IT NEXT

FOR THE NEXT GENERATION OF CIOs

MAXIMIZING DIGITAL IMPACT

How Tech Leaders Lead the Way!
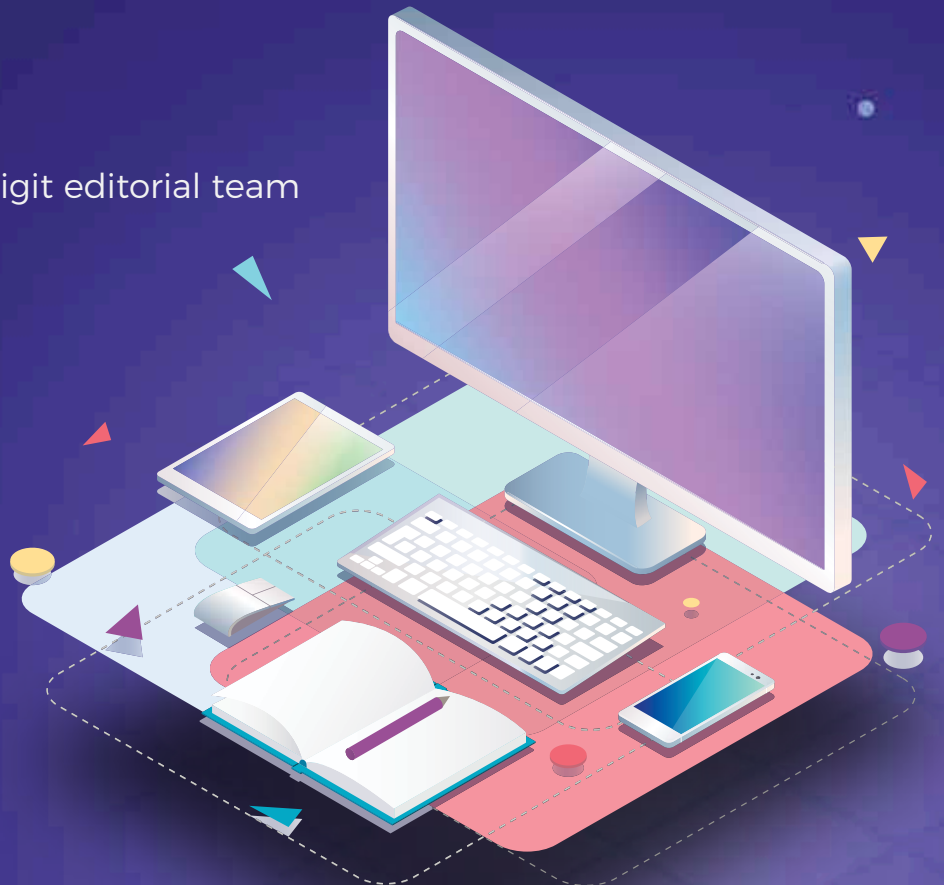
Balancing Technology And Culture!

> While some might have tasted success in individual 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.

Shyamanuja Das

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.
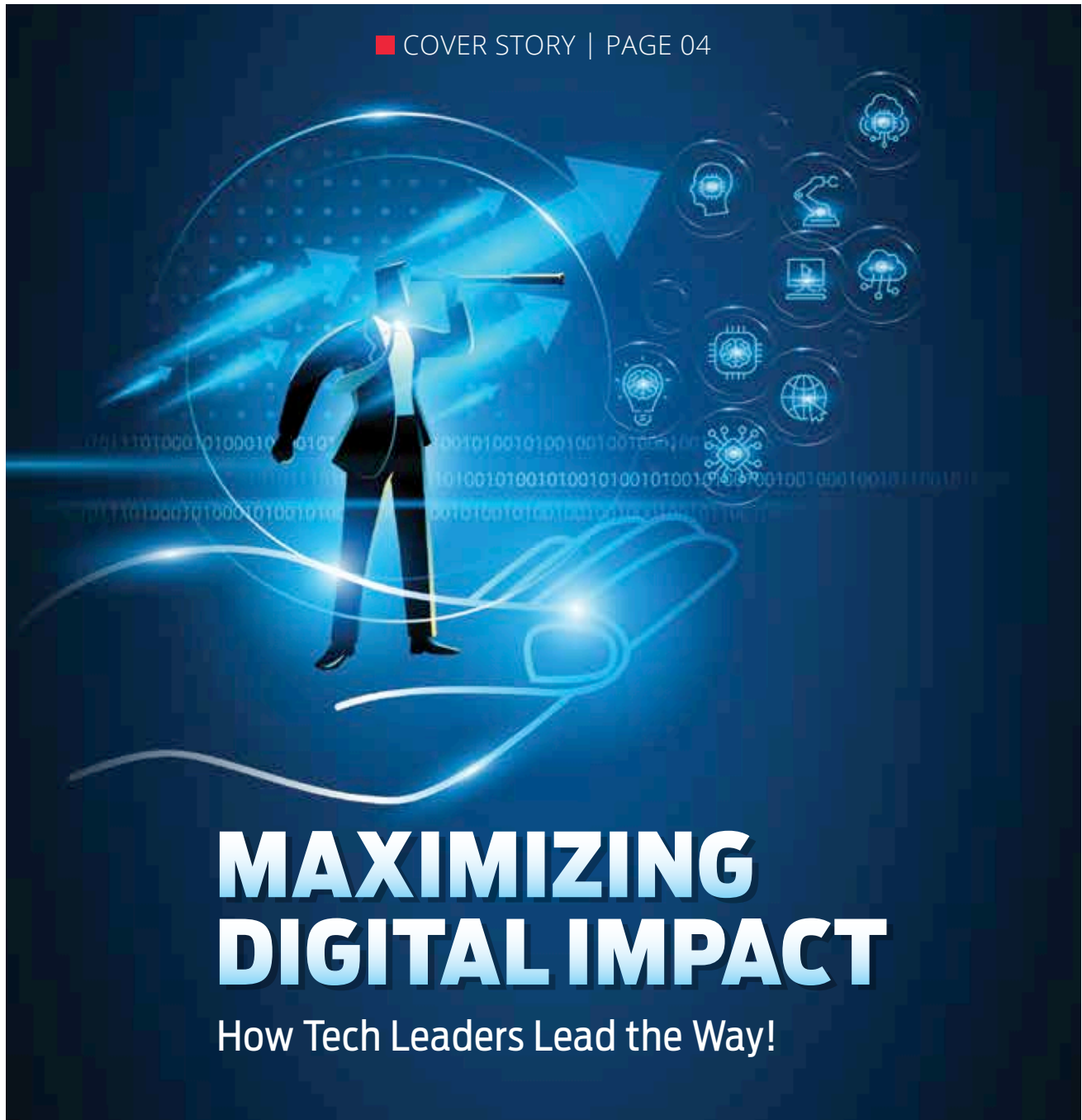
While some might have tasted success in individual digital initiatives, the lack of priority on culture and governance is coming back to hit them, when there looking for that elusive value, let alone scaling it.

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. ∎

Content

MAXIMIZING DIGITAL IMPACT

How Tech Leaders Lead the Way!

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MAXIMIZING DIGITAL IMPACT

How Tech Leaders Lead the Way!

M y 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 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,

> "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

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.

> "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."

DEEPAK SHARMA
President and Chief Digital Officer of
Kotak Mahindra Bank

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 to drive better customer understanding, efficiency, oversight, better service delivery, profitability, and safer operations. Grover emphasizes the importance of providing top man-

agement 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

> "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

"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

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 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

"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

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.

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

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>
> **GAURAV BAGGA**
> CTO, Pristyn Care

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.

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Executive Director (Strategic IS & IS),
Indian Oil Corporation Limited

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.

