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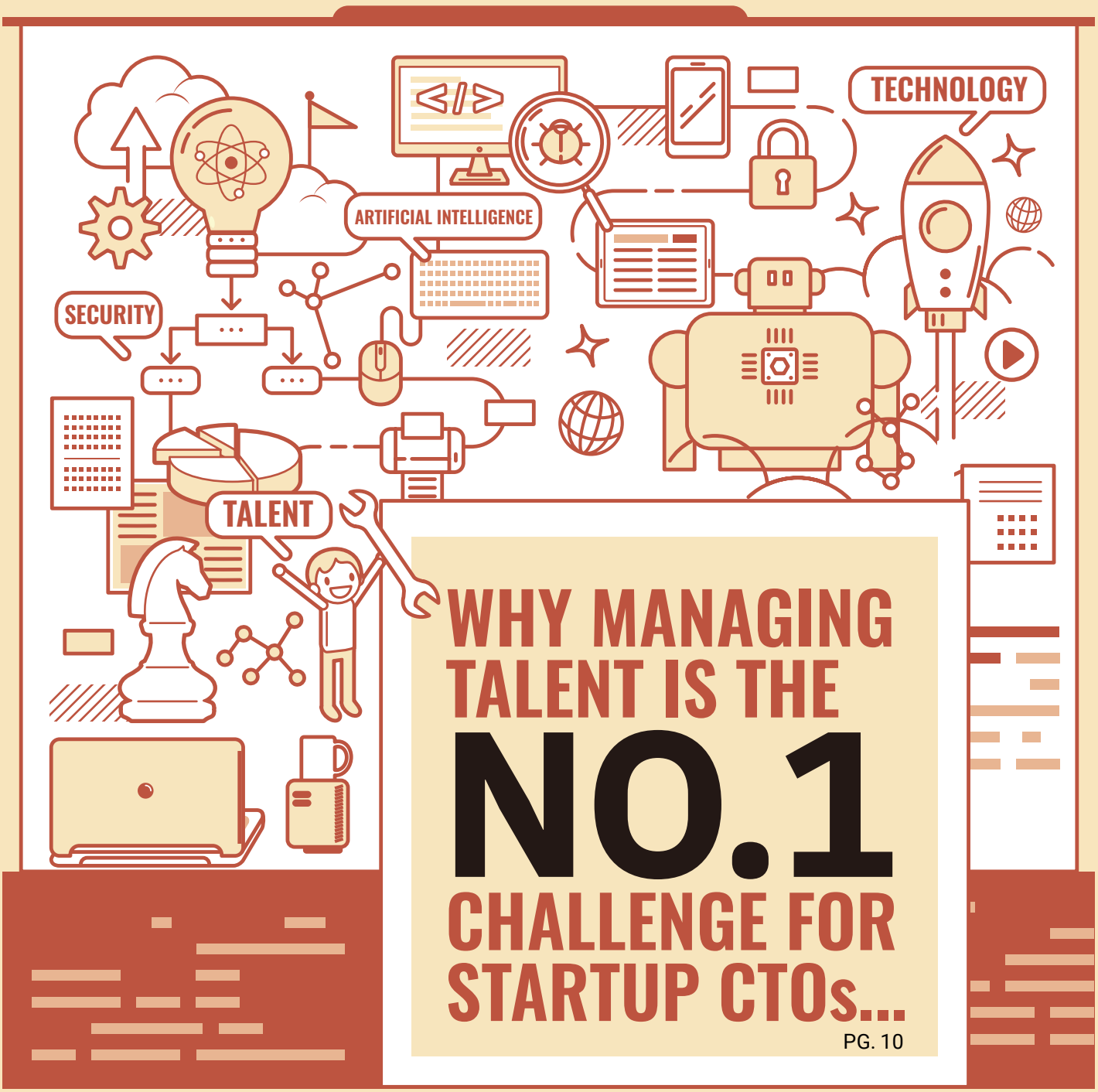

WHY MANAGING TALENT IS THE NO.1 CHALLENGE FOR STARTUP CTOs...

PG. 10

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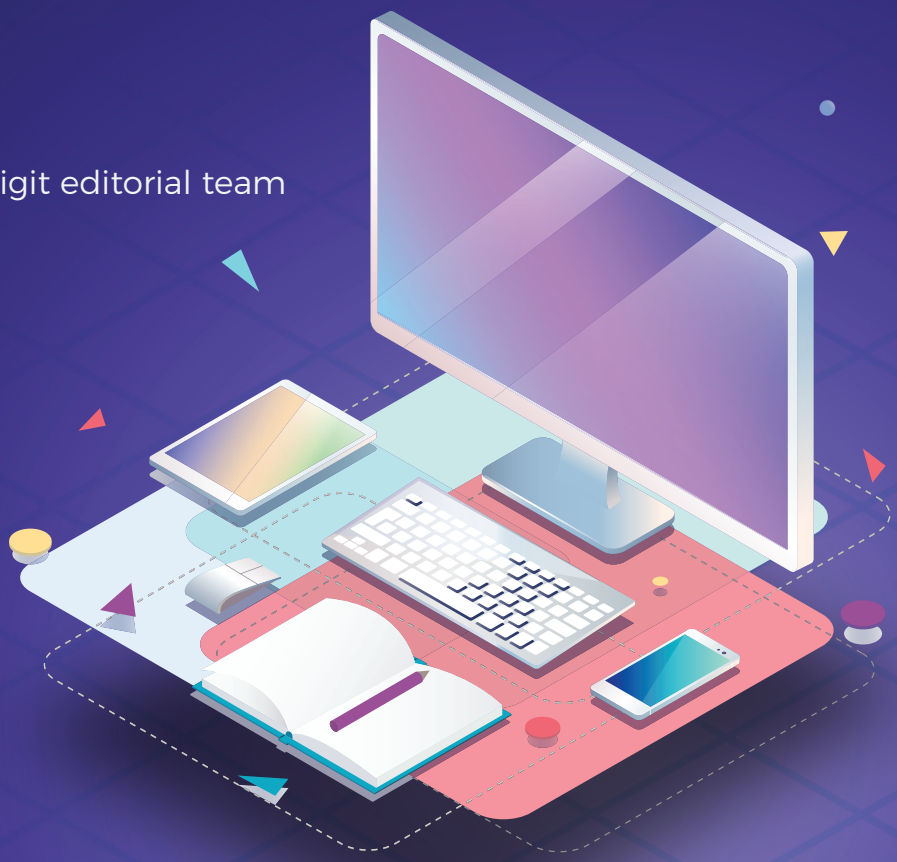

