CDOSCAPE
THE TECH TAKEOVER

How and why the CDO role is increasingly going to tech leaders?
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Digital transformation – and its various forms, most notably Industry 4.0 for manufacturing industries – was the reigning dream, a decade back. And Chief Digital Officers were appointed to help achieve that in some organizations. Their role was not just to do everything that was needed to achieve.

In India, large groups with significant manufacturing presence – like Tata Group, Mahindra & Mahindra and Vedanta/Sterlite – took the lead. Our cover story this time explores the evolution of CDOScape – or the universe of Indian CDOs. As the story illustrates, CDO role is proving to be a transitional role that is increasingly getting aligned with IT in many organizations.

Initially, when CDO role was envisaged, it was hotly debated if it should go naturally to techies or marketing folks. As the role evolved, many large organizations went for neither. They appointed out and out business guys - often with experience in the same vertical or a horizontal function that is very important in that business – as CDOs.

Partly because the first phase of mobilization is over – and greatly because the pandemic made heroes out of CIOs and CTOs – the CDO role is not just going to techies, it is getting hyphenated with CIO roles. Our story analyzes this in detail.

The next big dream is running a business in metaverse. Like the Internet, and then digitization of everything, metaverse is the next big dream.

Organizations have to be steered towards the metaverse. Of course, much like digitization, the responsibility of doing this rests on the CEO. But the CEO needs someone to bring in the focus, bring in the requisite knowledge, and collaborate with business and functional leaders to transform the culture. It is a full-time job.

Let’s call the position ‘Chief Metaverse Officer’. The next question is: who, among the current functional leaders, is the best to take up the role? Is it the marketing guys who take the products and services to customers through right narratives and context? Or the customer experience guys, as metaverse is all about a new experience? The data/analytics guys who have all the insights about the customer? Core business guys who have the best understanding of their business? Or the IT guys who are on top of latest technological changes and can bring them to the business at the right time, right place?

If we had a straight answer, I would not have written an edit on the topic. All we need now is to realize the centrality – or otherwise – of metaverse to business and try exploring how they can impact our businesses? With the right understanding, actions will get themselves in.

For the time being, all we need to do is bring in this issue – if we need a Chief Metaverse Officer – why or why not? – to our discourse sphere.
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Focus on resilient supply chains

The pandemic, climate change and geopolitics are driving global manufacturing executives to focus even more than before on a twin transformation: smart digitization and a focus on environmental, social and governance (ESG) goals, according to KPMG. The findings are based on a global survey of almost 150 CEOs in manufacturing companies in 11 countries in Europe, North America and Asia-Pacific. Three quarters are at companies with annual revenue of USD1 billion or more. CEOs at manufacturers have learned two important lessons from the pandemic.

Value-added services to drive manufacturing

Spending on smart manufacturing will grow from USD345 billion in 2021 to more than USD950 billion in 2030 as manufacturers advance their digital transformation initiatives, according to ABI Research. A greater reliance on analytics, collaborative industrial software, and wireless connectivity will drive spending on value-added services, namely connectivity, data management, and enabling platforms, to more than double over the forecast.

Next decade of payments

We live in a world where centuries of glacial paper-based payments evolution have given way to exponential digital payment innovation: a world of fragmentation across device, form factor, and payment methods. Against this backdrop, regulators struggle to contain risk, and firms struggle to meet the changing needs of consumers. By 2030, payments will become a feature in devices - including vehicles - with owners loading preferred payment options and usage rules into their profiles.

Advanced digital governments

The pandemic-inflicted global disruption caused government organizations to renew their focus on and accelerate the transition to digital government. For CIOs, achieving true digital transformation within government requires a full commitment to emerging technologies and capabilities that can scale across an organization. The recent Gartner Digital Transformation Divergence Across Government Sectors Survey explored the differences in objectives, practices, and makeup of digital initiatives that have led to successful transformation implementations.

Top sectors that lead DX in manufacturing

The semiconductors, electronics, and pharmaceuticals sectors are leading the way in the digital transformation of manufacturing, reveals a new report, “Manufacturing Transformation Insights Report 2022”, launched by World Economic Forum in collaboration with the Singapore Economic Development Board (EDB). The report outlines the current state of industrial transformation across different sectors and presents detailed case studies on how different stakeholders are actively leveraging the SIRI program to accelerate digital transformation.

5G trends & opportunities in 2022

As 5G rolls out in India in 2022, we will witness enterprises and network providers seeking use cases to implement 5G in business operations. This will see business use of 5G move out of its nascency and the adoption of advanced features such as Ultra Reliability Low Latency Communications (URLLC) and Massive Machine Type Communicators (mMTC) for faster and better results. The ecosystem will expand to include public cloud providers and new open infrastructure for an Open 5G ecosystem, delivering private 5G networks with more capabilities.
Privacy is now mission-critical

**Privacy** is mission-critical, as 90 per cent of organizations consider privacy a business imperative, according to Cisco published its 2022 Data Privacy Benchmark Study. The survey showed privacy investment continues to rise and organizations see a high return on investments from privacy spending. Privacy has become a true business imperative and a critical component of customer trust for organizations around the world. Privacy continues to grow in importance.

51% enterprise IT spend to cloud by 2025

**Enterprise** IT spending on public cloud computing, within addressable market segments, will overtake spending on traditional IT in 2025, according to Gartner, Inc. By 2025, 51% of IT spending in these four categories will have shifted from traditional solutions to the public cloud, compared to 41% in 2022. Almost two-thirds (65.9%) of spending on application software will be directed toward cloud technologies in 2025, up from 57.7% in 2022. The research includes only select enterprise IT categories.

Smart manufacturing spends to rise

The COVID-19 pandemic quickened the pace of digital transformation, placing technologies at the very center of how people live, work. The rise of always-on 5G portable devices, an explosion of edge AI adoption, the formation of the metaverse, and a growing concentration on cybersecurity are just some of the many changes that are indicative of a more connected, vulnerable, and technology-driven world.

Machine vision key enabling tech

**Machine** vision is rapidly becoming a key enabling technology for digitalization and automation in automotive, healthcare, manufacturing, retail, smart buildings, smart cities, transportation, and logistics. The total revenue of machine vision technology in the seven major markets is expected to reach USD36 billion by 2027, up from USD21.4 billion in 2022. This growth translates to a CAGR of 11%, according to ABI Research. The pandemic and the desire for digitalization have led to the emergence of innovative use cases, such as occupancy detection, crowd monitoring, predictive maintenance, automated picking, etc., in warehouses.

Embedding intelligence into packaging

**Traditional** packaging is often challenged by several factors such as rising material costs, the use of plastics threatening the environment, and creating compelling first impressions to consumers. Product Protection, Distribution, Point of Sale Impression, Rising Costs and Sustainability are the key challenges for the packaging sector, reveals GlobalData. Companies are obligated to translate packaging quality into customer satisfaction with a value proposition for product strength and brand reputation. Rise of e-commerce and last-mile delivery are behind the need to scale up.

Metaverse to give new business models

**By** 2026, 25% of people will spend at least one hour a day in the metaverse for work, shopping, education, social, and/or entertainment, according to Gartner, Inc. Vendors are already building ways for users to replicate their lives in digital worlds. From attending virtual classrooms to buying digital land and constructing virtual homes, these activities are currently being conducted in separate environments.

Crypto & blockchain hot investment areas

**Global** fintech funding across M&A, PE, and VC reached USD210 billion across a record 5,684 deals in 2021. Fintech funding in H2’21 accounted for USD101 billion of this total – down slightly next to H1’21’s USD109 billion, according to the Pulse of Fintech H2’21 – a bi-annual report published by KPMG. Payments continued to attract the most funding among fintech subsectors, accounting for USD51.7 billion in investment globally in 2021. Blockchain and crypto were also a very hot sector, attracting a record USD30.2 billion in investment – up from USD5.5 billion in 2020. Cybersecurity (USD4.85 billion) and Wealthtech (USD1.62 billion) also saw record investment.

India’s tech spends to grow 8.7% in 2022

**Indian** tech spending is expected to grow 8.2 per cent in 2022, Forrester forecasts in a new report, “Asia Pacific Tech Market Outlook By Country For 2021 And 2022. This is one of the highest growth rates in the Asia Pacific region. In 2022, continuous improvements in vaccination rates and the progressive reopening of economies will produce more sustained tech market growth, on par with or higher than the growth they typically recorded before COVID-19, expects Forrester.
AI to scale enterprise creativity

With artificial intelligence and its capabilities continuing to expand, AI may be able to broaden creativity for companies moving forward. AI tools available to technology executives will assist with overcoming digital repetition, and AI can help empower more unconventional thinking, found Forrester in a recent study. In addition, AI can help power a cooperative mindset for a team and make for better collaboration. Like with agile, identifying AI opportunities and building AI solutions require all stakeholders to sit around the table, brainstorm, and let the creative ideas flow.

Cybersecurity leader role must be reframed

According to Gartner, the role of cybersecurity leaders needs to evolve, as accountability for cyber risk shifts outside IT, and an increasingly distributed ecosystem leads to a loss of direct decision-making control. Security and risk management (SRM) leaders now invest significantly more effort into evaluating and influencing the cyberhealth of external parties. Employees are making more decisions with cyber risk implications and executive committees being established outside the scope of the cybersecurity leader. Analysts said that these factors will lead to an environment where the cybersecurity leader will have less direct control over many decisions.

