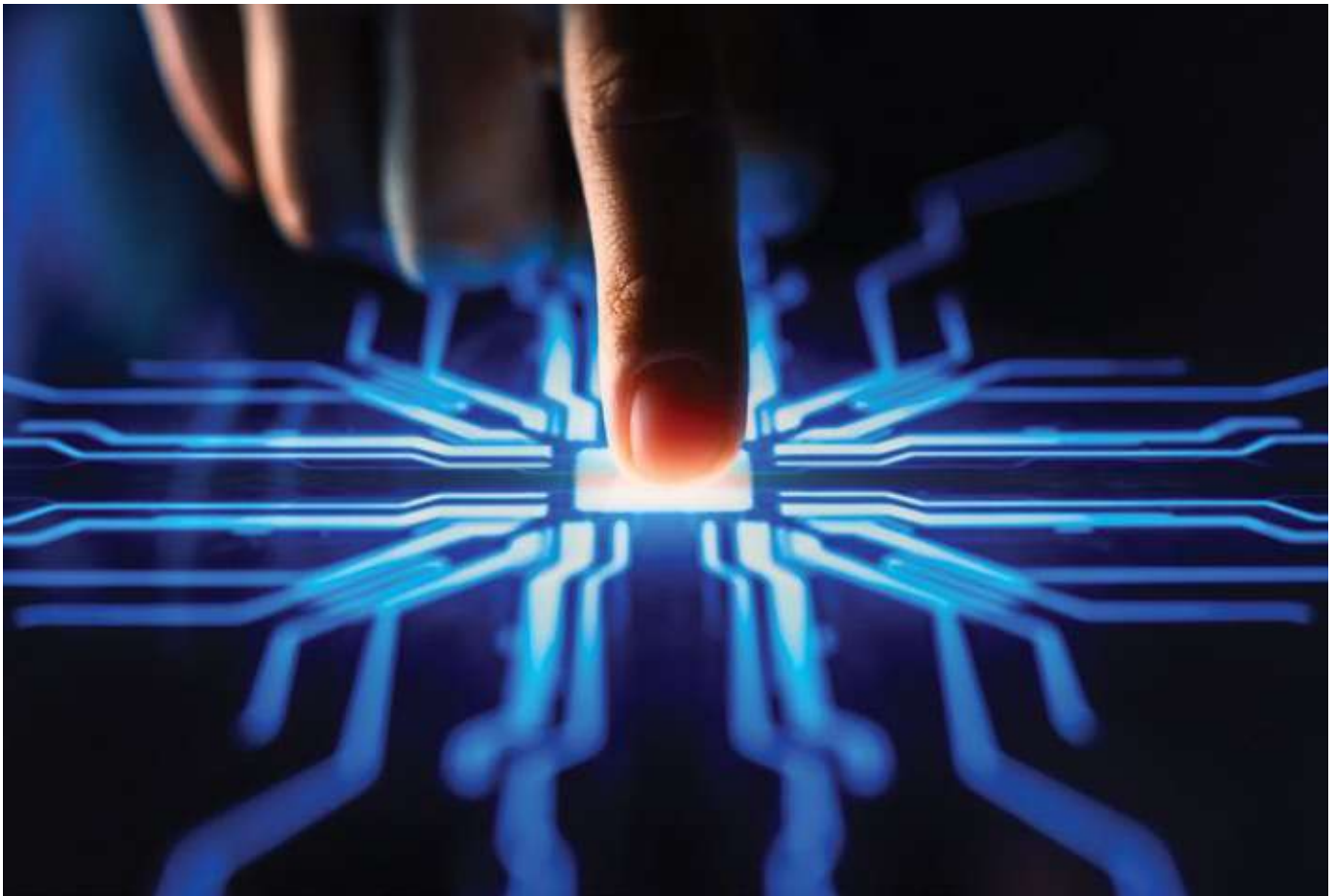
To propel the next stage of innovation, enterprises must leverage scalable and sustainable digital technologies effectively.

By Dr Karippur Nanda Kumar

While many enterprises have embraced digital technologies to survive the last three years, enterprises across all sectors are facing even more challenges in the post-pandemic world such as economic uncertainty, fierce global competition from online players, supply chain constraints that require dynamic handling of partners, higher costs of customer acquisition and increasing focus on sustainability.