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Shyamanuja Das
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The start-up CTO's talent conundrum

People is something that India has plenty of. Tech people are India's largest exports to the world in recent years. It is difficult to find a large global company worth its name which does not have a tech development center in India. .

Yet, ask any CIO, CISO or start-up CTO about their top challenge. Talent – is the most likely common answer.

Of course, the challenges that each of these three communities face when it comes to challenge is slightly different from the other. But I am not getting into that here.

I want to highlight a different dimension.

For that, we must start two decades back. When, for the first time, India's emerging technology services industry – followed by the business services industry – faced challenges related to hiring, training and retaining people. In an industry, which was making its revenue on the number of people deployed on a project, it was no surprise that number of people hired, lost, and their utilization became the most common metric tracked by investment analysts, after the top line and bottom line numbers. And people issues were often headline grabbers as the top industry issue. This industry created huge employment opportunity and were hence welcome by politicians.

"Start-ups are the anti-thesis of the IT services companies. They are about risk and continuously stretching your limits, not about 'settling' at the age of 22; they are about individual talent, not about large numbers."

But this is also the industry, which unwittingly made people a commodity measured by numbers. It marketed to the parents of the young, promising their children 'settled' careers, even as they kept salaries low, always looked for freshers, invested very less in training of their manpower and why, many encouraged experienced people to leave, as their cost became untenable for their people-factory model. The most common suffix with the word 'people' was 'cost'.

These industries saw them as 'manpower', not 'talent'. They were important metrics, not individuals.

Even today, many of the talented students from tier good engineering colleges beyond IITs and NITs, are influenced by their parents and teachers to join 'big' companies, not 'unknown' start-ups. If you are a B2B start-up, it is even worse. Start-ups are the anti-thesis of the IT services companies. They are about risk and continuously stretching your limits, not about 'settling' at the age of 22; they are about individual talent, not about large numbers.

This is the psyche which the start-ups hiring techies will have to live with. As one CTO, himself from a small town, told me, it is not because they love large institutes that they go to them; it is because awareness is more. They do not have to struggle selling their brand to students.

How does it matter to start-ups if the required numbers are not high – one would ask. It matters because many talented youngsters are still not part of the pool that they are hiring from.

Just think about it ■

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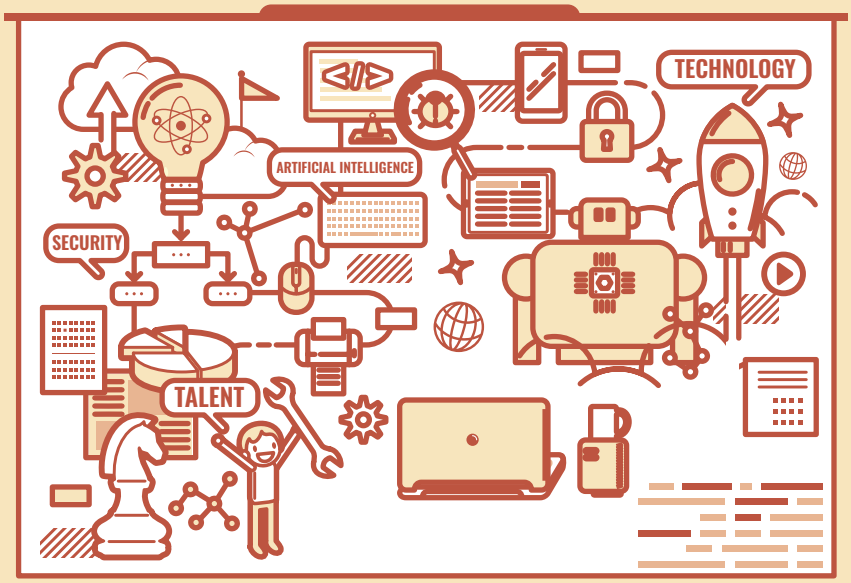

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Spotlight: Additive Manufacturing

By Akash Jain

Cover Design by: **Shokeen Saifi**

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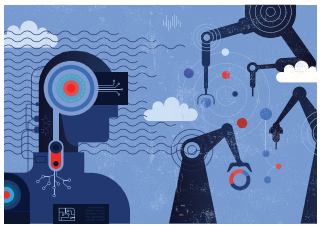
By Sangeet Paul Choudary



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around the tech

KNOW THESE TOP TECH TRENDS

The worldwide IaaS market grew 41.4% in 2021 to total $90.9 billion, up from $64.3 billion in 2020

RESEARCH REPORTS

AI to add $500 bn to GDP by 2025

IT industry body National Association of Software and Services Companies (NASSCOM) says that AI in India can add $500 billion to the country's GDP by 2025. NAASCOM unveiled 'AI Adoption Index' for India, which provides an assessment of the AI adoption trends in four major areas – Banking and Finance Services, Consumer Packed Goods (CPG) and Retail, Healthcare, and Industrial and Automotive. These sectors could contribute about 60 per cent of AI's potential value-addition of $450-500 billion to the country's GDP by 2025.