One-third consumers unaware of metaverse

According to Gartner, more than one-third of consumers (35%) have never heard of the metaverse stats. The survey finds that 58% of respondents have either heard of the metaverse but do not know what it means or think they understand the metaverse but would struggle to explain it to someone else. Only 6% of people identify as being comfortable enough to understand the metaverse to explain it to others. Of those who at least know about the metaverse, 60% have no opinion on it, and only 18% are excited about it. Meanwhile, 21% say they’re concerned about the impacts the metaverse might have on the regular world.

Consensus on securing internet

The global market size of the consumer internet of things (IoT) is forecast to grow from USD45 billion today to USD154 billion by 2028. As the use of connected devices increases worldwide, so does the potential for cyber threats. Stakeholders agreed on security requirements for consumer-facing IoT devices.

New legal tech automation offerings by 2025

According to Gartner, by 2025, 30% of new legal technology automation solutions will combine software with staffing for a “human-in-the-loop” offering. Despite growing demand for greater automation and increasing sophistication of tech innovations, machine learning solutions for corporate legal teams will struggle with the high levels of domain expertise required and high rates of exceptions expected. The question is whether the legal department has the capabilities required to customize and configure advanced machine learning systems.

Improving supply chain customer experience

Due to the increased pace of change in customer preferences and expectations chief supply chain officers (CSCOs) must take three actions to improve supply chain customer experience (CX), according to Gartner. Organizations must adapt quickly, as failing to understand and meet customer needs can result in the loss of exactly those customers. According to a Gartner survey, 62% are investing in capabilities to capture, analyse and leverage supply chain-specific customer satisfaction data. The supply chain of the future will be totally tuned into their customers.

Metaverse pushes XR market spend

The rise of always-on 5G portable devices, an explosion of edge AI adoption, a proliferation of smart manufacturing platforms, the formation of the metaverse, and a growing concentration on cybersecurity are just some of the many changes on the horizon that are indicative of a more connected, more vulnerable, and ultimately, more technology-driven world. In 2024, the XR market spend will hit USD4.84 billion.

Govt, PSU CIOs need to sustain digital acceleration

Government and public sector CIOs now need to sustain digital acceleration’s momentum after the pandemic’s initial chaos. Gartner identified the top 10 government technology trends for 2022 that can guide public-sector leaders in accelerating digital transformation and mitigating disruption risks. Government CIOs must consider the collective impact trends.
A tech-focused budget

Not only did finance minister Nirmala Sitharaman read out her budget speech from a tab, but the Union Budget 2022-23 also gave a lot of emphasis to technology. 'Digital' was the most frequently occurring specific word, leaving aside generic words like 'percent' and 'crore', and ahead of words like 'development', 'capital', 'government' and even 'investment'.

Here are top tech-related announcements in the Union Budget 2022-23:

- A data exchange among operators of different transport modes on a single platform, Unified Logistics Interface Platform (ULIP), that will connect the individual entities through APIs.
- A scheme for delivering digital and hi-tech services to farmers in PPP mode, with the involvement of public sector research and extension institutions and private agritech players and stakeholders of the agricultural value chain.
- Kisan Drones that will be promoted for crop assessment, digitization of land records, spraying of insecticides, and nutrients.
- Digital ecosystem for skilling and livelihood and launch of DESH-Stack e-portal. This is targeted at empowering citizens to skill, reskill or upskill through online training. It will also provide API-based trusted skill credentials, payment, and discovery layers to find relevant jobs and entrepreneurial opportunities.
- A digital university that will provide access to students across the country with a personalized learning experience.
- Open platform for the National Digital Health Ecosystem. It will consist of digital registries of health providers and health facilities, unique health identity, consent framework, and universal access to health facilities. A similar idea was mooted by CIOs in a discussion organized last year by CIO&Leader.
- The issuance of e-Passports, discussed for a long, will be launched this year, according to the FM.
- To facilitate quicker bill processing by central ministries for their procurement, a paperless, end-to-end online e-Bill System will be launched.
- 5G spectrum auctions to be held this year.
- Government funding to support research in AI, Geospatial technologies and drones, and semiconductors among the few identified sunrise sectors.

GOVERNMENT NEWS

National Logistics Portal to be integrated with Unified Logistics Interface Platform

National Logistics Portal (NLP) is to be integrated with the Unified Logistics Interface Platform (ULIP). Prime Minister has called for the involvement of the private sector in ULIP.

DDA launches web portal for displaying region layout plans

The Delhi Development Authority (DDA) has launched a web portal (dalop.org.in) displaying layout plans of various regions in the national capital to make old records accessible to people. It contains layout plans from the 17 planning zones of Delhi for an area of 1,483 square km. Earlier, the physical layouts were not legible. The scanned layouts were vectorised and stitched together zone-wise and the zones were overlaid on the master plan of Delhi, to make them legible.

Assam launches night navigation mobile app for waterways

Assam has launched what it calls the first-night navigation mobile application in rivers in the country. The inaugural night journey of an Inland Water Transport ferry fitted with the system sailed between Guwahati and North Guwahati and completed the return journey also in about an hour.

Karnataka launches mobile app for school adoption

Karnataka has launched a mobile app, Nanna Shaale Nanna Koduge, through which anybody can access the details of the government schools. This is expected to make the school adoption program more transparent. Odisha has a similar app, Mo School, running successfully.
Udaan flies in 2021, ships over 1000 cities

The e-Commerce platform, Udaan, shipped over 20 lakh tonnes under the essentials (fresh, FMCG, staples, pharma) and 260 million products of non-essentials (electronics, general merchandise, and lifestyle) categories catering to 50 million orders across 1000 towns and cities of Bharat, media reported. It also onboarded over 5 lakh new retailers and kirana store owners in 2021. Over 625 sellers on Udaan achieved sales worth ₹1 crore each.

ElasticRun’s valuation triples to USD1.5 billion

B2B e-commerce company ElasticRun which is kirana-focused, raised USD300 million in a new funding round led by SoftBank Vision Fund II, said reports. It added Goldman Sachs as a new investor in the fundraising that trebled its valuation to USD1.5 billion. The Pune-based company had raised USD75 million in April 2021 at a valuation of more than USD400 million. ElasticRun has now become the sixth unicorn so far this year. As per reports, the latest fundraising also includes a secondary share sale.

Burgerama raises Rs 5 crore in funding round

Burger delivery platform Burgerama raised Rs 5 crore in a funding round led by Anicut Angel Fund, said reports. In this round, new and existing investors, including Rishab Malik (Droom, Jungle Ventures), Ashvin Chadha (co-founder, Anicut Capital), Bikky Khosla (Chairman, Tradelndia.com) and Arjun Seth (angel investor), participated. The new investment would go to expanding the brand’s geographical presence across north India.

Moglix valued at USD2.6 billion after USD250 million funding

B2B e-commerce platform Moglix has raised USD250 million as a part of its latest funding round, at a valuation of USD2.6 billion, per reports. Existing investors Tiger Global and Alpha Wave Global led the financing round along with Hong Kong-based Ward Ferry, a new investor. Seed-stage investors have made an exit by selling their shares. Moglix works to help streamline end-to-end supply chain.

SpeakIn, an experiential learning platform

SpeakIn is a software as a service (SaaS) platform with customised and localised content that allows users to listen and speak to experts in eight different languages on topics covering 500 subjects. The founder and CEO, Deepshikha Kumar, claims that this platform is different from other edtech platforms in the country. It provides experiential learning to people all over the world.

B2B spending to grow 10.3% in 2022

Media reports said that the total B2B spending in India might rise by 10.3 per cent in 2022 as the spend of businesses in India is growing three times faster than the expectations from its comparable peers in other countries in the third quarter of last year. The total B2B spend for India rose 9.4 per cent in Q3 2021 on a year-on-year basis, as per the India Business Spend Indicator (IBSI) report by American Express, India and Invest India in partnership with the Centre for Business and Economic Research (CEBR).

Take-Two to buy Zynga for USD12.7B

Take-Two Interactive, the maker of the Grand Theft Auto series of video games, is set to buy Zynga, the company that created Farmville, for almost USD13 billion dollars. This would be the largest acquisition ever in the video game industry. Take-Two Interactive is buying Zynga, the creator of ‘Farmville’ for USD12.7 billion (USD11.04 billion excluding debt), said reports. The move is part of the company’s plan to tap into on-the-go gaming on smartphones. Take-Two, known for “Red Dead Redemption”, offered USD9.86 a share, or a 64% premium over Zynga’s last closing price. Traditional video game makers look to cash in on the trend.

Rupifi raises USD25 million funding

Rupifi, a digital payments startup focused on B2B payments, has raised USD25 million as a part of its first round of institutional funding led by Bessemer Venture Partners and Tiger Global. The round also saw existing investors Quona Capital and Ankur Capital participating, along with Silicon Valley-based early-stage investor, Better Capital. Rupifi’s Series A funding of USD25 million shows the increasing size of early-stage rounds being raised by Indian startups. During 2021, 166 investments at the Series A stage amounted to about USD1.67 billion, as per data by UK-based Preqin until December 20. In all of 2021, Indian startups raised USD36 billion, Indian media reported this February.
DEBABRATA NAYAK has been appointed CTO at Digital India Corporation. Nayak has joined Digital India after taking voluntary retirement from NIC, where he was a senior technical director.

