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OF CIOs

THE NEXT GENERATION



FOR

TOKYO OLYMPICS 2020

How technologies like AI, analytics and robotics played a crucial role in its success?

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EDITORIAL

IT in sports: Can India produce champions?



For 2028 Olympics, if not for 2024, India should have two goals: to excel on the field and to excel in the background, as a technology supplier

Shyamanuja Das

okyo was India's best Olympics ever – with 7 medals, the first athletics Gold in Olympics history and a Hockey medal after 41 years. Yet, when we compare India's performance in Olympics to its performance in other aspects of our lives – such as science, arts and commerce – it is nothing really to write about.

What is a little discomforting, however, is that when it comes to technology—where India excels—there is little involvement that we see from Indian technology companies.

The kind of innovations that we saw in Tokyo 2020—which our cover story captures this time—shows us the time to come. Technologies like robotics were in full display in this unusual, pandemic-impacted Olympics.

India's capability as a global technology hub is well acknowledged. So is India's dominance of the global IT workforce. Yet, few Indian companies have managed to crack the technology at global sporting events.

Cricket, where India is today the undisputed global power, has actually led in technology usage. The Decision Review System (DRS) in cricket, based on the Hawkeye system incorporating technologies such as UltraEdge, Ball Tracking and Hot Spot, have changed the face of cricket. Many international sports such as Hockey have now implemented similar technologies.

It just needs a little will power and may be a concerted effort on part of Indian IT companies, sports bodies, venture capitalists and the government to come up with a sports technology ecosystem. States like Odisha which are increasingly hosting large global sporting events like World Cup Hockey can be good testbeds for such technologies.

Whether it is in better conduct of the sporting events, improving the accuracy in decision making in individual sports, helping prepare the teams and the individuals better, helping broadcasters create better user experience or simply help analysts forecast—IT can change the face of sports in general.

It is not difficult to guess which technologies would be most useful in sporting applications. They are the usual suspects. Tokyo has already shown how to use robotics effectively to smoothly conduct games and improve efficiency in operations. Al can have various applications. From video analytics to forecasting, Al can help in various ways. IoT-based sensory technologies can go a long way to accurately measure, quickly capture and almost instantly broadcast data about sports. Of course, the underlying cloud infrastructure can ensure that all these run smoothly and can be built quickly, almost on demand.

For 2028 Olympics, if not for 2024, India should have two goals: to excel on the field and to excel in the background, as a technology supplier. And of course, there are many sporting events in India and abroad before that to experiment and hone those skills.

Can we do that? I mean win more medals and more tech contracts.

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Life In A Canvas

NEXT100 winner 2019 **Neeraj Bhople**, Head of Engineering & Technology -Lending Products, Mahindra Finance shares his immense passion for painting and how it helps him professionally and personally...

> s a kid, I was never good at painting. I liked writing and reading more, but since drawing and painting was a part of school curriculum, I had to do it and barely scraped through.

Cut to 2018, I was watching some YouTube videos and



Neeraj Bhople

Neeraj Bhople is Head of Engineering & Technology -Lending Products at Mahindra Finance. He has been a NEXT100 winner in 2019. Bhople was earlier

Painting is a cathartic experience as all stress gets channelled into creativity

came across an acrylic painting once. Just watching that person paint and create a beautiful piece of art, was so calming to see. I loved it so much that the next day I got the paints and brushes and canvases – thus began my journey into the world of painting.

The next step was learning how to paint! I must tell you one thing - I am a lifelong learner. I love to learn new things - Photography, Graphology, Hypnosis, and many such things I have learnt and continue to learn through various channels. One advantage that we have today (and didn't have when I was a kid) is that we have a lot of information available online! It's really good information. That's where I used to learn painting as well. I read a lot about mixing colors, various techniques of painting, and the works. And the best learning channel was YouTube. So many amazing artists have uploaded fantastic videos of their paintings, giving detailed explanations on how and why. I used them to start my journey and loved every bit of it.

When I paint, I feel calm. If there's a reference photo or painting that I am trying to use for my painting, it helps me focus all my energy into it. If it's a complete abstract of my own, I feel like all of the creative energy I have is getting channeled to create a piece that's like a rendition of my feelings at that time. It's a very cathartic experience sometimes.

And we all need it. We all lead pretty stressful lives with so much going on at work and at personal level. A little bit of me-time, a way of helping us de-stress and calming ourselves is essential.

As told to Dipanjan Mitra, Team ITNEXT

Snapshot

associated with Seniority, Tata Communications, Tech Mahindra and Infosys. He completed his BE in Electronics from Visvesvaraya National Institute of Technology.



Fitness & Travel -A Perfect Combo!

NEXT100 winner 2019 **Pratibha Monga**, GM - IT at LG CNS India shares her immense passion for travelling and shares useful tips on how to stay fit and fine...

have a long list of extracurricular activities that I enjoy like fitness activities, travelling, surfing internet, watching movies, window shopping, playing with kids and cooking, but the ones that top my chart are the first two.

When talking about fitness, mental and physical fitness both are concerned, and both are equally important. One should not ignore one kind of fitness while working on the other. With this thought, I

Travel is thrapeutic and you also get to explore new and beautiful destinations

would like to share few aspects of my life.

As a child I was very passionate about travelling and even created a wish list of places that I would someday visit. As I grew older, I seized every opportunity to travel and experience different cultures and learn their uniqueness.

Travel for me is therapeutic and so whenever I get a chance, I try to explore a new destination along with my family. By far, my best trips have been unplanned ones. Though the current pandemic situation has put many restrictions on us, I look forward to many more trips in future.

Before this unprecedented situation, I was lucky to explore some of the most beautiful states in India including Himachal Pradesh, and Rajasthan. I also enjoyed Kashmir – truly it is the 'The Heaven on Earth'.

Elaborating further on the Rajasthan trip, the experience was amazing. It was a 10-day trip where I got a chance to visit amazing cities including Pushkar, Ajmer, Jodhpur, Jaisalmer, Bikaner and Jaipur. This trip was all about exploring heritage properties, and forts. Moreover, I really liked the vast sand dune rides and the delicious authentic food.

Apart from travelling, another activity that I thoroughly enjoy is practicing Yoga. My connection with Yoga goes back to the days when I had experienced motherhood for the second time. As childbirth had made me weak with several health and stress issues, a close friend of mine introduced me to Yoga and that made all the difference. Today when I look back, I realize that Yoga was truly an awakening in making me fitter both mentally and physically. I take Yoga as worship as it helps me navigate smoothly through stressful and tough situations. Yoga has benefited me in multiple ways ranging from building confidence, maintaining emotional stability, proper breath control, flexible body, elevating focus and toning of muscles and senses.

As told to Dipanjan Mitra, Team ITNEXT



Pratibha Monga

Pratibha Monga is GM - IT at LG CNS India. She has been a NEXT100 winner in 2019. She was earlier associated with Heuristic Solutions, HSD Informatics and Aptech Learning Services.

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Snapshot

COVER STORY

TOKYO OLYMPICS 2020

How technologies like Al, analytics and robotics played a crucial role in its success?

Top tech innovations that made the 29th edition of iconic games more hopeful and hi-tech than ever

By Jatinder Singh



the world's biggest quadrennial sporting extravaganza, the Olympics. But thanks to the indomitable human spirit and the role of advanced technologies, we witnessed one of the most successful global sporting events in recent times at the comfort of our home.

In continuance with the rich legacy of tech innovations at the Olympics, the 29th edition of the mega event also saw a range of cutting-edge technologies powered by Artificial Intelligence (AI), 5G, virtual and augmented reality, robotics, and automation.

Before the event started, a lot was at stake for the International Olympic Committee (IOC), the Japanese organizing committee, and the event sponsors. The games were already postponed by a year due to the pandemic. Not many people within Japan bought IOC's decision to organize Olympics in these unprecedented times. There was relentless anxiety among the masses, fearing an uncontrollable surge in COVID cases and a possible impact on Japan's global stature if anything goes wrong. Amidst the pandemic considerations, one of the significant challenges for authorities was to deploy contactless processes while ensuring greater efficiency across 42 Olympic venues in Tokyo. Not to forget the enormous pressure on everyone involved to ensure the safety of the participating athletes, who have prepared rigorously to compete at the major sporting competition.

In addition, providing private training facilities to every athlete at the Olympic Village while monitoring their health round the clock had been a herculean task. With no spectators allowed at the venue, it also became critical for organizers to improve the remote viewing experience of people to cheer and celebrate the victories of their favorite athletes.

In 2013, when Tokyo won the bid to host the 2020 Olympics, nobody would have anticipated that it had to organize the event amidst the crisis of the worst order. Conducting the entire two-week event with COVID-19 safety protocols, where 3,00,000 lakh people, including athletes, journalists, volunteers, staff, and delegates, were involved, was not only challenging but also unprecedented.

However, with the support of some outstanding and inclusive technology interventions enabled by AI, analytics, automation, and cloud, the entire sporting action became exceptionally enthralling for viewers and the participants.

Artificial Intelligence at the forefront

Across industries and sectors, the interest in Al/ ML and analytics has grown manifold after the onset of the COVID-19 pandemic. The Olympics were no exception either. Al/ML tools can forecast future outcomes and provide valuable insights in real-time by detecting and analyzing patterns in the data.

At Tokyo Olympics, the most critical priority for organizers was to ensure the safety and security of all athletes, staff, journalists, and other supporting delegates while adhering to the COVID protocols. The massive heat and high levels of humidity in Tokyo had further augmented the risks of heatrelated illness, making it even more challenging for everyone to wear masks all the time.