Cybercrime thriving on ransomware DIY tools

Many illicit organisations are now providing Ransomware-as-a-Service (RaaS), a new type of malicious subscription-based service to sell or rent ransomware to cybercriminals that lack the technical skills to commoditize ransomware.According to a Tenable study, ransomware gangs made $692 million from all of their attacks in 2020 alone, a 380 percent rise over the previous six years combined ($144 million from 2013 to 2019). RaaS's popularity has drawn in other participants.

75% of India's top 100 android apps are vulnerable

Appknox, a mobile security testing platform has recently conducted security research that revealed that more than 75% of the top 100 Indian Android apps contained critical security risks, which puts the sensitive customer and business data at risk. According to the report, titled, Evidence-based Insights – India's Top 100 Android Mobile Apps tested for Cybersecurity, over 78% of the Top 100 Indian Android apps had a CVSS score greater than 10 - implying a very high vulnerability to critical cybersecurity risks. This research consists of mobile applications based on Android and available for use in the India region of the Google Play Store. Only Android applications were chosen to maintain consistency in comparison and analysis. Appknox put 100 applications through a rigorous automated testing process using Appknox, their mobile app security solution.

62% prefer flexibility over a four-day work week

As the idea of a four-day work week continues to gain traction across India, almost two-thirds of full-time employees in the country (62%) would prefer the flexibility to work whenever they want over one-fewer days at work (38%). Flexibility is also a bigger driver of retention (60%) than a four-day work week (51%). These findings are from a study conducted by Qualtrics, an experience management company. The Qualtrics study was carried out in May 2022, and includes 1,277 respondents 18 years of age or older.

Global IaaS market grew 41.4% in 2021

The worldwide infrastructure as a service (IaaS) market grew 41.4% in 2021 to total $90.9 billion, up from $64.3 billion in 2020, according to Gartner. According to the research major, Amazon retained the No. 1 position in the IaaS market in 2021, followed by Microsoft, Alibaba, Google, and Huawei. In 2021, the top five IaaS providers accounted for over 80% of the market. Amazon continued to lead the worldwide IaaS market with revenue of $35.4 billion in 2021 and a 38.9% market share. Microsoft followed in the No. 2 position with a 21.1% share and above-market growth.

Scaling AI for finance a massive challenge for enterprises

Half of current finance artificial intelligence (AI) deployments will be either delayed or cancelled by 2024, while the use of business process outsourcing (BPO) for AI will rise from 6% to 40% within two years, according to Gartner. The finance department of enterprises will face major barriers to scaling up the use of AI in-house and will increasingly turn to business process outsourcing (BPO) solutions to meet their digital transformation objectives.

While finance departments have made reasonable progress in laying the groundwork for AI, the challenges come when attempting to scale up solutions that can manage the complexities of function-wide use.

Global government IT spending to grow 5% in 2022

Worldwide government IT spending is forecast to total $565.7 billion in 2022, an increase of 5% from 2021, according to Gartner, Inc.

In 2022, government IT spending is forecast to increase across all segments except internal services and telecom services. Continuing the trend from 2021, software is forecast to record the strongest growth across all segments in 2022. As legacy modernization continues to be a priority in government organizations, growth in the data center systems segment will continue to slow though the forecast period

Anything-as-a-Service (XaaS) is gaining popularity across government organizations as it provides better return on investment normalizing IT spend over time making budgeting for IT more predictable, while avoiding the accrual of technical debt.

Organizations are still not fully prepared for the digital age

The pandemic has turned into a catalyst for transformation in enterprises across sectors. Indian organizations are continuously learning to adapt to the new realities of working. However, they still seem uncertain about their digital capabilities and future technology requirements.

According to a recent report published by A10 Networks, the enterprises in India are facing significant challenges around all aspects of digital resilience in the post-pandemic era. "Of the 250 enterprise organizations surveyed in India, nearly all (97%) showed high levels of concern around all aspects of enterprise digital resilience. Overall levels of concern were highest around optimization of security tools to ensure competitive advantage and deliver a superior user experience with customers accessing their ecosystem both efficiently and securely," the report states.

The Enterprise Perspectives 2022 study was undertaken by an independent research organization, Opinion Matters, among 2,425 senior application and network professionals from across ten regions, including the UK, Germany, Southern Europe, Benelux, Eastern Europe, and Nordics, USA, India, Middle East and the Asia Pacific.

Indian enterprises top AI adoption

Indian businesses lead both US and UK regarding data maturity and adoption of Artificial Intelligence (AI), according to the State of AI 2022 report by PEAK, a Decision Intelligence company. Most (84%) Indian businesses with 100 or more employees are currently using AI in one form or another, nearly twice that of the UK (46%), whereas the US is at 68%. A staggering 98% of companies in India using AI are leveraging it to automate decisions. The report is based on a survey of 775 decision makers from the US, UK, and India. The research, conducted in partnership with the Centre for Economics and Business Research (Cebr), finds that Indian respondents are more likely to say they have the technical knowledge and managerial skills in-house to facilitate digital transformation.