KAMAL GOEL has been appointed Director - IT & Chief Evangelist at Web Werks Data Centers. In his last stint, Goel worked with Yotta infrastructure as Executive Vice President - IT & Chief Evangelist.

MATHANGI SRI has joined CredAvenue as Chief Data Officer. Sri joins CredAvenue from Gojek where she served as the Head of Data Organization for GoFood-Gojek’s food business.

NEETAN CHOPRA has been appointed Chief Digital & Information Officer at IndiGo. With over 25-years’ experience, Chopra will take on this newly created role. Previously, he was Group CTO at Dubai Holding.

PRASHANT THAKUR has been appointed CTO at Vakrangee. Previously, Thakur was working with HDFC Life.

PRIYA DAR has joined Valvoline Cummins as Head of Information Technology. Earlier, Dar was associated with Amway as CDO. She has been a NEXT100 winner in 2016.

RISHI MEHTA has joined HCL Technologies as CISO. In a career spanning over 20 years, Mehta has made his mark as an eminent cybersecurity expert. Before joining HCL, he was CISO at Cyble.

VARUN SINGLA has joined Airtel as SVP & CISO. Before joining Airtel, Singla worked at the US-headquartered Micron Technology as Vice President & Chief Security Officer (CSO).
ABHIJIT PAL has been appointed Country Head - India at Okta + Auth0.
Before joining Okta + Auth0, Pal was with Liferay.

BISWAJIT MOHAPATRA has joined AWS as India Head of Customer Solutions Management.
Earlier, Mohapatra was Partner & Executive Director at IBM.

DAYAPATRA NEVATIA has been appointed COO at Mindtree.
Nevatia joins Mindtree from Accenture where he was the MD & Director of Delivery for Advanced Technology Centers in India.

GIRISH DEV has joined Commtel as Head of Artificial Intelligence (AI) and Digital Transformation (DT) Business Unit.
Before joining Commtel, Dev served as a Strategic Advisor & Head at a global technology group for its blockchain and DLT ventures.

RAJESH REGE has joined Honeywell as the new India Head.
Before, Rege was with Microsoft as Executive Director leading the Technology & Cloud Solutions Business for India.

SANDEEP GIROTRA has been appointed as the India CEO at ATC.
Girotra joins ATC India from Sterlite Technologies where he was Chief Sales Officer.

JASJIT SINGH KANG has been appointed Head of Digital Operations & Platforms (DOP) of Wipro’s iCORE (Integrated Cloud Infrastructure, Digital Operations, Risk and Enterprise Cyber Security Services) business.
Prior to this, Kang has worked across companies like Genpact, WNS and AON.

DILLIP GURU has been appointed Senior Vice President at International DC Expansion, Renewable Energy & Edge Strategy.
Previously Guru has worked with Amazon.
Dementia content gets billions of views on TikTok, raises ethical concerns

**This** is not something that can be endorsed. Some online influencers have recorded people with dementia in their worst moments, and that too without their consent. Given the vicariousness of social media platforms, it is not surprising that these videos have gone viral, garnering billions of views. This has drawn sharp criticism from certain sections questioning the ethics of such popular videos. Mental health is personal, and in a world that stigmatizes dementia, a public diagnosis can mean that the world immediately changes how it sees someone. The stigma can be devastating for the family and friends of the patient as they immediately become social outcasts.

True that the internet can help people understand the challenges of living with dementia more visible and perhaps become a place for connecting with others going through the same thing. But it can be devastating too. The dementia hashtag on TikTok has content creators upload videos about their experiences caring for someone with late-stage dementia. Some are inspirational or educational, but the viral ones are where “caregivers” are shown mocking dementia patients.

IASTM technique, a breakthrough in physiotherapy space

**This** is a welcome piece of news for all of us who spend hours hunched over laptops. Our posture has been collateral damage to modern tech. Now modern tech can work with soft tissue treatment to provide us with some relief.

Physiotherapy experts in India have recently said that instrument assisted soft tissue mobilization (IASTM) technique has been immensely effective in the treatment and management of stiffness in joints and shoulder pain, as per reports.

**IASTM** technique helps in the speedy recovery of patients and saves time as well.

The tech is rapidly gaining recognition globally. Last year, the United States Professional Tennis Association (USPTA), the global leader in tennis-teacher certification and professional development, signed a multi-year partnership with Stā Active to introduce the Fiix Elbow product to the tennis marketplace. The attempt is to introduce the Fiix Elbow product to the tennis marketplace and educate teaching professionals and players on the benefits of instrument-assisted soft tissue mobilization (IASTM).

FACE RECOGNITION FROM JUST YOUR DNA!

**It** could soon be possible for the police to crack knotty cases with just a strand of hair or some other DNA material if all things go as planned at Corsight AI, the facial recognition subsidiary of Cortica, an Israeli AI company. It claims to be working on a solution that can create a model of a face based on DNA material that can then be run through a facial recognition system. The company recently unveiled its DNA to Face product that also constructs a physical profile by analysing genetic material from DNA samples.

If this product is a success, solving whodunnits could become rather routine.
How and why the CDO role is increasingly going to tech leaders?

By Shyamanuja Das
Chief Digital Officer (CDO) first started to appear as a designation around the beginning of the 2010s. These were executives organizations were looking to hire for driving their evolution from traditional businesses to digitally enabled businesses. The expectation was a lot—and quite vague.

It is exactly 10 years back—in January 2012 to be precise – executive search firm Russel Reynolds, in a since well discussed report articulated the need for CDOs and defined the attributes of a CDO.

“The CDO needs to be someone who not only has digital acumen but also is a seasoned general manager who can operate within a large-scale business and influence effectively across the organization,” said the firm, adding, “this is a relatively new type of leader and one who is hard to find, attract and retain.” It said the CDO ‘should be able to plan and execute long-term strategy around driving customer awareness, engagement, experience and monetization.’

The same year Gartner identified CDO as the next hot job. In 2012, Gartner predicted that, by the end of 2015, one in four large companies would have a position of Chief Digital Officer (CDO). That was probably the beginning of the CDO hype cycle.

Evolution of CDOScape India

By 2015, India was feeling the first ripples. By the end of 2015, though, only three Indian companies - Yes Bank, Titan, and Aviva - had full time CDOs.

The next year was the beginning of India CDO hype cycle. As many as a dozen CDOs were appointed in the first half of 2016. That is also when we, at CIO&Leader, started tracking and mapping this community.

In the next one year, it almost doubled. By December 2017, we could track 43 CDOs.

[We, for all our studies, have ignored the CDOs in agencies/digital agencies because many of them are frontline business managers who are designated CDOs, often for making a marketing point]

By this time, some definite trends had become noticeable.

The most important—and somewhat startling—trend was that most of the CDOs, in contrast to earlier speculations, did not come from either marketing or tech background. They came with core business background.

In the hindsight, it was looking obvious, because by that time, digital transformation efforts were on in many companies and senior leadership had realized the business impact that such an exercise could create.

Another significant trend was that it was the experienced professionals who were being entrusted with the work.

We again did a tracking exercise in August 2018. The numbers had gone up slightly but there was no major change in specific trends. But by this time, the buzz was visible among the CIO and tech community and they had started preparing for the role.

When we last did a major CDO story (that is in May 2019), there were a few questions. The number of CDOs had actually dropped for the first time, though marginally, despite the fact that digital transformation initiatives in organizations had accelerated. As a concept, digital transformation had become mainstream.

Interestingly, that was the first time we saw some CDOs moving back to their traditional functions – business, technology, marketing – wherever they came from. We concluded that though the digitization mandate and the skills were not going anywhere, CDO as a position was probably not too hot.

Onto the New Normal

Less than a year later, came one of the greatest disruptions that our generation has seen – the COVID pandemic. As is now well acknowledged, it brought with itself a huge digitization mandate.

For the organizations slow on the digitization path, it did force digitization. But for organizations already on a well-articulated digitization path, it did derail their plans. While it accelerated digitization in some areas, where it was needed most to survive the pandemic, it did affect other important (but not so urgent) areas where planned digitization took a backseat— thanks to uncertainty about the future, lack
of management time, and even availability of products and services.

When things started settling down, after the first wave of COVID, which caused huge disruption, organizations realized that they could not just carry on with ad-hocism as the stated digitization strategy.

That created a need for someone steering overall digitization in the organization. Probably that explains a sudden rise in appointment of CDOs by many organizations. From September-October 2020, when things became a little normal after the first wave, CDO appointment accelerated – with 46 recorded appointments (a little less than half of the size of CDOScape in February 2022), happening between September 2020 to December 2021.

Number of CDOs in Indian organization has risen to 103, not taking into account those
designated as CDOs in marketing/ad agencies and small companies. One disclaimer, though. We cannot claim to be as confident about our comprehensiveness now, as we were in 2016, because of obvious reasons.

But the real story that the numbers tell is this. Out of 100 CDOs, whose detailed background info we could obtain, as many as 51% are from technology background. That is in comparison to just 28% of CDO positions that they held in December 2017. The dominant tribe then – those with core business background – with 51% has dropped to just about 30% now.

Surely, the CDO role has been transformed too!

What explains the tech takeover?
If we look at data, it is not just that majority of CDOs come from technology background. Another revealing piece of stats is that almost one-third (32%) of the CDOs hold the dual charge of CDO and CTO/CIO.

Many of those CDO holding the positions now are veteran CIOs who

Contours of CDOScape ‘22
So, how does the CDOScape look like in 2022?
As mentioned earlier, we could track 103 CDOs in large and medium companies, excluding marketing and ad agencies. Here is analysis of their data reveal.