With so many events and everything happening at a breakneck pace, keeping a tab on everyone's health and extending timely support was very taxing through any manual process. To tackle the intricacies of the situation, the Tokyo Olympics team took several initiatives where they leveraged AI/ML and big data to track real-time conditions of all staff and venues.

Real-time health analysis and alerts: This was the most critical area for the entire administration organizing the Olympics. As part of their efforts, IOC and Tokyo Olympics Committee collaborated with a leading tech company to deploy an Al-based system on the cloud that would trigger health alerts in case of any unusual or perilous signals.

At the mega sporting event, the entire staff was provided with an Al-based black earpiece that would send an individual's heart rate and body temperatures condition to the cloud system in real-time. By leveraging AI and big data and combining it with cloud computing, the system would analyze individuals' pulse rate, body temperature, and heart rate through a diverse set of intelligent data algorithms to determine the real-time risk levels to their health. The system would then send recommendations and cautionary advice to people at higher risk or showing unfamiliar risk symptoms. Athletes were also seen wearing a wide array of wearable tech, intelligent clothing, and augmented reality glasses to achieve a maximum of their performance levels.

Facial recognition: The COVID-19 pandemic has proved to be a compelling driver in the adoption of facial recognition technology that has grown by leaps and bounds around the globe. Harnessing AI and neural networks' potential, the technology enables users to map visitors' facial and audio patterns with precollected data stored in the existing database to decide their entry into specific areas. It was the first time the IOC used automated facial recognition technology to give accredited delegates, staff, and athletes entry into the places across the Olympics Village, main stadium, and International Broadcast Center. The technology replaced the traditional and cumbersome process of ID checks, which required extensive manual effort and high chances of lapses. The entire system was designed and implemented by Japanese IT company, NEC Global, in collaboration with Intel, to strengthen security and decrease the waiting time. In the wake of the high frequency of movements across the Olympic site, this effort made it possible for everyone to travel easily within the designated premises while averting hoaxing



and unauthorized access into VIP areas. Earlier, Tokyo had also planned to integrate facial recognition with AI-enabled drones at Olympics for effective crowd management and timely risk assessment. However, with no stadium spectators allowed due to the pandemic restrictions, the Tokyo Olympics Committee could not implement many of those add-ons at a broader scale.

Improving the performance of athletes: By applying the capabilities of AI technologies such as deep learning, machine learning, and language processing, many athletes at the Olympics understood their and opposition strengths and weaknesses better. In many sports such as swimming, gymnastics, equestrian, and hockey, coaches used AI-driven tools to evaluate a player or team performance and how it can be improved.

While Olympics 2020 may not be the first international sporting event where the potential of AI and ML-driven tools has been leveraged to get the best from a sportsperson, it was undoubtedly the event that raised the bar of using these advanced technologies. For instance, the coaching staff of the Indian Hockey Team, which won an Olympic medal in hockey after the gap of four decades, taps into AI to analyze the recent matches to track the movement of its players at every stage and how they play at different positions against different opponents. Even before the Olympics, many coaches in the international circuit had been extensively using machine learning algorithms to provide realtime feedback to warn players if they are training too hard and prone to injuries. An exciting concept called 3D Athlete Tracking (3DAT), developed by Intel and hosted on Alibaba's cloud platform, gained substantial interest in the Tokyo Olympics. By capturing additional images from its unique wide-angle cameras, the AI-based system enables coaching teams to leverage deep learning algorithms to get a three-dimensional view of a competitor to identify the potential of athletes to win a medal. The technology also enables broadcasters to present detailed analysis to the viewers on the performance of specific athletes.

The army of robots came into the limelight

The Olympics at Tokyo seemed to be a perfect ground to test and validate the future robots,

Tokyo 2020: Facts and Figures

- 11000+ athletes participated across events
- 10,500 torchbearers involved in the Olympic Torch Relay
- 339 medal events, including 18 mixed/open events
- 205 National Olympic Committees + IOC Refugee Olympic Team (EOR) involved
- 42 competition venues (for the Olympic Games)
- 33 sports and 32 International Federations

Source: IOC, Olympics.com

equipped with Al, automation, digital eye, and automation capabilities.

Delegates at the Olympics witnessed a fascinating sight of an army of robots actively executing several human-oriented tasks. They were seen everywhere from surveillance, patrolling, greeting athletes and delegates, helping guests locate their seats, carrying luggage, and providing on-field support for the ground events such as javelin throw and discus throw. Practical usage of robots ensured that minimum staff members were required for many tasks, a far less health threat to athletes and delegates during these uncertain times.

Categorized as Human Support Robot (HSR), Delivery Support Robot (DSR), and Field Support Robot (FSR), these robots use omnidirectional wheels and several integrated cameras and sensors for free movement even in a jam-packed environment without colliding with anyone. They are multilingual and trained to communicate with delegates and athletes in their preferred language and often act as a catalyst to bridge any language gap between athletes of different nationalities.

According to Olympics.com, the official website of Olympics, these robots were designed and developed as part of the 'Tokyo 2020 Robot Project,' being managed by the Government of Japan, the Tokyo Metropolitan Government (TMG), and official marketing partners Toyota Motor Corporation (Toyota) and Panasonic Corporation (Panasonic) with the cooperation of robotics experts.

"Developed by Toyota Motor Corporation, The Human Support Robot (HSR) and the Delivery Support Robot (DSR) are designed to support people's activities in everyday life and will be able to assist those with impairment and in wheelchairs. The HSR is to guide people to their seats and deliver beverages to them. The DSR is designed exclu-



sively for moving items and collecting garbage," according to a report titled Tokyo 2020 Robot Project: Toyota Motor Corporation - Supporting people by planting 'seeds for the future, published in the official website of Olympics.



The debut of driverless electric vehicles

While the success of driverless cars on roads is yet to get tested, they grabbed massive headlines at the Tokyo Olympics 2020. Leveraging the capabilities of 5G, Japanese automotive company, Toyota, deployed a range of Palette electric autonomous vehicles, box-shaped future-focused buses, to ferry athletes and officials around the Olympic site.

Fans and spectators around the globe were especially thrilled to see the mini version of the e-Palette that was employed as a ball boy for rugby matches at the Olympics. The little autonomous car moved across the field and was cheered by spectators on social media. In its 2019 press release, Toyota explained that these multi-passenger vehicles are equipped with preventive safety technologies and intelligent senses to avoid any collision.

Some notable features include Intelligent Clearance Sonar (ICS), designed to assist the braking in any unintended misapplication of the acceleration pedal; contrasting colors interior and exterior so that people suffering from color blindness have no hassles to board the vehicle at ease.



Besides Toyota, several global car manufacturers such as Tesla, Renault, Volvo, Mercedes, and Audi are continuously testing new and advanced technologies to design successful autonomous vehicles for the mass market.

Visitors and delegates at the Tokyo Olympic Village also witnessed a fleet of hundreds of zeroemission fuel cell cars in action, considered one of the most aspirational hydrogen experiments in modern history.

Enhanced 5G experience

Well, this is an area that would have gained great coverage across media should there be no restrictions on spectators' attendance at the Olympics. 5G has been seen as a gamechanger in every aspect, from accelerating the adoption of the Internet of Things (IoT), AI, augmented, and virtual reality to enabling autonomous vehicles, remote healthcare, and exceptional broadcasting experience.

The Tokyo Organizing Committee of the Olympic and Paralympic Games (Tokyo 2020) partnered with Intel Corporation, Nippon Telegraph and Telephone Corporation (NTT), and NTT DOCOMO to showcase innovative sports viewing experiences deploying the 5G technology at three competitions venues during the Tokyo 2020 Games.

"These brand-new sports viewing experiences will allow spectators to enjoy events in hitherto unimaginable ways. These will include broadcasts of ultra-high-resolution videos and simultaneous





multipoint videos leveraging the high-speed and capacity offered by 5G technology, as well as an AR experience that takes advantage of 5G's low latency. These facilities will be at the respective venues for sailing, swimming, and golf," stated an earlier update from the Tokyo Olympics.

However, since this Olympics edition deprived stadium spectators, the end-users could not showcase the 5G-based innovative real-time and immersive experiences. Nevertheless, the sporting event delivered meaningful 5G experiences to athletes by providing them high-resolution videos, insightful data, and analysis, helping them focus on their skills while observing the performance gaps in their competitors.

Next level of broadcasting through cloud

These unprecedented times have thrown unexpected challenges for broadcasters, who will have to rely on innovative measures to provide realtime coverage of the Olympics with an improved end-user experience.

Tokyo 2020 saw phenomenal broadcasting innovations, numerous AR experiences, and live fan interactions and video messages for athletes for an engaging experience for athletes and audience even if they are not in the stadium together. The Olympic Broadcasting Services (OBS) help broadcasters worldwide with content production and delivery workflows of broadcasting the Olympic Games through a cloud broadcasting solution. All visual and audio assets of the Olympic Games were stored in this cloud platform and delivered on-demand to all rights-holding broadcasters (RHBs).

The cloud technology enables athletes to watch their fans cheering for them from their homes on the big screens installed at the different competition venues.