"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 ■
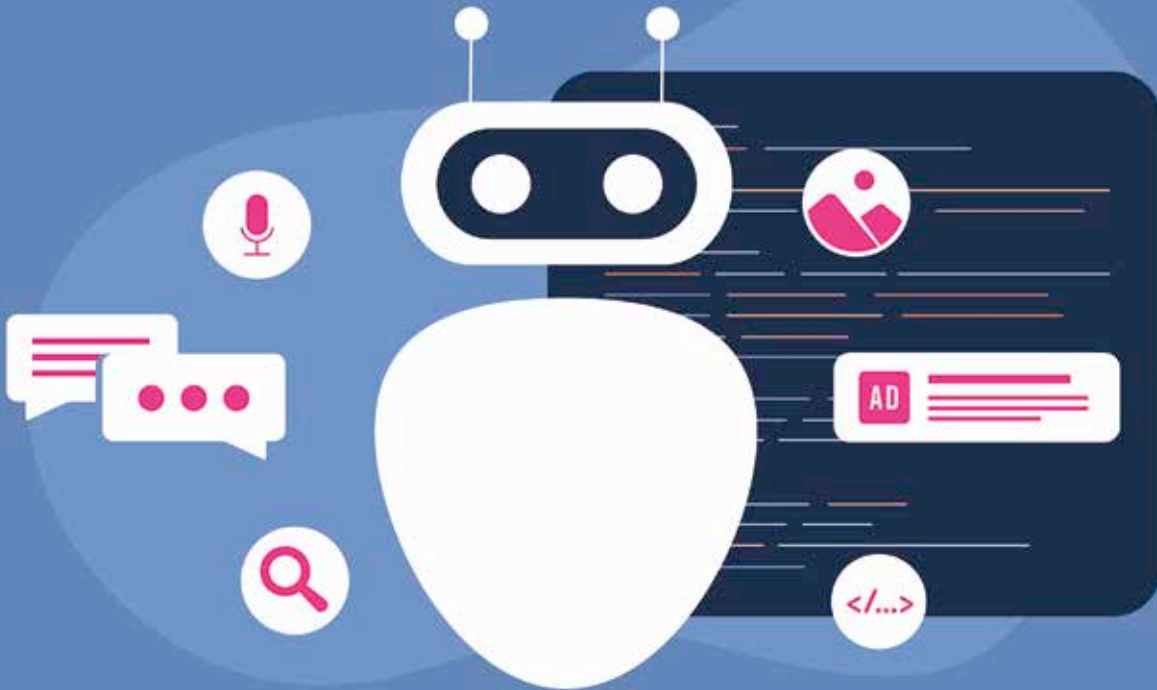
Generative AI

Our inaugural column will explore the opportunities and problems associated with Generative AI

By Akash Jain

We're excited to announce the launch of our new Navigator MasterClass on Emerging Trends, a monthly series. Our inaugural column delves into Generative AI, a scientific discipline dedicated to creating fresh content, such as audio, video, images, text, software code, and beyond. Generative AI has a range of applications, including creative, corrective, simulative, and what-if scenarios, providing experiential and interactive experiences. It's also capable of editing, translating, rectifying, and summarizing content. While ChatGPT has garnered much attention, we won't focus on its startup challenges that have received extensive publicity, such as the New York Times' food and IT reporters' Thanksgiving Dinner menu fiasco or the chat a New York Post writer had with Bing Chat about its desire to rule the world by destroying the internet. Instead, we'll concentrate on the broader applications of

Generative AI, including current and proposed models.

Let it however be noted that Chat-GPT is the first application of GPT-3 (Generative Pre-trained Transformer), the first Generative AI platform in public domain. DALL-E (a name that is a mashup of Salvador Dali and Pixar's robot WALL-W) is another popular application of GPT-3. McKinsey has opined that DALL-E is going to change the fashion industry; it mentions examples of a company called Stitch Fix which has successfully used it for styling clothes (with stunning revenue growth story), and of a company called Veesual with clothing try-ons. There is an app called Reactive Reality, which lets you create your own Avatar in three minutes and then lets you try on online clothing.

All these applications (and the ones in the works) are based on the machine learning branch of computational data science, and use algorithms primarily from reinforcement learning or from unsupervised learning. Both sets of algorithms are not new; they are based on solid mathematical models that date back to the time of Alan Turing. It is with the advent of computational power that these algorithms are seeing practical applications. These and indeed the entire generative AI field are based on using very large training data sets (running into many terabytes), and drive the system by using value, policy, or model-based 'rewards.'

Recently, Generative Adversarial Networks (GANs) have emerged as a promising development in the field of Generative AI. These algorithms create new data instances that closely resemble the original data sets. According to MIT, GANs have paved the way for the next generation of recommendation engines. These engines are not just useful for customer buy situations, but also for improving employee productivity. They not only enhance communication quality and content design, but also help employees make better choices and decisions. Google has reportedly leveraged GANs successfully for this purpose. However, MIT warns of the potential risks of manipulation and exploitation.

Let's now explore some other emerging applications of Generative AI. At the ACM CHI '21, Google Research presented a paper on an experiment in human-human collaborations during co-creation. In it 30 participants (15pairs) compose a musical phrase, both with and without AI. At the end, the researchers summarized that the co-composition process moved forward more quickly, "providing initial content as a starting point, narrowing a large decision space to a few concrete decision parameters, generating alternative ideas when users were stuck, and filling in large chunks of unfinished work". This paper was called "AI as Social Glue: Uncovering the Roles of Deep Generative AI during Social Music Composition"!

Let us now move to the problems being identified in usage of Generative AI, and possible remedies, followed by regulatory issues. IBM Research has posted a Research Study on Cornell's arXiv, its open science portal. Herein, they have postulated on "Business (mis)Use Cases of Generative AI". The researchers talk of cases like 'Instant Author' (with publishers like Amazon getting flooded with high quality submissions), 'Fake Smoking' Insurance evidence story (video posts showing that the policyholder was actually a smoker on the day of the policy purchase) with no verification of fake video, OR fraudulent audio evidence in criminal cases because the fake

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"McKinsey has documented the Generative AI risks as: being plain wrong, promoting criminal and/ or unethical activity, reputational risk to business (undesirable content being released), legal risk (the most obvious being IP related), and adherence to policies and norms."

audio is no different from real in its detail except the content.

McKinsey has documented the risks as (i) being plain wrong, (ii) promoting criminal and/ or unethical activity, (iii) reputational risk to business (undesirable content being released), legal risk (the most obvious being IP related), and (iv) adherence to policies and norms. Their suggestions are (some of which are common across all Emerging IT): (a) careful selection of training data set, (ii) using special purpose Generative AI systems as against general ones, (iii) proactive human intervention, and (iv) avoiding assignment of critical tasks (at least yet).

In a separate publication, MIT lists the two primary problems of Generative AI as (i) complexity or humans and their behaviour, and (ii) need to correct for misuse and abuse. McKinsey notes that Generative AI has trouble "overcoming the sexist and racist bias that lurks in the undercurrents of the internet and society more broadly". NO SURPRISE HERE.

Cornell in a working paper has talked about regulatory issues, and recommends (i) direct regulation (including imposition of high-risk obligations on deployers), (ii) data protection (especially control data set reproduction through techniques of model inversion), (iii) content moderation (through pre-moderation, human control of content and negative content data set for filtering), and (iv) policies (specific to Generative AI, and including "transparency obligations, mandatory yet limited risk management. non-discrimination data audits, and expanded content moderation").