All industries are open to CDOs now. While Banking & Financial Services, manufacturing, IT/ITES and Insurance lead, that is primarily because those industries do account for a higher share of business. Almost all major industries now have CDOs managing their digitization. The notable insight here is that unlike the other three, in top four slots that together account for 56% of the CDOs, manufacturing industry has been less mature in terms of IT usage. Yet, they have overwhelmingly taken to digitization, post the pandemic, which explains so many CDO designations. Most of these CDOs are from enterprise IT background.

The latest signal is from the PSU banks. At least two such banks publicly advertised for CDO positions last year. While we are not aware of the progress that Union Bank of India (UBI) made, Canara Bank declared that its search for a CDO was unsuccessful.

Similarly, both B2B, B2C companies as well as those having both B2B and B2C business employ CDOs.
Large groups realize the value of CDOs. Some of India’s top groups – Tata, Aditya Birla, Adani, L&T, Vedanta/Sterlite and Mahindra – have gone for CDOs in their group companies. In fact, one out of every five CDOs in India works for a group company of these six conglomerates.

Where are the CDOs? Mumbai and Delhi together account for two-thirds of the CDOs in India, even as most of them are based in large cities.

Profiles of CDOs. A typical CDO is more than 40, male and an experienced professional, most likely an engineer-MBA.

The CDO role was always supposed to be transitional. The mandate was to drive digitization with a clear focus for some time so that every function, every process becomes digitized. So, probably that need has been served.

CDO positions are senior positions. So, it comes as little surprise that these are held predominantly by people with more than 20 years of experience. Whether it remains like that or not is an interesting topic. But at present, ‘digital savviness’ is not what dictates if you would occupy the CDO role, as thought earlier.

Not surprisingly, most CDOs are engineers, MBAs or both.

Men still dominate but with 6% women, the share of women is better than in the CIO community.

have CIOs for long. They have now been given the CDO role, either designated as CDO or as Chief Digital & Information Officer. Examples include Bhavesh Gandhi at Aarti Industries, Goutam Dutta at Bajaj Allianz Life Insurance, Jitendra Sigh at JK Cements, Mukesh Rathi at Dr Reddy’s Lab, Neeti Wahi at Sterlite Power, Praveen Shrikhande at

The CDO role was always supposed to be transitional. The mandate was to drive digitization with a clear focus for some time so that every function, every process becomes digitized. So, probably that need has been served.
Aditya Birla Fashions & Retail, Priya Dar at Valvoline Cummins, Rajesh Garg at Yotta Infrastructure, Rahul Shandilya at GMR, Sanjay Kotha at Adani Group, Sreenivas Tata at Greenply Industries, Venkatesh Natarajan at Ashok Leyland, and Yogesh Zope at Kalyani Group, to name a few.

Another trend that is noticeable is that most of them, if not all, are in manufacturing and infrastructure industries. That is an important trend, as manufacturing is aggressively going for CDO positions, with almost one in every five CDOs is in a manufacturing company.

So, what explains this preference for CIOs and techies for the CDO role?

One theoretical explanation is that the CDO role was always supposed to be a transitional role and hence was temporary. The mandate was to drive digitization with a clear focus for some time so that every function, every process becomes digitized. So, probably that need has been served.

But this is highly unlikely. It is difficult to believe that these companies have completed their digitization. One, digitization is a long journey. Two, these companies – manufacturing and infrastructure players in particular – still have a long way to go.

One more explanation is that the exemplary role played by IT leaders during the pandemic has created a lot of confidence and trust on them and that explains their being given the full digitization mandate.

This may be true to a great extent and could have boosted their chances to head digitization activities.

The third explanation is that in some industries (like manufacturing and infra), digitization still is about enhanced efficiency through automation, now steered by newer technologies like edge computing, 5G and AI. Techies are the best people to drive that. This is also true to a great extent.

But the most important explanation could be the changing expectations from CDOs, post the pandemic. A large mandate for a CDO was to drive cultural change – and change the mindset of the senior people by making them more receptive to digital. That is the reason why a lot of business insiders, who have been there, done that, were given the responsibility.

However, in the last two years, COVID has done that very well, by creating large bases of digital converts among enterprise CXOs. Today, that expectations from CDOs – to convince others about the value of digitization – which CIOs were ‘notoriously’ (the word is that of a veteran CIO) lacking, is no more there, at least not a major criterion.

This probably is the most plausible explanation why CIOs and techies have successfully invaded the CDOScape. Their initial challengers – marketers – are no more there, barely one in ten companies having a marketer as the CDO.

**Whither CDOScape?**

There are two questions here. What is the future of the designation, Chief Digital Officer? And what is the future of the chief digital officers of today?

The answer to the first question is challenging, as there is no clear precedent? By brief, it was created to steer organizations towards leveraging digital. If that purpose is achieved, then theoretically, there is no need for such a role. And as all of us know, that purpose is not getting fully achieved anytime soon. Just that the actual brief may keep changing. A CDO may practically become a Chief Metaverse Officer.

The current trends show that it is getting hyphenated with the CIO/CTO roles. If that continues, it will be like a badge of honour for the senior IT leaders. In manufacturing industry, it seems very likely. But in many consumer and services industries, it may not be so easy. The jury is still out on that.

The next big question is what happens to the current lot of CDOs – their growth. Our guess is as good as yours. It is the same for CIOs, CTOs or any other CXOs.

In 2012, Russel Reynolds said CDOs who demonstrate their ability to manage change and transform their businesses almost certainly would lead the way in the rise of the Digital CEO. That is most definitely not happening in the way we then understood.

But it is already happening, albeit in a different way. A look at career progression of some of the past CDOs can give us an idea.

From the CDOs in March 2020 who are no more serving as CDOs, most (45%) have taken up senior functional roles within or outside the organization. Head of Digital Marketing, Head of Music (in a music streaming company), Managing Director, Chief Operating Officer, Chief Strategy Officer, Director of Consumer Experience, CIO, CTO, Deputy CEO – Innovations are some of the roles that former CDOs are now in.

The next biggest chunk – and at 35% that is a fairly big number – have turned entrepreneur. Thanks to India’s huge start-up ecosystem that primarily thrives on digitizing different industries, this has been a tailor made opportunity for them. Instead of digitizing the operations of one company, now they are looking at doing the same across an ecosystem in a hitherto un/low-digitized industry.

About 13% have become consultants. And the rest have retired.

So, the two big paths for CDOs are entrepreneurship and heading their expertise area in a more digitized business.

Watch this space for following how the Indian CDOScape, as it evolves.
In late 2014, I joined the healthcare industry from a pure technology service provider. One apparent question was, what represents the difference between two industries? I was unequipped to even comment as it took some time for me to understand the ecosystem. Technology is all about going deeper into diverse function/domain from traditional areas of HR, finance, supply chain, marketing to sunrise sectors like e-commerce, logistics, fintech, etc. The work is full of excitement as each day there is a new dawn, a new way of solving problems, applying some best practices in creative modes, etc.

Now, let me flip to the core of healthcare. On a daily basis clinicians see the same kind of patients for their respective specialization & almost the same job, maybe a little bit of variations. On the surface it looks boring, but it is unadulterated satisfaction of the highest level when clinicians see the unstated gratitude in the eyes of their patient and the family. In my view, that’s the difference between two industries – Excitement Vs Satisfaction. That’s the satisfaction one looks for in the professional life. For me, it was a blessing to get associated with a noble cause of care, though indirectly.

Unfortunately, worldwide in general and particularly in India, the doctor-to-patient or nurse-to-patient ratios are low. And healthcare workers are over-burdened resulting in compromise on two fronts – quality care and timely care. The government and private players have undertaken several initiatives to increase the seats or set up new medical & nursing colleges.

But apart from doctors and nurses, there is an equally significant cadre of healthcare support staff who takes away the load from them. This cadre includes a phlebotomist, biomedical engineer, emergency & OT technician and home-care aide. The industry is one of the most stressed, and one of the reasons is the shortage.
of skilled healthcare professionals. The dichotomy is, on the one hand, we have rising unemployment in the country, and on the other hand, there is a shortage of skilled healthcare workforce. The logical way to address the gap is by skilling the new entrants and up-skilling the existing workforce for these attractive and exciting roles.

**Technology-Bridging the gap**

To address the current crisis, the government, NGO & private forums offer multiple customized crash courses for COVID-19 healthcare workers. But the gap is enormous, it is beyond COVID-19 and need is multi-facets on quality and quantity. Traditional methods using typical class room experience may take extremely prolonged time to address this gap as the need is in each and every district of the country. We don’t have the luxury of time to develop the infrastructure in the whole of the country. The suggested action plan is think-digital-do-digital. Comprehending the sensitivity of the environment, the healthcare staff needs a skill which is driven by reality, has first-hand interpretation, is activity-based and is almost real-life learning.

Virtual Reality (VR) represents a cost-effective technology, appropriate for lasting and high impact training to healthcare staff. VR is the platform which can simulate critical situations in controlled environments, i.e., without essentially putting patients or staff in danger. VR simulates the real-life environment, enact patient interactions and perform measurements which are more engaging than the classroom-driven workshops or through the modern computer-based training. Some familiar examples could be training on Cardiopulmonary Resuscitation (CPR) or Acute Cardiovascular Life Support (ACLS). These are lifesaving techniques effective in many emergency situations when someone’s breathing or heartbeat has stopped.