Many engagement efforts were also made by users and global technology giants to keep the enthusiasm alive. Google, for instance, brought



Notable Tech Innovations

- CUE3: A humanoid robot, dubbed CUE3, stole the show by dipping half-court shots and three-pointers at ease during the halftime of a basketball match between the US and France. Equipped with multiple sensors and AI technology, the droid astonished everyone by executing three perfect basketball shots, demonstrating the kind of athletic skills future robots could have. A team of Toyota engineers has developed the concept robot.
- Power-assist suits: Developed by Pansonic, these suits helped operations staff during Games-time and made available to perform activities such as loading/unloading and delivering heavy boxes (food and beverages), transporting bags of waste, and loading/unloading luggage on buses.
- 5G x ultra-realistic communication technology: By leveraging 5G, 12K resolution video was broadcasted on a 50m screen floating on the water of the Enoshima Yacht Harbour, giving spectators the sensation of the races being held right in front of their eyes. A similar broadcast was provided simultaneously at the Tokyo 2020 Main Press Center to provide the media with a more realistic viewing experience. Similarly, delegates in specific seats at swimming competitions were provided with wearable AR devices which displayed detailed race information during events.
- Clothing to help athletes beat the heat: Many athletes, especially from the US, were seen wearing innovative clothes that check body temperatures of the wearer and separate heat through a sophisticated device that monitors and optimizes temperature like the world's most advanced computer systems.

Source: IOC, Olympics.com, Ralph Lauren Corporation

many leading athletes such as gymnast Simone Biles, tennis player Naomi Osaka, and India's bronze medal winner PV Sindhu to its Augmented Reality (AR) athlete list on its search platform. The feature enables viewers to see the skills and shots of their favorite athletes in real-time with custom backgrounds.

To summarize, the Tokyo 2020 Olympics' success showed us that sports and technology could inspire us to do more incredible things even in challenging settings. The success of various advanced and innovative technologies at the biggest sporting event could also further spark new working models and collaborations for businesses across all sectors.





How To Successfully Transition To A Hybrid Workplace?

Embracing a flexible mix of remote and office-based working has become critical for many organizations. Presenting a practical guide for implementing an intelligent 'team anywhere' model.

By Jatinder Singh

he growing post-pandemic digital ecosystem has pushed organizations to redefine flexible work strategies for all employees while ensuring they remain happy, productive, and innovative. In the wake of ongoing uncertainty, the needs of people will continue to be diverse. Even if the impact of COVID subside, some employees would still prefer to work from home, and others may be more comfortable getting back to a routine office schedule at the earliest.

For many entry-level workers, delivering while working from home without the necessary training can become a huge challenge, if not an obstacle. Many would also be facing challenges related to adapting to the new culture, lack of training, and insufficient bandwidth. Similarly, people who have to spend a significant amount of unproductive time commuting to the workplace may not find it very encouraging to go to the office every day. Many global companies such as Google, Amazon, Microsoft, Ford, among others, are extensively planning to give their employees the flexibility to work both remote and in-office to their employees.

Interestingly, employees who rarely or never teleworked have become so hooked to the idea of working from anywhere that they might leave their jobs post-COVID-19-pandemic if they do not get some form of work flexibility, as per the EY 2021 Work Reimagined Employee Survey. What looked like a concept in its infancy before the pandemic has become the New Normal.

The overwhelming success of remote working has put CIOs and other business leaders in a conundrum as they plan for the future of work. By using technology at scale, enterprises have created roundthe-clock location-agnostic work platforms for millions of employees across the globe. In the above context, adopting a hybrid workplace model is the natural transition for businesses to support a high degree of collaboration across stakeholders and ensure business continuity. However, creating a perfect remote and office work environment recipe while adhering to the COVID protocols requires much rethinking. It needs advanced technology interventions and a redesigned, tech-enabled workspace where every employee feels secure, excited, and self-driven.

1. Identify unique business needs

The widespread health crisis has



"Collaboration, continuous learning and innovation, and performance will determine the future of new workplaces. It would be a huge challenge to keep track of how individual workers are performing, innovating, and collaborating in the new hybrid work environment."

MAHENDRA K UPADHYAY Chief Information Officer at BARC India dramatically transformed the way enterprises operate today. Across all industries, there have been several experiments, tech integrations, process refinements, and new learnings to navigate the uncertainty and build capacities to support the distributed workforce model.

During the pandemic, businesses faced a considerable challenge to transition to remote work, to the cloud, and to accelerate digital transformation at a breakneck speed. However, getting their employees back to offices after COVID is even a more monumental shift that they are dealing with.

According to a report, "It's time to reimagine where and how work will get done" by PwC, the success of remote work has reimagined how corporate work gets done and where the work takes place. It has resulted

> in the need for a hybrid workplace model, which embraces the flexibility that most employees (and some employers) crave after working from home for months. "Given the trends accelerated by the pandemic, executive leaders need to articulate what their office is meant to accomplish quickly. That clarity will enable them to reimagine how and where their work gets done, how much office space they need, and how to support employees to be effective in any work environment," it adds.

While some employees exhausted of work-from-home would happily resume offices, many others will resist, given the uncertainty around the future waves of the pandemic. For instance, with vaccines becoming available in most places and pandemic slowing, several employees, especially the young talent, are excited to return to the physical workplace. But that may not be the case with caring parents or people requiring long travel time to reach offices.

In this light, enterprises must revisit their unique business

SPECIAL FEATURE

requirements before moving towards the new hybrid workplace models. Rational deliberations must be put in place by top function and tech leaders around:

- Why are certain people required in offices?
- Who should be called to the offices first, of which department, and how frequently?
- What should be the short-term and long-term strategy to create an efficient mix of remote and on-site working for different roles?

"Collaboration, continuous learning and innovation, and performance will determine the future of new workplaces. It would be a huge challenge to keep track of how individual triumvirate of remote-working, physical workplace, and hybrid working models will become a reality across industries. This will be possible by significant enterprises' investments in technologies, process innovation, and reskilling to maintain productivity, leading to enhanced customer satisfaction levels."

The 'new workplace' concept will continue to change/evolve rapidly, presenting businesses with novel challenges that technology interventions can solve.

2. Focus on healthy and safe return to offices

Once enterprises have identified their business needs and decided about

ment among employees in the new hybrid work environment. For leaders, it will be critical to better understand the emotions and comfort of their employees as many of them would still be facing new personal and professional challenges," says Anshuman Tiwari, Global Head of Delivery Excellence, DXC Technology.

Embrace employee health monitoring tools: Building a new workplace requires enterprises to leverage the latest technology innovations to collect and analyze distributed workforce's health data to monitor their current anxiety levels and well-being requirements. CIOs should ensure the



"Besides leveraging technology, businesses also need to continue to focus on compassionate leadership to drive more productivity and engagement among employees in the new hybrid work environment. For leaders, it will be critical to better understand the emotions and comfort of their employees as many of them would still be facing new personal and professional challenges."

ANSHUMAN TIWARI Global Head of Delivery Excellence, DXC Technology

workers are performing, innovating, and collaborating in the new hybrid work environment," says Mahendra K Upadhyay, Chief Information Officer at BARC India.

Upadhyay adds that effective feedback mechanisms and data analytics tools can help business leaders identify visible patterns and answers to the above questions, enabling them to decide on the real estate, IT, and office design requirements.

Agrees, Roop Singh, Chief Business Officer, Birlasoft. "A co-existing

the population that can work from offices, it becomes critical to develop a comprehensive and consistent workplace strategy to keep their employees safe and alleviate their fears. Enterprises need to ensure that people coming to offices are fully vaccinated and strictly follow safe work practices.

"The pandemic has brought a monumental shift in the way we work or collaborate. Besides leveraging technology, businesses also need to focus on compassionate leadership to drive more productivity and engagedeployment of necessary tracking and automation capabilities at various office entry points to identify employees who are yet to be vaccinated. While doing so, make sure that you follow best practices and compliance to use employee information only for their welfare and provide proactive support. "Employee safety and wellness will be the key priorities as organizations determine the balance between remote, hybrid, and office routines. Seat visualization and

SPECIAL FEATURE

people finder, parking reservation, contactless access, smart cafeteria, visitor management, wearables, IoT solutions, AQM, and digital information walls will play an essential role in building confidence among the workforce to return to the workforce office," says Aashish Agarwal, Managing Director, Workspace, ANSR.

Ensure social distancing at the workplace: Make sure that layouts of new workspaces should be able to provide necessary social distancing to employees. The public dealing desks should have physical barriers such as acrylic partitions to protect employees from catching an infection. COVID-19 temperature and oxygen screening mechanisms should be at the entry gate to keep people rescued from the new virus strains. "Al, Data Science, Cloud, API are driving digital transformation and reshaping several service sectors, including the Capital markets, financial services, and insurance industries. This acceleration will continue even in the post COVID era as many organizations look at the hybrid workplace model. In light of this, we have reimagined our physical offices with a series of initiatives, such as deploying thermal screening machines, distant cubicles, and pedal-powered hand sanitizers across floors. There is also a provision of in-house doctors and ambulances within the office campus, explains Hareesha Pattaje, Managing Director and Country Head (India), Synechron. Communication is critical in holding distributed work populations together. The New Workplace should provide frequent updates around the overall health situation of different geographies the firm operates from to its employees.





"Conceptually, the idea of new modern workspaces is still very new and bound to fail if organizations do not have the right assessment capabilities about their employees' unique requirements and strengths."

> **RAJESH AGGARWAL** Head of IT at Aamor Inox

Touchless tech is at the top of the list that businesses should adopt to limit the potential vectors of virus transmission and strengthen employee health and safety. Businesses should deploy cloud-based touchless technologies and QR codes at various office points or at high-risk zones – such as elevator buttons, door handles, attendance check-in, visitor screening kiosks. In addition, provision for disinfecting mechanisms at night or early morning should be made.

Make a provision of employee isolation zones: By deploying video surveillance in common areas, organizations can closely watch employees' health and isolate them immediately should there be a risk of infection. The potential of analytics can be leveraged extensively to study and analyze key employee and customer trends.

3. Assess your business transformation strategy

During the pandemic, technology became a savior and played a crucial role in ensuring businessas-usual scenarios. Organizations sped up technology adoption in the race to stay current, improve customer experience and keep pace with future-specific innovations.