Digital payments in India to reach $10 trillion by 2026

India's digital payments size is forecasted to touch US $10 trillion by 2026, up from US$3 trillion today, according to a research report by PhonePe and Boston Consulting Group (BCG). India's digital payments landscape has transformed dramatically. In the report titled "Digital payments in India: A $10 trillion opportunity," BCG states that India's digital payments landscape has witnessed phenomenal growth over the past five years. "Today, 40% of payments (by value) are digital, contributing to a US$3 trillion digital payment market on account of rapid expansion in digital infrastructure, UPI-led migration to the digital, pandemic-led acceleration of shift in customer preferences, growing merchant acceptance network and disruptive innovations by fintech," it said.

GOVERNMENT NEWS

PM launches NIRYAT portal

Prime Minister Narendra Modi launched NIRYAT (National Import-Export for Yearly Analysis of Trade) - portal that will provide real time data to all stakeholders. Important information related to more than 30 commodity groups exported to more than 200 countries of the world will be available on the portal.

Centre launches portal for awards nominations

For inviting nominations for various civilian awards, the Central Government has launched a common Rashtriya Puruskar Portal (https://awards.gov.in). This has brought in various ministries/departments/agencies of the Government of India under one digital platform to ensure transparency and public partnership (Jan Bhagidari).

Kerala launches school bus tracking app

Kerala has launched, Vidyavahini, a school bus tracking mobile app for parents. The route of the school bus and the duration in which the bus will reach the respective stops would be updated in the Vidyavahini app. The app has been developed by the Kerala transport department. The school buses are connected to the servers of the transport department using GPS. There are around 20,000 school buses running in the state. The process of fitting GPS comes under the Surakshamitra scheme.

Indian Railways launches new e-auction portal

Indian Railways has brought commercial earning and Non-fare revenue contracts under the ambit of electronic auction through Indian Railway e-Procurement System (IREPS), in line with prevailing e-auction of scrap sale. The auctions will be conducted online through 'E-Auction Leasing' module of IREPS: www.ireps.gov.in.

Some of the additional earning assets that would be added location-wise in the portal are parcel Van, pay & use toilets, advertisement rights on station circulating area and coaches, AC waiting rooms, cloak rooms, parking lots, plastic bottle crushers, ATMs, station co-branding, video screens for content on demand etc. Presently, participation in e-tendering requires physical registration with the concerned field unit.

Odisha asks Google to remove fake loan apps

The Odisha Police's Economic Offence Wing has asked Google Inc to remove more than 40 fake loan apps from the Google Play Store. These apps have been illegally providing short term loans at very high interest rates. These apps are not authorised by the RBI to do so. Besides, these loan apps are using illegal methods of harassing, threatening, blackmailing, using extremely filthy language in order to extort money from victim loanees, the wing told Google.

Dilli Bazaar portal to be launched

Delhi government's Dilli Bazaar e-portal is likely to go live in December this year. The portal will allow users to have a shopping experience similar to other e-commerce platforms. More than 10,000 vendors have already been registered. Through this portal, the government is looking to bring Delhi's markets on a digital platform where elhi-based sellers can showcase and sell their products to a worldwide audience.

Delhi Govt to launch portal for payment certificates to contractual workers

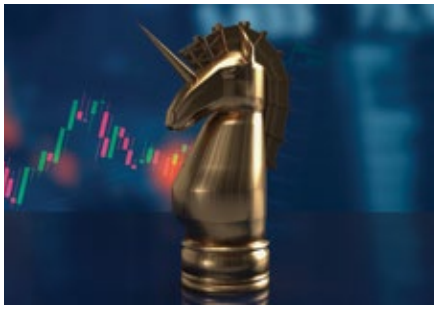
The Delhi government will soon launch a portal for submitting certificates of payments made to contractual workers by each department, according to a circular issued by it. All heads of departments are required to send the certificates by the 20th day of the month to the chief secretary, confirming that all the employees have been paid the due wages.

Telangana launches portal for senior citizens

The Telangana government has launched a portal "Telangana Senior Citizens Maintenance Cases Monitoring System" (tsseniorcitizens.cgg.gov.in). This will make the process of filing maintenance cases hassle-free and transparent as per the provisions.

STARTUP NEWS

India's future unicorns valued at $49 billion



According to a survey by Hurun Research Institute, the value of India's prospective unicorns, which include Shiprocket, Zepto, Turtlemint, Pepperfry, Juspay, and Ather Energy, has increased by 36% in the past year to $49 billion. The research lists privately held Indian firms that were established after 2000, are worth at least $200 million, and are predicted to become unicorns in the following two to four years. According to the report, companies like the buy-now-pay-later ZestMoney and the furniture firm Pepperfry are expected to attain unicorn valuations .

Haryana announces new startup policy

The New Haryana State Start-up Policy 2022, created by the Department of Information Technology (DPIIT), Electronics, and Communications, Haryana, has been approved by the state's cabinet. As part of the new strategy, various financial incentives are offered for entrepreneurs, including 50% net SGST reimbursement for 7 years, lease rental subsidies, financial help for patent registration, reimbursement for cloud storage, and others. With this new strategy, the government aims to develop an ecosystem that is more encouraging for young entrepreneurs. At least 13 unicorn startups (with at least USD 1 billion valuation) are based of Haryana.

Ola closes its used cars business, food delivery service

Ride-hailing major Ola has decided to shut down its used car subsidiary, Ola Cars, as well as its food delivery division, Ola Dash. The company has reportedly made this decision to put its energy and efforts on electric vehicle and mobility business. Ola launched its used cars platform in October 2021 and was competing with the likes of Spinny, Droom, Cars24 and Olx.