Also, most of the medical interventions need coordinated activities which are difficult to simulate in the classroom. Examples includes emergency response, fire safety, disaster management or performance of a complex operation by a well-coordinated caregiver team. Another skill in the primary healthcare setting is to enable correct understanding of symptoms and correlation to a possible ailment as the first step of any diagnosis.

**Conclusion**

Finally, let me talk specific on why the IT workforce should join healthcare. In a traditional IT service company, IT team involvement is typically in coding, testing, etc. while in healthcare IT, the work starts by nailing the accurate problem definition to design thinking to change management, and connecting three dots of the domain, technology, and scale of operations.

Additionally, in my view, there are a few areas where a disruptive transformation is expected using IT. These are IoT, Big Data, AI, VR and Robotics. Not many industry verticals apart from healthcare can boost to have availability of such data and defined use cases for usage of mentioned technologies. There is no dearth of examples on how these technologies will be leveraged in the healthcare industry. And the IT team, indeed, would be at the fulcrum of such initiatives.

Professionals from various streams should explore joining healthcare to get that sense of satisfaction and also enhance their social equity.
Once upon a time, we all lived in another world - a world pre COVID, pre-March 2020. And then the pandemic hit and suddenly everything just changed. A new culture of work from home started. While there were a few organizations who had experience managing work from home, there were many others who never imagined that they would have to do it – or simply they could do it. Most of their employees had never been allowed to formally work from home earlier (not considering the after office hours work that employees would be doing from home); there was no work from home policy. Suddenly, a few new terms emerged. Lockdown, Work From Home, Remote Working – they are now part of common vocabulary.

It fell on IT leaders and their teams to ensure that they meet the requirements of the organizations. The Business Continuity Plan was more discussed than practiced. It existed only in very few cases. And in many cases, it was last updated at the time of ISO-27001 or any other audits. That suddenly became one of the most sought-after documents as management and boards started focusing on business continuity and business resilience. CIOs and their teams scrambled to ensure laptops and access to systems and data to employees were in place so that they could work from home. Now once the basic Work from Home issues were kind of sorted, companies needed to ensure people work efficiently and systematically, and so they graduated to developing more systems, contactless approaches, and other things.

As IT leaders now look back, after almost two years of living in this “No Normal”, they realize that the amount of automation that has been done in most organizations in the last two years is much more than what was done in years before March 2020. The key reason as I see here is that suddenly there was a business exigency and business need. There was a huge pull from the business as it was a question of survival, in many cases.

On the positive side, the IT teams and business managers could collaborate much more as people were available almost at all times as they saved a lot of commuting time (and because of external conditions, no
CIOs and IT leaders need very different kinds of leadership skills. In the last two years, CIOs used their leadership and technical skills to ensure that their organizations flourish or at least survive.

What’s Next?
Now, we are all reading and hearing that despite wave 3 or 4, hopefully, we are either at the end of the COVID or people will have to live with this situation and the “No Normal” could transition into “New Normal”. In this New Normal, the reality is that the world has changed from March 2020 to Feb 2022. It’s a different world. And in this new world, CIOs and IT leaders need very different kinds of leadership skills. In the last two years, CIOs used their leadership and technical skills to ensure that their organizations flourish or at least survive. However, moving forward in this New Normal, CIOs need a new set of traits to sustain this change. If I was to give 5 things that CIOs need to focus on, these will be as follows:

- **Focus on Upskilling:** It is not just the companies that have changed. The entire ecosystem has changed. We are now living in a completely new environment where it is a digital-first thought process for our customers, partners, stakeholders, employees, or government. Recently in the budget speech, we all heard about virtual digital assets, cryptocurrency, 5G, drone as a service, Blockchain, etc. Words that one could not imagine a few months back are now part of the national agenda. So suddenly, everyone is talking about them. In this entire scheme of things, IT leaders need to focus on learning about emerging technologies, how they will impact their businesses (not just in the short term but in the medium and long-term too), and upskilling themselves and their teams before they go to end-users. End users also need to be reskilled so that companies can derive greater value from the adoption of digital technologies.

- **Focus on Agility:** It is not just about digitizing and implementing IT solutions, it is about implementing them right and in a manner that is scalable, secure, interoperable, cost-effective, and easy to manage. Several initiatives that might have been taken in an ad hoc manner in the last 2 years might have to be redone (or even stopped) considering the overall vision going forward. CIOs need to relook at their IT landscape and their digital strategy.

- **Focus on Collaboration:** Collaborative working has been a pillar of success for CIOs and IT teams. However, in the New Normal, where a large number of IT professionals want to work at their terms and work from home (or with flexible schedules) and a large number of startups coming up with excellent IT solutions and a huge manpower shortage that companies are facing, CIOs and their teams have to take their collaborative working to a different level - working collaboratively in this fast-emerging gig economy and with startup founders and their teams.

- **Focus on Information Security:** We all know that 2021 saw a huge surge in hacking and ransomware attacks. Reports are indicating that 2022 could be even worse in terms of cyber-attacks. While CIOs and their teams need to continue to strengthen their technology, processes, policies, and monitoring and threat intelligence mechanisms, at the same time, a major focus has to be given on the “weakest link” viz. human factor and get to a situation where it goes beyond regular awareness and training sessions to cyber security and safe practices becoming a part of the DNA of the organization.

Is there a Choice?
The reality of the world today is that it is not just the CIOs and their teams that are aware of the power of technology but the entire organization and the other CXOs. A lot of CXOs today are very IT savvy and focus on the digitalization of their functions. In such a scenario, if the CIOs and their teams don’t show agility, collaboration, or upskill themselves, there will be the birth (or shall I say increase) of shadow IT – say for example HR head could say that if I am not getting the kind of response that I want, let me just go to some cloud service provider or start-up and put up my HR system or someone else would say, let me put my own system and role of CIO and IT team would be highly diminished – shall I say just keeping the lights on?
A battle between the Human Mind and AI-Analytics

Recently, an incident happened in the Australian Open Men's Single Final during the Daniil Medvedev and Rafael Nadal match, which was circulated widely through WhatsApp. Medvedev, also known as the dark horse, was leading the first two sets and suddenly a message flashed on the live TV which was being viewed by millions of people across the world that Medvedev had 90% chances of winning the match and Nadal, only 10%. The message started rolling when Medvedev was already won the two sets and was leading the third set. But, in the end, Nadal won the match 2-6, 6-7, 6-4, 6-4, 7-5.

So that is what AI is. AI is a technology that majorly depends on historical data and is only able to extrapolate within that boundary. It cannot go into uncharted territory. Until there is a well-structured data set, even an unstructured but readable one, AI and analytics will bring some projections & predictions, and some theoretical assumptions on what can happen under certain circumstances. However, if you ask the machine to provide you with the information on situations that never happened in the past, I think it is anyone’s guess what the answer would be!

Technologies like AI and analytics are widely dependent on the historical and incremental data set. As long as these models are fed with multiple variables and scenarios, they will become mature. But in any uncharted territory where a situation had not been experienced in the past, AI or analytics models will find it difficult to articulate or express the outcome. Here, we need to be assured that our AI and analytic strategy should be as close to the business as we mature with various situations and assets.

The conclusion to make here is that the human mind at any point can beat AI and analytics in any unchart-
ed territory even if we have data and confirmed predictions. And this goes reverse as AI does not have any control over the human mind.

**Manufacturing Industry and AI**

Artificial Intelligence is most applied in manufacturing to improve overall equipment efficiency (OEE) and first-pass yield in production. Over time, manufacturers can use AI to increase uptime, improve quality and consistency, which allows for better forecasting.

The first requirement in AI or analytical models is how contextual data can be collated, gathered, and put under the respective models and how we can fine-tune that given the ground reality outputs or the results under various situations. So over time, we need to continue to capture the data, live & real. We also need to capture the resultant output under various conditions and feed it into the model to make it much more mature, realistic, and reliable.

The approach should be to automatically bind relevant models’ traceability data to the outbound machine or sensor data, in real time as it is read from the source, and store it fully cataloged as such in a scalable analytics database.

This is like - What if you had a system in place that automatically detected production issues in real-time before they happen?

The benefits would be predictive maintenance, inventory, and product outlier detection in an accessible and intuitive way, driving operational excellence to new levels.

**Today’s Technology and Data collection**

Technology has improved and matured a lot in the last three to five years. Today we are using technologies that can help us to gather data from machines that are fifteen-twenty years old.

**The first requirement in AI or analytical models is how contextual data can be collated, gathered, and put under the respective models and how we can fine-tune that given the ground reality outputs or the results under various situations**

With such advancement, we are now living in the pool of data, which in turn forces us to understand the data collection protocols, how to collect data safely and securely. As more and more machine data are getting integrated, the risk of losing data sets to external agents has also increased. Further, this also increases the risk of getting hacked and intruded, impacting the production.

The importance of data security and information security has also become a relevant and close-knit topic today. So, while the technology is maturing, we need to take control of where the data is collected from, where it is kept/stored- on-premise or cloud, and security measures while it’s in motion or at rest. With all this, the risk management from an information security perspective becomes very critical in today’s world.

**Business Benefits**

Different organizations have their own look, feel, target, and benefits definitions. Some organizations will look at improved quality, customer satisfaction, and improved consistency as an output of their AI and analytics strategy that will ultimately improve their profitability and bottom line.