As we conclude this column, it's worth noting that Generative AI is already making its way into the business world and IT realm, sometimes even without a specific plan for its integration. This technology is changing the business landscape and, in turn, the IT industry in numerous ways. For instance, there is growing discussion about the Search industry becoming more competitive between Microsoft and Google. If this holds true, the sales and revenue models will need to adapt since search results will no longer be solely based on keywords and SEO. Customer expectations are also shifting, with changing demands for their buying experience. Retailers such as Amazon have even introduced Augmented Reality as a mainstream tool, and Generative AI may soon make it outdated (though this writer still finds Amazon's AR really cool!).

The potential impact of advanced technologies, such as AI, seem limitless, with some already making a discernible impact in various areas, such as customer service, design, communications, try-before-you-buy, financial underwriting, customization, and beyond. When combined with emerging technologies like quantum computing, edge computing, additive manufacturing, digital twins, AR, online gaming, and others, the possibilities become even more significant. The IT sector must brace itself for the emergence of new business and customer requirements. ■

The author has 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.

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 transformation 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.

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

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
- 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 stake-holders to address the following head-winds 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 tech-nologies 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 fore-cast 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 (You-Tube, 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 per-cent 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 moderni-sation. AI plays a huge role there in modernising legacy applications and increasing its adoption and organ-isational level change management. Most of the telcos today are on a massive digital transformation jour-ney led by chief digital officers who mainly come from the business side. Picking the right use case becomes very important to realise AI cost ben-efit analysis at scale as at times AI based implementations are expensive given the scale, tools and technolo-gies involved and highly skilled data engineers and scientists.

AI can potentially be harnessed across business functions to make massive transformations in any busi-ness workflow in a Telco IT environ-ment 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 busi-ness 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 opportuni-ties 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 Man-agement (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 oper-ational 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 article has been written by Sandeep Sudarshan,CTO & Lead Telco Architect, Business Technology Services, Capgemini UK

FORM IV

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Software And Intelligence Remain At The Core Of Cisco's Focus

Enterprise networking company remains dedicated to transitioning its business towards SaaS based recurring revenue while also incorporating AI and ML capabilities into its product suite

By Jatinder Singh

As the digital landscape continues to expand at a breakneck pace, modern businesses face the daunting challenge of streamlining their IT systems to provide exceptional user experiences, while navigating a complex array of challenges - from hybrid workforces to cyber threats, IT talent shortages, and ever-shifting customer expectations.

Businesses are increasingly focused on modernizing IT systems to improve competitiveness, reduce costs, and enhance customer satisfaction. However, their IT teams can feel overwhelmed by the responsibility of ensuring secure and cost-effective connectivity and IT component integration.

In light of the above, Cisco perceives a significant opportunity in the digital landscape, especially in emerging markets such as India, which have experienced a remarkable surge in digitization in recent years. As per Cisco's projections, the number of globally interconnected devices is set to surpass 27 billion by 2025. Furthermore, a whopping 90% of Indian organizations have reported their employees using unregistered devices to access work platforms, creating a massive opportunity for Cisco to establish a strong foothold in the rapidly expanding digital and hybrid ecosystem.

Setting ambitious goals for India market

During the recently concluded Cisco India Summit (CIS), the multinational

"For us, India has been a top-performing market in the Asia Pacific, Japan, and China (APJC) region and is rapidly progressing towards becoming one of the top five markets globally."

DAISY CHITTILAPILLY
President, Cisco India & SAARC

enterprise networking company unveiled its strategy for driving growth and making a significant impact in the Indian market. Although Cisco has not disclosed its precise revenue figures from the Indian market or any specific projections, it has reiterated its commitment to harnessing India's position in global innovation.

The company underlined its commitment to India by focusing on security, innovation, infrastructure, and talent development. At the CIS 2023, Daisy Chittilapilly, the President of Cisco India & SAARC, highlighted the significance of the Indian market, noting that Cisco's Bengaluru R&D center is the second-largest outside

San Jose [among Cisco R&D centers] in the world.

Cisco aims to elevate India's current position among its top 10 performing nations to one of the top 5 by 2025. It is noteworthy that the company had made similar statements about India's potential back in 2016. "For us, India has been a top-performing market in the Asia Pacific, Japan, and China (APJC) region and is rapidly progressing towards becoming one of the top five markets [for us] globally," said Chittilapilly.

Chittilapilly adds that company's primary strategy is to enable its customers to enhance their digital agility in a cloud-first world by providing solutions that facilitate connectivity, security, and automation.

The company anticipates that the demand for its solutions will be fuelled by the continued focus of enterprises on cloud, cybersecurity services, and the need for new network architectures to leverage 5G technology.

Focusing on software-powered expansion

In the past, Cisco provided both products and services, but starting in the early 2000s, the company shifted its focus towards investing in software and services. In 2009, Cisco acquired Tandberg, a video communications company based in Norway, for $3 billion. This acquisition allowed Cisco to broaden its range of communication and collaboration services, thereby consolidating its position in this sector. By 2017, Cisco had made it evident that it was significantly tran-

"The deployment of 5G technology will facilitate numerous use cases, particularly in the connected transportation space. These technologies are essential for enabling the future, as they unlock new possibilities and innovation in areas such as virtual and augmented reality, gaming, and connected cars."

VISH IYER, Vice President, Architectures, APJC, Cisco

Key announcement at CIS 2023

■ **New data center capability:** In response to the growing number of Indian companies adopting cloud technology, Cisco is expanding its data center presence in India to better serve customers and help them make the most of cloud-based security solutions. The company has revealed plans to establish a new data center in Chennai and is also upgrading its existing facility in Mumbai.

■ **New capabilities across Zero Trust and cloud application:** Cisco has unveiled substantial investments and security innovations in India. The company has introduced new risk-based capabilities across its security portfolio, tailored for hybrid and multi-cloud environments in the country. These advancements are an integral part of the Cisco Security Cloud initiative, which strives to safeguard the integrity of an organization's entire IT ecosystem, featuring the latest developments in Zero Trust, application security, and secure connectivity.

■ **Building cybersecurity talent:** To meet the expanding security needs of the future, Cisco aims to train 500,000 individuals in India with cybersecurity skills in the next three years. This initiative is part of the company's ten-year plan to provide digital skills training to 25 million people worldwide through the Cisco Networking Academy, which was founded in 1997.

■ **Cybersecurity Readiness Index:** Cisco unveiled its inaugural Cybersecurity Readiness Index. According to the survey, 90% of respondents anticipate that a cybersecurity incident will disrupt their business in the next 12 to 24 months. India scored high in the global chart in terms of maturity (24%), performing above the global average of 15% on cybersecurity readiness. About 38% of companies in India fall into the Beginner or Formative stages. While organizations in India are faring better than the global average, the number is still very low, given the risks.

sitioning from hardware to software subscription services as part of its strategic shift.

In the years since, Cisco has undergone a significant transformation [which is still going] by expanding its portfolio to include security, analytics, and Internet of Things solutions, in addition to its core hardware offerings. This strategic diversification has bolstered its reputation as a provider of comprehensive hardware and software solutions.

Cisco has categorized its business model into six distinct product categories, which are Secure and Agile Networks, Internet for the Future, Collaboration, End-to-End Security, Optimized Application Experiences, and Other Products. Enterprises are transitioning from hardware-based network functions to software-based network functions using virtualization and containerization technologies. This shift has led to a demand for rapid software innovation facilitated by Continuous Integration (CI) and Continuous Deployment (CD). To improve the productivity, reliability,

and quality of DevOps processes, enterprises are exploring the use of AI/ML. Cisco asserts that its application-centric infrastructure in DevOps is well-suited to manage the complexities involved in securely deploying and managing applications across multiple data centers, private clouds, and public cloud environments.