Arzooo secures $70 Mn funding

Arzooo, a B2B retail technology business, raised $70 million in its Series B fundraising round. SBI Investment, based in Japan, Trifecta Leaders Fund, Celesta Capital, and 3 Lines VC, as well as new investor and creator of Doordash Tony Xu, also took part in the round. The startup will use the funding to improve its technological foundation and drive business growth.

Zomato acquires Blinkit

Zomato, a food delivery service, has acquired Blinkit (formerly Grofers) in an all-stock deal for INR 4447 crore. By early August, the acquisition is anticipated to be completed. Swiggy, Zomato's main rival, has been increasing its investments in the grocery market through acquisitions like Supr Daily, and it appears that Zomato is attempting to catch up in the grocery market after recently terminating its own grocery setup. Blinkit joined the club of unicorns last year.

CredAvenue renames as Yubi

CredAvenue, a debt market place player, has changed its name to Yubi. The company says that the revamped website, social media accounts, and current product lines will all reflect the new identity in every client touchpoint. It has announced the following five verticals that it will be operating under the new brand: YubiLoans, a marketplace for corporate loans for businesses and banks; YubiCo.Lend, a platform for co-lending; YubiInvest, a fixed income investment platform; YubiFlow, a supply chain finance platform; and YubiPools, which offers an end-to-end securitization management system .

Indian cities up their start-up ecosystem rankings

According to a survey by Startup Genome, a policy consulting and research organisation for public and commercial organisations, Indian cities have improved significantly in terms of their rankings for providing a favourable climate for startups. Delhi climbs up the rankings in 2021 by up to 11 spots, landing at position 26. Bangalore, an Indian city that houses the R&D centres of some of the most well-known tech firms in the world, including Amazon, Microsoft, Facebook, and Google, has climbed one spot from the previous year to rank 22.

CIO & CISO MOVEMENTS

PAWAN SATYAWALI **Promoted to Group CIO At Tata Consumer Products.**

Pawan Satyawali has been promoted to Group CIO at Tata Consumer Products. Before this, he was CIO at Tata Consumer Products. Earlier, he was associated with esteemed companies like GE, Unisys Global Services India, Genpact, Canon India, etc. Satyawali completed his MBA in Marketing & Systems from Sikkim Manipal University - Distance Education.

NEXT100 **Winner Ashish Khanna Joins as CISO At Evalueserve India.**

Ashish Khanna has joined as CISO at Evalueserve India. Earlier, he was CISO at the Oberoi Group. He also served as the IT Incharge at Taj Group of Hotels and Customer Support Engineer at Mahindra & Mahindra. Khanna has been a NEXT100 Winner in 2011. He completed his Senior Management Program from IIM-Calcutta, Management Development Program from MDI, GNIIT, Computers from NIIT and BCom from Lucknow University.

RAMAN PILLAI **Joins as Director - IT At VerSe Innovation.**

Raman Pillai has joined as Director - IT at VerSe Innovation. He joins from Ather Energy where he served in the same capacity. Pillai had also worked in esteemed companies like Meru Cab Company, Motilal Oswal Securities and HCL Comnet Systems and Services. Pillai completed his MSc in Electronics and Telecommunications from Rani Durgavati Viswavidyalaya.

ANIL KURIL **Is Now CTO At Union Bank of India.**

Anil Kuril is now CTO at Union Bank of India. Previously, he was GM - IT at the same bank. Earlier, he was associated with Punjab National Bank and Allahabad Bank. Kuril completed his BE in Computer Engineering from Shri G.S. Institute of Technology & Science, Indore.

SRIDHAR GOVARDHAN **Promoted to VP & Head - Information Security at Flipkart.**

Sridhar Govardhan has been promoted to VP & Head - Information Security at Flipkart. Previously, he was Senior Director & Head - Information Security. Earlier, he had served in Wipro and Infosys Technologies. Govardhan has been a NextCSO jury member in 2020 as well as a NextCSO winner in 2017. He completed his MTech in Software Systems from BITS, Pilani and BE from Sir M Visvesvaraya Institute of Technology, Bangalore.

SUBHASH SINGH PUNJABI **Joins as CISO & Head of Enterprise Architecture at Deepak Fertilisers and Petrochemicals Corp. Ltd.**

Subhash Singh Punjabi has joined as CISO & Head of Enterprise Architecture at Deepak Fertilisers and Petrochemicals Corp. Ltd. He moves from Naprod Life Sciences where he was AVP & Group Head - IT & Systems. Punjabi was also associated with Alicon Castalloy, Endurance Technologies and Ring Plus Aqua. Punjabi completed his Bachelors in Computer Science from R.Y.K. College.

Around The Tech

INDUSTRY MOVEMENTS

DEBAJIT ROY appointed India MD for Rackspace Technology

Cloud solution company, Rackspace Technology, has announced appointment of Debajit Roy as the Managing Director of its India business, based out of Bengaluru.

Adobe appoints ANINDITA DAS VELURI as India Marketing Head

Adobe has appointed Anindita Das Veluri as Head of Marketing for Adobe India. In this role, Anindita will lead Adobe's marketing strategy across the Indian market.

MURLI MOHAN appointed as CoreStack MD-Sales for IMEA

CoreStack, a global cloud governance provider appointed Murli Mohan as MD–Sales for India, Middle East, and Africa (IMEA). Murli will be primarily responsible for building a go-to-market (GTM) strategy.

Exterro appoints DEBORA JONES as COO and Dr. Kavitha Thangasami as Chief R&D Officer

Legal GRC software provider Exterro Inc. has appointment Debora Jones as Chief Operating Officer and Dr. Kavitha Thangasami as Chief R&D Officer. Prior to Exterro, Jones was with Lighthouse Global.