Then some want to monitor the effectiveness of the AI and Analytics strategy at each KPI level, for example - am I consistently improving the quality of my products? Many would want to leave it to their operation team or leadership and don’t mind improvisation of just one percent at the bottom level.

So, the business benefits must be decided and designed at the beginning so that you can measure and monitor the effectiveness of the strategy. In today’s world, it’s never been free money. So every single penny that you invest in any of these technologies needs to be assessed and measured for appropriate business benefits.

Additionally, when we talk about any technology deployment, it cannot go without a financial strategy to give the business all the benefits over a specific period of time. Finally, choosing the appropriate technologies relevant to the business or the industry is critical. So, in my assessment, the major factors that can make an AI and Analytics strategy successful in any enterprise are - deciding on the KPI’s output, pre-requisites, and the right technology.

**At the end**

In conclusion, all the above-mentioned factors are applicable to any business, industry, and specifically on the business intention of the leadership on how much they depend on the technology to push their business. Further, after deploying any technology it becomes critical to verify the outputs with the historical results and check the benefits on the ground before trusting the strategy by closing our eyes.

One thing which helped us today from the past and which may be helpful in the future (especially in scenarios like COVID), is the Data.

Lastly, we can only predict or control what will happen tomorrow within known / past scenarios.
Indian CIOs’ IT Spending Priorities In 2022

With technology driving, most of the businesses today have placed lots of expectations and responsibilities on the leaders

By Chetan Trivedi

Currently, the major concerns in the CIO list are -how do we improve the digital dexterity; how do we speed up the digital transformation journey which we have embarked upon. With everyone getting impacted by the Industrial Revolution 4.0, most organization is going through this transitional phase.

Recently Gartner forecasts that Indian IT spending will reach USD101.8 billion in 2022, a rise of 7% from the last year, and it will be tricky to understand what the Indian CIOs IT spending priorities will be.

We need an effective structure around the digital transformation programme and then should be driving those initiatives with clear-cut business outcomes and priority.

■ Strengthening Cyber Security- As the threat landscape is changing very fast, we need to strengthen our cyber-security systems. It is true that as cyber threats increase, there is a danger that security concerns simply choke off a business’s speed and flexibility. The solution to this conundrum lies in recognizing that security is primarily a cultural and managerial issue rather than a technical one.

Traditionally there were some focus areas where the majority of the attacks happened but today, we are fighting with the attackers who know their targets, are well-sponsored and our operational technology system is at high risk. We need to upgrade our security operations to improve prevention and resilience. This can be done by applying a developer mindset to security rather than a compliance one. We also can have DevSecOps working models or security as a code approach that defines cybersecurity policies and standards and then instantiates them as code through architecture and automation.

■ Cloud at the Center – This is the age of agility, where speed is an important parameter. We should understand that the cloud is not only a source of IT productivity improvements rather a source of transformative value. Many organizations are well into their cloud journeys, and they do understand that cloud has big prospects today and tomorrow. In my opinion, CIOs should master cloud economics and target business areas that can benefit
from the cloud’s advantages of speed, flexibility, scale, out-of-the-box self-service utilities and must focus on hiring cloud talent.

Nevertheless, whenever there is any new technology there are some hiccups in terms of adoption. So, while there are many organizations who have adopted the Cloud, there are many who are still struggling to capture the full value that the cloud offers.

- **Data, the pillar of any organization** - One can’t be great at analytics and transformation without being great at data. We say Data is the new oil, and with so much data generating every day, becoming a data-driven organization is the new ambition for any organization. Today, Data and AI are transforming business models and the concepts of scale. The value of great data can be summarized as using best-in-class to become a market leader, driving revenue/growth/profitability, creating sustainable competitive advantage, and reducing business risk.

Furthermore, India has come up with its data privacy bill, and organizations are required to proactively start working around it.

- **Creating a digital mindset** - The biggest priority I would say is how to create a digital mindset in the organization. Digital is not just word about technology, it is as much about people and seamlessly bringing together people and technology. Hence, an important part of operating in today’s landscape is having a ‘Digital Mindset’, meaning being able to incorporate technology in the blood of the organization and extracting value from it.

- **Sustainability** – Everyone is talking a lot about sustainability in a big way, and technology plays a critical role to bring that sustainability into the organization. Now from a technology perspective, C-Suite should have a priority of focusing on partnering with organizations ecosystem for a creating that sustainability.

**Challenges impacting CIOs in 2022 and beyond**

Though we have started investing in digital transformation, the question is still left- do we have that kind of talent around? If yes, then there is another challenge of retaining them and if not, then we need an advanced structure to upgrade and upscale the team we already have and then again retain them.

Similarly, with the digital transformation, the ecosystem is also evolving, and we need to find the right partners and the right use cases. Further, we know that there is no one-stop solution for every organization, so finding the right technology according to our requirements is yet another challenge.

**How to maintain momentum in the digital acceleration journey?**

In any organization, the major aspect of maintaining the digital acceleration journey is to have the motivation to keep on doing better and better, and that motivation will come from the successes we achieve during our journey. Then as a leader, CIOs should have an agile approach and must encourage their team to learn from their failures. Break the large programmes into multiple small ones and let your team, work on them as an initiative.

**Conclusion**

With technology driving, most of the businesses today have placed lots of expectations and responsibilities on the leaders. When a CIO talks about digital transformation, it’s probably about improving the business like KPI, volume, cost, customer experience, trying to change the business model, or completely wanting to change the way the business is running. And with this come a major responsibility of maintaining a balance between all the areas of technologies - infrastructure, operations, applications, the speed at which we work, the ecosystem which we created around us, creating the digital-savvy culture and finally how to get the most out of these.
This is the 2nd column of the 12-part series called Navigator MasterClass, wherein we will find our way through the myths and realities of one Bleeding Edge technology each month; in terms of where it truly stands at the time of writing, and its business applications—implemented, being attempted, or speculative. This month’s topic is Digital Twins.

As is the wont of this columnist, a Google search was done on the topic. As “expected”, one billion results showed up. Then idle curiosity led to some clicks. And one interestingly found that many large players have their flavour of “Digital Twins” (which kind of explains why no one can clearly explain it).

- IBM calls it a tool to watch the entire product lifecycle
- Microsoft calls it a replication of the entire environment
- GE calls it the road to improved productivity, operations, and profits.

One can go on, but the point is that everyone looks at it from their perspective. In reality, Digital Twin is a replica of a physical person or process and is used to monitor, diagnose or prognosticate real-life situations. While it was conceived as an idea in 1991 (by David Gelernter in his book “Mirror World”), it took a University of Michigan professor to get this idea some credibility in 2002. And then, in 2010, NASA gave it the official name of Digital Twin. In the meantime, they had used a physical twin to rescue the crew of Apollo-13 and had realized that the same could have been done using the virtual world.

So, in simple language, Digital Twins (DT) replicates the physical world. There are of course multiple interpretations. While MIT calls
it a 2-part model of a physical model and sensors to record data, others call it a 3-part model of the physical world, a virtual world, and connections. As we can see, there is not much of a difference, except in where we want to lay the importance.

The world of DT is expanding exponentially because of leapfrogs (and cost drops) in IoT, Machine Learning/AI, Augmented Reality, Virtual Reality, and Edge Computing. Imagine if all of these came together (as they are beginning to). Imagine if these could be used to break all limits of innovation as they are already beginning to. Imagine if they could start to discover.

MIT believes that DT is moving from tactical to strategic. It started as a specialized tool for PLM, now it can be used for any IT project/business function. It also says that the three most common uses that are emerging are:

1. Sustainability.
2. Smart Innovations; Innovations On The Edge.
3. Health and Safety
   All of these relate to one word: INNOVATION. And all this fosters innovation because DT helps in (i) continuous evaluation; (ii) faster and cheaper prototyping, and (iii) the ability to work at the limits. Let us now look at two hot & emerging applications.

McKinsey talks extensively of an after-market commercial engine. The huge success of this engine lies in a granular view of opportunity, customized offers, and customized experience. All of these are delivered with “real-time” adjustments based on data feedback from a DT.

Gartner espouses the cause of “machine customers”. The ‘machine customers’ are everywhere and slowly doing more and more for us. They can be purely rule-based (for example, Amazon Subscriptions), or “select” based on rules (for example, HP’s printer ink shipping model), or autonomous (emerging technology like autonomous vehicles). And we are seeing them around us, without realizing it: a refrigerator that orders food, a washing machine that orders detergent, a car that schedules its own service….

There is the example of the Apple Watch, where it senses when you have fallen and NOT gotten up for a specific period; it then calls for help automatically. There have been numerous false alarms, including when people have been too lazy to bother to get up, but they have all appreciated the fact that this App was there.

There are four things that make DT tick:
1. They are logical; they do not think that I can delay my laundry;
2. They thrive on information; not feelings;
3. Speed is not an issue; it is of the essence;
4. Machines are connected, so they “learn” faster” from each other.

And these are the three things that make them scary:
A. Privacy risks.
B. Does Technology work all the time?
C. Plain old FEAR.

At the end of the day, DT is here to stay. Gartner calls it the next evolution after simulation. Manufacturing calls it the next stage of prototyping. Maintenance calls it “try before you do”. Financial Services calls it risk management. Everyone has a name for it, and they also have a use for it.

Like any emerging technology, there are risks. The biggest is the loss of jobs. We have known since the Industrial Revolution that jobs do not disappear, they just reinvent themselves.