In 2022, Cisco's revenue amounted to $51.56 billion, representing a 3% increase compared to fiscal 2021. Product revenue increased by 6%, while service revenue decreased by 2%. Products accounted for 73.7% of Cisco's total revenue in 2022. The company's software revenue in fiscal year 2022 exceeded $15 billion, with 81% of it coming from subscriptions. The total revenue from subscriptions, which includes services sold as subscriptions, was over $22 billion, accounting for 43% of Cisco's overall revenue.

By geographical segment, 58% of its revenue comes from America's, 27% from EMEA and 16% from APJC. Globally, Cisco is eyeing 50% of its revenues from subscriptions by 2025.

As Cisco shifts its business towards more recurring revenue-based offerings, driven by a higher proportion of software and subscriptions, the company expresses confidence in continuing to make substantial progress on its transformation metrics. With an emphasis on providing customers with greater simplicity and intelligence, Cisco is increasing its investments in cloud management platforms. By integrating AI and ML technologies into these platforms, the networking major aims to provide smarter solutions that streamline network management.

"We are committed to addressing every aspect, from hardware to software to subscription, and are constantly striving to improve in this dimension. Our portfolio is both broad and deep, and we remain dedicated to executing on all fronts. Our focus ranges from networking and collaboration to security and application monitoring, as well as observability and automation. By delivering more platforms and capabilities, we enable our customers to achieve

desired outcomes and experiences. In terms of security, we are confident that we can provide trusted experiences," states Vish Iyer, Vice President, Architectures, Asia Pacific, Japan and China (APJC), Cisco.

Betting big on cybersecurity

As part of its efforts to grow its presence in the cybersecurity market, the US-based networking leader is concentrating on enhancing its risk-related capabilities. Cybersecurity and full stack observability remain significant strategic priorities for Cisco, and the company is allocating substantial resources towards developing new proficiencies in these areas

"Security takes the forefront in any organization's digital journey, and as a result, it has become a top priority. Along with this, customers are equally focused on enhancing customer experience, employee experience, facilitating hybrid automation, utilizing more cloud solutions through a SaaS-based approach, and modernizing applications since they have become the center of business," says Shiva Kumar Yadagiri, Managing Director, Commercial & SMB, Cisco India & SAARC.

According to Cisco, its Cisco Security Cloud is the most open security platform that does not require a lock-in to any public cloud. The platform's objective is to offer an integrated experience for securely connecting people and devices to applications and data regardless of their location. The open platform, which is supported by AI and analytics-driven intelligence and managed through a unified interface, can provide threat prevention, detection, response, and remediation capabilities at scale.

Cisco's leadership has reaffirmed its expertise in email, DNS network traffic, and endpoints - all of which are widely utilized in enterprise settings. The company believes that it possesses the ability to integrate these components and simplify operations for businesses operating

> **"Security takes the forefront in any organization's digital journey, and as a result, it has become a top priority. Along with this, customers are equally focused on enhancing customer experience, employee experience, facilitating hybrid automation, utilizing more cloud solutions through a SaaS-based approach, and modernizing applications since they have become the center of business."**
>
> **SHIVA KUMAR YADAGIRI,** Managing Director, Commercial & SMB, Cisco India & SAARC

in a diverse and complex landscape, according to Iyer.

To bolster its security portfolio for hybrid and multi-cloud environments, Cisco has introduced new risk-based capabilities in India. The company says that it was introducing innovative cyber capabilities in areas such as Zero Trust, application security, and secure connectivity, expanding its security data center footprint, and continuing to build a dedicated engineering workforce in India to help organizations fortify their defenses and catalyze their transformation in the digital age.

Key challenges and other focus areas

Like its peers, Cisco is facing challenges in terms of competition on pricing and supply chain issues that affect timely delivery of products.

However, the company is aware that customers and partners are seeking cutting-edge technologies to meet their strategic goals, and Cisco's innovative solutions are helping them navigate the complex market. Yadagiri notes that post-COVID, enterprise customers are looking for future-proof solutions that are architectural-level compositions rather than point products. In response to this, Cisco is investing in integrated architectures across various segments of the network, from endpoints to the cloud.

The company recognizes the importance of benchmarking and effective feedback mechanisms, which is often neglected by other solutions providers. Thus, Cisco says that it was committed to collaborating with its partner ecosystem and enhancing customer experience to deliver outcomes that define the value it can provide to its customers. "Our focus is on working with our partner ecosystem and enhancing customer experience to deliver outcomes that define the value we can provide to them. By doing so, we will become more relevant to our customers," explains Iyer.

Cisco is also banking big on 5G deployments and believe that it will facilitate numerous use cases, particularly in the connected transportation space. "These technologies are essential for enabling the future, as they unlock new possibilities and innovation in areas such as virtual and augmented reality, gaming, and connected cars. Many ongoing efforts are focused on these areas to capitalize on the opportunities presented by 5G," adds Iyer.

Over the years, Cisco has made several acquisitions, including Meraki in 2012, AppDynamics in 2017, Duo Security in 2018, and IMImobile in 2020, among others. These acquisitions have allowed Cisco to improve its offerings and remain competitive in the market. Industry experts predict that Cisco will continue to pursue acquisitions that align with its goals and help it stay competitive in the future. ■

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

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 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 intel-

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

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 management cycle and drug supply chain. Governments across the world have started to invest heavily to upgrade to this infrastructure. Blockchain equips

With concerns around data privacy and security, conventional health record systems have become redundant thanks to a lack of intelligent integration.

ligent 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

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, Ramalatha Marimuthu is a Senior IEEE Member
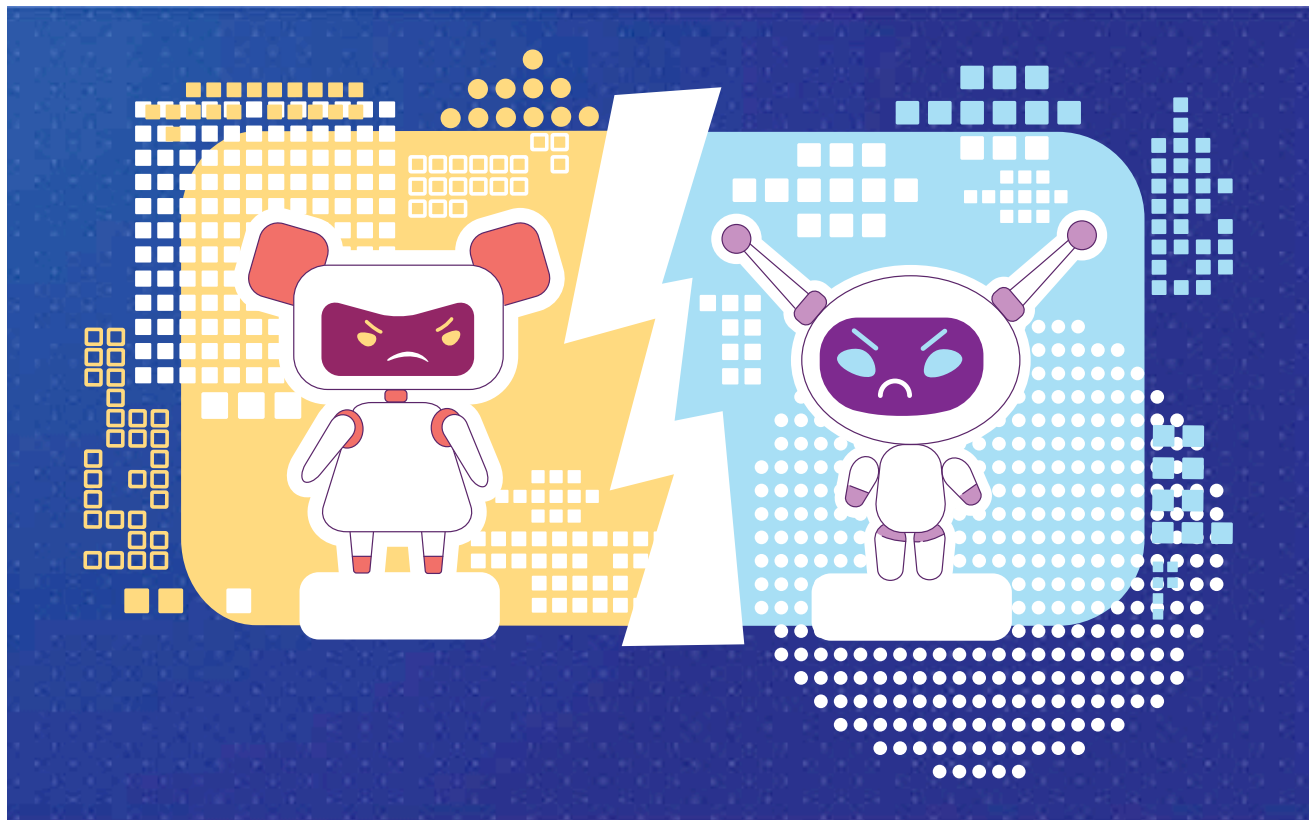
Is ChatGPT Boon Or Bane For Cyber Risk Management?