In the new hybrid workplace scenario, the role of technology will continue to be critical in building a functional and data-driven future workspace. As a crucial step, enterprises should reflect on their technology readiness to drive the culture change, upskill people and ensure cross-departmental collaboration across its distributed workforce seamlessly and securely.

Across all industries, there have been several experiments, tech integrations, process refinements, and new learnings to navigate the uncertainty and build

capacities to support the distributed workforce model. Business leaders have to make subtle shifts in managing their teams remotely.

Evaluate your talent transformation needs: As we move toward a post-COVID era, enterprises need to address several challenges related to talent transformation. The pandemic has made many erstwhile job profiles redundant and required most talent pools to be IT savvy to operate and thrive in the new digital era. IT leaders will need to collaborate with HR leaders to identify the talent readiness to work in the new hybrid workplace environment. Create a plan to identify skill gaps to develop necessary learning modules to retain and nurture the talent.

SPECIAL FEATURE

One must remember that almost two years of an abrupt shift in the working model has created a large pool of young talent who may need extensive training support to work efficiently in the new workplace model. In addition, the remote work environment has also provided companies the scope of expanding their talent pool from the farthest of locations. This will increase the need for cultural alignment in the era of modern workplaces.

"There is a tremendous change in mindset and culture. A lot of traditional companies have earlier shied away to implement distributed work environments. And now organizations are hiring a lot of talent from remote locations. The success of the new hybrid workplace model will hinge on how effectively organizations leverage various technologies to enable working in a sustained manner in that model. Adopting unique collaboration tools and beefing up IT security will play a pivotal role in the success of new workforce models," says Neeti Wahi, Group Chief Information & Digital Officer at Sterlite Power.

Do you have a work-fromhome policy yet?: The main

challenge for companies in developing a new workplace foundation is rapidly forming a WFH policy. "Many don't have one and have never needed one. But guidelines are imperative. However, the biggest challenge facing organizations deploying work-from-home policies is trust and accountability. Many Indian companies are centralized institutions, so decentralizing that authority is difficult to adapt to. The adoption of digital solutions has been significantly helpful in enabling collaboration amongst decentralized staff or teams instead of a single, cen-



"The success of the new hybrid workplace model will hinge on how effectively organizations leverage various technologies to enable working in a sustained manner. Adopting unique collaboration tools and beefing up IT security will play a pivotal role in the success of new workforce models."

NEETI WAHI Group Chief Information & Digital Officer at Sterlite Power

tralized location", says Sankalp Saxena, SVP and MD-Operations, India, Nutanix.

Automate your business processes intelligently: Processes that are dumb and require manual efforts can be automated to increase productivity, reduce costs, better accuracy, and improve customer experience. According to a study, Automation with Intelligence: Pursuing Organization-wide Reimagination, from Deloitte, many organizations deploying automation at scale have tripled in the space of two years. COVID-19 accelerated the need for automation solutions within enterprise organizations, particularly those that offer scalability and rapid deployment options. "Building a new workplace must require critical thinking of key decisions to enhance trust, transparency, and teamwork. Developing virtual solutions has helped us increase flexibility, inclusivity, and accessibility during these trying times," states Rishi Bhatnagar, President, Aeris Communications.

Ensure experience equality across distributed workforce:

In the New Normal, workspaces will be built for people to collaborate, celebrate and elevate their output over remote work. One of the critical challenges for organizations will be to provide experience parity - ensuring people feel connected to the organization in a secure manner regardless of whether they are remote native, working-fromhome, or work-from-office. According to Umesh Bhapkar, Senior Director - Systems, Synechron, a New York-based IT and consulting company, Cybersecurity is critical, mainly for companies dealing in banking and financial services. "We will continue to invest in new

technologies powered by AI/ML such as deployment and usage of Chatbots, automated processes, and more that will help in boosting our cybersecurity posture, enhance employee productivity, and ensure end-user delight. Employee awareness is one of our biggest defenses against social engineering attacks such as Phishing and ransomware threats. We are, therefore, constantly educating our employees through Infosec training, quizzes, and phishing simulators by using digital platforms, and will continue so," Bhapkar adds.



Organizations must also deconstruct synchronous and asynchronous work patterns across generational and behavioral profiles to overcome hybrid work challenges and foster collaboration. "While CHROs, CREs and CIOs need to work closely on identifying and deploying solutions, there is a need to collate and analyze data, monitor emerging trends, assess challenges, determine ROI of investments and explore more efficient and interoperable solutions that align with the organization's broader workplace strategy," says Aashish Agarwal, Managing Director, Workspace, ANSR.

home, they can incentivize the working from home aspect. If they are focusing on bringing people back to work, then they can incentivize those set of employees, of course in the kind of proportion (WFH vs. Office) they want."

4. Conduct detailed analysis of office space costs

The unprecedented scenario has put severe pressure on many companies to look at the budget allocations, and CIOs and business leaders are not oblivious. Transforming workspaces comes at a cost. Be it implementing new technology areas, buying modern work equipment, or getting more sary for excellence, and where offices are located today, among other factors.

5. Track employee pulse before taking a decision

Most business leaders agree that the new workspaces will be designed to collaborate, celebrate and elevate their output over remote work. One of the critical challenges for organizations will be to provide experience parity – ensuring people feel connected to the organization regardless of whether they are remote-native, frequent work-from-home, or frequent work-from-office.

Organizations must also deconstruct synchronous and asyn-



"An effective hybrid workplace strategy should be driven by incentivization. Let's say if the organization is inclined toward working from home, they can incentivize the working from home aspect. If they are focusing on bringing people back to work, then they can incentivize those set of employees, of course in the kind of proportion (WFH vs. Office) they want."

ARCHIE JACKSON Senior Director (Head - IT & Security), Incedo

From a cultural perspective, technology interventions will focus on enhancing the experience of virtual meetings, online whiteboards, document synchronization, learning applications, mobile applications, and community development.

Incentivization: According to Archie Jackson, Senior Director (Head - IT & Security), Incedo, "An effective hybrid workplace strategy should be driven by incentivization. Let's say if the organization is inclined toward working from retail space. There will be an operational cost associated with it.

For smaller companies, it may not be easy to design new ways of working straightaway. McKinsey, in its report, Reimagining the office and work-life after COVID-19, noted, "Leading organizations will boldly question long-held assumptions about how work should be done and the role of the office. There is no one-size-fits-all solution. Different for every organization, the answer will be based on what talent is needed, which roles are most important, how much collaboration is neceschronous work patterns across generational and behavioral profiles to overcome hybrid work challenges and foster collaboration.

Flexible work arrangements are among the significant employee trends that the pandemic has accelerated due to widespread remote work. During the last few months, organizations have successfully helped their employees become more productive remotely by introducing flexible work arrangements – letting employees decide the working hours after taking account of their personal needs.



However, the pandemic has impacted different people in different ways. Hence, it is paramount to take qualitative and quantitative feedback from employees about their preferences, work skills, readiness levels, and productivity impact analysis to help organizational leadership prepare an action plan around a welldefined structured workspace and seating capacity.

SAP Labs India, for instance, conducted an internal poll to check the employee readiness of its people to back to offices. The result disclosed that 80% of the company's employees were keen to adopt a hybrid workspace with limited time in the office. The company has been leveraging its technology capabilities to design new workplace tools and apps to enable its employees to resume offices in the future.

"Earlier this year, we began a phase-wise reopening of our offices to facilitate teams wanting to work from the office. We leveraged our technology expertise to build an app to book office visits and ensure safety on the campus through Al-based mask detection and contact tracing. We developed an Al-based video analytics solution that helped our physical security team reassure realtime, social distancing, and proper usage of masks in common areas across SAP office buildings. An app that allows employees to pre-order meals at the cafeteria is also in place. However, our campuses were closed once the second wave of virus spread guickly across the country," said Sindhu Gangadharan, SVP & MD, SAP Labs India.

The company has recently announced a flexible working policy for its employees worldwide and focusing on a flexible and inclusive work environment that is trust-based.

6. Prioritize intelligent workspace experiences

Contactless facilities, AI-powered devices, motion sensors will form a part of the return-to-work strategies as organizations continue to maintain employee well-being and employee safety as essential parameters of the New Normal-based employee experience.

The traditional office environment comprising fixed individual office seats and meeting rooms is a thing of the past. Even before the pandemic, many global enterprises moved away from the concept of fixed seating capacities. They introduced various tools and apps to find and book personal workspace online before coming to the office.

"The road to building future of work involves developing world-class enterprise applications across platforms. Everybody is talking about digital transformation and the future of work. But in reality, nobody knows where to begin. Building proof of concept is the first thing that any organization should do. There are security concerns, issues related to risk compliance which need to be evaluated thoroughly," states Sandeep Sudarshan, Head - Business Solutions & Consulting, Subex.

Besides applications to support distributed workspace, there will be a massive focus on developing physical workspaces that ensure a safe distance between employees to stop the transmission of infections while enabling them to interact with their remotely located peers through seamless teleconferencing. American technology firm Google, for instance, is extensively focusing on redesigning its office spaces. According to a report in The New York Times, the internet giant is working on concepts like 'Team Pods,' comprising blank canvas of chairs, desks, whiteboards, and storage units in casters, replacing conventional row-based office-desk setups. It has also designed futurefocused meeting rooms in its offices where employees can be seated in a circle facing giant screens to interact with their distributed team members or clients.