A top priority for the leader in today's world hence is the need to accurately sense the changes in their environment in the post-pandemic world, including potential shifts in technology, competition, and customers, and then determine the strategic areas for the next phase of innovation. The pandemic and the ongoing war have brought an imbalance in the demand and supply of goods and services and there is a compelling need for companies to embrace technology-led supply chain management solutions to proactively handle these challenges. Hybrid work models that were initially experimented with during the pandemic are likely to stay and enterprises need to invest in a wide range of technologies that enable agile ways of working, increase workforce productivity, and enhance employee satisfaction.

Digital-driven new opportunities

The pandemic era has opened wholly new opportunities for enterprises to embrace digital technologies for business model innovation. Leaders such as CIOs traditionally were tasked to focus on automating and improving the processes of an existing business. Today, enterprise leaders require the ability to challenge assumptions of the past and reimagine and reinvent that business itself. Enterprise leaders'

ability to co-create and drive an enterprise digital vision that is clear and meaningful for the post-pandemic era is critical. Leaders need to focus on a range of organizational areas for innovation such as diversifying business models through meaningful partnerships and adopting new digital platforms for better integration with business value chain partners and to achieve sustainability goals.

Another important area is to capitalize on artificial intelligence and data analytics to sense new customer-centric trends and enhance data-driven decision-making. As per IDC, 75% of large Asia Pacific enterprises will rely on AI-infused processes to enhance asset efficiency, streamline supply chains, and improve product quality across diverse and distributed environments by 2026. Traditionally, research and development and testing ideas were expensive and done by a few in the organization in isolation.

Today, digital technologies enable experimentation and continuous testing through technologies ranging from predictive analytics to simulation to 3D printing which was inconceivable in the past. Such prototypes can be built rapidly at a fractional cost and ideas tested quickly with end-user communities. Technologies such as the digital twin, which is a virtual representation of a physical system enable more affordable and effective research and design of products, with a lot of insights created about the likely performance outcomes.

## Balancing innovation with governance

Enterprise leaders need to be natural collaborators who proactively connect with stakeholders and partners for innovative digital business ideas and opportunities. Allowing the employees to generate their ideas by establishing cross-functional teams and fostering digital innovation is equally important. Leaders should take risks in this context and be smart about managing

risks and open the door to new possibilities, new markets, and new partnerships. To facilitate such collaboration effectively across an enterprise, there is a need to balance innovation with good governance.

Digital governance plays an important role in supporting organizational change, enabling collaborative communications across organizational boundaries, and building a shared digital decision-making culture of an organization. Governing this transformation requires leaders to determine the issues and challenges relating to the identification, prioritization, and implementation of new digital projects, and stipulate new policies and roles within and outside the organizations to manage these projects effectively. Enterprises hence need to put in place plans to equip leaders with the judgment and skills to make ethical decisions in complex business situations, by understanding and demonstrating the sound business principles, needs, and goals of different stakeholders and various government regulations.

Successful digital transformation requires new leadership practices to drive innovation, engage employees and transform the organization. Enterprises need to find, nurture, and retain leaders and senior managers with the right leadership attributes and digital skillsets. Training organizations could play a critical role here. For example, business schools across the Asia Pacific should accelerate collaborations with industry to align curriculum with the needs of the post-pandemic world and undertake more enterprise transformation projects and industry internships giving opportunity for students to enhance their leadership attributes and develop relevant practices for the future workplace ■