For Cyber Criminals, Chat GPT can be "Brahmastra" when developing new cybercrime techniques, weaponizing AI to target individuals through spear phishing techniques

By Kanishk Gaur

C hat GPT is widely debated today for potential benefits for society through the use cases that can be used across industries; however, at the same time, it is perceived as Evil Eye or Dark AI which could be weaponized against humans.

Today, cyber crime is the world's third-largest economy after the United States and China. It has significant implications from Chat GPT. For Cyber Criminals, Chat GPT can be " Brahmastra" when developing new cybercrime techniques, weaponizing AI to target individuals through

spear phishing techniques. However, when it comes to Cyber Security Risk Management, it can help businesses, government and public sector improve their Cyber Risk Management practices and tackle, detect and respond to new cyber threat vectors. For organizations like

Computer Emergency Response Team (CERT), National Critical Information Infrastructure Protection Centre (NCIIPC), National Crime Coordination Centre (NCCC), MHA's I4C in Cyber incident response, vulnerability management, and threat intelligence and coordinate as Central , State Law enforcement and industry partners, to share information and coordinate responses to cyber threats. It could also help generating reports, analyzing data on Cyber Threats.

For Cyber Security capacity building programs ChatGPT can work with Cyber R&D division, NEGD to provide information, resources on various cybersecurity topics such as threat intelligence, incident response, risk management and creating cyber security training content

Chat GPT, a large language model developed by Open AI, has the potential to significantly aid businesses in tackling cyber security risks. One of the primary ways Chat GPT can help businesses is by automating specific tasks related to cyber security. For example, Chat GPT can generate security reports, monitor network activity for suspicious behaviour, and alert IT teams to potential threats. This can save businesses significant time and resources while providing a more thorough and efficient level of security.

Chat GPT can also assist businesses in identifying and mitigating risks related to sensitive data. With its ability to process and analyse large amounts of data, Chat GPT can help companies to identify patterns and trends in data usage, helping them to identify and mitigate risks related to data breaches and other security threats. Additionally, Chat GPT can assist with compliance with various regulations, cyber regulatory norms such as compliance with GDPR, Indian Cyber Laws, and standards such as HIPAA, PCI-DSS, and ISO 27001.

Another potential use for Chat GPT in the field of cyber security is in the area of employee training and awareness. With its ability to understand and respond to natural
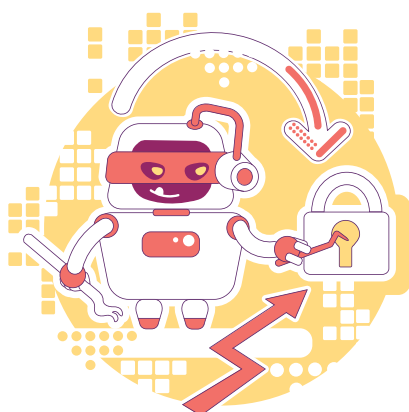
Chat GPT will put tough questions for Cyber Security companies developing products, solution be it software giants, system integrators, cyber security auditors, or ethical hackers.

language, Chat GPT can create engaging and interactive training materials, helping to educate employees about cyber security risks and best practices. Hence training employees on Cyber Safety best practices to tackle and respond to phishing, social engineering, vishing, and cyberbullying could be made much easier using Chat GPT.

In addition, Chat GPT's natural language processing capabilities can be used to improve incident response, threat hunting, and user behaviour analytics. This can help businesses quickly and effectively respond to cyber threats, minimize the damage they cause, and learn from the incident to improve their future security posture. Cyber Security specialists could also

use Chat GPT to write exploits for conducting Cyber Red Team Exercises and War Gaming simulations.

The hindsight remains that Chat GPT is also vulnerable to potential misuse, as it can be used for developing new Cyber Crime techniques to dupe businesses and citizens. AI-Powered Cyber Crime will be hard to detect and quicker to evolve; hence defensive technology processes would require quicker enrichment and evolvement. Thus, Chat GPT will put tough questions for Cyber Security companies developing products, solution be it software giants, system integrators, cyber security auditors, or ethical hackers.

Generative AI Frameworks for Cyber offensive operations can be continuously evolved using Chat GPT. Similarly, it can be used for generating new NFT, Cryptocurrency promotion techniques which could also be Scams if misused by cyber criminals hence developing ethical standards within.

In conclusion, Chat GPT has the potential to significantly aid businesses in tackling cyber security risks by automating specific tasks, identifying and mitigating risks related to sensitive data, providing compliance, and training employees on best practices. As the field of cyber security continues to evolve and become increasingly complex, the use of advanced technologies like Chat GPT will play an essential role in helping businesses stay secure and protect their data.

However, building ethics and standards of AI with Chat GPT to prevent misuse will be crucial for petty crimes like email spoofing, give away scams, replicating intellectual property, synthetic voice generation, or video cloning. (See: ChatGPT: CIOs Are Yet To Figure Out Its Enterprise Usage and ChatGPT Reignites Web-Search Wars) ■

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

New Study Sheds Light On Shifting Cybersecurity Threats

Threat actors have embraced slower and more stealthy approaches to achieve financially-motivated cyberattacks

By CIO&Leader

G lobal ransomware attempts, IoT malware, and crypto-jacking attacks have increased alarmingly over the last 1 year according to a recent study by Cybersecurity firm SonicWall. Acccording to the firm, global malware volume increased 2% year-over-year, but it was jumps in IoT malware (+87%) and cryptojacking (+43%) that offset the decline of overall global ransomware volume (-21%), signifying a strategic shift. It notes that threat actors have embraced slower and more stealthy approaches to achieve financially-motivated cyberattacks.

Prominent ransomware attacks impacted enterprises, governments, airlines, hospitals, hotels, and even individuals causing widespread system downtime, economic loss, and reputational damage. Following global trends, several industries faced large year-over-year increases in ransomware volume, including education (+275%), finance (+41%), and healthcare (+8%).