RUPESH LUNKAD joins as India MD of TeamViewer

TeamViewer, a provider of remote connectivity and workplace digitalization solutions has announced the appointment of Rupesh Lunkad as Managing Director for TeamViewer India.
He will be responsible for spearheading the business and creating value for its customers in their digital transformation journey.

Verizon appoints SOWMYANARAYAN SAMPATH to Executive Vice President and CEO of Verizon Business

Verizon has announced the appointment of Sowmyanarayan Sampath to Executive Vice President and CEO of Verizon Business. Sampath joined Verizon In 2014 and served as Chief Revenue Officer for Verizon Business earlier.

InterDigital Appoints New Chief Technology Officer

InterDigital, Inc, a mobile and video technology research and development company has appointed industry veteran, Dr. Rajesh Pankaj as its new Chief Technology Officer effective. Dr. Pankaj joins InterDigital from Qualcomm where he most recently served as the Senior Vice President, Engineering and Head of Corporate R&D.

WHY MANAGING TALENT IS THE NO.1 CHALLENGE FOR STARTUP CTOs...

And how they can build a better tech team in the hyper-competitive talent market.

By Jatinder Singh

Gaurav Kumar, Co-Founder and CTO of a start-up that specialises in the food delivery business appears to have been dealing with nightmares. His frown lines are becoming deeper, indicating that he has a lot on his mind. On being questioned, Kumar revealed that the problem isn't a lack of funds or any shortcomings in the use of technology, but rather the difficulty in attracting and keeping top-notch tech personnel, as well as reducing high attrition rates. Well, Kumar is not the only start-up CTO with this issue.

Over the past six months, we have spoken to a number of start-up CTOs and founders, and the majority of them cited managing talent and striking the correct balance between managerial and technical talents as their top concerns. Why not, then? The consequences of a skills shortage can be extremely severe given the size of the changes the world is undergoing and the fundamental technological basis on which many start-up businesses are built.

Similar sentiments were shared by a recent study of 100 company founders conducted by debt-fund InnoVen Capital, according to which finding competent personnel to hire is the biggest difficulty facing start-up owners in India, and managing talent would be their top concern over the next 12 months.

Even established firms and their tech executives are juggling a lot to find the perfect tech fit for their company, so it's not like the skill shortage problems are exclusive to start-ups and their CTOs. The CTOs of start-ups, however, face additional unique challenges, in contrast to established IT or non-IT firms, where processes are already defined and potential tech hires could associate themselves with the company brand.

For start-up CTOs, overseeing the entire hiring process—from candidate selection to onboarding, offering opportunities for upskilling and reskilling, and, of course, ensuring outstanding employee experiences throughout their employment—represents a major priority. And only a select few have cracked the code.

The cover article for this month will look at some of the crucial factors that have elevated talent management to the top of start-up CTOs' concerns, as well as how they can get better talent in today’s competitive scenario.

> "We have a leadership program for our folks to grow into senior roles and we go to leadership offsites for training and ideation. Some of the best innovations have come from the team below the founders which exhibits our people first culture and belief in empowering the team."

AKHIL GUPTA
CTO, NOBROKER

> "The important ingredients for effective talent management in start-ups are flexibility, accountability, freedom, and creating a culture of high psychological safety to fail. Over the past few years, we've really benefited by giving our tech team the confidence to flag issues even if they don't know how to address them."

GAURAV BAGGA
HEAD OF PRODUCT & ENGINEERING, PRISTYN CARE

TALENT SUPPLY AND DEMAND GAP

The lack of skilled workers has long been a big concern for the entire industry, and if enough is not done to address this issue by all stakeholders concerned, it will only get worse. According to NASSCOM, India currently has a demand-supply gap for digital tech talent of 21.1%, which is lower than that of the US, UK, and China. Still, it presents a serious problem because, by 2026, that gap is expected to have increased by more than 3.5 times.

According to the industry experts, start-up CTOs struggle mightily to find a steady supply of top tech talent because of the growing demand-supply gap and competition. As the economy strengthens, tech talent begins to have more options from rival companies and major corporations, including better pay and work roles.

According to a LinkedIn survey titled "Jobs on the Rise 2022 India List," the majority of professionals who are quitting their jobs or express interest in doing so are citing reasons such as poor work-life balance (30%), insufficient pay (28%) or higher career objectives (23%) for their move. Flexible working arrangements are now a high priority for both tech and non-tech employees because of the pandemic, which has demonstrated to employees the advantages of flexible working hours.

There is a growing demand for excellent IT skills from all types of firms, whether unicorns or IT behemoths, as the majority of organisations, have gone digital. They are willing to spend a sizable sum of money to hire capable IT professionals.

However, it is very challenging for CTOs to retain talent in their organisation for a longer period of time because a company or rival is always willing to pay even more to get the same competence. As a result, in these circumstances, the CTOs must focus on a strategic talent approach to deal with the problems of talent hiring and retention.

Not only does the HR department require funding to increase recruiting, but CTOs also need to step up their game and collaborate with the talent team to create more employee-friendly policies. The majority of burgeoning businesses and unicorns have also established offices in hotspots for technology, like Bangalore, where they can access a wealth of expertise.

LACK OF BRAND AWARENESS

A large portion of the credit for India's start-up and unicorn's unprecedented growth goes to the country's growing adoption of technology and the people using it to develop new and innovative solutions. Technology is helping these forward-thinking businesses to challenge the status quo of business, from digital healthcare and software-as-a-service to fintech, edtech, AdTech, ride-hailing, and grocery.