—The author works as Professor of Information Technology at SP Jain School of Global Management, Singapore.
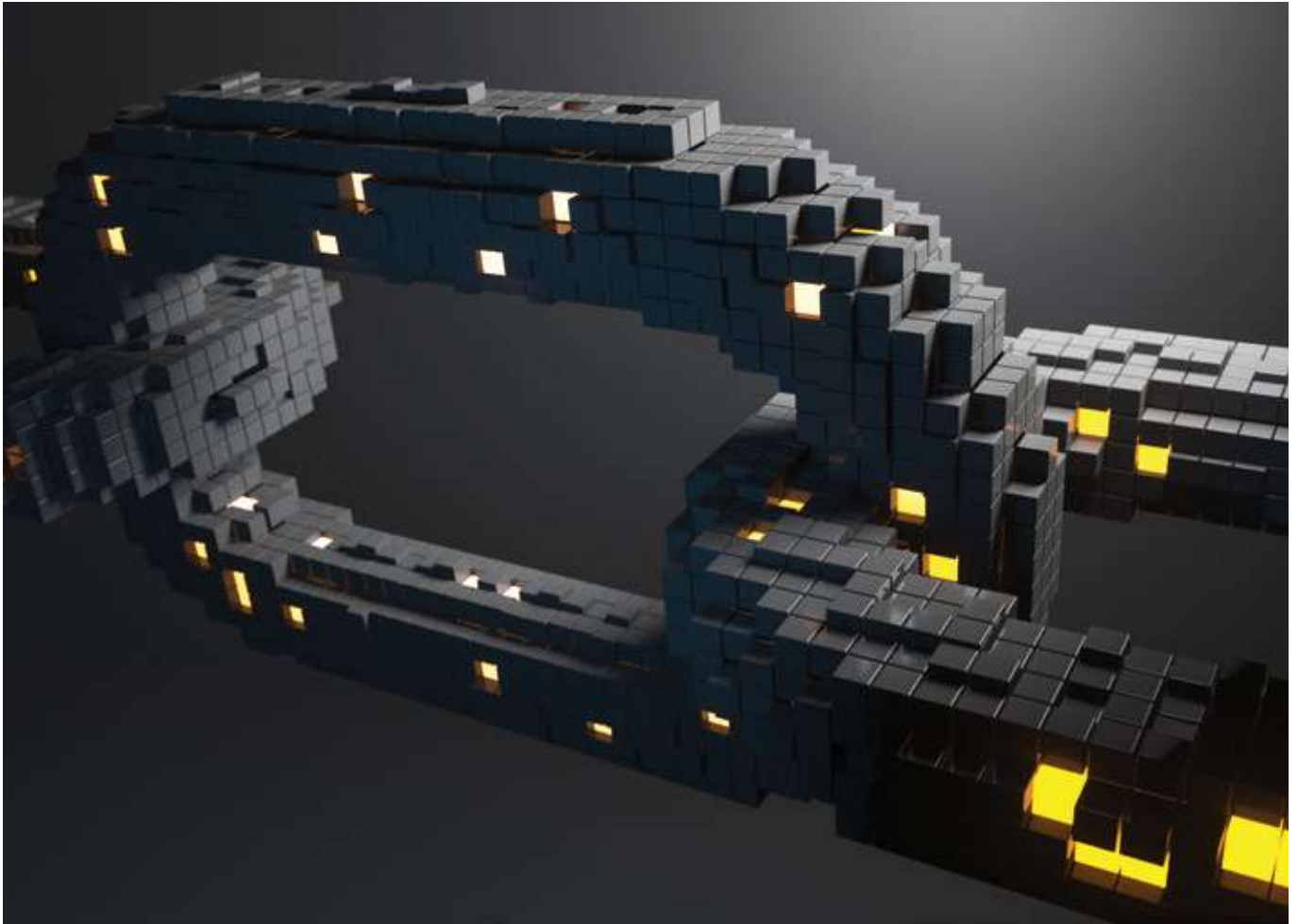
Blockchain: The Next Tech Disrupting The Healthcare Industry

There are multiple aspects of Blockchain ascertaining its prominent role in transforming the healthcare sector.

By Ramalatha Marimuthu

B

Blockchain has captivated enormous interest from experts, technocrats, and researchers across fields since the technology originated. A digitally secure algorithm-based technology, Blockchain is highly effective for eliminating the risk of threats of intermediaries, especially for intense data-driven industries like healthcare, where multiple stakeholders must come together from various parts of the business.

The digital acceleration and the rapid adoption of new-age technologies led by the pandemic has altered our code of conduct – especially with social distancing making customers adapt to online purchases and services and further propelling the business models to change from traditional face-to-face to phygital models, which combine digital tools and strong customer relationships. Correspondingly, the pandemic made it imperative for the healthcare industry to leverage new tech to assess health information better, capture it by various healthcare providers and improve areas such as tracking and identifying fraud in the payer manage-

ment cycle and drug supply chain. Governments across the world have started to invest heavily to upgrade to this infrastructure. Blockchain equips the healthcare industry by enabling transformed, efficient, and secure electronic medical records. According to reports, the Global Blockchain in the Healthcare market is expected to reach USD 1189.8 Million by 2028.

There are multiple aspects of Blockchain ascertaining its prominent role in transforming the healthcare sector. With concerns around data privacy and security, conventional health record systems have become redundant thanks to a lack of intelligent integration capability. Today, there is an emerging need for healthcare providers to use multiple health technology systems to manage patient records, bring in connectivity and integration, and eliminate transparency challenges.

