CIO&LEADER

TRACK TECHNOLOGY • BUILD BUSINESS • SHAPE SELF

CK Prasad

Edsel Pereira

Dinesh Talniya

Kirti Patil

4TH
CIO&LEADER
SAMMAN

LEADERSHIP • BY THOUGHT • BY ACTION

Kersi Tavadia

Rajeev Pradhan

The fourth edition of the Samman announced during the 23rd annual conference on 28th August 2022, honoured nine veteran Indian CIOs. pg. 10

Liton Nandy

Rajiv Sharaf

Sanjay Gupta

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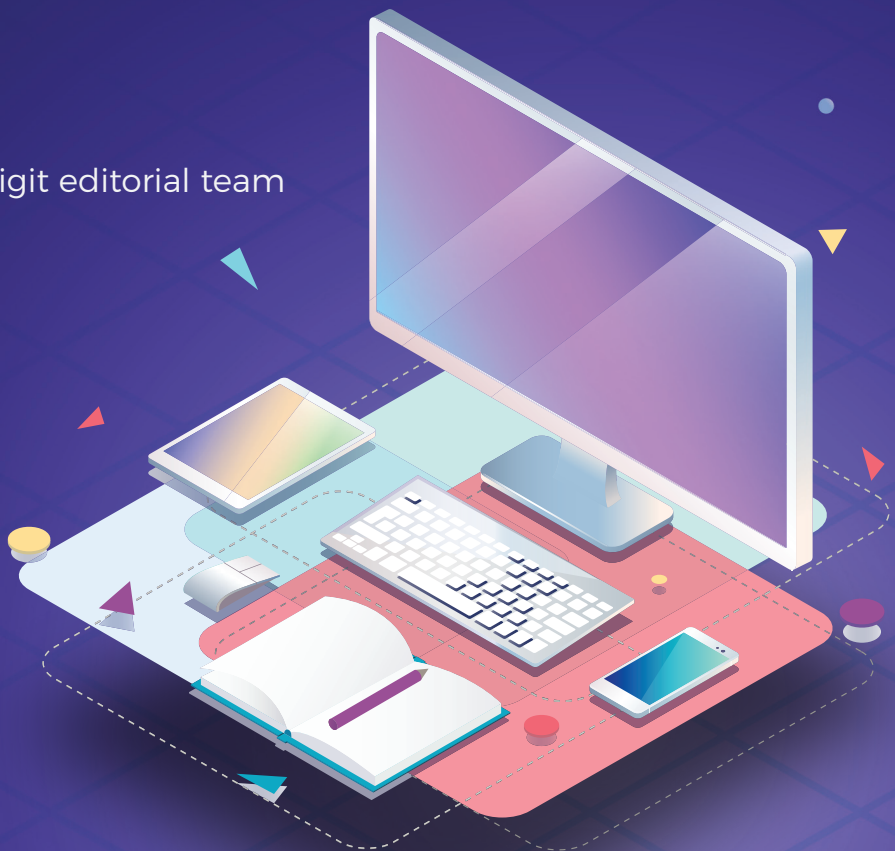Become a Digit Certified tech influencer

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Shyamanuja Das
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Celebrating Leadership

We started CIO&Leader Samman in 2019 to mark the 20th anniversary of CIO&Leader Conference. 9.9 Group, as a media house, has always stayed away from CIO awards. This is simply because unless it is given for specific projects – and in that case, it is for those projects - we do not see any value in such awards.

Any recognition/celebration of individuals must have a specific purpose. Our NEXT100 awards are aimed at identifying the future CIOs. Similarly, the Samman - which is not actually an award – is for honoring the veteran CIOs. What is common between these two recognitions is that the recipients are identified by the community members through an elaborate process. We do not have a say in the selection.

In a way, the lifecycle of our relationship with the community starts when an IT manager applies for NEXT100 awards and continues right till they become jury members for CIO&Leader Samman, after retiring from an active CIO role. That pretty much covers the entire professional life-cycle of an IT leader.

> **"In a way, the lifecycle of our relationship with the community starts when an IT manager applies for NEXT100 awards and continues right till they become jury members for CIO&Leader Samman, after retiring from an active CIO role."**

We have many NEXT100 winners who have become jury members of NEXT100 in later years. We have at least once instance of an IT leader winning NEXT100, becoming jury of NEXT100, receiving CIO&Leader Samman, and becoming a member of CIO&Leader Samman jury panel. Deepak Agarwal, erstwhile Executive Director of Indian Oil Corporation has played all the four roles. We hope to see more such luminaries in the future.

Increasingly, talent, leadership, and succession planning are becoming key issues for CIOs, as the expectation from them within the organization has increased manifold in the last decade or so. In most of our formal and informal communications with the community, this clearly comes through. This made us bring together the NEXT100 awards ceremony and annual CIO&Leader Conference incorporating the Samman felicitations ceremony. The NEXT100 winners – that is the future CIOs – were in full attendance during the Samman felicitations. One NEXT100 winner put it as 'beyond all my imagination' to describe the atmosphere.
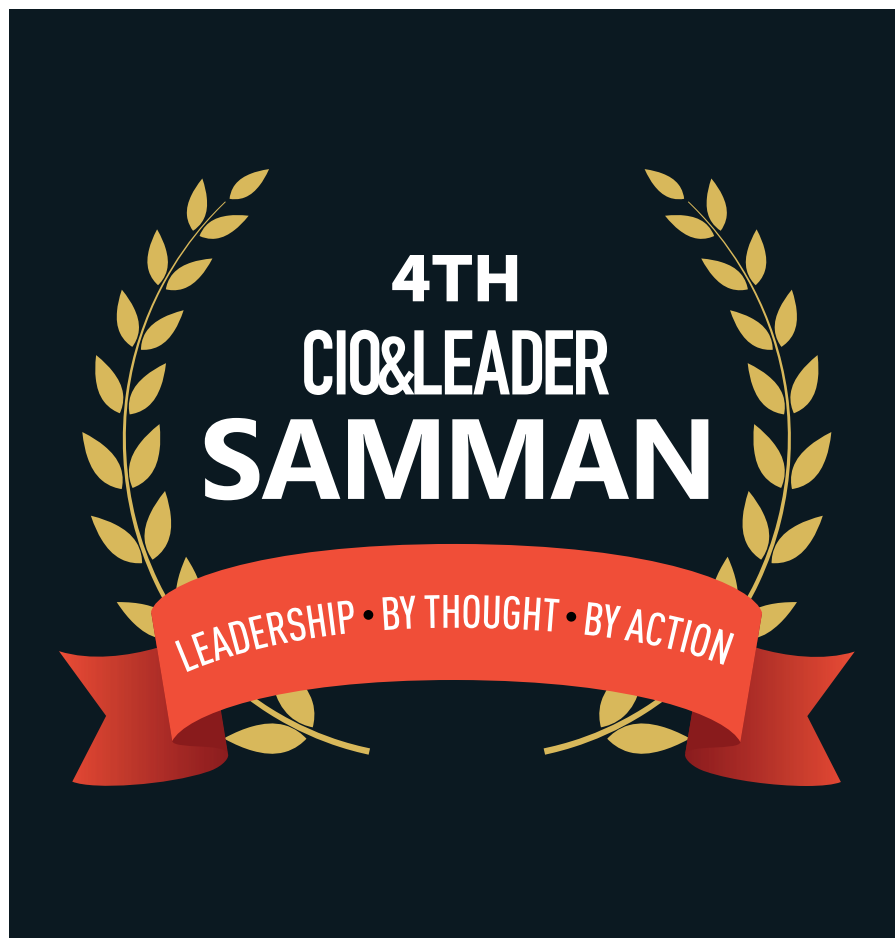
By celebrating leadership, we are just following an age-old Indian tradition. All we are adding is facilitating a seamless connect with veteran leaders and the future leaders ∎

CONTENT OCTOBER 2022

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CIO&LEADER

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9.9 GROUP

around thetech

75% of healthcare providers in Asia/Pacific will increase spending on customer engagement apps

Global PC market witnesses steepest decline

Worldwide PC shipments totaled 68 million units in the third quarter of 2022, a 19.5% decrease from the third quarter of 2021, according to Gartner, Inc. This is the steepest market decline since Gartner began tracking the PC market in the mid-1990s and the fourth consecutive quarter of YoY decline. The top three vendors in the worldwide PC market remained unchanged in the third quarter of 2022, with Lenovo maintaining the No. 1 spot, HP in second and Dell at third.

Healthcare providers to increase app spend

A latest IDC report titled, Patient of One: Redefining Patient-Centric Care, found that almost 75% of healthcare providers in Asia/Pacific will increase spending on customer engagement apps to better cater to the shift of care delivery from in-person to care anywhere. This IDC report portrays the patient-centric care trends into three care areas such as care anywhere, artificial intelligence (AI)−driven predictive care, and personalized care, strongly supported by technology and patient/consumer-centric ecosystems.

Financial services firms operating under false sense of security

According to a research survey, financial services companies are more certain than any other sector that they are secured from ransomware, but they are also exposed due to supply chain risk and inadequate detection skills. As part of a larger cross-industry report on ransomware, Trend Micro hired Sapio Research to conduct a survey of more than 355 IT and business leaders in the financial services sector worldwide. The study found that 75% of respondents thought they were properly protected from ransomware, which is much higher than the industry average of 63%. 72% of respondents admitted their organisation has been compromised by ransomware in the past, and 79% see their sector as a more attractive target for threat actors than others.

Digital transformation continues to be a top enterprise priority

Indian businesses are expected to continue accelerate their investments on technology with a strong focus on digital transformation, cloud computing and cybersecurity, according to a recent survey conducted by CareEdge. CareEdge expects that the enterprise appetite for digital spending will continue during FY23. According to CareEdge, cloud computing, artificial intelligence, cybersecurity, data analytics and IoT, among others are expected to be the key focus areas going forward. During FY22, IT majors have seen a strong progression of client addition in existing as well as new geographies and verticals.

Banking-as-a-Service to hit mainstream adoption

Banking-as-a-Service (BaaS) will hit mainstream adoption within two years, according to the latest Gartner Hype Cycle for Digital Banking Transformation. Gartner predicts that 30% of banks with greater than $1 billion in assets will launch BaaS for new revenue by the end of 2024, but half will not meet targeted revenue expectations.

Global AI in cybersecurity to reach $57.1 bn by 2028

The Global Artificial Intelligence In Cybersecurity Market size is expected to reach $57.1 billion by 2028, rising at a market growth of 24.5% CAGR during the forecast period, according to a study by Reportlinker. com. According to the study, the adoption of artificial intelligence is exponentially increasing all over the world. At the same time, the sophistication of hacks has increased while adopting stealthier techniques. Given that all industries were looking for better tools and innovative uses for their technology, the fusion of AI and cybersecurity seemed inevitable.

Data analytics market worth to be USD 346.24 bn
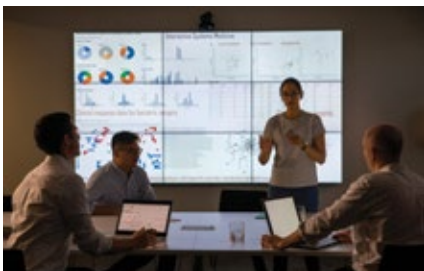
According to a study by Market Research Future, the data analytics market is anticipated to develop at a CAGR of 30.7% from 2022 to 2030, reaching USD 346.24 Bn (MRFR). According to the survey, the global market for data analytics has grown recently due to factors including greater competitiveness, growing need for improved insights, and rising disposable incomes. On the other side, the market's expansion may be constrained by the high implementation costs and a lack of competent skills. Among all the types, the big data analytics segment is predicted to secure the top position across the global market for data analytics over the assessment era.