"We are focused on helping our people succeed in their new digital workspace by providing the right collaborative tools and capabilities. Our strategy includes four guiding principles that clarify that virtual work is important and that our workforce appreciates flexibility. These prin"What looked like a concept in its infancy before the pandemic has become the new normal. By using technology at scale, enterprises have created round-the-clock locationagnostic work platforms for millions of employees across the globe"

ciples are: fostering connectedness and belonging, sparking creativity and innovation, solving for speed, agility, and productivity and attracting and retaining top, diverse talent," expresses Saurabh Saxena, Intuit India site Leader and Vice President -Product Development, Small Business & Self-Employed Group (SBSEG).

7. Develop an effective change management plan

One should not forget that exceptional employee experience is essential to delivering extraordinary



business results and customer experiences. Hence, businesses should put people at the core while developing strategies around hybrid workspace models. CIOs, HR leaders, and Operations leaders should analyze carefully if their hybrid workplace strategy is well-equipped to live up to employee safety expectations.

The pandemic has impacted different people in different ways. Hence, it is paramount to take qualitative and quantitative feedback from employees about their preferences, work skills, readiness levels, and productivity impact analysis before preparing an action plan around a well-defined new-age workspace.

"Conceptually, hybrid teams and workspaces are still very new and bound to fail if organizations do not have the right assessment capabilities about their employees' unique requirements and strengths," says Rajesh Aggarwal, Head of IT at Aamor Inox.

Last but not least, making an effective change management plan encompasses all the details around the timelines, advisories, and essential steps around the new modern workplace strategy. Ensure that the change management plan is accessible to all your employees and includes necessary web links, training details for employees, updated policies, FAQs, and details around execute and control phases in easy-to-understand language. ■

INSIGHT



Important Steps In Preparing For Data Breaches And Security Incidents

Preparing for an incident will eliminate confusion and missteps if, in the moment of response, things get overlooked and mistakes are made

By Rajesh Maurya

Security incidents and data breaches can have very disruptive and devastating effects on an organization. In fact, according to the Ponemon Institute's annual Cost of a Data Breach Report, the average total cost of a data breach is near USD 3.92 million, with an average of 25,575 records being stolen or compromised.

Recovering lost data is only part of the equation. Extended downtime can quickly compound costs on an hour-by-hour basis. And more difficult to quantify is regaining lost consumer confidence and damage to an organization's brand, which can take months or years to repair.

Part of the challenge is that modern cyberattack strategies involve new techniques and technologies designed to evade detection. As a result, not only do initial data breaches sometimes go undetected but the average dwell time of a breach – the time a compromise goes undetected while attackers scan your network and exfiltrate data – is sometimes 209 days. And even then, it can take more than a month to conduct a thorough investigation and completely recover affected systems.

Proper preparation, however, can cut costs significantly. Below are some high level points to consider when creating a security incident plan.

Preparing for an incident will eliminate confusion and missteps if, in the moment of response, things get overlooked and mistakes are made. This starts by identifying your incident response team, which should include not only technical team members and consultants, but also executives, the communications team, members of the legal team, law enforcement, etc. Each of these individuals will have critical insights that need to be incorporated into any preparations.

A chain of command across all team members will also need to be established so that incident responses can be carefully coordinated. Each member of the team should not only know their roles and responsibilities, but also the authority they have to make decisions.

In addition to having the right technology in place to of course detect a breach, other equipment is needed to respond to an incident, and that needs to be identified beforehand. Much of that equipment will need to reside off-network so that it isn't compromised in the case of a ransomware or similar attack. Likewise, regular backups of data and systems need to be available and stored offnetwork, and routine system and data recovery drills need to occur so bringing systems back online can be a smooth and seamless process.

To determine which technology will be needed, you also need to understand the kind of data you have in your environment and how it flows. In Preparing for an incident will eliminate confusion and missteps if, in the moment of response, things get overlooked and mistakes are made

addition, you will need to identify any critical business processes, and the assets that those processes ride over. Of course, you can't protect and monitor everything, so focus on what's important. Most importantly, determine if any of your data falls under any kind of regulation. Organizations subject to regulatory requirements need to ensure that official processes for documenting and reporting a breach are included in your preparations and strategies.

Detection and Analysis of Breaches

One of the biggest challenges organizations face is limited visibility across the distributed network. Not only do security tools and anomaly detection systems need to be in place, but they also need to be able to share information to detect events that would otherwise live under the radar.

This requires integrated security tools and a centralized system for analyzing and correlating data. Where possible, NOC and SOC operations should be tightly integrated so that security systems have a better opportunity to evaluate network data in real-time to detect suspicious behaviour.

Your incident response team needs to do the following to prepare for

data breaches and security incidents:

Data: Quickly determine what data and resources have been compromised or stolen and what critical business processes were affected. You will also need to analyse any systems compromised with malicious software to determine its intent and to clean IOCs, logs, and transactions.

• **Compliance:** Review what regulatory requirements need to be addressed. Because of the dwell time for most breaches, all critical data and logs will need to be saved off-line for a minimum of a year.

■ Authorities: Determine whether you need to contact the authorities, including law enforcement and regulatory bodies. This is especially critical for organizations bound by regulatory requirements. GDPR, for example, can exact significant fines for failure to report an incident in a timely manner.

• Evidence: Preserve evidence in case the incident becomes a legal issue. Law enforcement should have already been included in your preparation and planning, so steps for preserving the crime scene should already be part of your response plan so that any evidence is admissible in a court of law.

• Quarantine and Redundancy: Because impacted systems will likely need to be quarantined, redundant systems need to be available so that forensic analysis can take place. Quarantine capabilities are important to avoid spread.

■ Trace Attack Chain: Tools need to be in place that enable you to trace an attack path back to its point of entry. This will require determining the malware used and the dwell time of the attack. Once the attack chain and malware have been identified, every device along the attack path will need to be analysed. Incidents of compromise (IOCs) will need to be



used to identify other devices that may have been compromised.

■ **Training:** Employees, even those outside of IT or security roles, need to be cyber-aware and trained. Rarely do security incidents not affect the broader employee base. In addition, training will help facilitate proper response and could help with preventing incidents.

Contain, Eradicate, and Recover - Incidents

To prevent the lateral spread of an incident across the network, organizations should already have intentbased segmentation and zero-trust protocols in place. Intent-based segmentation logically separates systems, devices, and data based on business requirements, and are critical in preventing a system-wide incident.

Once malware or other elements of a breach have been detected, care needs to be taken to ensure that they are entirely removed from the network. Tools that modify shared libraries or files, that modify applications or code, or that exploit existing software tools - a technique known as living off the land - can make it especially challenging to identify and remove all elements of an attack. As a result, quick mitigations will need to take place to ensure that the attacker is not able to compromise the system again. This is accomplished by taking the information gleaned from prior steps and immediately address issues that led to the breach, such as reconfiguring a device, installing a missing patch, or resetting compromised credentials.

Finally, after an incident has been contained and eradicated, recovery needs to take place using good backups. Recovery teams should be able to bring essential systems back online as soon as possible. IT teams should also be aware that It can be difficult to totally eliminate embedded threats, especially those designed to evade detection, so it is always good idea to increase security monitoring for several weeks after a breach recovery ...organizations should already have intent-based segmentation and zero-trust protocols in place

to ensure the threat is completely removed.

Post-Incident Handling for Data Breaches and Security Incidents

This is a much longer mitigation process that will reduce the likelihood of an incident from reoccurring. Lessons learned need to be incorporated into security policies, points of compromise need to be repaired, hidden malware needs to be found and removed, and instances of the same weakness in other parts of the network will need to be hardened.

This is also when you may need to not only take a hard look at the security tools and systems that you have in place, but people and processes as well. What security elements are missing that could have caught the breach but didn't? What processes broke down? What skillsets were missing that could have sped up the discovery of a breach or the incident recovery process? This may mean adding additional tools to your security architecture, updating or replacing systems that failed to do their job, and providing additional training for critical security personnel.

Visibility is a critical element of that process. Critical gaps often exist between security devices, and you will need to assess where communications between different systems broke down. An event detected by one device that is not correlated to a related event detected by another, or that fails to trigger a response, can result in a serious incident that can go undetected for months.

Addressing this challenge not only requires consistent security across the distributed network but tools designed to share and correlate threat intelligence in real-time. You will need to assess what you can see and not see, and make changes to expand visibility and improve your network's ability to respond to events automatically.

Finally, lessons learned need to be turned into education for different groups within the organization. If the breach began with a phishing attack, for example, all employees should receive heightened education on preventing future incidents. Likewise, a breach due to a flaw in an internally developed application should trigger security best practices training for your DevOps teams.

Responding to a Future Data Breach Starts Now

Often, this requires a shift in thinking. It can start by assuming that your organization may have already been breached. If that's true, what issues exist in your security architecture right now that prevent you from seeing it? Are your existing solutions able to detect even the most subtle anomalous behaviors? How quickly can your network put two and two together and come up with a response? Do you have a team in place ready to respond once a breach is detected?

Answering these questions now, combined with regular wargaming, incident response drills, assessments of your current security technology capabilities, and ongoing training will help ensure that you can minimize the impact of your eventual cybersecurity incident.

The author is Regional Vice President, India & SAARC, Fortinet



The Power Of Al

ML and DL help us to create an Al system that can even create systems with more complex tasks that a human can do

By Kanu Butani

rtificial Intelligence (Al) is a science that deals with how we can build a system using computers, and the data that we have in the humongous form, that can do the manual tasks that humans do in to an automated one. Robotics Process Automation (RPA) deals with the conversion of manual process into automation. Al is still bigger than just automating the computer processes. It also has ML and DL at a very greater scale. ML and DL help us to create an Al system that can even create systems with more complex tasks that a human can do. The way human analyzes a situation and behaves or works here at first stage we want to see that the way a reasonable person with average understanding can do, such tasks can be done using ML and DL in an appropriate way.