To avoid challenges like a lack of seamless infrastructure, secure patient health record sharing mechanisms, reduced health outcomes, and other operational efficiencies, healthcare providers now seek a cost-effective health record platform for patients to help connect fragmented data efficiently. The idea is for this cohesive data to result in accountable patient care. Blockchain technology has come into existence at the right time to meet these growing needs without compromise. It is rapidly becoming a technology that offers significant value to the connected health ecosystem.

Along with shortening the time for locating patient records, Blockchain also reduces the time for providing permission-based access. Thus, Healthcare institutions can focus on the patient's requirements and line of treatment without being concerned about tedious administrative formalities. While many exciting and creative blockchain solutions have emerged from pioneering companies worldwide, this is just the beginning, and there is much more in store. With great potential in the healthcare ecosystem, Blockchain technology can solve major issues with its features and properties ∎

—The author is a Senior IEEE Member

To avoid challenges like a lack of seamless infrastructure, secure patient health record sharing mechanisms, reduced health outcomes, and other operational efficiencies, healthcare providers now seek a cost-effective health record platform

Information Security: Four Areas To Prioritize For Tech Leaders In 2023

Since the science behind making information breach-proof is constantly evolving, businesses must stay up-to-date to carry out smooth functions.

By CIO&Leader

What's the one key feature that every successful business has in common? They manage and secure their data to get the optimum results. But despite steady attempts at making data and information more secure, there are gaps in the cybersecurity landscape. Although businesses have prioritized information security in the past, not enough is done to seal the visible gaps completely. As a result, effectively protecting the confidentiality and integrity of information is paramount for every organization dealing with big data. Since the science behind making information breach-proof is constantly evolving, businesses must stay up-to-date to carry out smooth functions.

The Challenge of Information Security Today

The challenge to make data more secure has become quite personal in every organization as technology continues to shift and evolve drastically. Myriad quality protection tools have surfaced throughout the years to ensure better management and protection of user data. However, despite the sky-high requirement for security automation, the complex tool landscape has made "a water-tight information security landscape"

a far-fetched possibility. Moreover, the shortage of quality data security professionals has made the challenge of information security even more glaring for businesses and organizations alike.

Four areas to prioritize in 2023

Information security is an indispensable part of business management, essential for the security and scalability of the business. The scope for implementing a robust information security plan is huge. However, if you already have your data security ball rolling, here are the major 4 areas CISOs must prioritize in 2023 to level up their game.

Hiring among layoffs: Layoffs have become common across industries, with the recession officially dictating the job market. Layoffs are, however, a boon when it comes to the opportunity to hire top talents at a reasonable cost to the company. International hiring with regard to cybersecurity specialists can help CISOs hire some of the more sought-after talents, which are hard to find locally.

More Focus on TCO: In 2023, more focus shall be laid on acquiring cybersecurity products but with careful consideration of the total cost of

The challenge to make data more secure has become quite personal in every organization as technology continues to shift and evolve drastically.

ownership (TCO), including the cost of operations, deployment and maintenance. Value-seeking in terms of such products is sure to add the most value to the information security ecosystem in the organization.

Optimizing Cloud Infrastructure

Cloud is the future of cybersecurity. Organizations and CISOs can foster a cost-effective cybersecurity infrastructure by moving to the cloud. Nonetheless, choosing a cloud infrastructure must be done only after carefully considering the cost, vulnerabilities and potential weaknesses. Moreover, the security of the cloud operations must be ensured by implementing access control and strong authentication.

Embracing automation for information security: The focus will be laid more on prioritizing the implementation of automation for cybersecurity measures in 2023. A risk-first approach and security automation products for streamlining the cybersecurity process can help teams take vulnerability management head-on while making compliance checks easier. It will also reduce human errors and boost the efficiency of cybersecurity teams.

Conclusion

Information security can be a bit difficult to manage, but the key is to be consistent with the effort at streamlining the process. With a focus on the abovementioned key areas, the information security ecosystem can be expected to be strengthened better in 2023 ∎

—The article has been compiled by Scrut Automation, a risk focused compliance automation platform

Maximizing The Benefits Of Hybrid Cloud Adoption: Best Practices For IT Leaders

The journey toward a successful hybrid cloud adoption can be complex, and organizations must plan and execute their strategy with care.

By Kanishk Gaur

T

The adoption of hybrid cloud has become increasingly popular among organizations seeking to balance the benefits of public and private cloud computing. This solution offers organizations cost-effectiveness, scalability, and security while leveraging a mix of on-premises infrastructure and cloud services. However, the journey toward a successful hybrid cloud adoption can be complex, and organizations must plan and execute their strategy with care.