5G service revenue to reach $315 billion globally in 2023

A new study from Juniper Research has found operator-billed 5G service revenue will reach $315 billion in 2023; rising from $195 billion in 2022. The study forecasts over 600 million new 5G subscriptions will be created next year, despite the anticipated economic downturn in 2023. The report predicts the ability of standalone 5G networks to offer 'network slicing' will act as the ideal platform for the growth of 5G private network revenue. Standalone 5G uses next generation core networks supporting network slicing technology, which can be used to take a 'slice' of public 5G infrastructure and provide it to private network users.

APAC is experiencing a severe lack of cybersecurity personnel

With an estimated 4.7 million specialists working in the cyber security field worldwide, 859,027 of them are in Asia Pacific accordoing to a study by ISC. Despite having the highest regional growth rate (15.6%), APAC still has a workforce deficit of about 2.2 million people, a 52.4% YoY increase. The report also reveals that 71% of respondents from APAC anticipate an increase in cybersecurity staff within the following 12 months. The highest anticipated growth rate over the next two years (53% in 2021 and 41% in 2020) is within striking distance of the global average of 72%, which is represented by this figure.

90% of SaaS buyers are overpaying

Businesses overpay for SaaS products by 20 to 30% on average, according to a survey by Vertice, due to inadequate visibility into pricing and tool usage as well as restricted negotiation bandwidth. According to the report by the SaaS purchasing and spend management platform,pricing transparency is all the more crucial for SaaS purchasers because visibility is still a significant obstacle in the SaaS acquisition process. It continues by stating that data especially for the project collaboration business reveals that only 14% of project collaboration vendors post their whole pricing list online, far less than the SaaS industry average.

Biz struggle to measure sustainable supply chain practices

EY teams surveyed 525 executives about their sustainable supply chain practices. Many have long-term strategies but struggle to measure their progress. The study claims that business case sustainability activities go beyond cost reductions to boost revenue, customer loyalty, and stock price. According to the study, digital tools, data analytics and collaboration platforms help organizations capture metrics, set key performance indicators and establish governance. Technology offerings can also identify and introduce efficiencies in operations and resources.

Ministries collaborate to launch app for tracking water level

Centre has launched JALDOOT app that has been jointly developed by Ministry of Rural Development and Panchayati Raj. This app will be used across the country to capture the water level of selected 2-3 wells in a village. The app will work in both online and offline mode so that water level can be captured even without internet connectivity. Captured data will be stored in mobile and when mobile comes in the connectivity area, data will synchronize with the central server. The regular data to be input by the officers called Jaldoots would be integrated with the database of National Water Informatics Centre (NWIC), which can be utilised for analysis and display of various useful reports for the benefit of various stakeholders. Water level report, Monsoon Report and Registered user report are available at JALDOOT web portal.

Leather sector skill app launched

Ministry of Education and Skill Development Shri Dharmendra Pradhan has launched the SCALE (Skill Certification Assessment for Leather Employees) app which provides a one-stop solution for the skilling, learning, assessment, and employment needs of the leather industry. The SCALE studio App developed by Leather Skill Sector Council allows people from all age groups interested in leather craft to access online live streamed classes from the state-of-the-art studio at its office.

MeitY launches accelerator programme to support and accelerate XR technology startups

MeitY Start-up Hub (MSH), an initiative of the Ministry of Electronics & Information Technology (MeitY), and Meta launched an accelerator programme to support and accelerate XR technology start-ups across India. XR Startup Program focuses on skilling and building technological capabilities for the metaverse, and will help shape the ecosystem for these emerging technologies, including Augmented Reality (AR) and Virtual Reality (VR) in the country. The Accelerator Program will support 40 early-stage start-ups working in XR technologies with a grant of Rs 20 lakhs each. Further, the Grand Challenge will encourage early-stage innovators in sectors like Education, Learning and Skills, Healthcare, Gaming and Entertainment, Agritech & Climate Action and Tourism & Sustainability. The innovators will be provided support to upscale from the R&D phase to developing workable products and services. The XR Startup Program is supported by Meta's XR Programs and Research Fund.

Common Govt awards portal launched

A common Rashtriya Puruskar Portal (https://awards.gov.in) has been developed by the Government so as to bring together all the Awards of the various Ministries/Departments/Agencies of the Government of India under one platform to ensure transparency and public partnership (Jan Bhagidari). This Portal facilitates every citizen or organisation to nominate individuals/organizations for various Awards instituted by the Government of India. It opened with asking for nominations/recommendations for the awards like Padma Awards, Digital India Awards, National Award for Excellence in Forestry, National Gopal Ratna Award, National Water Awards, Nari Shakti Puraskar, Subhash Chandra Bose Aapda Prabandhan Puraskar, Jeevan Raksha Padak etc.

Convergence portal in food, agriculture launched

As a part of its celebration of Azadi Ka Amrit Mahotsav, the Ministry of Agriculture & Farmers Welfare (MoAFW) and Ministry of Food Processing Industries (MoFPI) has jointly launched a Convergence Portal between Agriculture Infrastructure Fund (AIF), Pradhan Mantri Formalisation of Micro Food Processing Enterprises (PMFME) scheme and Pradhan Mantri Kisan Sampada Yojana (PMKSY).

BYJU shuts Thiruvananthapuram ops

The Thiruvananthapuram (Kerala) office of BYJU'S has been closed as part of ongoing restructuring efforts. It plans to cut 5% of its workforce. Media reports claim that the edtech company offered the impacted employees the chance to relocate to Bengaluru. According to the startup, significant and progressive leave packages have been offered to any affected employees who do not feel comfortable relocating.

Uber pilots electric cab services in Delhi-NCR

Uber, a ride-hailing company, has begun testing electric taxi services in a number of Delhi-NCR neighbourhoods in an effort to reduce pollution. However, the platform does not currently offer real-time access to the EV taxis. The rider would have to schedule a pickup up to 30 days in advance and would not be able to hire the electric cab directly through the Uber app, according to Uber. Up to 60 minutes before to the scheduled departure, there is no charge for cancellation. Alongside the debut, the company will be able to compete in the EV cab market with Ola and Gurugram-based BluSmart Electric Mobility.

PhonePe launches its first green data center

Fintech platform PhonePe launched its first Green Data Center in India, leveraging technologies and solutions from Dell Technologies and NTT. This 4.8-megawatt facility, which occupies 13740 sqft at Mahape, Navi Mumbai, is built and designed with advanced alternative cooling technologies like Direct Contact Liquid Cooling (DCLC) and Liquid Immersion Cooling (LIC). PhonePe believes that the Green Data Center will help it with the new opportunities in data management, with efficient data security, power efficiency, ease of operations, and cloud solutions. The center will also help the company to build sustainable and efficient infrastructure to further seamlessly scale its operations across the country.

EV financing startup RevFin raises $10 mn

RevFin, an EV finance startup situated in Delhi NCR, has raised $10 Mn in a Series A round of funding that included debt and equity from a number of investors, including Green Frontier Capital (GFC) and LC Nueva Investment Partners. The percentages of equity and debt have not been made public by the startup. According to media reports, the company intends to finance almost 2 Mn EVs by disbursing loans totaling INR 40,000 Cr (more than $4.5 Bn) by 2027.

Indian government to set-up INR 500 cr startup accelerator for agritech startups

To expand up agritech firms across the nation, the Indian government aims to establish a Rs 500 crore startup accelerator. During a recent PM Kisan Samman Sammelan, Union Agriculture Minister Narendra Singh Tomar made the announcement. A steering group, executive panel, and separate department within the Ministry of Agriculture completely focused on agritech firms will also be carved off by the government and run by the joint secretary. This is a positive step because agriculture employs almost 70% of the rural population, but has not been able to profit from modern technologies.

Adda247 raises $35 mn

Vernacular test preparation website Adda247 has secured $35 million in a round that was co-led by WestBridge Capital. Along with new investment Google, previous investors Info Edge and Asha Impact also participated in the funding round. The edtech platform intends to use the additional funding to elevate its technology and products, grow its team of student counsellors, and make critical leadership hires. Founded in 2016, Adda247 had previously raised a total of $20 Mn in investment.

CIO MOVEMENTS

SUNIL MEHTA joins BDO India as CIO

Professional business and management consultancy company BDO India has named Sunil Mehta as its Chief Information Officer (CIO). Sunil has over 35 years of expertise in developing and executing IT strategies for companies, and he previously worked as President & Systems Director (Head of IT) – South Asia & South-East Asia with WPP PLC.

Johnson & Johnson ropes in NARENDRA AGRAWAL **as CIO**

Narendra Agrawal has recently moved from Dabur India to join Pharmaceutical major Johnson & Johnson as CIO. He has more than 15 years of experience, and in the past, he has held tech leadership positions with organisations such as Unilever and Capgemini. Narendra has led IT in multiple large scale business transformation programs including GlaxoSmithKline merger, rewiring Sales & Operations Planning, financial performance management, etc.

Next100 Winner PAWAN ROY joins ArcelorMittal as CIO

The 2021 Next100 winner Pawan Roy has been appointed as the new CIO of ArcelorMittal. He was earlier working with Birla Corporation Limited as a Digital Transformation Leader. Pawan has over two decades of rich experience with large Global and Indian Conglomerates such as Birla Corporation, Adani Group and Capgemini, overseeing digital transformation through the innovative use of digital technologies and business process enhancement.

MILIND NAGNUR joins Kotak Mahindra Bank as Chief Technology Officer

Kotak Mahindra Bank recently announced the joining of Milind Nagnur as President & Chief Technology Officer (CTO) to spearhead the Bank's technological transformation. Prior to joining Kotak Mahindra Bank, Milind served as the CTO for fintech firm Early Warning, the parent company for Zelle Payments. Milind brings in extensive experience in senior IT leadership positions at organisations including Wells Fargo, Citi, and JP Morgan dating back more than two decades.

KAPIL MAHAJAN moves to Allcargo as Global CIO

Kapil Mahajan has been named the global chief information and technology officer by Allcargo Logistics. In his new position, Kapil will be responsible for leading the group companies' next phase of digitisation and technological transformation, innovation, data, and product strategy to create long-term value for the company, its clients, and other stakeholders. Prior to his new role, Kapil worked with Safexpress as Group CIO.

MEHJABEEN TAJ AALAM is now CIO, Raychem RPG

Raychem RPG (P) Ltd. has roped in Mehjabeen Taj Aalam as its new CIO. She was previously working as a CIO with Tata Capital Housing Finance Limited. Mehjabeen has extensive experience in areas such as change management, business process reengineering and automation, digital transformation strategizing and implementation, virtualization, adoption of disruptive technologies like AI, chatbots, mobile apps, biometric and cloud solutions.

INDUSTRY MOVEMENTS

SAMEER GARDE joins Capillary Technologies as CEO

Former India chief of Dell and Cisco, Sameer Garde has joined as CEO of Capillary Technologies, the Bengaluru-based customer engagement platform.

Commvault appoints BALAJI RAO **to head India business**

Data management and protection solution provider Commvault has announced industry veteran Balaji Rao as the Area Vice President, India & SAARC .

CtrlS appoints VIREN WADHWA **as CMO**

CtrlS Datacenters has appointed Viren Wadhwa as Chief Marketing Officer. He was earlier with ST Telemedia Global Data Centers (India).

Databricks ropes in ANIL BHASIN **as Country Manager for India**

Databricks has appointed Anil Bhasin as the Country Manager for India. A tech industry veteran, Bhasin has more than 30 years of experience.

VIVEK SRIVASTAVA **new Country Manager for India & SAARC, Fortinet**

Cybersecurity solution provider Fortinet has appointed Vivek Srivastava as Country Manager for India & SAARC region. He has over 20 years of experience.

Kovai.co appoints ANDREW CLOKE **as COO**

Coimbatore-based enterprise SaaS company Kovai.co has appointed Andrew Cloke as the Chief Operating Officer (COO). Cloke will be working out of the UK office.

Lenovo appoints SUMATI SAHGAL **as Head of Tablets and Smart Devices**

Lenovo has appointed Sumati Sahgal as the Head of Tablets and Smart Devices for Lenovo India. She brings in over 18 years of professional experience.