In this article we will see some of the examples that can show us how Al can be powerful and its underneath technology, using ML and DL and the different formulae applied and then the power that Al gets to show how it can help humans in automating many things. Certainly, AI must be explored more and with the extent that AI has, it can help humans while they do some tasks manually and the human intervene deciding how to take this ahead.

AI Power

I was going through the videos and articles that discusses many examples that define the real-life AI and had done good things that make our life easier. When we see in our daily lives there are so many tasks that are repetitive and are done manually by people, even as a layman we would think if we can get some automated solution for these manual tasks to help us in a big way. The work that we do manually in our computers like data entry operations, or any support operations and try to make those into an automation process. Al is intelligent enough to help us in solving these sorts of manual repetitive tasks in the start and head towards being the leader in automation industry. This simply transforms reading of mails and other files and replying to those mails with not just auto-reply sort of things, but an added intelligent in the reply using ML technology.

Machine Learning

Data Science and AI show us how important the need of Automation is in today's world. When we do so many of the repeated tasks manually and getting connected from one software to another, and sometimes from one server to another and repeatedly doing those all the tasks manually, drain all our energy, and that is the time we hope of some such automation process if it exists, we will welcome it with our open hearts. This is only the striving thing that wants us to think and create a solution that would help the techies to just click a button and all the tasks are done automatically. For example, take a scenario, if there are some unread emails of the same subject, pending to be read for 50 days old mails, same emails, with same issues containing same





ML Train Data Set (1 lac data rows set)					
Features	Body Type	Color	Results		
ААА	BBB	ссс	German Shepard		
PPP	QQQ	RRR	Bulldog		
Total 1 Lac Training Data Set					

data, but they must go through those emails and figure out when the problem arose and when it was resolved. This can be done only by manually visiting those emails and checking one by one, and finally figuring it out when it was finally resolved so that we can send the closing mail to the recipient. Imagine if we create a bot that goes through these emails and searches all the emails with a same subject line and finally gives out the report saying that this email has been coming from last 60 days and the solution is yet



to be done, and this report goes to the SME who is responsible for these emails, will surely make the life easier for the SME, with such an automation solution. Isn't it?

In the above example, NLP (Natural Language Processing) helps us in a great way. With its help we can find the emails that contain same subject and then fetch the total number of emails that are there for that subject. The concepts of NLP like finding a word in a paragraph and by applying stop words we can eliminate words like pronouns, conjunctions, etc. to get a clean paragraph and then even execute other concepts to figure out the specific word from a paragraph or an article to fetch more required information. For example, if we want to search the internet for a celebrity where all and which all magazines and/or newspapers his name is mentioned or for which brands he is advertising, this can be very easily fetched through NLP and ML concepts of unstructured data.

ML opens up more ways to automate the process by applying concepts in Al. The two most important concepts are:

- Supervised learning
- Unsupervised learning

Easier and powerful supervised learning in which we have a last column called result, and other col-

If we have a training data of one of the humongous data sets of the "breeds of dogs" which the machine is made to recognize based on its features and the machine has now learnt much from its training data that is fed

umns called fields that can sort out the values and the data in a particular fashion.

For example, if we have a training data of one of the humongous data sets of the "breeds of dogs" which the machine is made to recognize based on its features and the machine has now learnt much from its training data that is fed. Now when it sees a picture of a dog in the real time data, input check, it goes through all of its training data set and based on that it can recognize which dog it is. In the machine learning this accuracy comes up to 70% to 75% and that is considered as the best accuracy. But same thing when it gets into deep learning (using CNN - Convolution Neural Network) then the accuracy shoots up to 95% because now the machine is doing its analysis like a human brain does.

These and similar examples show how AI interact with automation and help us in our day-to-day activity. It makes these technologies go a long way to make more and more intelligent solutions for us so that not only repetitive tasks but also apart from these we get more better solutions. We expect these technologies to play a vital role in displaying its presence in these manual processes and show more enhanced behavior.

The author is Manager - IT at Atos India



What's The Road Ahead For SAS?

After it failed to reach the sale agreement with Broadcom, SAS has surprised everyone by announcing plans to go public. Could there be another twist in the tale?

By Jatinder Singh

ithin two weeks after holding discussions to sell the company, the global analytics firm, Statistical Analysis Software (SAS), has surprised everyone by announcing its plans to go for an Initial Public Offering (IPO) by 2024. Announcing its plans of going public through a press release, the analytics firm specified that it "has achieved the financial strength, brand equity, and market leadership to make this move."

The move had come when the IT industry was rife with speculations that the pure-play data analytics firm held talks with Semiconductor giant, Broadcom, about being acquired for USD 20 Billion. At the time of writing, several media reports indicate that the acquisition discussions have ended without reaching any agreement. Headquartered in Cary, SAS is the world's largest privately held software company. On several occasions previously, Jim Goodnight, its Founder & CEO, has maintained its position to remain independent despite being approached by several global majors such as IBM and Microsoft for acquiring a stake in it.

In the context of the above, it's pretty astonishing to see the urgency adopted by SAS to raise its investor appeal. It would also be interesting to mention that the SAS, founded in 1976, made similar announcements to pursue an IPO in early 2000 without much progress due to the dot-com bubble burst.

Stagnant revenue and need for investment

Despite being profitable for 45 years, the revenues of SAS have largely been flat for the last five successive years. The company's last five-year revenues recorded figures are: USD 3 billion (2020); USD 3.1 bn (2019); 3.27 bn (2018); USD 3.24 bn (2017); and USD 3.2 bn (2016). Even if the firm's top executives do not accept it publicly, this trend can be concerning for any global company in the age of elevated uncertainty.

Among the new breed of data analytics experts and data scientists, SAS is losing acceptance to open source technologies based on Python and the R data analytics language. SAS commercial software is expensive for most young professionals, but it also lacks advanced graphical capabilities compared with Python and R.

SAS's key areas of growth are dataled experiences and innovation. In this light, it needs to make significant investments in Artificial Intelligence (AI), cloud, Internet of Things (IoT), and advanced analytics to further its position in data management and data analysis that is witnessing massive competition. The IPO bid can attract and retain quality talent by offering stock options and acquiring new startups in the emerging technology areas to strengthen its capabilities for enterprise customers.

With rising competition from companies such as AWS, Microsoft, and Google in the corporate software, SAS knows that it has to invest in technology areas to leap forward. Attracting the new-age talent, helping them stay connected, understanding, surveying them constantly to get an idea of how they are feeling, offering them remote HR capabilities for training and wellness will continue to be a massive



Among the new breed of data analytics experts and data scientists, SAS is losing acceptance to open source technologies...

priority (See: Gearing Up For Future Of Work Using Tech-Driven Innovation).

Future leadership dilemma

SAS is also dealing with the challenge of preparing next-in-line leadership for a company that has over 14000 employees worldwide. Seventy-eight years old James Goodnight, who has been holding the post of CEO of SAS Institute since 1976, had been grooming Oliver Schabenberger, the former COO of the company, for the future CEO role at SAS.

However, after the sudden departure of Oliver in December 2020, the company seems to be in a state of fix to decide on the next possible replacement to Goodnight. The analytics stalwart has a strong bench of leaders such as Bryan Harris, EVP and CTO; Jennifer Chase, CMO; and David Davis, EVP and CFO, among others, who are probably in line to lead the firm after Goodnight's departure.

Signal to Microsoft?

The analytics space is growing at an unprecedented pace. In the cloud-

INSIGHT

enabled digital-first business environment, in-depth analytics offer actionable insights that can help enterprises understand their customers better, find new markets, deliver exceptional experiences and help build resilience. However, this space is also witnessing a massive consolidation wave due to excessive competition. Global technology behemoths such as Google, Salesforce, Amazon, Oracle, Microsoft are looking to strengthen their analytics capabilities through acquisitions.

Salesforce, for instance, acquired Tableau in its largest acquisition ever for USD 15.7 billion in 2019. Microsoft acquired data analytics startup Looker for USD 2.6 billion last year.

SAS understands that it would need a strong collaboration or a partner to take its business to the next level in the future. By entertaining the acquisitions talk with Broadcom, SAS has gauged the acquisition cost (USD 20 Billion) that the semiconductor company was willing to pay. SAS has also hinted to its longstanding partner Microsoft that it was open for sale through this move. Concurrently, to restore the confidence of its employees, who may be worried about their future after the news reports of Broadcom - SAS acquisition talks, the analytics firm has announced its plan to go public. The possibility of getting possible stock options at a discounted price and the improved public image would help SAS retain and attract superior talent.

"The partnership between SAS as a leader in the analytics space and Microsoft as a leader in the cloud makes for an interesting strategic alliance. With SAS planning to build integrations across Microsoft's entire cloud portfolio (Azure, Microsoft 365, Dynamics 365 & Power BI), it opens up a lot of joint solution potential," stated Steve White, Program Vice President, Channels and Alliances at IDC, in a Microsoft-SAS press statement issued around a comprehensive technology and go-to-market strategic partnership with SAS. ■



What Does It Mean For Salesforce To Enter The RPA Market?

Salesforce's Servicetrace acquisition will enable it to add new bot capabilities to its existing platforms. But is the move coming too late?

By Jatinder Singh

alesforce is the latest to join the list of software vendors who have been expanding their Robotic Process Automation (RPA) muscles through acquisitions to improve performance and re-engineer business processes of its enterprise clients. The San Francisco-based CRM pro-

vider recently announced that it has entered into a definitive agreement to acquire Servicetrace, a provider of RPA, and will integrate with MuleSoft, an API solution provider that it previously acquired.