Here are some key insights and best practices for Global CIOs, CDOs, CTOs, and CISOs to help them maximize business value with secure and efficient hybrid cloud adoption.

Define your cloud strategy

The first step in adopting a hybrid cloud environment is understanding the organization's specific business requirements, including data sovereignty, regulatory compliance, and security needs. This information should be used to formulate a cloud strategy that aligns with the company's overall IT goals and objectives. Organizations must determine their long-term cloud goals and objectives, including their target state for the hybrid cloud environment, their desired level of cloud adoption, and the timeline for their transition.

Assess your current infrastructure

Before adopting a hybrid cloud environment, it is important to assess your current infrastructure to determine its compatibility. This includes evaluating existing hardware, software, and network components to ensure they can support the new environment. Organizations should also assess their current processes, applications, and data management practices to ensure they are prepared for the hybrid cloud environment.

Choose the right cloud providers

Organizations should carefully select cloud providers based on their specific needs, including security, compliance, and cost-effectiveness. It is important to consider the provider's reputation, track record, and ability to meet the company's specific requirements. It is also crucial to understand the cloud provider's service level agreements (SLAs) and security certifications, such as SOC 2, ISO 27001, and PCI DSS, to ensure that the provider meets the organization's security and compliance needs.

Develop a comprehensive security strategy

Security is a critical consideration when adopting a hybrid cloud environment, and organizations should develop a comprehensive security strategy covering all environmental aspects, including data protection, access control, and incident response. Best practices for security include implementing multi-factor authentication, encryption, and continuous monitoring and response. Organizations should also have a clear understanding of their cloud provider's security measures and should consider implementing a security-focused cloud management platform to monitor and manage security across the hybrid cloud environment.

Plan for data management

Data management is another critical consideration for organizations adopting a hybrid cloud environment. Companies should plan for the secure transfer of data between the cloud and on-premises systems, as well as the backup and recovery of data in the event of an outage or data loss. Organizations should also ensure they have a robust data management plan in place, including a clear understanding of their data retention policies, data classification systems, and data backup and recovery processes.

Implement a robust monitoring and management system

A robust monitoring and management system is essential for organizations to ensure the effective operation of their hybrid cloud environment. This includes continuously monitoring system performance and identifying and resolving any issues that may arise quickly. Organizations should consider implementing a cloud management platform to provide a centralized view of their hybrid cl automate resource deployment, management, and monitoring of resources.

Provide adequate training for staff

Finally, it is important to provide adequate staff training to ensure they are fully equipped to manage and maintain the hybrid cloud environment. This includes training on the specific tools and technologies used in the environment and best practices for security, data management, and monitoring.

Hence the Hybrid Cloud offers organizations a flexible, cost-effective solution for their computing needs. However, it is essential to carefully plan and execute the adoption of this environment to ensure that it meets the company's specific requirements and provides the desired benefits. By following these best practices, organizations can effectively adopt and manage the Hybrid Cloud, improving their overall IT capabilities and staying ahead in the digital race ∎

—Kanishk Gaur is a renowned Cyber Security, Public Policy, Government Affairs Specialist, and Digital Technology Expert based out of New Delhi.

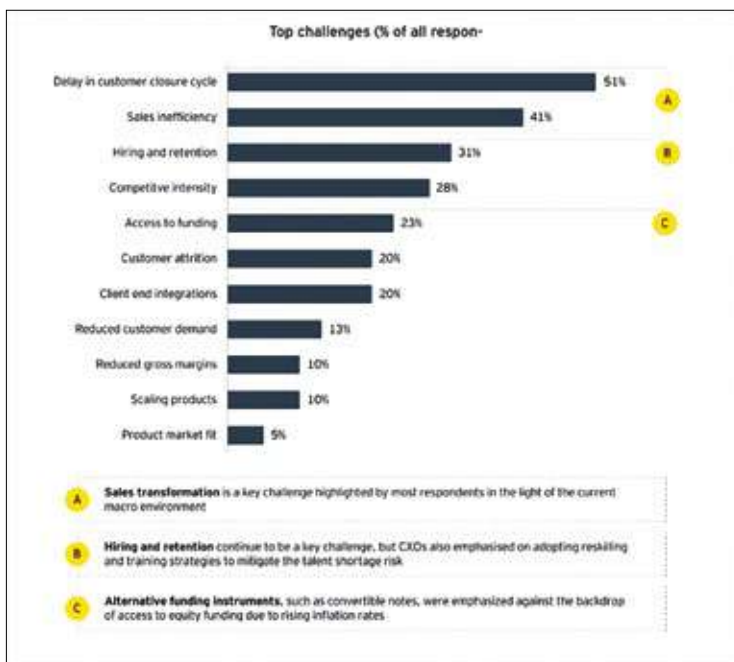# Talent Management, Tech Transformation Key Challenges For Indian B2B SaaS: EY

Indian B2B SaaS industry continues to have a bullish outlook for 2023 despite global headwinds.