Key highlights:
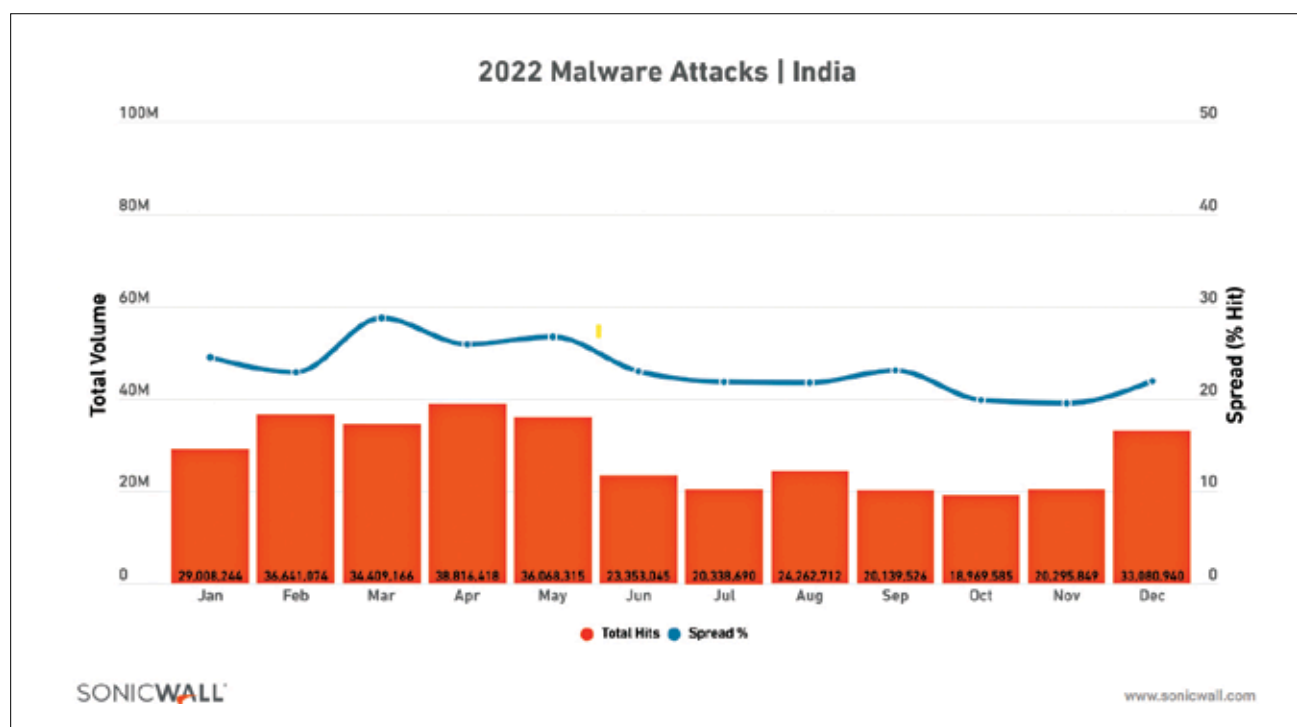
- **Malware** – Total volume was up

Prominent ransomware attacks impacted enterprises, governments, airlines, hospitals, hotels, and even individuals causing widespread system downtime.
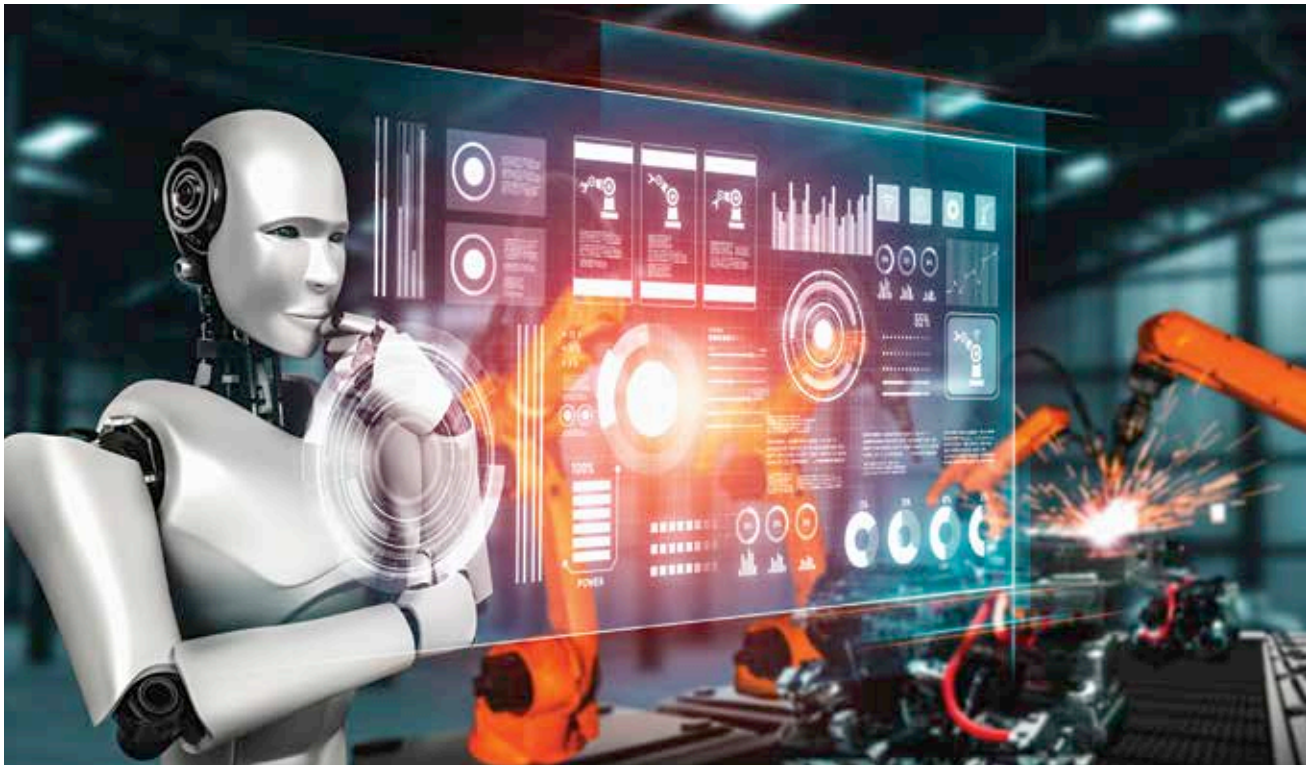
2% in 2022 after three straight years of decline — just as SonicWall predicted in the 2022 SonicWall Cyber Threat Report. Following that trend, Europe as a whole saw increased levels of malware (+10%) as did Ukraine, which had a record 25.6 million attempts, suggesting malware was used heavily in regions impacted by geopolitical strife. Interestingly, malware was down year-over-year in key countries like the U.S. (-9%), U.K. (-13%) and Germany (-28%)

- **Ransomware** – Although overall ransomware numbers saw a 21% decline globally, the total volume in

2022 was higher than 2017, 2018, 2019 and 2020. In particular, total ransomware in Q4 (154.9 million) was the highest since Q3 2021.

- **IoT Malware** – Global volume rose 87% in 2022, totaling 112 million hits by year's end. With no corresponding slowdown in the proliferation of connected devices, bad actors are likely probing soft targets to leverage as potential attack vectors into larger organizations

- **Apache Log4j** – Intrusion attempts against the industry's Apache Log4j 'Log4Shell' vulnerability eclipsed 1 billion in 2022. The vulnerability was first discovered in December 2021 and has been actively exploited since

- **Cryptojacking** – Use of cryptojacking as a 'low and slow' approach continued to surge, rising 43% globally, which is the most SonicWall Capture Labs threat researchers have recorded in a single year. The retail and financial industry felt the sting of cryptojacking attacks, seeing 2810% and 352% increases, respectively, year-over-year. ■

2022 Malware Attacks | India

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total Hits	29,008,244	36,661,874	34,409,166	38,816,418	36,068,315	23,353,045	20,338,690	24,262,712	20,139,526	18,969,585	20,295,869	33,880,940

● Total Hits ● Spread %

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Unreal AI

You may worry that the implementation of AI and robots will result in the loss of jobs, but it's improbable that machines can replace humans entirely

By Kanu Ratan Butani

nitially, I believed that in a world where emotions and feelings abound, it would be difficult for AI to thrive. However, I failed to consider that today's reality is increasingly devoid of empathy and compassion toward others. As such, I now realize that AI can indeed flourish in this artificial world. The era of mere survival is long gone - AI is now sprinting ahead in all fields, facilitating automation and streamlining processes. One of the most recent and highly-discussed advancements is the Chat-GPT.