Rackspace appoints AMAR MALETIRA **as CEO**

Cloud company Rackspace Technology has appointed Amar Maletira as Chief Executive Officer. He was serving as Rackspace Technology's President and CFO since November 2020.

Recognize appoints MUTHU KUMARAN **as Operating Partner and Head of India Operations**

Recognize, a technology investment platform, has appointed Muthu Kumaran as Operating Partner and head of India operations.

SAP Concur appoints KUMAR GAURAV GUPTA **as VP & Country Manager for Indian subcontinent**

SAP Concur has appointed Kumar Gaurav Gupta as VP & Country Manager for the Indian subcontinent.

4TH
CIO&LEADER
SAMMAN

LEADERSHIP • BY THOUGHT • BY ACTION

The fourth edition of the Samman announced during the 23rd annual conference on 28th August 2022, honoured nine veteran Indian CIOs.

By CIO&Leader

The CIO&Leader Samman was launched in 2019 to mark the 20th anniversary of the annual CIO&Leader Conference, to acknowledge the contribution of senior IT leaders in Indian enterprises.

The fourth set of honours was presented to nine veteran CIOs in the 23rd CIO&Leader Conference, held at Goa between 26th – 28th August 2022.

CIO&Leader has never been involved in giving any awards to CIOs, even though its sister publication IT NEXT confers the prestigious NEXT100 awards. That is because while that serves a community objective of finding future CIOs of India, giving awards to CIOs, in our humble opinion, is not exactly something we think we are qualified to do.

CIO&Leader Samman is not an award at all. It is a way of paying respect to the veteran CIOs.

To choose a few from among a set of deserving people is anything but easy. We decided to turn to the CIOs themselves to do the selection. To avoid conflict of interest, we turned to erstwhile CIOs, as serving Indian CIOs are eligible for the Samman.

Methodology

For the purpose of selection of the recipients of the awards, CIO&Leader invited three erstwhile CIOs to be members of a jury panel. They were:

- **Deepak Agarwal, former ED – IS, Indian Oil Corporation**
- **Prashun Dutta, former CIO Tata Power & Reliance Energy**
- **Vijay Sethi, former CIO, Hero MotoCorp**

While Dutta was a jury member for the last two editions as well, both Agarwal and Sethi, are new members of the jury. And they are both past honourees.

For getting the names initially, we decided to follow the peer nomination route and asked the CIOs to nominate a maximum of three CIOs each for the honour.

CIO&Leader spelt out the minimum criteria.

To be considered for the Samman, the CIOs needed to meet the following basic criteria:

- **He/she needed to have had a minimum of 30 years of professional experience.**
- **Out of those years, at least five should have been as a CIO. This year, the jury recommended bringing down that period to two years in the case of a PSU CIO, provided the person has been in an IT role before taking up the highest position, as it is rarely**

that a CIO serves for more than five years in a PSU.
- **He/she needed to be serving as a CIO in India now. Those who have retired or are serving in a non-CIO role or are based outside India were not considered.**

These criteria were publicized for the people who would nominate. Many CIOs came back with their nominations.

While each of the valid nominations—those meeting the criteria—were considered by the jury for the honour, the number of nominations had no bearing on the final selection. That choice was completely the juries.

The jury took into account the CIOs' professional achievements, the use of IT to maximize strategic values for businesses that they have been associated with, their leadership, and their contribution to and participation in the community cause.

After two meetings and exhaustive research put forward by jury members, they came out with nine recommended names.

The List

There were 43 nominees on the

final list. After intense discussions and deliberations, the esteemed jury panel came out with a list of 9 recipients.

The 9 recipients of the Samman, in alphabetical order, are:

- **CK Prasad, Executive Director, RailTel Corporation**
- **Dinesh Talniya, CIO, Apollo Tubes**
- **Edsel Pereira, Group Vice President - IT, Glenmark Pharmaceuticals**
- **Kersi Tavadia, CIO, Bombay Stock Exchange**
- **Ms Kirti Patil, Joint President - IT & CTO, Kotak Life**
- **Liton Nandy, Executive Director - IS, Indian Oil Corporation**
- **Rajeev Pradhan, CIO, NPL, BBTCL (Wadia Group of companies)**
- **Rajiv Sharaf, Head - IT, Torrent Power**
- **Sanjay Gupta, President & Business Head - IT, Kotak Mahindra Bank**

We present you the exclusive set of honourees – the recipients of the 3rd CIO&Leader Samman – with their brief snapshots...

The 4rd CIO&Leader Samman Jury

Deepak Agarwal

former ED – IS
Indian Oil Corporation

Prashun Dutta

former CIO
Tata Power &
Reliance Energy

Vijay Sethi

former CIO
Hero MotoCorp

A guru in all senses of the word, Chandra Kishore Prasad, Executive Director, RailTel Corporation, has made immense contributions in multiple areas of technology management to his parent organization, Indian Railways, to modernize quickly and seamlessly. Progressive in his outlook, he has gone for emerging technologies to get the best for his organization – a public sector giant.

Prasad has used his expertise in technology – telecom and IT – to transform his parent organization; help build a subsidiary organization from scratch, handle varied responsibilities; impart education as a professor and create curriculum for some of the best institutes in India, apart from publishing a number of papers in national and international journals.

This multi-faceted technology leader is an active participant in community initiatives as well.

CK Prasad

Executive Director
RailTel Corporation

Dinesh Talniya

CIO
APL Apollo Tubes

FOR CIOs, there are two challenges. The first is to drive technology strategy and execution to get desired business results. The second is to prepare organizations for a conducive culture where they can meet the first challenge effectively. In some industries, the latter is a far bigger challenge.

Dinesh Talniya, CIO, APL Apollo Tubes has met this challenge successfully and consistently across organizations, in his professional life. Building IT almost from scratch in many organizations that he has worked in – upping their digital quotient on the way – and making them realize the business value of IT.

Throughout his professional life, Talniya has worked in manufacturing industries and has transformed their IT – against all odds – and has displayed a unique leadership approach, far more relevant in the New Age.

He is an active participant in community causes and is a popular figure in his peer group.

Edsel Pereira

Group Vice President - IT
Glenmark
Pharmaceuticals

HIS detail-oriented and hands-on approach to IT, and the fact that Edsel Pereira, Group Vice President – IT, Glenmark Pharmaceuticals, is a man of few words, makes many conclude that he is a workaholic. While his actions speak louder than words – he has built the entire technology infrastructure and systems of his organization brick by brick in over two decades – he is very articulate when it comes to talking about how IT can create value for a business.

His attention to detail and his continuous involvement in newer technology projects that can make a real business impact, however, do not dilute his interests in and efforts towards mentoring, which he believes, helps in widening the perspectives and ideas of the entire team.

Very balanced in his technology thinking, Pereira's commitment to his industry is exemplary.

THE quintessential techie, Kersi Tavadia, CIO, Bombay Stock Exchange, has traversed Indian enterprise IT's evolution across decades. He has been there, done it across technologies spanning across generations.

In his more than two-decade career in the financial services industry, Tavadia has established his credential as a technology leader who is at equal ease formulating strategy at an organizational level and managing the nuts and bolts. The biggest testimony to his achievement is his success in making the platform for his business, the fastest in the world.

At equal ease talking about workplace modernization from Kubernetes to cloud manageability – he is a sought-after advisor and sounding board for many of his peers and juniors alike. Grounded, humble and extremely affable, his contribution to the community cause is immense too.

Kersi Tavadia

CIO
Bombay Stock Exchange

CLEARLY ahead of the curve in proactively identifying perfect use cases for emerging technologies in her business, Kirti Patil, Joint President - IT & CTO, Kotak Life, has been equally effective in implementing them to get the desired results.

Her belief that there is no substitute for hard work has given her that sincerity of approach, which makes her equally trusted and respected among her peers and juniors.

Her achievements go beyond her defined role as the IT leader. She has actively pursued the cause of women in IT by both voicing her opinion in forums and guiding younger women professionals, within and outside her own organization.

Kirti Patil

Joint President - IT & CTO
Kotak Life

Liton Nandy

Executive Director - IS
Indian Oil Corporation

LEADING technology in a public sector enterprise is challenging. And doing that for a behemoth, a Fortune 500 company with a huge sales and distribution network, and a complex mesh of sites with a significant share of India's critical infrastructure is many times more challenging.

Yet, Liton Nandy, Executive Director - IS, Indian Oil Corporation, has not just led the technology strategy and execution of his company from the front, he has personally steered a hugely transformational project that brought disruptive changes in customer experience, partner experience, and employee experience touching multiple areas as customer loyalty, authentication, efficient distribution, payment – while capturing valuable data in the process for more informed business decisions.

Very unassuming, he is always eager to contribute to the community.

A rare technology leader with experience on both sides of the table – managing user IT and managing IT business – Rajeev Pradhan, CIO, NPL, BBTCL (Wadia Group of companies) has done everything from consulting to business development, and large-scale deployment to creating and expanding global technology teams.

In his current organization, being in charge of multiple group businesses, Pradhan has successfully driven a number of transformational initiatives to align business with IT to maximize value creation, in all aspects of the business - touching customers, partners, employees and other stakeholders – and take up the digital quotients of these organizations significantly.

A willing community contributor, and well-respected among peers, he is seen as a leader with significant foresight.

Rajeev Pradhan

CIO
NPL, BBTCL (Wadia
Group of companies)

IN a career spanning over three decades, Rajiv Sharaf, Head - IT, Torrent Power, has consistently proven himself to be a strategic thinker, a problem solver, a team-builder and someone who strives to stay on top of changes.

A leader with a balance of both long-term and short-term views of business, he uses IT both strategically and tactically to create the right business impact. Also well known for his great people management skills, he is a natural hands-on leader. As digitalization becomes the core element of organizational strategy, he supports continued innovations that make technology more user-friendly.

Being a true humanitarian, Sharaf also spends a lot of time striving to improve society and has been volunteering at the Bangalore-based Art of Living International Center.

Rajiv Sharaf

Head - IT
Torrent Power

BUILDING the foundational technology platform of a new organization in a highly regulated industry is always challenging – for it requires the CIO to conform to all the regulatory requirements and try to create an edge over the incumbent at the same time. In his over three-decade-long career in the IT department at one of India's newest private banks, Sanjay Gupta, President & Business Head - IT, Kotak Mahindra Bank, has helped turn his bank into a role model in leveraging technology, acknowledge both within and outside India.

One of the few CIOs across industries who have already been practising what is increasingly becoming a new expectation - influencing business strategies. He is a big proponent of harnessing technology to enable equitable access to services at a better cost, quality, and assortment.