"With the addition of Servicetrace, MuleSoft will be able to deliver a leading unified integration, API management, and RPA platform, which will further enrich the Salesforce Customer 360 — empowering organizations to deliver connected experiences from anywhere. The new RPA capabilities will enhance Salesforce's Einstein Automate solution, enabling end-to-end workflow automation across any system for Service, Sales,

Industries, and more," states Brent Hayward, MuleSoft CEO, in the company's official blog.

While the Servicetrace acquisition will undoubtedly help Salesforce drive better experiences for its customers, it would be interesting to see if it has taken the move a little too late?

Catching up with other giants

RPA has been a hot topic in the IT industry for quite some time now. It enables enterprises to automate rule-based, repetitive, and error-prone tasks through software bots. Some of the examples could be filling data in a form, onboarding employees, and online scheduling. By amalgamating RPA with cognitive technologies such as machine learning and natural language processing, enterprises could free up their talent from manual work and leverage their skills to focus on strategic tasks and create new digital experiences for customers.

The competition in the RPA space has been intensifying in recent years, with leading software vendors already foraying into this space. In November last year, Microsoft acquired an RPA vendor, Softomotive, intending to add more to its automation capabilities and combining it with Microsoft Power Automate. The announcement came after IBM's declaration to acquire WDG Automation to advance Al-Infused Automation Capabilities for Enterprises. There's also Service-Now which acquired Intellibot.

Not to forget, in 2018, SAP acquired Contextor SAS, a European firm in the design and integration of RPA to accelerate its Leonardo Machine Learning Portfolio. In addition to this, the action at Google's end cannot be overlooked. The internet giant has recently announced a strategic alliance with Automation Anywhere to bring the Automation 360 platform to Google Cloud.

In the year ahead, the RPA space is likely to witness more action, with all top software vendors vying to take the lead and build their own RPA plat<text>

forms. This could make the survival of Independent RPA players such as UIPath, Blueprism, and Automation Anywhere tricky, leaving them an option to collaborate or getting acquired by software majors.

"Currently, Microsoft is the only player in the Automation field that has done well to accelerate its Automation focus with rapid product innovation, talent and leadership realignment, strategic GTM initiatives, and a captivating narrative for its customers. It is emerging as the market leader and has secured a spot amongst the top 5 platforms in the space. Considering the amount of competition in the Automation field, a new player like Salesforce must have a secure plan in hand and make moves carefully to make a significant dent," opines Nischay Mittal, Principal & Global Head - Automation/Al, Zinnov in his official blog.

Enterprise interest in RPA is exploding

Before the pandemic, the interest in building RPA capabilities was limited to large enterprises. However, the equation has completely changed due to the acute disruption caused by the COVID-19 pandemic.

According to a study by Gartner, Global RPA software revenue is estimated to reach USD 1.89 billion in 2021, from USD 1.58 billion in 2020, an increase of 19.5%. "Despite economic pressures caused by the COVID-19 pandemic, the RPA market is still expected to grow at doubledigit rates through 2024. 90% of large organizations globally will have adopted RPA in some form by 2022 as they look to digitally empower critical business processes through resilience and scalability, while recalibrating human labor and manual effort.," the research firm notes.

In times of remote work, there is a substantial increase in data, making it more challenging for CIOs and CTOs to manage, monitor, and govern workflows manually. To tackle the next wave of disruption, forward-thinking enterprises across the sectors, large or small, need to evaluate the best ways to automate their business processes and increase productivity.

The acquisition routes taken by the top software vendors such as Salesforce and Microsoft have demonstrated that automating internal and web-based applications are high on the agenda for enterprises in the post-COVID world. ■



Top 5 Enterprise Technology Trends For 2021-22

While the pandemic has induced a paradigm shift in the approach to enterprise technology, it has also accelerated the digital transformation journey of enterprises to foolproof their businesses

By Sindhu Gangadharan

futuristic business strategy always integrates the inclusion of rapidly changing technology to cope with ungovernable circumstances and to ensure business continuity. The COVID-19 pandemic has changed the way enterprises – large or small – operate and has fueled a cultural transformation that is now redefining the world of enterprise technology. Here are some trends shaping up enterprise technology in 2021-22.



been the undisputed winner in the crisis that followed the outbreak of COVID-19. The fact that almost every single industry was exposed to the volatilities caused by COVID-19 has led to this growing demand of a faster digital transformation of the Intelligent Enterprise.

An Intelligent Enterprise is all about adopting and leveraging advanced technologies which enable the rapid transformation of data into insight – thereby feeding process automation, innovation and optimal experiences. This also offers visibility across the entire enterprise with the ability to collect and connect data and take necessary action accordingly. This trend will continue into 2022 as many organizations announce their decision to go hybrid or fully remote with a global workforce.



Sustainable enterprises for a greener present &

When it comes to sustainability, settling for doing less harm is no longer sufficient. It is urgently time to do "more good". Today, every business must be agile, insight-driven and empowered with data to anticipate market trends - all while dealing with constant change and being mindful of the vital need to develop more sustainable business practices. Enterprises need to go beyond measuring top and bottom-line results to include a new dimension of success - a green line. More and more enterprises are embedding sustainability as a critical measure of business success. In a world where sustainability is a strategic and economic imperative, the time is now to transform to an Intelligent and Sustainable Enterprise.

Total Experience (TX) brings a new approach

When we talk about Total Experience (TX), we refer to a holistic program that ties customer, user, and employee experience together. The pandemic has necessitated the



An Intelligent Enterprise is all about adopting and leveraging advanced technologies which enable the rapid transformation

need for businesses to have a good TX strategy. Its goal is to not only enhance customer satisfaction but to also enhance employee productivity providing an exceptional experience to anyone interacting with your brand. Companies need to focus on interlinking the experiences as opposed to working on them individually. This way customers, users, and employees alike will be more satisfied as teams that work as an integrated unit. This trend will continue into 2022 as businesses try to eliminate communication silos and provide a unified experience for their dispersed workforces.



With cloud solutions becoming an indispensable part of enterprise technology, cyber threat sophistication continues to be a challenge for CIOs. A lot of the times, cyber offenders are successful because many organizations do not carry out due diligence in addressing the core problems of business email compromise, phishing, ransomware, etc. With dispersed workforces, organizations will need to rethink security where they protect employees, company assets and systems.

Byperautomation is the way forward Going forward, more busi-

nesses will want to combine the efficiency of automation with the decision-making capabilities that AI-ML bring to the table. It is advisable to invest in technology to automate tasks and integrate processes to connect the business end to end, including suppliers and partners, with full visibility. It is with this regard that hyperautomation is gaining popularity among smart enterprises. The idea is to automate everything that can be automated in an organization. With hyperautomation, enterprises can leverage new-age technologies to drive end-toend automation and deliver superior customer experience.

While the pandemic has induced a paradigm shift in the approach to enterprise technology, it has also accelerated the digital transformation journey of enterprises to foolproof their businesses. Therefore, when we talk about digitalization of intelligent enterprises, the question is no longer 'why', it is 'how.'

The author is MD, SAP Labs India & SVP, SAP User Enablement



Vulnerability And Patch Management Needs A Revamp In The Distributed Workforce Era

It's high time that organizations start looking at vulnerability and patch management as a unitary process

By Joyal Bennison

espite being cleared to return to the office, businesses have begun to embrace a hybrid work culture. While there are obvious benefits to a distributed workforce, having a sizeable portion of your endpoints beyond the corporate perimeter warrants guicker and more effective security methods. More than ever, there's a need to stay vigilant of vulnerabilities in your endpoints and keep them patched as and when vulnerabilities appear. This is even more pressing considering the recent surge in vulnerabilities, amounting to 8,993 security vulnerabilities (CVEs) so far in just the first half of 2021.

The shortfalls of the traditional approach

Traditionally, vulnerability and patch management involve dedicated tools operated by different teams. The security team employs vulnerability scanners to identify vulnerabilities in endpoints and shoots a ticket to the IT or remediation team with vulnerability details and required action items to fix them. IT administrators utilize patching tools to sweep the network for missing patch details, and they compare those findings with the data sent by the security team to correlate the patches required to resolve the vulnerabilities. Then the IT team proceeds to download patches from vendor sites, test them for stability, and deploy them to their production environment. Another round of scanning is performed by the IT team to ensure the vulnerability is thoroughly fixed, and the remediation status is sent to the security team, requiring the latter to perform additional validation to close the vulnerability management loop.

But there are multiple caveats to this fragmented approach. Here are a few reasons why it is inadequate for distributed IT, where vulnerabilities require instant, effective action.

Delayed remediation:

Juggling multiple tools for patch and

The deployment and maintenance of separate tools for patch and vulnerability management will cost you two times as much. It's as simple as that

vulnerability management results in a siloed, inefficient workflow, adding complexity, creating redundant scans, widening the gap between vulnerability detection and patching, and dramatically slowing down the process of remediating risk. It shouldn't come as a surprise that organizations in general take more than a couple of months to close a discovered vulnerability. Edgescan's 2020 Vulnerability Stats Report reveals the time taken by organizations to patch vulnerabilities for an internet-facing system is now 71 days. With the gap between vulnerability disclosure and active exploitation having shrunk in recent times, organizations need to be swift in remediating vulnerabilities, especially with remote endpoints exposed directly to the internet.

Lack of accuracy:

Point products don't interface well with each other, increasing the likelihood of potential disparity in data between integrated solutions. In other words, all the required patches may not get deployed completely and critical vulnerabilities could remain unaddressed.

Piling up management challenges:

Deploying and implementing multiple tools on remote endpoints can be clumsy and time-consuming, with the endpoints constantly plugging in and out of the network. Besides, managing multiple clients on remote endpoints can impact the VPN bandwidth of your organization. Adding to this challenge, installing multiple agents strains system resources and affects their performance.