By CIO&Leader

Indian B2B SaaS is targeting a positive growth for 2023 despite some weakening macro-economic trends. Yet, they are dealing with issues such as slow client closure cycles, ineffective sales practic-

es, and difficulty in finding and retaining top talent, all of which are holding back their growth, according to a recent survey report titled Bellwethers of Indian SaaS unveiled by EY and Upekkha Value SaaS Accelerator. The report reveals that Indian B2B SaaS industry continues to have a bullish outlook for 2023 despite global headwinds. It states that Indian SaaS growth is highly capital-efficient by default across stages and remains largely unmoved by recessionary trends of the past year.

The report highlights that with expected economic recovery in H2'2023 and availability of dry powder within the SaaS focused Indian VCs/PEs ecosystem, funding activity is expected to gain traction. This presents an opportunity for Indian SaaS companies with demonstrated profitability to raise capital at favourable terms and double down on growth. The survey's results also show that as businesses grow larger, they are switching from sales-centric growth to product-centric growth. Growth that is capital efficient is, nevertheless, being hampered by certain challenges. Delay in the client closing cycle and sales inefficiency are two of the biggest problems. Given the current macro environment, the majority of respondents emphasised sales transformation as a crucial difficulty in this situation.

Top challenges (% of all respon-

Challenge	%
Delay in customer closure cycle	51%
Sales inefficiency	41%
Hiring and retention	31%
Competitive intensity	28%
Access to funding	23%
Customer attrition	20%
Client end integrations	20%
Reduced customer demand	13%
Reduced gross margins	10%
Scaling products	10%
Product market fit	5%

A **Sales transformation** is a key challenge highlighted by most respondents in the light of the current macro environment

B **Hiring and retention** continue to be a key challenge, but CXOs also emphasised on adopting reskilling and training strategies to mitigate the talent shortage risk

C **Alternative funding instruments**, such as convertible notes, were emphasized against the backdrop of access to equity funding due to rising inflation rates

Source: EY

Hiring and retention continue to be a key challenge, but CXOs also emphasised on adopting reskilling and training strategies to mitigate the talent shortage risk.

The report also explores the current state of Indian B2B SaaS through the lens of performance metrics, growth strategies and challenges impacting businesses.

Top strategic priorities, challenges and shifts for India B2B SaaS

60% of company CXOs reported product innovation, pricing changes and partner-led expansion as their top strategic priorities. Top challenge inhibiting growth was 'delay in customer closure cycle' for 51% CXOs, whereas and sales inefficiency came next for 41%+ CXOs.

Hiring and retention continue to be a key challenge, but CXOs also emphasised on adopting reskilling and training strategies to mitigate the talent shortage risk. Alternative funding instruments, such as convertible notes, were emphasized against the backdrop of access to equity funding due to rising inflation rates.

The report further identifies that 1 out of 3 Indian SaaS companies are Trailblazers with very low burn multiple (less than 1x) and ultra or hyper growth targets (greater than 50% ARR growth target). Trailblazers adopt deep focus on product innovation to win niche market opportunities and rely on low-cost customer acquisition process ∎

Form IV
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	(b) If a foreigner, the country of origin Address	N/A C-144, Sarvodaya Enclave, New Delhi-110017
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6.	Name & Addresses of individuals who own the news paper and partners or shareholders holding more than one percent of the total capital	1. Dr. Pramath Raj Sinha, N-154, Panchsheel Park, New Delhi, 110024 2. Mr. Asheesh Kumar Gupta, 103, Tower II, The Palms, South City-1, Gurgaon-122001 3. Mr. Vikas Gupta, C-5/10, Safarjung Developement Area, New Delhi-110016 4. Ms. Anuradha Das Mathur, C-144, Sarvodaya Enclave, New Delhi-110017 5. Ms. Maumita Ghosh, BH-44, Sector-II, Salt lake City, Kolkata 700091 And Others

I, Anuradha Das Mathur, hereby declare that the particulars given above are true to best of my knowledge.

Dated : March 1, 2023

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