Sanjay Gupta

President & Business Head - IT
Kotak Mahindra Bank

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Executive Director IS
Indian Oil

Atanu Pramanic
Joint President & CIO
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Rajababu Kotta
CIO
Andhra Pradesh Paper Mills

Rajasekhar V V
Group CIO
ITC

Rajeev Batra
CIO
Bennett Coleman & Co

Rajiv Sikka
Group CIO
Medanta Hospitals

Ritu Madbhavi
Group CIO
FCB India

Sanjay Moralwar
Global CIO
Cadila Healthcare

Sanjay Prasad
CIO
CESC Power Ltd

Sendil Kumar
CIO
Shriram Capital

Sreekumar Balachandran
Global IT Head
Suntec

Subramanya C
Global CTO
Hinduja Global Solutions (HGS)

V Vasudevan
CIO
EID Parry

Ved Prakash Nirbhya
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CIO
Biocon

Bishwanath Ghosh
former CIO -
Enterprise, Manufacturing
& Corporate
Mahindra & Mahindra

Deepak Agarwal
former Executive
Director (IS)
IOCL

Dhiren Savla
Group CIO
Kuoni Group,
VFS Global Services

Girish Rao
former Group
Head - Digital
Transformation & CTO
Future Retail

Gyan Pandey
Global &
Group CIO
Aurobindo Pharma

Jagdish Lomte
former VP - IT &
CIO - BTG
Thermax

Rajat Sharma
former
President - IT
Atul Ltd

Sachin Gupta
President &
CIO
Usha International

Sanjiv Kumar Jain
Group CIO
Krishna Maruti
Group

S Raghunatha Reddy
CIO
UTI Mutual Fund

Venkatesh Natarajan
SVP - IT & CIO
Ashok Leyland

**Vinay Avadhut
Khargonkar**
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IT
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CIO
Apollo Hospitals

Parthasarathy VS
former Group
CIO & Group CFO
Mahindra Group

Rajeev Jorapur
Sr VP & CIO
Bajaj Auto

Rajesh Chopra
former Sr VP - IT
Oberoi Hotels &
Resorts

Rajesh Uppal
Sr Executive
Director - HR & IT
Maruti Suzuki India

Srinivas Tata
EVP & CDO
Greenply
Industries

Suresh Kumar
CIO & Partner
Grant Thornton

Umesh Mehta
Global CIO
Jubilant Life
Sciences

Vijay Sethi
former CIO,
Head - HR & Head
- CSR
Hero MotoCorp

The New CIO Role: In the Age of Tech Ubiquity

■ *Former CIO, project management expert and author Dr. Prashun Dutta addresses key changes in the CIO role with changing environmental factors, in a series of articles, starting this month.*

When I started my professional career, after graduating as an Engineer, I was intrigued by one nondescript yet morose looking person – Mr. Gupta, who was then the EDP Manager in the organization. The only reason I was curious was because in the plant, he and his team had the only air-conditioned room that they would share with a large machine – the computer. The computer and Mr. Gupta were called upon whenever bosses wanted a report on inventory or cash transactions or salary or some other similar subject. During the summer months, because of the air conditioning – a prerequisite for the computer I learnt, it appeared to be the best job available. At that stage the 'Information Technology' (IT) department was charged with the responsibility of maintaining the computer and 'running' certain applications as well as furnishing reports on those operations. The rest of the organization thought of members of the IT as magicians, since they (the rest of the organization) did not understand anything about their functioning. IT, back then, would normally cater to a few functions that routinely generated data and they (IT) were largely restricted to maintaining data in tables and churning out reports drawn from that data. However, owing to the limited scope of their functioning and the fact that their actions were not felt widely in the organization, they were not considered important enough.

However, that was forty years ago and is now history. Since then, the world has changed completely. Capabilities associated with technology have consistently grown, often in large tranches, as have usage and utilization. Initially major improvements used to develop one at a time but soon we had a situation where major

A natural extension to this logic is the fact that the role and responsibilities of IT functionaries, particularly that of the CIO ought to have changed correspondingly; but have they indeed? We need CIOs who think differently from their predecessors...

improvements were arriving in couples then in triads and later in quadruples. The combined effect of these changes was visible with a phase lag but was invariably huge. When major changes happen in groups the impact is not merely the cumulation of individual items in the list but a "cross product' if you will, where collective outcome is substantially more than the sum of its parts. The celerity and magnitude of change were and continues to be high and the scope of IT function's working has been growing as dependence on technology in organizations kept on increasing. A natural extension to this logic is the fact that the role and responsibilities of IT functionaries, particularly that of the Chief Information Officer (CIO) ought to have changed correspondingly; but have they indeed? We need CIOs who think differently from their predecessors complemented by business people who view the role and scope of IT function differently from the traditional view and that is the need of the hour.

I have, in a series of articles starting with this one, attempted to describe the new "business-technology" combine scenario and concomitant role and responsibilities that devolve from this altered environment. In addition, we shall mention main challenges that awaits new CIOs and how possibly these may be converted to opportunities

CIO and ubiquitous presence of technology

The present scenario is, obviously, in sharp contrast to the situation half a century ago and the main point of difference is the extent of usage of technology in business organizations. Role of computers and communication then was limited to a small set of functions and activities. A few departments used computers to record and maintain various books and extract reports after transactions were completed and records updated. In contrast today we have no part of any organization untouched by automation technologies. We transact, report, analyze using these technologies we also interact amongst ourselves, with customers, partners, and even various regulatory authorities on digitalized platforms. Software helps us in our decision-making process through analytics, machine learning, accessing data anywhere in the world; technologies like IoT, Edge computing help us "see" what is going on in the opaquest of places, it assists with our security; visualizing possible outcomes through intelligent simulation, and several other critical activities. In short, every single aspect of our functioning is majorly informed by use of technology. Convergence of several basic technologies (Mechanical, Electrical, etc) with microprocessor-based instrumentation and controls along with continuous improvement in the latter have gained IT a ubiquitous presence and a prima donna status, in business organizations.

This, as can be assessed, is a major change that significantly impacts the responsibilities and specifically the way of working of the CIO. Let me elaborate on this point further. By virtue of its all-round presence IT is in a unique

Such a road map, if presented with its concomitant benefits, would achieve a buy-in of leaders in the organization. It would help in developing a vision of how the organization will function in future…

position to integrate working of an organization. A common experience in organizations is often associated with the difficulty of achieving reasonable alignment in working of its different limbs. While this is true for mid-size organizations the problem is far more acute in large ones, as may be expected. Achieving such unified functioning is a major objective of any complex entity and would form the foundation for the next step of integrating with the environmental ecosystem. Integrating with partners, vendors, and governmental & regulatory limbs. Studies have unequivocally shown that when any logistics system inter connects its constituents the efficacy of the overall system improves substantially. The IT function, by intelligent design and execution, could play a pivotal role in integrating the entity and that could be indeed be a game changer.

The question that arises at this juncture in what way will this impact responsibilities and activities of a CIO? Well now the minimum unit for consideration is the entire organization and not any part of it. Earlier the CIO or the IT function would suggest IT enablement for a particular part of a department's function, for instance payroll or inventory control or any such application and that would be discussed for taking forward. Now however, any such proposal for introducing use of technology would necessarily have to be for the organization as a whole. The starting point for discussions on IT functions and activities will

have to commence with the organization-wide road map. This road map will derive, partially from the Strategic plan pursued by the organization and equally from present day technological innovations. The road map will comprise a full depiction of all applications and technological initiatives that are envisaged for the organization; an aspirational picture to be pursued sedulously. It is this that would need to be approved by the top management and all initiatives should be presented within this framework.

Such a road map, if presented with its concomitant benefits, would achieve a buy-in of leaders in the organization. It would help in developing a vision of how the organization will function in future and associated technology that shall be used to achieve this. A road map shall elucidate how technology will be utilized to augment functioning of the organization and the manner in which different functions will be integrated to benefit managers and end users. It would stress on enhanced productivity, more informed decision-making, real-time monitoring of critical parameters and so on, that would substantially enhance efficacy and, as mentioned earlier, will be a real game changer. Such an action will provide a high level of comfort and confidence to the top management; they will be able to understand that the CIO has a plan that is effectively aligned to that of the organization. This acceptance can be further augmented by getting an external expert to talk to members of the top management which would build sufficient confidence in the plan. Additionally, if the top management so desires, this plan can be vetted by a 'subject matter expert' who may be external to the organization, and his verdict sought. Additionally, the plan needs to contain sequence of implementation, and estimates associated time lines and costs along with assumptions on which these are based. Such a document, discussed threadbare with senior officials in business and top management of the organization, would be a source of confidence for the top management. It draws a boundary within which the department will function and subsequent proposals that derive from this master plan are likely to get approvals without any major difficulties.

In conclusion, technology had started off as a minor contributor to organizational functioning but now has become a major player with clear potential to be a game changer, if used properly. The approach of earlier CIOs was to propose individual projects covering a part of a function or even a data rich process. However, with extensive broad basing of technology in the functioning of today's organization a holistic approach covering the entire organization and integration of its part must be the focus now. New projects will necessarily have to be within the overall master plan. One question that begs answer is how will the CIO prepare such a master plan. We will dwell on this question in the next article ■

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INSIGHT

How Low Code And No-Code Solutions Are Bringing Agility For Businesses

To accommodate changing business needs, low code/no code applications provide great assistance.

By Dharmesh Godha

O **"One thing** constant about businesses is that it's always changing." Successful enterprises know when to bend, pivot, and change to accommodate forces more powerful than themselves, a process that requires business agility. Business agility can be used to adjust to market changes in addition to internal business changes. To accommodate changing business needs, low code/no code applications provide great assistance. Such apps are designed to replace legacy and ad hoc software while fostering agility across many business contexts. Agile businesses in dynamic environments are always looking for ways to increase productivity and tend to follow and latch on to tools that are available, efficient, memorable, and have great utility.

Low code/no code applications have been around for quite some time

Even though the concept has really taken off in recent years, businesses have been relying on low code/no code applications for quite some time now. A rudimentary example of low code/ no code application is a basic Excel spreadsheet with macros and/or formulas. Business professionals have created millions of low-code applications without even knowing what they are or their greater potential if made with the right set of tools. 90% of the low code/ no code applications are made on Excel, SharePoint, Lotus Notes, etc.

Even though these legacy solutions served their purpose for some time, they seem to be limited in use by multiple people and they possess data integrity issues. The structural integrity Issues of these apps make the data less trustworthy and usable.

Also traditionally, sharing capabilities of these sheets and applications have been limited. As a result, there may exist many instances and versions of a solution or many different solutions serving the same function.

Microsoft PowerApps along with other components of the "Power Platform" provides a set of specialized tools that can be used in these business situations. These tools provide a platform to make much more integral systems that deeply benefit agile businesses that are always looking for a quick and seamless way to manage procedures.

Transition to "modern" standardized solutions

Even though different groups of people in an organization are often working on the same data set, business managers have to rely on a variety of apps across several platforms that may or may not be connected. Consolidating business data becomes much simpler with the use of a low-code application that would gather the data automatically with little user input, resulting in a quicker, more standardized manner to manage organizational activities. With reduced time, costs, efforts, and faster decision making, businesses can move towards a more agile management. Moreover, businesses now don't have to make do with multiple versions of the same information.

Moving away from outdated tools and toward more current, dependable, and accessible software is a major advantage of low code, no code apps. Converting a legacy system into a modernized infrastructure can help decrease IT expenses and enhance agility, interaction, and uniformity across the organization. Modern low code/ no code tools like Microsoft PowerApps can replace, augment, or supplement your key legacy systems and applications, whether the purpose is to update a few important business processes or entirely rebuild

procedures across the business. For instance, businesses relying on sunset software like MS Access or Lotus notes would experience a great boost in productivity when they move on to modern solutions with low code/no code solutions. By replacing legacy tools, businesses can implement the best solution to replace all existing applications throughout their organization.

Simplified quick development applications

When businesses use low code/ no code application platforms like PowerApps, users get the ability to develop quick applications that can serve multiple purposes. Moreover, with the autonomy to make the applications, businesses can get solutions that are credible, reliable, and have longevity with the further scope of new applications. Older solutions like MS Access, Excel, etc. need detailed technical knowledge to make the solution. Moreover, these sunset solutions still don't solve all the problems that need to be addressed. This is where low code development platforms shine; they are quick to develop, require basic development skills and turn to reliable solutions that are easy to learn and memorize.