Difficulties in scaling:

The modern IT landscape is extremely dynamic and it's characterized by the frequent addition of new remote assets. An instance of one of the agents not being installed on any of the new remote assets could introduce further complications in the workflow and leave behind several security gaps.

Increased security budget:

Let's cut to the chase: the deployment and maintenance of separate tools for patch and vulnerability management will cost you two times as much. It's as simple as that. Further investments include dedicated training sessions on each product for new staff.

It's high time that organizations start looking at vulnerability and patch management as a unitary process. Investing in integrated patch and vulnerability management solutions helps overcome these caveats by providing all the involved teams with unified visibility and better tracking from detection to closure of vulnerabilities across your distributed IT. With just a single interface and a single agent to maintain, scaling and management challenges are considerably reduced. Besides, an integrated solution simplifies the entire vulnerability management life cycle by automatically correlating vulnerability and patch information and facilitating direct remediation.

The author is Product Consultant at ManageEngine



4 Trends Shaping The Future Of Public Cloud

Global end-user spending on public cloud services expected to exceed USD 480 billion next year

By ITNEXT

our new trends in cloud computing are continuing to expand the breadth of cloud offerings and capabilities, accelerating growth across all segments in the public cloud services market, according to Gartner. The four trends are: cloud ubiquity, regional cloud ecosystems, sustainability and carbon-intelligent cloud, and cloud infrastructure and platform service (CIPS) providers' automated programmable infrastructure.

"The economic, organizational and societal impact of the pandemic will

continue to serve as a catalyst for digital innovation and adoption of cloud services," said Henrique Cecci, senior research director at Gartner. "This is especially true for use cases such as collaboration, remote work and new digital services to support a hybrid workforce."

Cloud Ubiquity

Today, the cloud underpins most new technological disruptions, including composable business, and has proven itself during times of uncertainty with its resiliency, scalability, flexibility and speed. Hybrid, multi-cloud and edge environments are growing and setting the stage for new distributed cloud models. In addition, new wireless communications advances, such as 5G R16 and R17, will push cloud adoption to a new level of broader, deeper and ubiquitous usage. Use cases such as enhanced mobile banking experiences and healthcare transformation will also emerge.

As a result, global cloud adoption will continue to expand rapidly. Gartner forecasts end-user spending on public cloud services to reach USD 396 billion in 2021 and grow 21.7% to reach USD 482 billion in 2022 (see Table). Additionally, by 2026, Gartner predicts public cloud spending will exceed 45% of all enterprise IT spending, up from less than 17% in 2021.

"Organizations are advancing their timelines on digital business initiatives and moving rapidly to the cloud in an effort to modernize environments, improve system reliability, support hybrid work models and address other new realities compelled by the pandemic," said Brandon Medford, senior principal analyst at Gartner.

Regional Cloud Ecosystems

Growing geopolitical regulatory fragmentation, protectionism and industry compliance are driving the creation of new regional and vertical cloud ecosystems and data services. Companies in the financial and public sectors are looking to reduce critical lock-in and single points of failure with their cloud providers outside of their country.

Regions not able to create or sustain their own platform ecosystems will have no choice but to leverage the platforms created in other regions and resort to legislation and regulation to maintain some level of control and sovereignty. Concerns among politicians, academia and tech providers in these regions are increasing, leading to initiatives such as GAIA-X in European countries.

Table: Worldwide Public Cloud Services End-UserSpending Forecast (Millions of U.S. Dollars)

	2020	2021	2022
Cloud Business Process Services (BPaaS)	46,066	51,027	55,538
Cloud Application Infrastructure Services (PaaS)	58,917	80,002	100,636
Cloud Application Services (SaaS)	120,686	145,509	171,915
Cloud Management and Security Services	22,664	25,987	29,736
Cloud System Infrastructure Services (IaaS)	64,286	91,543	121,620
Desktop as a Service (DaaS)	1,235	2,079	2,710
Total Market	313,853	396,147	482,155

BPaaS = business process as a service; laaS = infrastructure as a service; PaaS = platform as a service; SaaS = software as a service Note: Totals may not add up due to rounding.

Source: Gartner (August 2021)

Sustainability and "Carbon-Intelligent" Cloud

Nearly half of the respondents in the 2021 Gartner CEO Survey believe climate change mitigation will have a significant impact on their business. Cloud providers are responding to this growing focus on sustainability by instituting more aggressive carbonneutral corporate goals, which creates

Nearly half of the respondents in the 2021 Gartner CEO Survey believe climate change mitigation will have a significant impact on their business. Cloud providers are responding to this growing focus on sustainability by instituting more aggressive goals new challenges for infrastructure and operations (I&O) leaders.

"New sustainability requirements will be mandated over the next few years and the choice of cloud services providers may hinge on the provider's 'green' initiatives," said Cecci.

CIPS Providers' Automated Programmable Infrastructure

Gartner expects the broad adoption of fully managed and artificial intelligence (AI)-/machine-learning (ML)-enabled cloud services from hyperscale CIPS providers. This will rapidly eliminate the operational burden of traditional I&O roles in the public cloud.

"Infrastructure is becoming programmable, and its operation is subsequently becoming automated," said Cecci. "Modern IT infrastructure, whether deployed in the data center or consumed in the public cloud, requires less manual intervention and routine administration than its legacy equivalents."



4 Types Of Tech-Buying Organizations That'll Influence Go-To-Market Efforts Of Tech Marketers In 2021

70% of global technology buyers are exploring more ways to purchase technology this year, however vendor engagement strategies continue to underdeliver when it comes to meeting tech buyer expectations

By ITNEXT

0% of global technology buyers are exploring more ways to purchase technology this year, however vendor engagement strategies continue to underdeliver when it comes to meeting tech buyer expectations, according to a survey by Gartner.

"Technology providers often create go-to-market (GTM) strategies with limited insights into how an enterprise will make a buying decision," said Christy Uher Ferguson, research vice president at Gartner. "As the size of buying teams continues to increase, ideal customer profiles (ICPs) increase in importance. While understanding individual buyer personas is important to align messaging and content to specific role-based needs, buying teams act as an enterprise, with enterprise goals first and individual goals second."

Four Types of Tech Buying Organizations

Gartner identified four marketing clusters of technology buying enterprises based on key behaviors that influence GTM tactics – the Cooperatives, the Strict Planners, the Catalysts and the Business-Leds.

"The best consumer marketers tune their messages and channel strategies based on the behaviors of their ideal customers, but this is rarely done in the world of B2B technology marketing," said Hank Barnes, distinguished research vice president at Gartner. "Gartner's behavioral marketing clusters make it easier for tech providers to focus their efforts to be most appealing to the enterprises that are the best fit for their solutions with the right message and approach at the right time."

The Cooperatives make up the largest group of enterprises, representing 43% of buyers, but they are also the most challenging to predict. Their cooperative approach often means that they are less clear on what matters most to them — everything seems to matter equally. When exploring a new product or service, Cooperatives said that they evenly use all information types to learn more about it, including thought leadership, the product's or service's features, and product reviews.

Cooperatives said they leverage self-driven search and interactions equally for both new technology and replacement technology buying decisions. In fact, Cooperatives evenly cited self-driven search with thirdparty and vendor partner websites and interactions with vendors and partners in both buying situations.

Strict Planners are often coveted as targets due to the clarity with which they define their buying process. Strict Planners prefer proven technology that aligns to their strategic vision. 55% of Strict Planners said they rely trials or proofs of concepts and interactive tools to support the Catalysts cluster's buying process.

Business-Led buyers, representing 21% of those surveyed, involve the business throughout the entire buying process and seek to ensure that technology drives business value. Business-Leds seek specific product and service information in the form of customer references and proof points. In addition to product review sites, they are heavily reliant on direct engagement with vendors to learn more about products and services.

When buying new technology, 80% of Business-Led enterprises said they look to understand a provider's products and services primarily by selfdriven search rather than interactions. Yet, the opposite is true when buying

Catalysts accept the risk and costs of new technology and deploy as early as possible, but they want assurances and validation that technology will meet their needs

primarily on information about the product's or service's features when exploring a new purchase, so vendors should focus on supplying information that contains quantified results and rely heavily on expert interactions.

Catalysts accept the risk and costs of new technology and deploy as early as possible, but they want assurances and validation that technology will meet their needs. Catalysts look to understand a provider's products and services for new technology primarily through search within a trusted independent site. When buying replacement technology, they are more likely than other enterprises to seek information through direct vendor interaction. Tech providers should share information on product capabilities and implementation details, provide free

replacement technology as only 43% look to self-driven search, relying on interactions instead.

"Strategies must be built that are relevant to buyers and will engage buying committees throughout their buying and owning journeys. To do so, tech marketers should determine which of the four tech buying organization clusters aligns to their ICP and apply these as a filter or segment strategy within account-based programs to identify accounts that fit into each buyer cluster," said Ferguson. "Using buying behavior analysis, technology teams should develop personalized engagement strategies (messaging, account-based marketing programs, content and channel mix strategies) that are relevant to each cluster and implement these into their GTM efforts."



डिजिट अब हिंदी में

देश का सबसे लोकप्रिय और विश्वसनीय टेक्नोलॉजी वेबसाइट डिजिट अब हिंदी में उपलब्ध हैं। नयी हिंदी वेबसाइट आपको टेक्नोलॉजी से जुड़े हर छोटी बड़ी घटनाओ से अवगत रखेगी। साथ में नए हिंदी वेबसाइट पर आपको डिजिट टेस्ट लैब से विस्तृत गैजेट रिव्यु से लेकर टेक सुझाव मिलेंगे। डिजिट जल्द ही और भी अन्य भारतीय भाषाओ में उपलब्ध होगा।

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