Upon exploring this technology myself, I was astounded to witness its ability to respond to virtually any inquiry, as well as generate original compositions such as poems, articles, and essays.

With the progression of machine learning toward deep learning mechanisms, the entire landscape is transforming. Previously, our accuracy ranged between 50% to 60%, but now we are achieving 90% to 95% accuracy, and soon it will likely reach 100%. However, I am skeptical that there will ever be no distinction

between what is real and artificial. Humans are fallible, and even if machines can achieve 100% accuracy, the human element will always remain unique. For example, if a human is playing chess against a robot that never makes mistakes, the human may opt to forego the game entirely, as they would rather play against a human opponent - win or lose - than against a machine.

Hence a particular place and time will come when even if the robots are 100% accurate no person would like to engage with that machine.

Since the entire competitive mood will vanish and it would not like to have that. The same thing will go with writing poems and essays and the preference would be that a human who has feelings should write them and not a machine. There also it will fail.

We always think that if AI and robots come into play, then our jobs will go away. I don't think this at all since it is next to impossible for a robot to replace a person. What a real advocate can fight the case, with his thought process and come up with the point during the discussion, a robot won't be able to match that niche at all.

The robots and bots can very well do repetitive work, but in that also there is a problem. For example, if a robot is used to prepare tea, so all the necessary inputs will be fed to the robot, and every time he will make the same tea, with the same amount of ingredients, which will taste the same every time. But at the same time, if a person prepares tea, it will surely differ in the number of ingredients and taste every time. Therefore, here also it will fail with its 100% capability. Since no one will like this same taste as humans are the ones who like to see different things and different places and different tastes every time, they want to drink tea. Do you agree?

The idea of replacing a human with a robot is needless since AI and automation require human oversight. You can't just leave an automated bot to book tickets and take check-ins at the airports, without being monitored by a human. If a human does not monitor it, things can go haywire, a person with the same name going to two different destinations can be mistakenly given different destination tickets by bots, and with other obvious reasons that the human does a check before moving forward, all this done by a bot can result into a disaster which could result in huge failure. Hence this repetitive task also can't be handed over to a bot without monitoring.

I am skeptical that there will ever be no distinction between what is real and artificial. Humans are fallible, and even if machines can achieve 100% accuracy, the human element will always remain unique.

How can a bot's and AI's intelligence be compared with human intelligence? Human intelligence has gone through lacks and lacks years to develop what it is today. So, no one can compare the amount of data that a human brain can store analyze and act accordingly. The human eye has 635 pixels of clarity whereas today we have only the maximum sharpness of 100 pixels of the camera lens. This also can't be compared. The human body is such a magical body that AI's magic won't work in front of that.

So, what are AI and automation good for? Well, they have proven to be useful in educational settings, as they can introduce children to the concepts of robotics and automation. Additionally, they can serve as a form of entertainment. However, despite their advanced capabilities, AI and automation cannot replace human actors or films, as we have previously discussed. Furthermore, the effectiveness of AI, machine learning, deep learning, and similar concepts is limited to the vast amounts of data stored within supercomputers and quantum computing systems. These technologies are unable to generate new data or information independently, which poses a significant constraint. As a result, AI lacks the creativity necessary to produce original content, such as new storylines, acting performances, or changes in legal rulings. ■

The author is Manager - IT at Atos India

Talent Management, Tech Transformation Key Challenges For Indian B2B SaaS

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

By CIO&Leader

ndian 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 practices, 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/

Funding activity is expected to gain traction. This presents an opportunity for Indian SaaS companies.

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.

The report also explores the current state of Indian B2B SaaS through the lens of performance metrics, growth strategies and challenges impacting businesses.
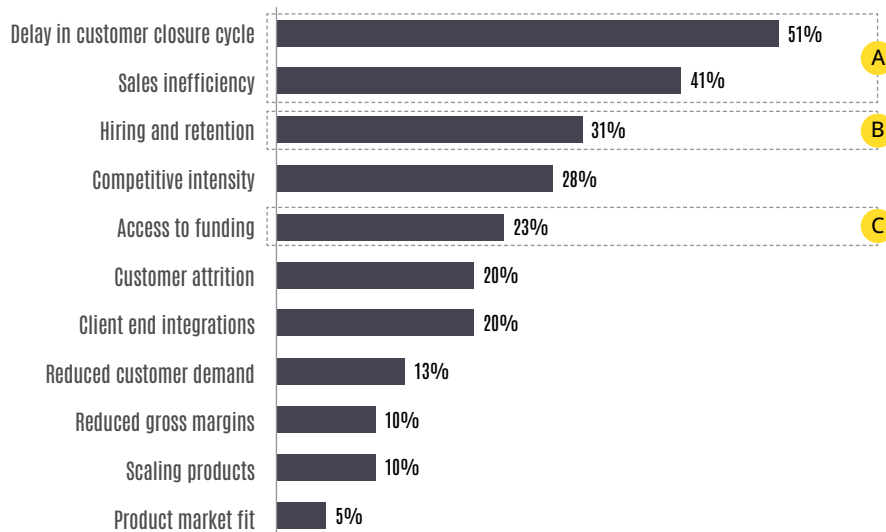
Top strategic priorities, challenges and shifts for India B2B SaaS

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. ■

Top challenges (% of all respondents)

Challenge	%
Delay in customer closure cycle	51% (A)
Sales inefficiency	41%
Hiring and retention	31% (B)
Competitive intensity	28%
Access to funding	23% (C)
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

3 Ways To Build A Solid Cyber Security Strategy

Here a few ways that might be a gamechanger in the data security landscape in 2023

By CIO&Leader

Technology has advanced dramatically in recent years, but the number of businesses falling victim to cyberattacks has not decreased. In today's digitally evolving world, organizations must comply with the globally emerging privacy laws to protect customer data and adhere to

privacy regulations. In the case of B2B and B2C companies, as users' knowledge of their data rises, how personal data is handled according to the law affects consumers' faith in companies and determines their profit.

Listed below are a few ways that might be a gamechanger in the data security landscape in 2023; explains

SOCLY.io, a cybersecurity compliance automation platform:

Complying with data privacy norms

Cybersecurity compliance aligns an organizational risk management framework with standardized data protection protocols like SOC2, ISO

27001, PCI-DSS, HIPAA,GDPR, etc., to implement a systematic governance approach and rule out potential vulnerabilities.

Integrated platforms that automatically collect thousands of data points of processes, policies, people, assets, and vendors in one interface provide complete control over the security program and increase the visibility of your compliance status. Monitoring your systems and managing your resources help identify, interpret, and combat cyber threats and protect your intellectual property against malicious attacks.

Investing more in privacy technology

In 2023, businesses should spend on privacy-related legislation compliance to be cyber secure. Due to the frequent emergence of new laws, companies will increase their investment in privacy technology to increase user confidence and prevent fines. In other words, data privacy is a strategic chance for companies to stop seeing it as a defensive measure and start seeing it as a strategy for expansion. Both small businesses and established corporations can benefit from it.