Many businesses are still using legacy applications due to their affinity with old vendors whom they don't want to let go of and are not fully aware of modern alternatives. Business applications have evolved to include all types of users and focus on utility, not on development skills. This has led to the rapid adoption of low code solutions that are the need of agile businesses today. As the business environment is dynamic in nature, companies need solutions that can bring standardization, modernize their existing solutions, and are quick & simple to develop, which thankfully these platforms 'excel' at ∎

—The article is authored by Dharmesh Godha, CTO & President, Advaiya

Moving to the cloud without falling off a cliff – A Cryptography Perspective
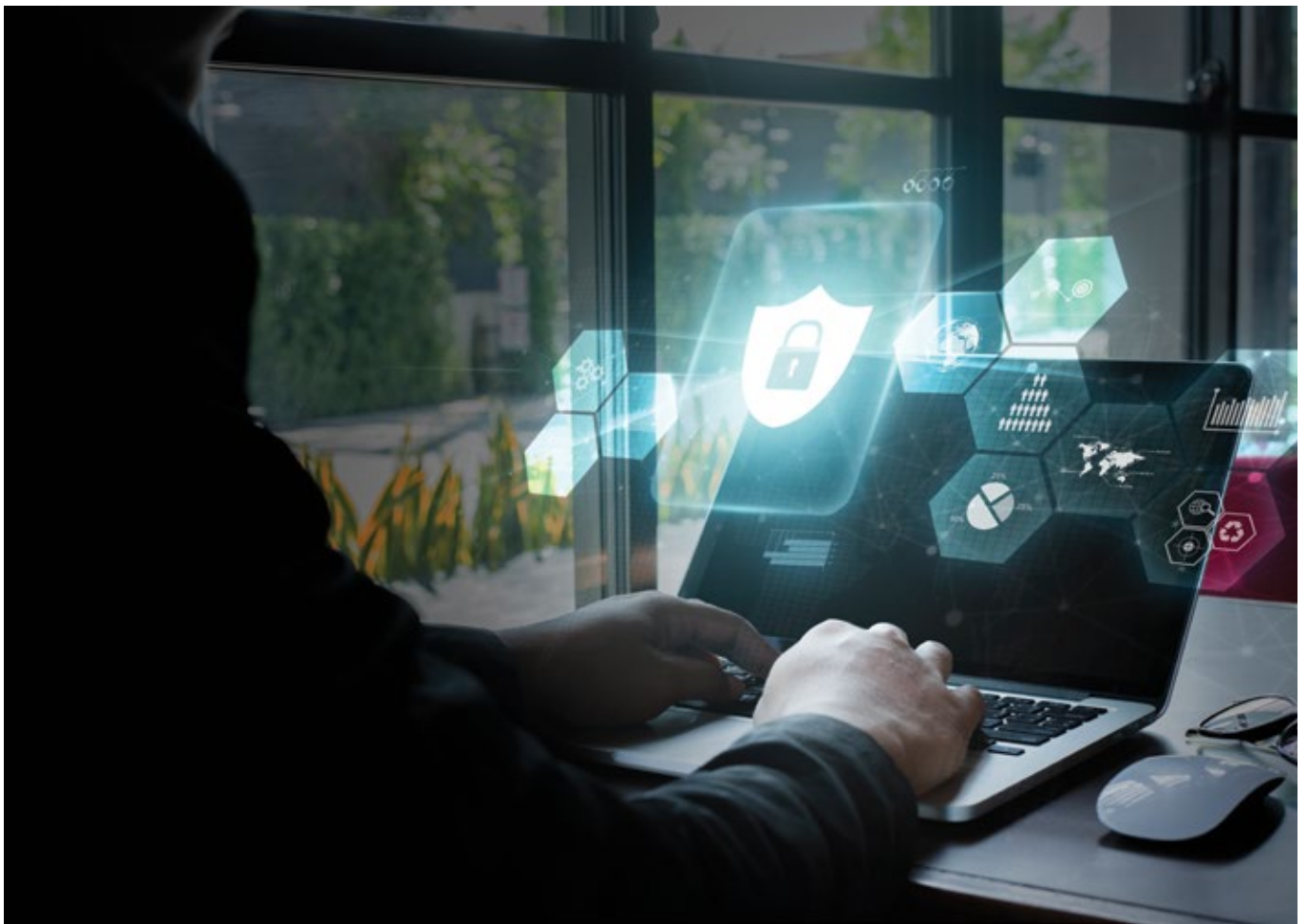
By Ruchin Kumar

With cloud adoption on the rise globally, some organizations nevertheless hesitate to move their customers' data to the cloud. It can be seen as a risk to forfeit the hands-on control of on-premises cryptographic infrastructure in favor of a cloud solution hosted by another entity. To mitigate these perceived risks, some organizations favor private cloud solutions over the public cloud. No matter which cloud strategy an organization adopts, it should demand stringent security measures and ensure that all the applications meet the latest rigorous

security standards. This is doubly true for banks and fintechs, which deal with customer transaction data, to the point that banks are well advised to maintain Service Level Agreements (SLAs) with providers where essential metrics and measurements are clearly discussed and documented.

HSM cryptography is the most reliable way to avoid the breach of data, and cloud platforms are quickly becoming the simplest way to deploy it. The power of the cloud has expanded to offer cloud-based key management as well as encryption, giving organizations more options to implement data security solutions and protect sensitive data. However, efficiency isn't the only driver of cloud adoption. Due to the COVID-19 pandemic, more and more companies are investing in cloud computing services. While cloud services do improve the efficiency of an organization, they can also be susceptible to cyberattacks. To prevent such attacks, new encryption and authentication tools have been developed to prevent hackers from exploiting vulnerabilities in cloud computing systems.

Things to look for

Security is a top priority in nearly every industry. Afterall, maintaining security is crucial to maintaining consumer trust in your organization. While data breaches often come at a dire financial cost, the resulting loss of public trust can be even more costly in the long term. Hardware-based cryptography —in the form of HSMs and key management servers —is the best way to protect trust. However, the cost to entry is high. Aside from the physical hardware, there is the effort to integrate it with existing applications, to manage it on a day-to-day basis, to maintain it, and to eventually upgrade it when the time comes. This can prove troublesome for startups or fintechs, who need the cryptographic capability at a lower cost.

This is where cloud-based cryptographic platforms prove their true worth. With hardware-backed cloud encryption solutions, organizations can design and deploy a complete cloud cryptographic platform on-demand, and even save time and effort while integrating it with their applications. Some key advantages of
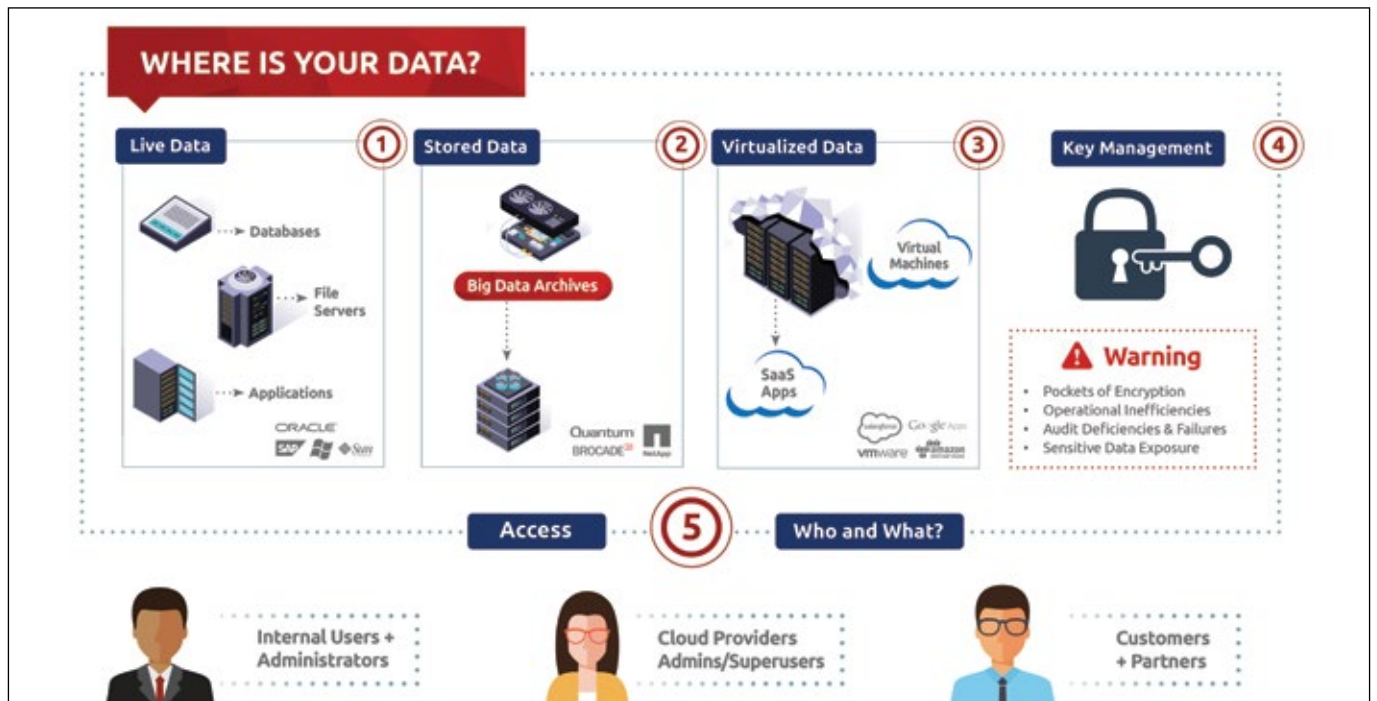
hardware-backed cloud encryption solutions include:

- **Data localization:** with data centers located in every geographic region, data residency is never a hassle
- **High security:** These solutions when run off of industry-leading cryptographic modules, provide clients with hardware-backed security
- **Strict compliance:** Hardware compliance with a wide range of global standards, such as PCI PTS HSM v3 ensure that clients get a universally-compliant cloud solution
- **Simple integration:** Due to design features that support all common APIs, making the process of integrating hardware-backed cloud encryption solutions with existing applications becomes easier

Addressing the Concerns

Despite the advantages apparent | in cloud platforms, some industries and organizations have been slow to embrace them — particularly those organizations with large, legacy HSM infrastructures. To use a metaphor, bigger boats offer smoother sailing but are slower to turn. So, what is necessary to consider before steering the ship toward a cloud cryptographic solution?

Will adopting a cloud platform create more management duties?

Quite the opposite. With powerful multitenancy and virtualization options, you can run an entire cryptographic solution suite in a single pane of glass, managing an entire cloud platform from a centralized location. This helps avoid data siloes and IT sprawl while consolidating your infrastructure.

How will we ensure the same level of compliance?

Go with a cloud provider whose cloud solutions are based on highly compliant hardware. That way, every cryptographic function taking place in the cloud is directly running off a PCI-validated physical counterpart.

How will a cloud solution impact our ability to conduct audits?

In short, by making it easier and more transparent. A centralized management dashboard can deliver audit logging functionality, as well as real-time monitoring and alerting. All metrics are compiled and can be exported into different formats depending on your system.

Will we lose any amount of control over our and our customers' data?

Organizations that adopt cloud solutions typically expand their options for control. Not just through more efficient management, but through innovative cloud-based services such as bring your own keys (BYOK), remote key loading (RKL), and support for Google External Key Manager (EKM) and Client-side encryption.

## Do cloud platforms create security risks in the form of user access?

On the contrary, it is easy to manage user permissions and separation of duties with cloud platforms. Horizontal and vertical separation of user privileges include cloud admin super-users.