But we will have to watch for the real fear that comes from books and movies: will the machines take over our world. “Unlikely” according to this columnist, simply because DTs are a replica (and can therefore be shut down by “reality”). And as we march in this direction, we will use them only for mundane tasks (vacuuming?! or sorting envelopes).

Yes. DTs have been around us for a while. And are increasingly taking over jobs that we humans do not want to do.
Harnessing AI, Blockchain For Intelligent Contract Management

Read how contract management unicorn Icertis is carving a niche for itself by bringing intelligence and agility to the CLM process

By Jatinder Singh
In these volatile times when business cycles are ambiguous and customer demands are erratic, enterprises are facing several challenges, such as poor contract visibility, procurement complexities, diverse sales, gaps in obligations management, licensing models, and poorly defined contract compliance processes. All these challenges cause a severe impact on the supply chain's performance and a firm's profitability.

The number of contracts business handles today is overwhelming, and processing them timely and efficiently is a challenge. While contract lifecycle management (CLM) tools have existed for the last three decades, enabling organizations to digitize the analog processes, the solution providers have not been able to simplify the processes related to developing contracts, assessing risks thoroughly, negotiating, and concluding contracts.

Data-driven automation

According to Monish Darda, Co-founder and CTO of Icertis, a contract management startup, there has been a growing amount of pressure on enterprises and their legal teams to reconcile, negotiate, and approve contracts promptly. And the erstwhile processes have been inefficient and contracts need to be digitised and dynamically monitored to track all obligations in real time, ensure regulatory compliance while also ensuring that the commercial promises are met.

“...a contract is the validator. Rules that define whether the transaction can go through or not. So, if you are buying something and you have to make a payment of say, US$100, then the contract can say, on the US$ 100, you can buy more things or maybe a 5% discount. The discount can be automatically calculated and paid in a trustless manner,” says Monish.

Icertis Contract Intelligence (ICI) platform leverages cloud-first APIs with intuitive user experience, and has been deployed extensively by leading enterprises such as Johnson and Johnson, Microsoft, Google, Cognizant, Wipro among others. The AI platform, according to the company, help enterprises reduce risks associated with missed contract obligations and ensure commercial compliance, track spending against the contract and seamless auditability for compliance reporting and SOW preparation.

Focus on Blockchain

Monish says that Icertis is leveraging the potential of Blockchain technology to deploy innovative and smart contract management solutions. "A consortium is a limited number of people but more than two. And all of them don’t trust each other. You want to make sure that the same code is deployed and the community validates the transaction. Now your contract is the validator. Rules that define whether the transaction can go through or not. So, if you are buying something and you have to make a payment of say, US$100, then the contract can say, on the US$ 100, you can buy more things or maybe a 5% discount. The discount can be automatically calculated and paid in a trustless manner,” says Monish.

Icertis’s Blockchain Framework, enables enterprises to keep the supply chain clean. “Ethical standards are essential for large and small manufacturers. So, how do you make sure that your supply chain is clean? Everybody is at least contractually signed to source ethically. And you can’t expose the supply chain. Going and checking 500 different vendors and their vendors is complex. So, Blockchain becomes very effective in saying that the contract you do, put it on the Blockchain, we’ll hide the actual people, you are working with, your vendors and their vendors, but we will expose all of the ethical sourcing and sustainable sourcing clauses. So, that people know that the sourcing is ethical and legal.”

The B2B SaaS unicorn continues to explore the potential of Blockchain to deliver enhanced CLM visibility to all its clients, suppliers and vendor relationship...
How HGS Overcame Talent Acquisition Challenges Using AI

Natarajan Radhakrishnan, President and Global CIO, HGS, shares how emerging technologies have helped them address the challenges of sourcing talent in the new normal

By Jatinder Singh
During the pandemic, one of the biggest challenges for organizations has been hiring, nurturing, and retaining the best talent. Due to minimal human intervention, conventional hiring processes have become obsolete in the digital-first remote workplace ecosystem. The blurred geographical boundaries have further resulted in stiff competition among organizations to tap the best talent from all parts of the globe.

Given the above context, enterprises cannot rely on erstwhile recruitment strategies and onboarding high-potential candidates.

When Bangalore-based IT Service management company Hinduja Global Solutions (HGS) faced a similar challenge during the pandemic, it deliberated extensively with its technology partners and internal technology teams to re-orchestrate and revamp its strategy to match the suitable candidates with the right jobs and skills at a cost and time-efficient manner.

Besides evaluating skill sets, a candidate’s integrity, ethics, confidence, and ability to work efficiently are equally crucial for HGS. And remote talent assessment for such skills needs focused technological interventions.

HGS, which serves the back office and contact center for several Fortune 500 organizations, also wanted to ensure that the changes in the processes should not impact the hiring experience.

“The pandemic catalyzed the digitization agenda of organizations. Companies that went digital were less impacted by COVID-19. At HGS, we were already on the path of internal automation, and now we’ve accelerated the process, whether it is automation in HR, finance, or operations,” says Natarajan Radhakrishnan, President and Global CIO, HGS.

Transforming the recruitment process
HGS built an AI-based chatbot named Sophie to facilitate hiring. "As part of our hiring process, the initial screening of candidates occurs through the bot; all candidates must interact with the bot. During this automated process, the candidate can always speak to the recruiter directly if they have any additional questions – the recruiters will address their specific questions," says Natarajan.

But how does it address the problem of candidates dropping out?

"Recruiters closely monitor the candidates being dropped during the bot’s screening process. They connect with select settled individuals to understand the reason for dropping better, which can help us close the feedback loop on the experience. Later in the hiring process, we have the interview rounds, where the candidates can attend an asynchronous interview through video conferencing, and they always have the option to participate in discussions live with the recruiters as well," Natarajan explains.

The company has also developed a candidate experience sheet, through which it checks and analyzes candidates’ experience, enabling them to focus continuously on delivering a better and hyper-personalized experience.

HGS says that its analytics platform has been a key contributor in achieving recruitment smoothly. "Using predictive analytics, we can identify candidates who are an ideal fit. It gives us insights from an organizational point of view and the candidates. Both benefit from finding the right fit. This enhances the candidate experience significantly," Natarajan updates.

For HGS, Analytics and AI is a crucial agenda, going forward. “The millennial mindset is to be attached to jobs rather than organizations. So, we need to create an engaging and interesting platform for people to contribute to and enjoy their work,” says Natarajan.

The outcome
HGS’s increasing focus on automating the entire recruitment process has dramatically improved efficiency in talent acquisition teams. With the usage of chatbots in the initial screening, HGS says its recruiters can focus on more critical activities, such as speaking only to shortlisted candidates and conducting more focused and in-depth interviews. The company says it has been reaping great dividends and significantly improved recruitment process efficiency by 25-30% by minimizing human errors and eliminating unconscious bias while delivering a seamless screening and candidate experience for prospective employees.

The company is also experimenting with AI/ML and AR/VR to expand the gamification quotient in its recruitment process.

“Our priorities of automating the end-to-end employee lifecycle and operational agility have remained the same – but we have augmented the execution time frame by about one year. In 2022 and ahead, we will continue to focus on legacy modernization, application rationalization, and cloud migration,” Natarajan signs off.
Leveraging Data Analytics To Address OTT Challenges

Leveraging data-driven technologies, Zee is accelerating digital content delivery, engaging new-age viewers, and ad-targeting capabilities

By Jatinder Singh
The rise of on-demand content consumption digital platforms, the availability of affordable internet, and an array of media-streaming devices have opened up many opportunities for entertainment providers. The shift from traditional to new media witnessed a massive jump during the pandemic when most production houses paused their content development activities. Most traditional media channels had to re-run old shows, noticed a considerable drop in revenues, and started focusing on alternative digital platforms to meet new-age consumers' on-demand content and binge-watching appetite.

Facing a similar challenge, Zee Entertainment Enterprises (Zee), a media and entertainment firm, identified over-the-top (OTT) and on-demand content as a massive opportunity to grow and started investing in a plethora of technologies to improve its digital streaming capabilities. Zee has recently established the center, focusing on expanding its digital footprint.

Key challenges
In the OTT space, there are different challenges that Zee had encountered and needed deep technological interventions to strengthen the experience. "It’s a different space altogether and has other challenges. There are aspects of the technologies that are needed to build this space. The kind of scale the OTT ecosystem requires is enormous. It requires full ownership, agile capabilities, talent to support, and deep domain knowledge," says Kishore AK, Chief Technology Officer (CTO) of Zee Technology and Innovation Center.

Besides providing a more extraordinary viewer experience, the challenge in digital content delivery also revolves around providing relevant ads to the customers. Zee is extensively focusing harnessing data science so that the broadcasting major can further grow in video-on-demand and over-the-top streaming space.

There is also a challenge to reduce latency to provide high-definition video streaming, live sports, and event coverage. "When things go on-demand, the challenge is to align with what happens in the real world. So, the question is: how do we use all data algorithms and bring in new age kinds of features to unlock the new-age discovery experience and provide an exceptional omnichannel broadcasting experience? You need deeper and actionable insights around what content a subscriber likes, how frequently he consumes, what kind of devices he uses for streaming, and so on," Kishore remarks.