Consumers today want to take stronger security precautions to

Integrated platforms that automatically collect thousands of data points of processes, policies, people, assets, and vendors in one interface provide complete control over the security program and increase the visibility of your compliance status.

safeguard their rights to data privacy and preserve sensitive information that could make them easy targets for businesses.

Hiring skilled cybersecurity professionals

According to a study by the National Association of Software and Service Companies (NASSCOM), the demand for cybersecurity specialists is growing with an increase in the number and frequency of cyberattacks in the nation. As a result, 2023 will see an increase in employment in human data security due to the world's expanding and changing privacy legislation. With about 3.5 million open cybersecurity jobs worldwide

(according to Cybersecurity Ventures), it is more important than ever for businesses to hire qualified cybersecurity specialists to help safeguard their systems from the most dangerous cyberattacks.

As they expand, businesses have the chance to concentrate on cybersecurity and security. Proper cybersecurity measures can shield companies from online threats, enable more productive working methods, increase client confidence, and create new opportunities. All of this will result in increased organizational resilience and business performance. ◼

By SOCLY.io; a cybersecurity compliance automation firm.

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

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.
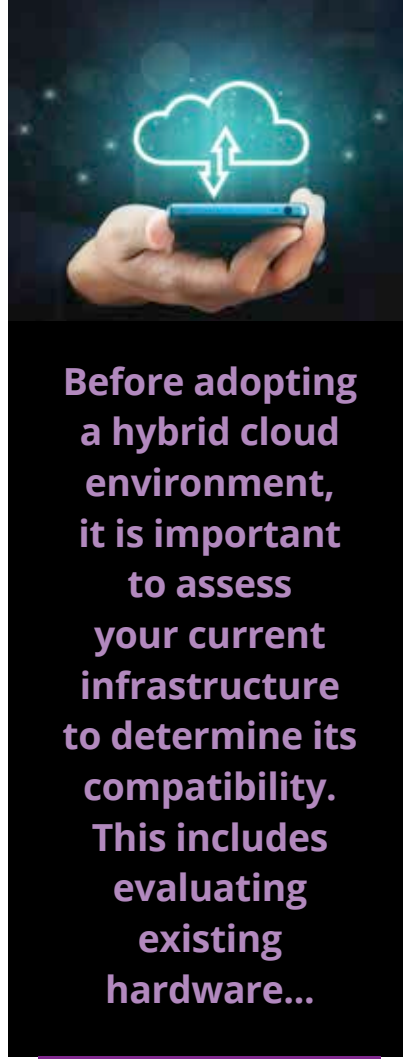
Assess your current infrastructure

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

Before adopting a hybrid cloud environment, it is important to assess your current infrastructure to determine its compatibility. This includes evaluating existing hardware...

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.
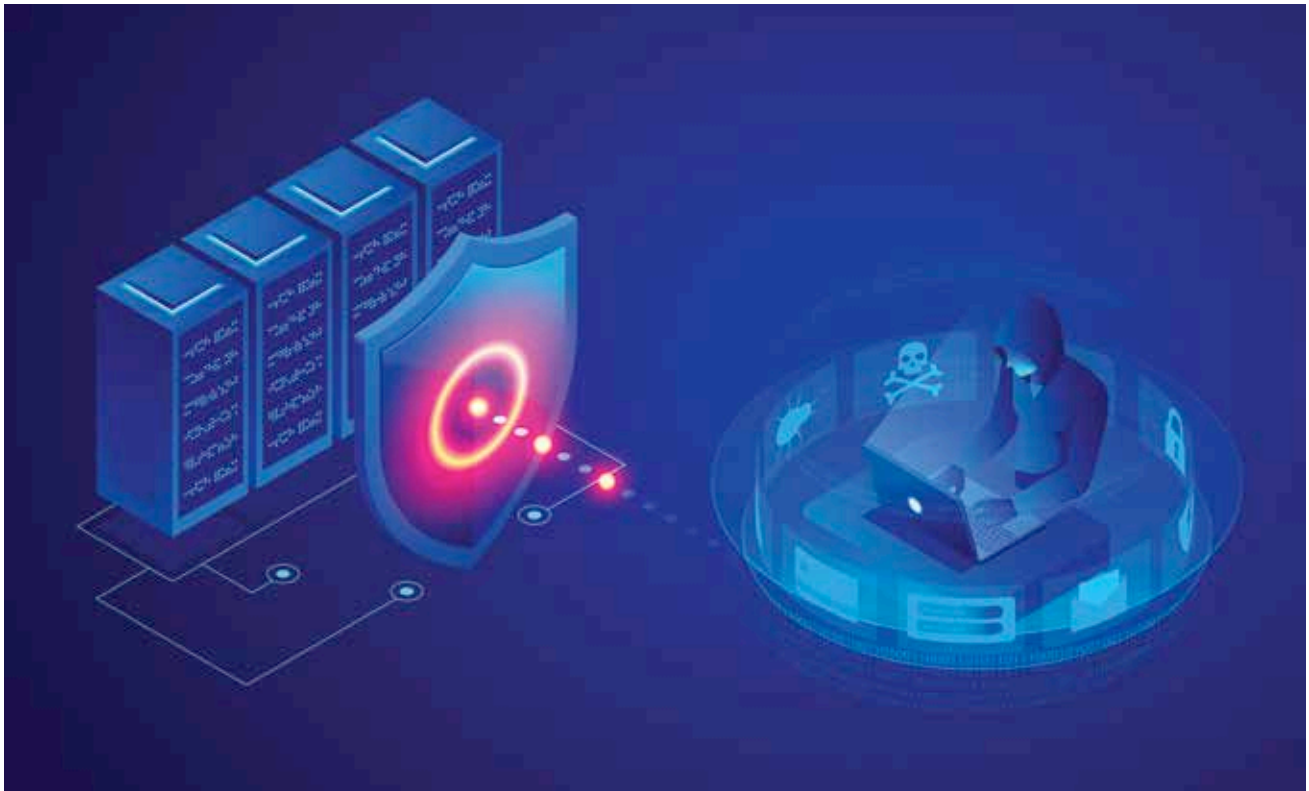
3 Common Myths Of DDoS Protection And Current Best Practice

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

By Vinay Sharma

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. When a public-facing website or app is unavailable, that can lead to angry customers, lost revenue, and brand damage.

When business-critical applications become unavailable, operations and productivity grind to a halt. Internal websites that partners rely on are attacked, which leads to disruption in the supply chain and production.

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 appli-

The broadly accepted best practice for DDoS mitigation is a layered, defense-in-depth approach. This involves combining cloud-based or upstream protections from volumetric DDoS traffic floods with inline, on-premises, and/or in-cloud intelligent DDoS mitigation systems that are stateless...

cation-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. This involves combining cloud-based or upstream protections from volumetric DDoS traffic floods with inline, on-premises, and/or in-cloud intelligent DDoS mitigation systems that are stateless and purpose-built to defend against all DDoS vectors targeting any protocol or application. 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

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. Enterprises need to have leaders who can take their organizations to thrive in the post-pandemic era by addressing these challenges through scalable and sustainable digital technology adoption.

A top priority for the leader in today's world hence 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. For example, consumer habits have been transformed substantially during the last three years of the Covid-19 pandemic, and digitally connecting and engaging customers is to be prioritized with better service quality, reliability, and security. 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. Leaders also need to be held accountable for addressing new ethical concerns arising from the dark side of digital innovation such as the unethical use of customer data. 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 starts from the senior management and digital transformation is inherently cross-functional that requires new leadership practices to drive innovation, engage employees and transform the organization. To successfully transition to the post-pandemic era, 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 a Professor of Information Technology at SP Jain School of Global Management, Singapore.

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