Endnote

Today, many organizations host their critical applications with a public cloud provider and implement data security using a cloud HSM service. These organizations reap the benefits of hosting in the cloud – flexibility, customizability, reduced cost – and maintain a high standard of hardware-backed security. Organizations self-manage the connection between their applications and their cloud HSMs ∎

—The author is Vice President – South Asia, Futurex

Automating SEBI Compliances End-To-End
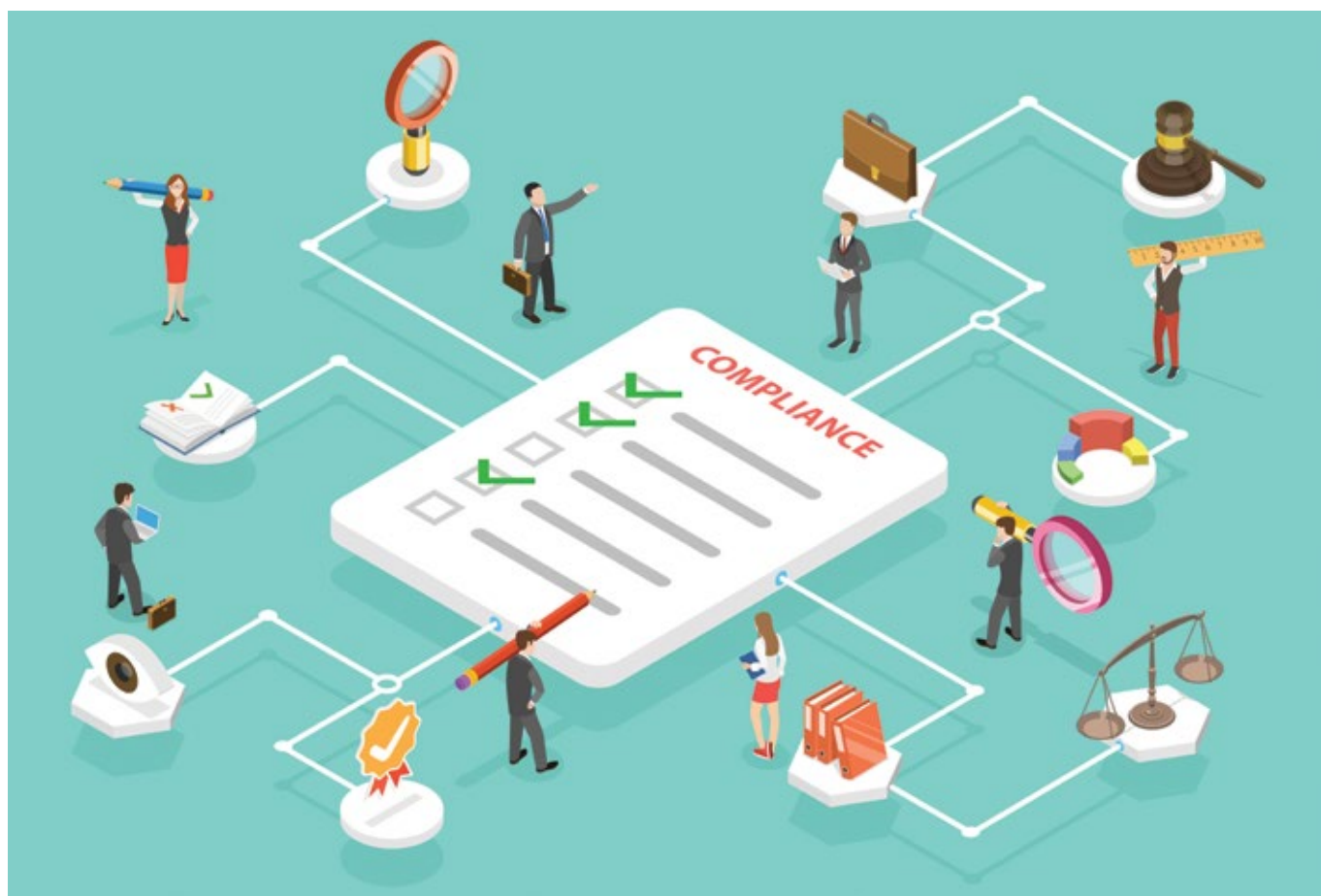
Digital tools automatically detect defaults and delays and come integrated with regulatory updates to ensure timely and accurate compliance.

By Rishi Agrawal

India has set its sight on becoming a 10 trillion-dollar economy within the decade. Capital markets will play a pivotal role in capital formation. Protecting integrity and fostering trust in the market is imperative.

Earlier this year, for the first time, India made it to the coveted list of world's top five economies by market capitalization. At $3.2 trillion in m-cap, it surpassed developed economies like the UK and Canada. Its capital market has expanded tremendously, hosting over 7,000 listed entities and 100 million demat accounts. The country's stock market regulator, SEBI (The Securities and Exchange Board of India), plays a key role in effective functioning of the market. It uses a wide array of rules and regulations to foster an environment of free, fair and transparent trading and preserve the integrity of the market.

It is estimated that there are over 2,000 unique compliances under various SEBI rules and regulations. At least 433 among them are applicable to all listed companies. These include compliances under the SEBI (Listing Obligations and Disclosure Requirements) Regulations, 2015 and SEBI (Prohibition of Insider Trading) Regulations, 2015, among others. There are additional compliance requirements for substantial acquisition of shares, buy-back of securities, and issue of capital and disclosure requirements. Furthermore, there are a host of compliances applicable to specific types of listed entities such as

Mutual Funds, Real Estate Investment Trusts, Portfolio Managers, Foreign Portfolio Investors, and Alternative Investment Funds.

On a granular level, the nature of compliances is wide-ranging. At the outset, there are a variety of on-going compliances relating to composition of board, committees, quorums, directorship, and meetings. In addition, various types of filings must be made to SEBI, stock exchanges and depositories in both PDF and XBRL formats. A large number of filings are triggered on specific events such as conversion of share certificates from physical to dematerialisation, draft letter of offers, and annual submissions for off-shore derivative instruments. Other critical compliance obligations of listed companies include periodic payments of fees, maintenance of records and management of disclosures.

Unfortunately, ad-hoc, manual, and paper-based processes form the basis of compliance management in most listed entities. This leads to inadvertent delays, defaults and lapses creating financial and reputational risks. Even minor non-compliance can create a perception of weak corporate governance and affect share prices.

Digital technologies have taken the world by storm. The new class of regulatory technology companies are offering end to end automation of SEBI compliances including tracking and management, data processing, preparation of statutory filings, maintenance of digital records and automated flagging of potential non-compliances. These solutions allow

listed entities to migrate to digitisation of their entire data and process flow. They can automatically detect defaults and delays. Additionally, these solutions come integrated with regulatory updates to ensure timely and accurate compliance. They offer centralised document upload, generation in PDF and XBRL formats, approval and archival capabilities in line with the SEBI rules and regulations. In addition, smart software solutions flag trading windows, compliance to structured digital database ('SDD') requirements, performance evaluation of board members, executive directors and independent directors, and prompt payments of annual listing fee for securities.

As the country's capital markets become stronger and deeper, end to end data journey from a listed entity to the regulator and back has to become fully digital. A framework with open APIs from the regulator will enable straight through filings, communication of regulatory changes and requests for information.

India has set its sight on becoming a 10 trillion-dollar economy within the decade. Capital markets will play a pivotal role in capital formation. Protecting integrity and fostering trust in the market is imperative now more than ever. Timely, seamless and error-free compliance will pave the way. Digital tools and technologies need to become an ally in this journey ■

—The author is Co-Founder & CEO, TeamLease Regtech, A TeamLease group

Top 5 Trends Driving The Future Of Retail Industry

The retail industry is one of the sectors which always keep fluctuating and truly amazing with large-scale disruptions every single year.

By Rakesh Jaitley

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The retail industry is one of the sectors which always keep fluctuating and truly amazing with large-scale disruptions every single year. The industry indeed relies on customer interests and preferences while depending upon various other factors. Thus, it is important to get a better understanding of these trends that are disrupting the retail industry,

Here top 5 trends to be seen driving new imperatives in 2023:

- **Consumers changing Shopping Behaviour and increasing Expectations:** The global pandemic has completely changed the way consumers shop and how retailers respond to that change. Also, as soon as economies reopened, we saw how innovations emerged out of necessity during the pandemic. The shopping patterns of consumers will always evolve as the way they engage with a retailer. But retailers still face challenges in aligning their channels to a consistent shopper or customer experience which in turn makes it difficult for them to get into new service models, such as recycling and subscriptions, rental models, and direct-to-consumer. On the top of it, the consumer also expects personalization, and which needs to be aligned to their demands and expectations.

- **Affecting Supply Chain:** The sudden shift in consumer behavior has overall impacted the supply chain and urged retailers to realign their success models, streamline their assortment, and improvise the supplier network chain to fulfil consumer expectations and demands. Supply chain disruptions are for real and may continue for a while and retailers should be ready for that dislocation of supply logistics. Retail supply chains will need to be reconfigured because of these global disruptions. An effective retail supply chain management could be lead us in increased profitability.

- **Economic uncertainty:** The country inflation state also creates a huge impact on consumer spending power. The cost-of-living crisis affecting consumer's disposable income, in turn retailers ultimately are reducing their sales and revenue, It is an unprofitable affair since consumer is either trading down or looking for alternative options. However, the transition is easily visible, and inflation is affecting costs for retailers. With increased costs, retailers are struggling with squeezing from the consumer expectation side. The retail inventory planning and management can help some leading companies define assortment, placement, pricing, promotions, and product lifecycles for maximum profitability at a time when productivity and profitability matters the most.

- **Attracting and Retaining Talent:** To meet customer's demands

> **Retailers that have standardized processes and enabled their teams with the right AI and ML tools will act immediately and build a blueprint for agility to serve their customers with the experience they prefer.**

and expectations, retailers should adapt to the operating procedures like labor, buying, forecasting, and merchandising. Across sectors, it's been increasingly challenging to attract and retain the best fit people. Whereas in this sector for retailers it is quite ssential to establish modern and interactive workplaces where employees have the right tools, automated workflows, and the right set of data to do their jobs. Today, there are multiple advanced human resource technologies that allows businesses to recruit, onboard, educate, and retain employees. The ultimate goal is to turn front-line staff into loyal brand ambassadors who can manage customers to drive long-term loyalty. For the operational team, the day-to-day experience should be supported by sophisticated technology and a modern user experience.

- **Mapping ESG and Sustainability Goals:** Sustainability is something that is adapted by every business process that a retailer undertakes to make all the efforts to attract a customer. Retailers require better transparency, and this represents a growth opportunity. It's actually more than just compliance and reporting, and the focus should result oriented. Sustainability is actually a tactic to increase sales margins. Some consumers are willing to pay more for sustainably and ethically sourced products. Retailers that have standardize processes and enable their teams with the right AI and Machine Learning tools will react immediately and build a blueprint for agility to serve their customers with the experience they prefer. Meanwhile, retailers who can leverage the power of a retail platform will know how to sustain in the business ∎

— The author is Senior Sales Director, Oracle Applications

The Importance Of Tech In Safeguarding Patient Health Information

Healthcare organizations must establish a boundless defense in-depth approach that they can depend on when providing safe, reliable and uninterrupted patient care.

By Debasish Mukherjee

Patient care is shifting from treating acute medical problems to a new model: fostering ongoing wellness and quality of life. This transition is significantly transforming healthcare operational norms: today, there are many digital health innovations helping make patient-provider engagements more interactive, personalized and flexible throughout the patient-care continuum.

The Indian healthcare sector is one of the fastest-growing sectors in the country and is estimated to reach a market size of USD 320 Million by end of 2022. Along with supportive government policies, accelerated technology adoption and leveraging emerging tech innovations, across the country, is one of the key drivers of growth for the sector. From robotics and AI to ML, IoT, Nanotech, and 3D Printing, the Indian health tech is fast progressing to become world leaders. The pandemic has further accelerated digital adoption across smaller, non-urban health service providers, making it accessible to the masses.

Because of the unique nature of healthcare's critical infrastructure, the diverse roles of its personnel, and the demand for anytime, anywhere access to medical records, protecting data and computer systems is a complex mission. So, when security risks increase in every threat category, healthcare organizations must establish a boundless defense in-depth approach that they can depend on when providing safe, reliable and uninterrupted patient care. This approach should map into healthcare cybersecurity three fundamental care-critical missions guided by the Confidentiality, Integrity, and Availability (CIA) Triad security model as the standard for:

1. **Safeguarding the confidentiality and privacy of personal health information (PHI) against misuse.**
2. **Protecting the integrity of electronic health records (EHR) for patient safety.**
3. **Ensuring the availability of critical infrastructure and business operations with a defense in depth security approach.**

How healthcare hacks occur

Hacking incidents involving network servers and email remain the leading attack vectors, making up more than 80% of the total count

Each patient profile contains rich demographic and health information, consisting of eighteen identifiers as defined under the HIPPA privacy rule. The 18 identifiers include: Name, Addresses, All dates, including the individual's birthdate, admission date, discharge date, date of death, etc., Telephone numbers, Fax number, Email address, Social Security Number (SSN), Medical record number, Health plan beneficiary number, Account number, Certificate or license number, Vehicle identifiers and serial numbers, including license plate numbers, Device identifiers and serial numbers, Web URL, Internet Protocol (IP) address, Biometric identifiers, such as finger or voice print, Full-face photo, Any other characteristic that could uniquely identify the individual.