One of the most challenging tasks facing CTOs is encouraging IT talent to work for start-ups. You must earn people's trust if you want them to want to work for you. The CTOs and founders should be able to clearly communicate their vision for the company. For many CTOs and co-founders, especially in the beginning stages of their businesses, this continues to be a significant challenge. Even though they may have a disruptive product or an innovative concept with the potential to revolutionise an industry, many are unable to persuade the best tech talent.

Senior technology leaders from unicorns including Moglix and Infra.Market recognised that they had encountered these challenges initially because so many young IT professionals were ignorant of what they were doing in the market and how strong their brand was. However, when they began their branding initiatives, particularly on campuses, they were able to significantly alleviate this problem and were able to attract quality tech talent.

Greater social recognition among family and friends comes from working for a well-known brand than from a start-up company that is new or unheard of. In addition, many software developers and engineers would prefer to advance in more traditional, well-established companies than to begin their careers with start-ups due to the conventional belief that the work experience at the prestigious company will improve their employment prospects in the future.

The fact that many new businesses lack the necessary PR and branding skills when they first launch only makes the problems worse. Even if a start-up gives prospective employees a higher wage and more interesting job, if they are not aware of the company or market reputation of the latter, top IT talent is likely to choose a well-known IT behemoth over them.

Over the past several years, tech behemoths have made investments in both online and physical branding initiatives to drastically improve the perception of their businesses. By being more open about their goals, they have been able to attract and keep quality talent with them.

To stand out from the crowd, CTOs must take proactive steps with their talent team to support a thriving workplace culture, maintain the fun, offer competitive pay and benefits, and make sure their brand and strengths are effectively communicated through social media and other digital channels.

"To keep people motivated, we often start working in technology areas which may not have an immediate requirement. But it achieves two purposes. It keeps us ahead in technology maturity cycle and of course, it motivates people."

AJAY PODDAR
SR. VP-ENGINEERING
SHAADI.COM

TECH TALENT: SKILLS IN DEMAND

DevOps: agile product-life-cycle management, scrum management, agile coaching, continuous integration and continuous delivery (CI/CD)

Platforms and products: product ownership, life-cycle management across platform layers, Industrial Internet of Things (IIoT)

Automation: cognitive AI, robotic-process-automation (RPA) technologies, AI-enabled analytics

Customer experience: design thinking, user research, journey mapping, test-and-learn at scale, prototyping

Cybersecurity and privacy: data-protection laws and practices, shift-left security

Data management: analytics, data science, data engineering, use-case life-cycle management, automated machine learning

Cloud: multicloud and hybrid-cloud architecture, smart distribution/metering

Source: McKinsey

ENTREPRENEURIAL MINDSET OF EMPLOYEES

Having a strong talent pipeline is crucial for start-ups that are expanding, especially when CTOs are constantly under pressure to scale and launch new product lines. You need flexible and agile people to experiment and develop solutions. The abilities required of tech professionals are changing as a result of rapid technological advancements in areas like cloud computing, application development, and data analytics.

> **"There is a scarcity of people who know how to put everything together by leveraging tech and helping business solve a specific problem. In today's competitive era, start-ups need to reinvent their ways of building new products and services constantly. While tech empowers them to do things differently, much time goes into making people productive and then retaining them."**

SATYA KALIKI
CTO, INFRA.MARKET

> **"The other dimension of the challenge is to find people willing to work on older technology areas. In India, which has a younger workforce, almost no one wants to work on older technologies."**

NITISH PANDEY
CTO, POWER2SME

Young IT talent is drawn to start-ups and unicorns for a variety of reasons, one of which is the challenge of creating something new and innovative that will also be financially rewarding for them. As compared to traditional IT companies or enterprises, the IT talent that works at start-ups expects more autonomy and influence at work, plays a role even outside of their domain and does the deployments on their own.

The CTOs of start-ups need to ensure that they have good reasons for keeping such a strong pool of talent on board. Experienced technology leaders believe that startups should not limit talent to their particular specialities, and allow them the chance to explore and work in a variety of tech fields including DevOps, customer experience, cloud, automation, cybersecurity and platform. The IT talent at start-ups, in contrast to tech behemoths and traditional businesses, wants to be challenged more and generally has an entrepreneurial mindset. It is well known that the majority of top IT talent chooses start-ups or unicorns for their first job because they have an entrepreneurial mindset and eventually wish to develop their own original ideas into a profitable business model.

Growing businesses like Healthkart, and Curefit have been successful in cultivating a mini-enterprise culture within their tech ecosystems, pushing their tech team members to try out new concepts, and funding concepts that are distinctive and have the potential to be scaled up. The CTOs must make sure that there is enough room for such enthusiastic people to be creative, innovative, and entrepreneurial.

In addition, it is also critical to ensure that the workplace not only meets the standards for a good and challenging work environment, but also fosters effective communication and collaboration so that staff members can express their career preferences and take up new roles and responsibilities.

LOSING FOCUS ON LEADERSHIP TRANSPARENCY AND ACCOUNTABILITY

Tech talent seeks an environment where they can openly and fearlessly communicate their ideas, questions, and concerns. Although the majority of start-ups and CTOs promote this behaviour, there may have been obvious gaps when start-up CTOs

themselves dealt with unparalleled ambiguity.

High-performing tech talent at start-ups and unicorns wishes flexibility, accountability, freedom to do work without micro management and expect their seniors to be transparent and listen to their grievances without being judgemental. Start-up CTOs must make sure that developers are treated more like creators than like coders. They must make sure that they participate in the business as active members.

Many start-ups frequently lose focus on these crucial personnel requirements when they are under intense pressure to achieve results or when they are looking for the next round of funding, creating an environment at work that is both unclear and uncertain. Top-performing tech employees would prefer to explore other options if they feet that their leadership was unaccountable or that the impact of their work had not been acknowledged.