The approach
Zee is leveraging emerging technologies to transform its processes into a digitally adept, data-driven broadcaster and deliver all formats of content consumption across geographies, both linear and digital. In collaboration with its technology partners, it is developing strong data-analysis capabilities to understand its different subscribers and predict their future content consumption patterns. According to Kishore, the challenge has not been the availability of data but to analyze it more effectively. A couple of years back, the company implemented intuitive Tableau-based dashboards that the entertainment major says have helped democratize data usage.

"My roadmap is not limited to what I can unlock in the next six months or one year. The capability roadmap is for a longer-term. We are investing in emerging technologies such as AI and ML, which will unlock value for longer," says Kishore.

Impact and future
The data-driven platforms have helped Zee understand what kind of content a consumer watch during different hours of the day on its Zee5 OTT platform, so that they offer relevant subscription packages to the viewers and monetize its content more effectively. "We are improving video streaming capabilities, partnering developing multi-content delivery network (CDN) strategy to distribute the content across geographies strategically and for real-time streaming performance," adds Kishore.

The broadcasting major has also developed a homegrown broadcast management system for media traffic and scheduling across the globe and leveraging algorithms which can help it provide ratings for the movies and different content available on its digital platform. These initiatives have helped it grow its monthly active users across its digital platforms from 75 million in 2019 to over 300 million in 2021.

The digital content distribution enables broadcasters to deliver personalized content and increases governance and data-security challenges around managing consumers' data. So how is Zee managing that aspect?

"We are bringing complete visibility to the ecosystem. So, now we are looking at basically every aspect of data – when the data is in motion, at rest, what kind of encryption will we follow for that, what kind of governance tools will be there?” says Kishore.

"There are insider threats, as well as external threats. We are holistically looking at security with all the latest solutions and capabilities. We are rearchitecting our systems with security and privacy as fundamental aspects. You’ll hear more on that front soon.

Zee is also looking at AR/VR and Metaverse capabilities in the year ahead to gamify the overall broadcasting experience for its users."
Noida-based Moglix has played a pivotal role in transforming B2B commerce since its launch in 2015. Having achieved the distinction of becoming the first unicorn in the industrial B2B commerce platform in the manufacturing space, the company is experimenting with a slew of technologies to manage data and the spikes between the business cycles while providing a consistent user experience.

"If you look at the 100% of the orders that we process in a month, the first half of the month is slightly leaner, where we would do about 25% of the transactions. Maybe in the next five days, we will do an additional 25%, and during the last 5-10 days, a big chunk of transactions will occur," says Puneet Kumar, VP - Tech, Moglix.

So, what is Moglix doing to address this challenge...
and strengthen its ability to respond to demand changes proactively?" To handle those spikes, we have to make sure that we use reasonably scalable infrastructure, where the cloud-based set-up comes in very handy. We frequently upgrade and modernize our web applications. Our current capabilities from the vendors such as AWS and GCP are reasonably durable, and we keep a firm eye on the best possible ways to leverage tech to overhaul the user experience," Kumar states.

"There is much information moving to and fro between systems, and a lot of them are financial in nature, having very core data from the customer side, the supplier side. So, there is much focus on the security of the systems we take care of really well. As we start transacting with more and more businesses, the volume of data that we are storing is also going up. So, again, efficient cloud models will enable us to scale up those demands," Kumar adds.

The company says that it follows security at multiple levels, such as data encryption, which happens at the application and network level, two-factor authentication levels, and making data as granular as possible based on the user's role.

Kumar also talks about how Moglix ensures a consistent and integrated user-centric and cross-channel customer experience.

"Everything builds on top of the data. We must ensure that our underlying data is consistent across any user using that information – be it the internal user, supplier, or buyer, they access the same repository. So, the focus is on whatever information they see is consistent. While there may be some lag in cross-platform experiences, non-digital and digital (web and app-driven), we follow a certain amount of experimentation (by leveraging tech such as AI/ML) on a platform with higher adoption. And once we see a significant adoption, we learn from it and apply those capabilities on the other platforms to normalize the experience," explains Kumar.

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Form IV
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How Technology Is Changing The Indian Retail Landscape

India’s retail industry is close to USD1T and witnessing several interesting shifts like premiumization, move towards fresh, reignition of retro habits, increase in customer trust in ecommerce and demand for 10 minutes delivery.

By Rahul Chowdhri

India’s retail industry is close to USD1T and witnessing several interesting shifts like premiumization, move towards fresh, reignition of retro habits, increase in customer trust in ecommerce and demand for 10 minutes delivery. Some of these were secular trends and others benefited from the COVID tailwind. The old-world order of organized retail, power of shelf space, importance of location and scale are all up for toss. Technology-led disruption has been at the center of each of these changes. Following are seven changes that have grabbed my attention:

- **Omni-channel retail** – Offline going online and online going offline. While regulations differentiate between retail and ecommerce companies, consumers don’t. If you are an offline brand/retailer, you can’t survive without an online experience. Retailers who make these experiences seamless will come out as winners. You see a product on the website, connect with the store which has the inventory, do a video call with the store rep, go and try it out at the store, get some customization done and have it delivered to your home. Conversely, if you are an online first brand, offline presence after a certain online scale will become increasingly important in multi-brand/exclusive-brand outlets. Going offline from day one is expensive since distributors will want credit, retailers will not carry products on their shelves and consumers will not pick them up. Once the brand is established, several of these challenges are taken care of, allowing new age brands to get access to a much larger market. These companies can further redefine the offline experience with lower inventory, smaller shelf space, and a higher knowledge of their customers.

- **Digitization of distribution** – There are 3 models that have emerged here. 1) B2B marketplace models like Udaan, Amazon B2B, Flipkart Wholesale, and others that started a few years back. In this model, retailers get to pick and choose from different brands on a single platform. 2) Several large/midsized brands have started consolidating their distributors in bigger cities, under a single tech-first distributor. This happened once brands started realizing the issues of dealing with traditional distributors e.g. lack of professionalism, inability to scale, opacity of data. 3) Several mega brands think of distribution as their moat and don’t want to give power to new age distributors. They have started tech-enabling their existing distributors. All these 3 trends are likely to intensify over the next few years.

- **Use of AR/VR** – Several consultative sales or touch-and-feel kinds of categories will see increased penetration of AR in their buying process.
This could be a skincare brand asking you to share a picture of your face to determine what products will suit you best, a fashion brand providing a virtual fitting service or a virtual car dealership where you can roam around and interact with different car models just like in the offline world. There are several underlying reasons why this will become more popular. First, online retailers need to provide an offline kind of experience to convert customers. Second, in some cases, technology can provide better options than a human or answer product queries better than a human can, and, third, in a store with a large number of SKUs, it helps customers make quicker and better choices.

**Use of AI/ML** – This topic can be a complete discussion in itself. There are certain areas in which AI is already starting to make inroads. They are as follows: 1) Level 3 chatbots that can hold conversations with a customer, help them get to the right product and complete the sale. 2) Auto catalog generation of all kind of formats (image, voice, text and video) with the use of AI. 3) Optimized ads by generating 100s of campaigns using a base idea, running A/B tests and customizing the targeting based on different user persona that a brand/retailer wants to target. 4) Payment & checkout solutions that can help reduce drop offs, identify high risk customers and provide the right default payment option. 5) Use of AI for new product design, where you use internal data (customer search, sales, color preferences etc.) and external data (social media trends, weather, sentiments etc.) to predict what product line to launch next.

**Social commerce** – With most of the target population on social media, no brand/retailer can ignore the rise of social media. Social commerce distribution will gain significance, especially in fashion, beauty, health & wellness, and grocery categories. This works well in low ASP categories with models like group buying or categories where social proof is needed. In particular, with Whatsapp opening up business APIs, it is likely to become a massive retail channel considering their active user base in India.

**Video commerce** – Both live and video commerce will gain traction in coming years. Live commerce will work well in creator driven businesses or for higher end brands where cost of live streaming is justified. On the other hand, video commerce will require building a new age Shopify where videos are themselves shoppable combined with tools that make it easier and faster to build these catalogs.

**Hyper local commerce** – There are two flavors to this – 1) Q-commerce - with billions of dollars pouring into 10–20 minute delivery space, consumer habits with respect to impulse grocery shopping are likely to change. The unit economics in this model will be under pressure but the consumer value proposition is loud and clear. This is also an opportunity for low priced/impulse oriented brands (e.g. in the food category) to grow on the back of this trend. 2) Hyper-local commerce – With the rise of fresh and healthy eating patterns among consumers, several startups are gaining traction within their housing societies or close circles. Today they mostly operate on whatsapp, but as business grows, these single person startups are likely to look for tech solutions for their business.

There are several other enabling technologies like dynamic demand forecasting and use of computer vision to understand in-store shopper behavior that I did not get a chance to cover. Given how fast the industry is changing, one can be sure that there will be a new set of landscape shifts taking root by 2023.

—The author is Partner at Stellaris Venture Partners
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देश का सबसे लोकप्रिय और विश्वसनीय टेक्नोलॉजी वेबसाइट डिजिट अब हिंदी में उपलब्ध है। नयी हिंदी वेबसाइट आपको टेक्नोलॉजी से जुड़े हर छोटी बड़ी घटनाओं से अवगत रखेगी। साथ में नए हिंदी वेबसाइट पर आपको डिजिट टेस्ट लैब से विस्तृत गैजेट रिव्यू से लेकर टेक सुझाव मिलेंगे। डिजिट जल्द ही और भी अन्य भारतीय भाषाओं में उपलब्ध होगा।

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