Threat actors favor electronic health records (EHR) or personal health records (PHR) because they're useful in a wide array of criminal applications, such as identity theft, insurance fraud, extortion and more. Because there are so many ways this data can be used fraudulently, cybercriminals are able to fetch a higher price for it on the dark web. Meanwhile, these illegal actions cause long-term financial and mental stress for those whose information has been stolen.

Even though we have well-funded, fully equipped anti-hacking agencies across international jurisdictions, cybercriminals can still act with impunity and without fear of getting caught. With hacking tactics, techniques and procedures (TTP) evolving and getting better at evading detection, healthcare facilities can no longer risk having inadequate or unprepared defensive capabilities.

Besides the risks that data breaches pose to healthcare delivery organizations (HDOs), they can also dramatically affect facilities' ability to provide lifesaving care. In a recent Ponemon Institute report, 36 percent of surveyed healthcare organizations said they saw more complications from medical procedures and 22 percent said they experienced increased death rates due to ransomware attacks.

Why healthcare needs a boundless connected cybersecurity approach

The increase in sophistication and frequency of cyberattacks continues to be a material risk. The security

The addition of remote and mobile care workers accessing these same computer systems and digital records from virtually anywhere using unmanaged personal devices also adds to healthcare cybersecurity's growing challenges and complexities.

An integrated security system can aggregate information on threats and provide a more complete perspective on threat actors' Tactics, Techniques and Procedures (TTP), thus strengthening the overall security posture.

challenges HDOs collectively face are multi-dimensional. Threats come in many different forms and are used by various threat actors who wish to do harm without regard for patient wellness. Whether socially, economically or politically motivated, the results of these attacks are the same: the loss of something of considerable value, such as PHI data or operational continuity, that puts patient lives at risk and providers out of business.

The expansion of critical infrastructures and the proliferation of IoMT, mobile, wireless and cloud applications enlarge the attack surface with boundless exposure points. Threat actors can deliver ransomware using multiple attack vectors and hack your organization through any vehicle, traffic, network or device.

As cyber-defenses are a challenge at every enforcement point, from the endpoint to the network and the cloud, there has been a trend toward the proliferation of security tools pieced together to stop these threats. The resulting security tool sprawl is a big concern with regards to management, efficiency and cost. In addition, security teams with rigid lines of

responsibilities and controls create security siloes, making it nearly impossible to work as a unified team. The less these units communicate with one another, the more threat intelligence is isolated.

The danger behind unconnected security is that it creates a security system in which each independent enforcement point is only as strong as the weakest enforcement point in the collective defense. An integrated security system can aggregate information on threats and provide a more complete perspective on threat actors' Tactics, Techniques and Procedures (TTP), thus strengthening the overall security posture. A security system that is not interconnected can allow an attacker to succeed with multi-vector campaigns. To combat these attacks, healthcare organizations need a boundless, connected approach.

Zero-Trust is reshaping access security for safer anytime/everywhere care

The digital transformation journey for healthcare had already gained tremendous momentum when

COVID-19 threatened the wellness of the entire human race. Overnight, the pandemic began reshaping the future of healthcare services, expanding the front lines of healthcare at scale and flexibly connecting providers with patients outside of traditional care facilities.

Advances in medical technologies, medical devices, electronic health informatics, cloud data exchange, and mobile and virtual communication enable this new "anytime/ everywhere" care approach. Unfortunately, although these new capabilities improve the quality of care and patient satisfaction, they also raise significant privacy and security risks for healthcare organizations.

Healthcare personnel, such as doctors and nurses, often move from hospitals to other care facilities, workstation to workstation, and device to device with varying privileges to access patient health information. The addition of remote and mobile care workers accessing these same computer systems and digital records from virtually anywhere using unmanaged personal devices also adds to healthcare

cybersecurity's growing challenges and complexities. In this environment, continuing with the outdated security model of "trust first and then verify" increases susceptibility to human error and data misuse, resulting in compliance violations, fines and classaction lawsuits.

Healthcare organizations adopt a new zero-trust (ZT) and least-privilege security model to protect the integrity and privacy of patient health information. The foundation of this ZT security concept is the belief that organizations must always assume that attackers can be anywhere, inside or outside the perimeter. Therefore, without exception, no persons, machines or locations (even within the corporate network) should be inherently trusted; instead, verify every employee and device before granting access to care-critical resources.

Assuming all endpoints are risk vectors is the safest policy

Healthcare professionals typically roam around, accessing various endpoint devices such as tablets, laptops and workstations to record medical notes and access health data during care engagements. If not managed, patched and protected with modern security, these endpoints are often open targets for threat actors to easily exploit and orchestrate an attack.

The consequences of a network or data breach are too dangerous to bear for both patients and providers, so treating all endpoints as risk vectors that must be tracked and monitored actively and constantly is the safest policy. The management and security of endpoints are more mission-critical now than ever in protecting healthcare data and systems and, ultimately, patient safety. Healthcare must employ next-generation endpoint security that can stop all threat forms and methods of attack.

Reduce the human risks factor

The growing adoption of cloud office applications like Microsoft 365 gives employees many different channels to access and share healthcare data that IT never intended to allow. Data exchanges — deliberate or accidental — between employees, partners and customers via emails, attachments and file sharing/collaboration platforms are not just customary but prevalent in today's remote workforces and cooperative business partnerships.

The sources and mechanics of data leaks are endless. Although employees pose the highest risk, account compromise, application vulnerabilities, social engineering and configuration errors are still the top root causes that companies must address.

Keep phishing messages out of the Inbox

Phishing attacks are a top concern cited in healthcare despite the increase in security education provided to workers. Medical staff are focused on clinical analyses and treatment decisions for many patients, making healthcare systems highly vulnerable to phishing attacks that prey on distracted workers. Even the most trained and security-conscious users can be tricked by phishing emails that are crafted to look genuine and are sent from stolen or fake but known identities

Conclusion

Boundless Cybersecurity solutions should be scalable with cyber-defense architecture that can cater to healthcare IT needs. They should be flexible, easy-to-deploy tools to strengthen healthcare cybersecurity, making patient care delivery more efficient, resilient and secure. An integrated, centrally managed security stack will then protect all assets and workers and ensures care continuity, patient safety and data confidentiality. Whether it is ransomware, targeted phishing, or vulnerability in healthcare systems, a Boundless Cybersecurity approach enables healthcare to counter all threat forms, attack vectors and exposure points with the highest security efficacy and performance ∎

—The author is Vice President, Regional Sales APJ at SonicWall Inc.

Enabling Last-Mile Adoption Through Data Assurance

As data evolves and SaaS takes over the IT world, drawing insights from the data deluge for last-mile adoption will become increasingly critical. And this is where data assurance and data engineering validation will play a crucial role.

By Srikanth Manoharan

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The retail iIn 2017, The Economist wrote, "The world's most valuable resource is no longer oil but data." It was a catchphrase picked up by several other mainstream publications, but the idea had been around for well over a decade. As far back as 2006, British mathematician and data science entrepreneur Clive Humby had said, "Data is the new oil."

In 2020, the International Data Corporation (IDC) estimated that more than 59 zettabytes (ZB) of data would be produced, acquired, duplicated, and consumed globally. It also predicted that the data produced over the next three years would surpass that of the previous thirty years!

These projections are likely conservative given the shift to the virtual that the pandemic entailed. The question today is not how to collect data but how to optimize it to provide valuable insights and timely action. Because ultimately, data is as data does.

It is in this context that data engineering has become so relevant. By enabling organizations to optimize data for usability, data engineering touches various stages of data, right from creation to movement, validation, curation, storage, and, in some cases, data retention. And as data engineering projects become more prominent and complex, testing is increasingly essential to keep pace.

The role of data testing

Testing works on the premise that, like software, data is vital to the suc-cess of your enterprise. Therefore, it must always be dependable and trustworthy. Data testing enables you to identify data quality concerns before they reach the production data stream. Data engineers can confirm their organization's assumptions and develop rules to prevent problems.

Generally, when testing, two distinct aspects need consideration: software and data pipelines. Software testing initially had a three-tier architecture, covering the front end, middle tier, and database. To maximize efficiency, the backend has been divided into manageable, independent components that are interlinked but independent of each other.

This trend began about 5–6 years ago with the advent of service-oriented architecture (SOA). The transition to manageable, self-operating SOA components changed the entire IT industry. Today, we call these APIs or microservices. APIs are bridges that carry data. Testers need to focus on the frontend, the GUI, and the middleware, which includes APIs. You can test APIs and microservices without touching the front end. Similarly, you can test the backend independently by running SQL queries to evaluate the performance of CRUD operations.

The data's effectiveness needs to be evaluated when it comes to data. For instance, are there null values in the extractor source system? Has the data been transposed correctly, and so on. Since data engineering touches upon various stages of data, we will need to rely on data testing tools that can test the data from all these angles.

There are a host of tools for testing the data. For instance, there is a toolset from Apache for extracting; certain Lambda functions in AWS allow you to transform the data, and there are different tools for load functions.

Automating the process

There are several toolkits for automating testing, and this field is expanding. However, even today, only some degree of automation is achievable. For instance, in data validation, open-source tools such as DataDog and Metabase (along with a few commercial solutions) may assist in monitoring the data's characteristics.

When transferring data in batches, you may use these tools to examine the data's attributes. From the perspective of data ingestion, where you load the data, Zookeepers and Apache Kafka create a pipeline to transfer data from A to B. You can also set up monitoring and logging methods to collect data-related information.

Data storage systems, such as your S3 buckets, data lakes, or HDFS file system, will include data-related metadata, indicating what kind of data is received and saved. Talend and Kettle are open-source ETL alternatives for data migration.

These tools help with configuring, testing, and moving the data. A test environment can be set up before these tools are configured in production. If you find anomalies in the source, you can rewrite the SQL queries or correct the dates, which will eventually fail in the target system. With automation and semi-automation, you can use some of these tools, look at the logs and then automate the logs to monitor the data, inspect its quality, and configure it in production.

Data testing enables you to identify data quality concerns before they reach the production data stream. Data engineers can confirm their organization's assumptions and develop rules…

Testing-first approach

Automation can help establish a testing-first approach, which has been important for the last decade. As opposed to bringing in testers at the end of the development cycle, both developers and testers are involved in requirements gathering right from the beginning.

DevOps pipelines automatically test code when it is fixed and redeployed, so fixing these errors early on improves the quality of the system and the product. Similarly, with data pipelines, especially as we embark toward smart automation with AI and ML.

Smart automation brings low-code aspects into the machine world, with drag-and-drop tools such as Mendix, Claris, or Filemaker simplifying workflow configuration even further. However, AI-led automation is complementary rather than substitutionary. While AI helps analyze data and get a model for forecasting, the testing world is guided by actual metrics rather than prediction. Even if the data engineering side of testing is evolving, it can still aid with automation and ensure quality assurance.

A script or code created today may be irrelevant tomorrow because the application will have changed. AI-led smart automation tools can identify elements through multiple means—such as element IDs, X-Parse, or CSS—and generate scripts automatically.

Moving towards data assurance

In the days ahead, we can expect to see tools that will automatically analyze the data, curate it, and so on, without human intervention. As data evolves and SaaS takes over the IT world, drawing insights from the data deluge for last-mile adoption will become increasingly critical. And this is where data assurance and data engineering validation will play a crucial role.
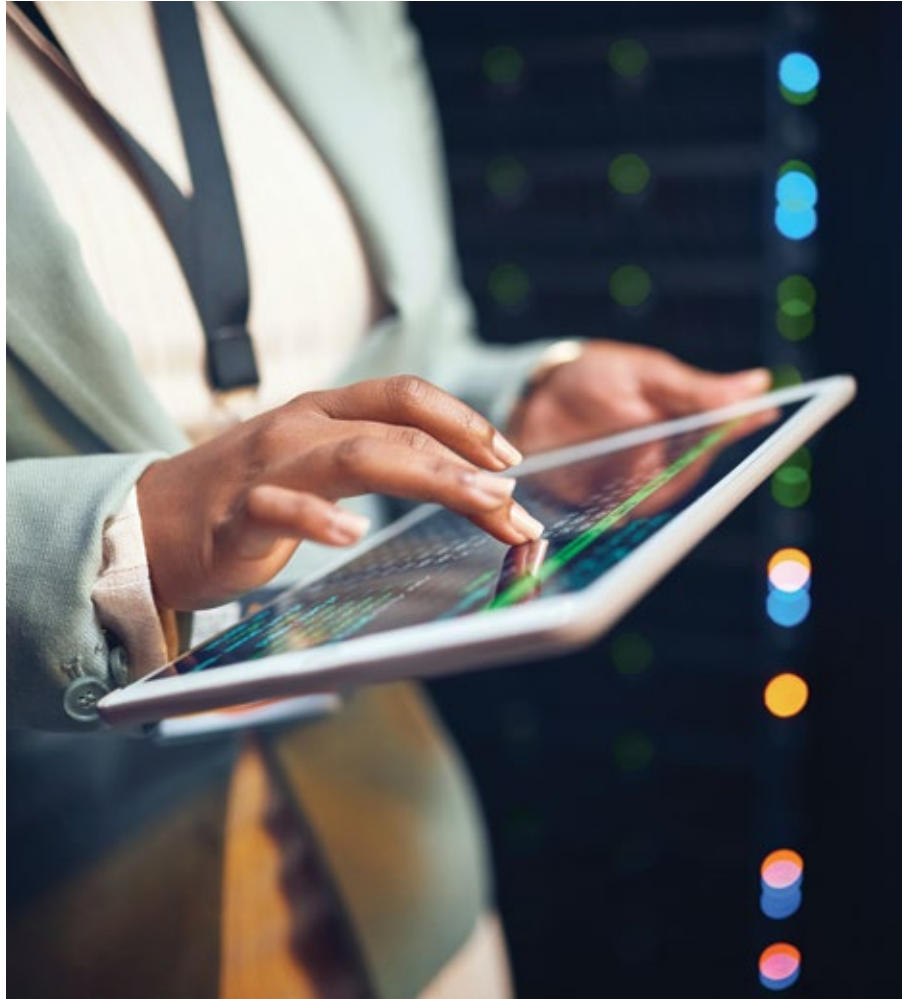
The next step that companies can look at would be establishing R&D groups inside the data assurance practice and evaluating various OpenSource tools to create a spectrum of automation.

Trustworthiness and ease of use will be pivotal to adoption. When data scientists work with data, they usually divide it into training and test data in a 60:40, 70:30, or 80:20 ratio. Nevertheless, the model will be inaccurate if the training data is wrong. Manually checking zillions of rows and columns is impossible. By using tools such as DataBricks, Pandas, or Python, data assurance increases the model's accuracy level from 80 to 90%.

The next step that companies can look at would be establishing R&D groups inside the data assurance practice and evaluating various OpenSource tools to create a spectrum of automation. Such customized automation solutions will take data assurance to the next level and prepare the system for the upcoming IoT revolution ∎

—The author is the Executive Vice President, Digital Assurance

Digital Transformation: Enabling Recovery A Reality

As we seek to build back flourishing global economies, technology has a key role to play as an inclusive and unifying bridge to our digital futures.

By Dharmesh Godha

As recovery ambitions and investments filter through to vital digital transformations, global collaboration, determination, and collective innovation must be called upon to turn the vision for a better, and more equitable world into reality. The consequences of today's decisions will impact generations to come, and we owe it to them to build societies and economies fit for digital native generations.

Harsh realities require strong collaboration

There are plenty of challenges along this path of recovery. The WEF Global Risks 2022 report forecast that by 2024 the global economy will be 2.3% smaller than it would have been without the pandemic.

That's without considering the impact of current global, geopolitical uncertainties, conflict, and unrest. But implemented well, technology and digital-led businesses can help reduce this impact, creating jobs and economic opportunity across the world. As we seek to build back flourishing global economies, and address some of the most pressing challenges facing society, technology has a leading role to play as an inclusive and unifying bridge to our digital futures.

This will be particularly important as we adapt to meet the evolving needs of a world engulfed in a climate crisis. The annual Global Trends Report by the United Nations found that nearly 5 million people in India were internally displaced due to climate change and disasters in 2021. By 2050, the number is projected to reach around 1.2 billion people globally, while vital ecosystems which are critical to both the planet's prosperity and people's livelihoods will continue to deteriorate, without significant action. The challenge is large, but as we learned with the pandemic, when we truly invest and apply ourselves to a global problem – technology can speed up the pathway to solutions.

Tech-enabled solutions to global challenges

The technology industry has the capability to take on these challenges and start making a genuine impact. With emerging technologies maturing and powering critical innovations, they can help to bring hope right when we need it most. AI can help transform healthcare, and edge computing can unleash the full power of IoT for environmental monitoring and climate modelling, transport, and sustainable resource management. And with 5G connectivity rolling out in many countries, the possibilities really are endless – particularly when built on a solid foundation of cyber resiliency and data storage through multi cloud infrastructure.

The increased demand for connectivity will require more data transfer power akin to 5G. Intelligent platforms at edge and faster network, together, varying but connected systems will enable huge amounts of data to be wirelessly processed in real-time—anywhere in the world, providing ability to make intelligent data-based decisions faster.

More importantly, Edge computing also plays a crucial role of enabling digital transformation on a sustainable pathway to help reduce global emissions up to 15% by 2030 – further helping businesses to cut costs, energy usage, emissions, and waste by optimising processes and better utilisation of resources. From energy distribution to challenges in food provisioning, IoT applications powered by 5G offer many other innovative solutions to sustainability. Digitally enhancing our cities by empowering the Indian citizens and laying a robust knowledge economy foundation will be another critical area where Edge computing will come into play. An Invest India report highlights that cities contribute about 63% of the GDP, which is expected to increase to 70% by 2030. Leveraging 5G connectivity, IoT and data analytics innovations can provide critical information that will further enable crowd management and ensure smarter governance – using technology and data resolutely to make better decisions and deliver a better quality of life.

Building sustainable 5G networks is a massive undertaking that requires considerable public and private support for new infrastructure, devices, and services. However, despite the premium cost, it's critical to future-proof the economy and sustain competitiveness. Further, 5G's open innovation platform will also enable India to move closer to its vision of Digital India.

Beyond solutions, the skills gap remains a top concern for C-level executives and is increasingly becoming a board-level priority. According to the India Skills Report 2022, 75% of Indian organisations have reported a skill gap at their workplace. While the digital-first economy presents significant growth opportunities to the organisations, it also creates a critical need for new talent with significant expertise in cybersecurity, AI, cloud computing, blockchain and DevOps. India's digital talent is now growing 5x faster than core tech talent, however, despite this quantum growth the demand- supply gap for digital talent is expected to increase over 3.5x by 2026.
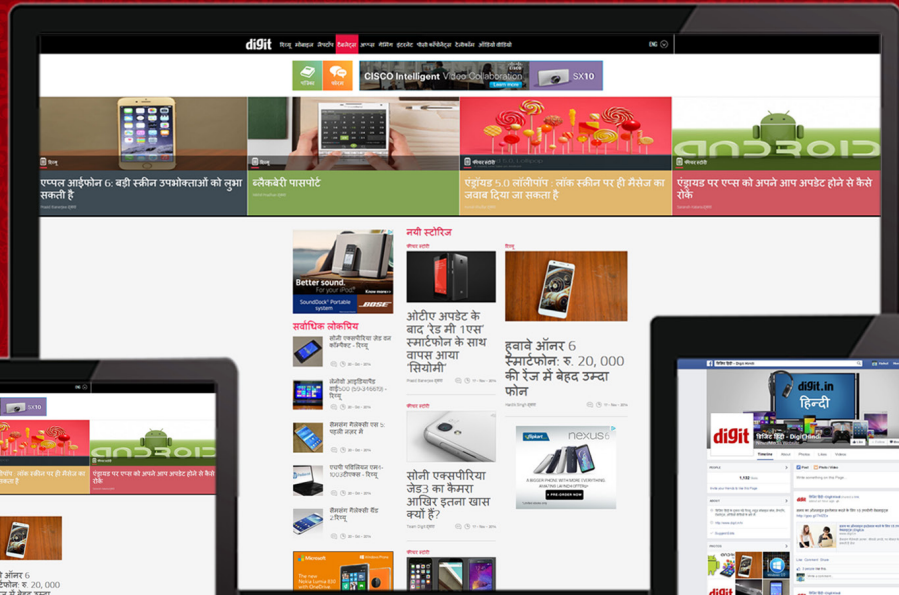
These innovative solutions rely on human progress. It is our responsibility as an industry to drive the reduction in this skills gap, but we can't do it alone. To unleash the full power of transformational technologies and to truly share those benefits with everyone, private and public sector commitment to work together to turbocharge digital skills growth, and tech infrastructure for the long term is vital. This means maximising the power of technology through adoption of 5G, AI, and Edge Computing underpinned by robust cyber solutions to ensure we are ready, and future-proofed for the economies of tomorrow. In order to maximise the potential of people and our ever-evolving tech solutions for economic progress, we need to ensure our skills capabilities are developing and progressing at a similar scale and speed. Human progress is integral to our digital progress ∎

—The author is Vice President and General Manager, Infrastructure Solutions Group, Dell Technologies India

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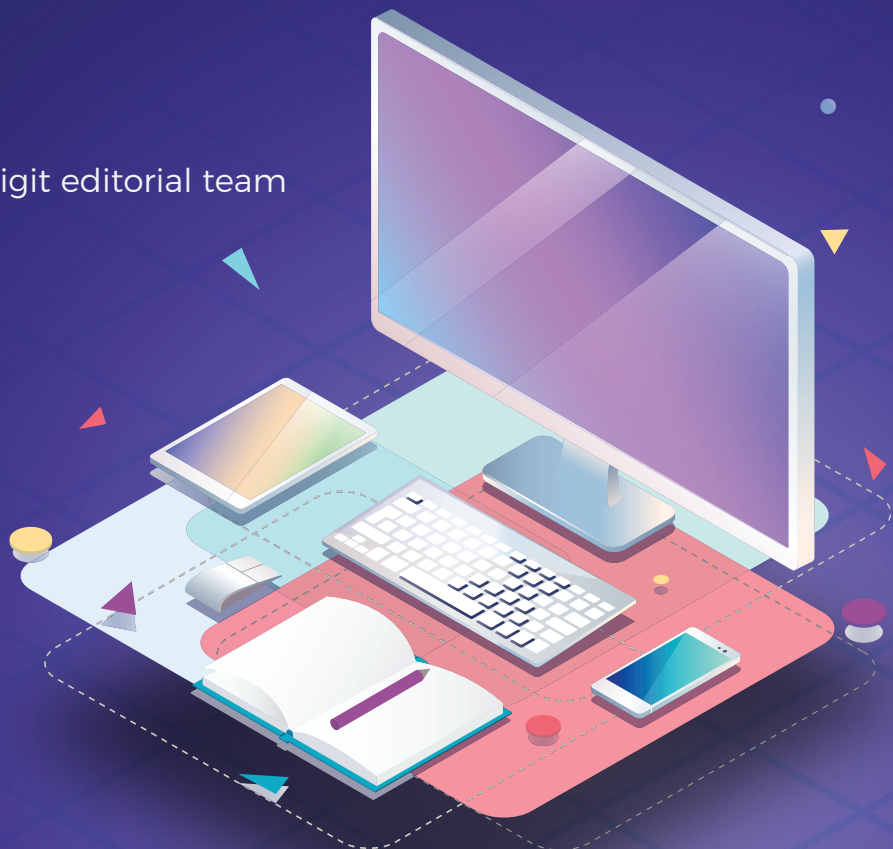Launch your own tech channel on Digit.in

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