Pristyn Care, a healthtech start-up that was founded in 2018, has been heavily focusing on these factors and claims to have had great success in keeping the majority of its key technological personnel. By allowing people to experiment without fear of failure and by not being critical even when they fail, the company claims to have greatly strengthened the confidence of its IT team, and that keeps them motivating.

In addition, the IT talent at start-ups expects the company to have finances to support experimentation, give access to the newest technology, and give them more exposure to work beyond the Indian market in addition to regular training and competitive salary and perks.

CHANGING PRIORITIES OF TALENT POOL

Another big element that perplexes CTOs and unicorns is a dramatic shift in employee needs, particularly in the post-pandemic context. For tech professionals, work-life balance and the freedom to work from any location have emerged as major priorities. Start-ups and unicorns need to step-up their game because top IT businesses and enterprises offer incredible wellness perks, flexible working hours and healthcare packages, as well as a substantial number of paternity and maternity holidays.

To promote themselves as an employer of choice, many unicorns have been providing their employees with ESOPs, advance salary policies,

PERKS OFFERED BY SOME OF INDIA'S START-UPS AND UNICORN TO ATTRACT TECH TALENT

Cred: Weekly and fun activities such as mini golf, trips to the movies, happy hours, paid vacations, flexible working, pet-friendly office, maternity and paternity leave to all employees

Dunzo: Higher incentive for referrals of female candidates, non-taxable monthly food wallet, wellness camps, maternity leave for 6 months

UpGrad: Reimbursement of the training programs of choice, attend conference and training programs, annual bonus incentives, insurance coverage and health benefits, rewards and recognition programs

Swiggy: Pre-loaded food card, paternity and adoption leave policy, car lease, tax and investment planning assistance, insurance for self and family

Pristyn Care: Team outings, gymnasium, ESOP, culture that is open to failure

Yubi (formerly CredAvenue): Generous insurance, holistic wellness programs, flexi-hours for women returning to work after maternity, child care reimbursement for all employees up to Rs 15,000

"You talk to any CTO of a start-up company, and more often than not, he would point out hiring and retaining the right talent as the biggest focus area and pain point"

AJAY TIWARI
CTO, HEALTHKART

"Any engineering company needs a strong tech team, and for startups it is crucial that they are able to explain to potential employees why they should work for you and what the company's mission and vision are. Our mission is to make the roadways safer, and we make sure that our tech talent shares this goal,"

VINAY RAI, SVP ENGINEERING OF NETRADYNE, A DEEP-LEARNING STARTUP THAT FOCUSES ON SOLUTIONS FOR THE TRANSPORTATION INDUSTRY.

training initiatives, and a wide range of benefits.

However, CTOs of young and start-up companies face a difficulty here because they frequently lack resources and require a lot of support from their tech personnel to become competitive and stand out from the competition.

During our conversation, a top CTO of a leading start-up revealed that while his company has been doing reasonably well in terms of talent management, many of its technical staff are still leaving the company because the policy of work from anywhere has been abandoned and given the company's aggressive growth plans, all tech staff has been asked to come to the office regularly for brainstorming and developing new ideas.

BAD HIRING

It's not enough to just find talented people; they also need to fit in perfectly with the culture and vision of the company. Even if some people have exceptional professional skills, mindset and cultural barriers prevent them from excelling in a particular company environment.

According to a McKinsey report, titled, Tech talent tectonics: Ten new realities for finding, keeping, and developing talent, finding great talent doesn't help if the talent doesn't want to work for you, and hiring great talent doesn't matter if the talent leaves quickly. Companies have to invest simultaneously across the entire "hire to retire" life cycle.

For instance, hiring experienced tech people from a process intensive organization may not be a great idea for a start-up who is just into its preliminary or growth phase. The reason being they may not fully blend with the environment that demands rapid innovation and quick turnarounds. However, once the start-up reaches a more advanced level and implements good processes, the same tech specialists may be very valuable to the business.

In contrast to the issue faced by CIOs and established businesses in hiring and managing talent, start-up CTOs also need to ensure that the software professionals, coding specialists, and developers they hire have the ability to multitask, are highly self-motivated, self-managing and work autonomously as needed. Hiring the unfitting IT talent and then firing them after a short period of time frequently can be a negative influence on both the company's reputation and overall growth plans.

While some IT specialists enjoy multitasking when necessary, during a company's growth phase, others might not feel as at ease and prefer to work in an environment where their roles are more clearly defined and their career advancement path is structured. In such a scenario, spotting right tech talent who can relate to the company's mission and have a focused approach becomes crucial for a CTO.

In addition to the aforementioned elements, CTOs must pay close attention to those that are crucial to attracting and keeping top personnel, including diversity and inclusivity, timely performance reviews, efficient feedback channels, and empathy in the workplace.

Start-ups occasionally lack the requisite talent acquisition and retention skillsets to attract and manage their employees, despite the fact that many of them place a high emphasis on market-defining goods and services. Ineffective work-life balance and competitive talent snatching could also be significant hindrances to effective talent management in any firm.

Without a doubt, the industry and CTOs will continue to be under pressure due to the technology's quick developments in terms of talent management. CTOs who are focused in their approach and prepared to develop a systematic process and action plan based on their present and future talent requirements, however, will outperform their competitors in the talent wars ■

डिजिट
अब हिंदी में

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

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SILLY POINT

By Akash Jain

Spotlight: Additive Manufacturing

Additive Manufacturing is not just 3D printing; 4D is equally important. At the baseline, 4D is smart or stimulus driven manufacturing.

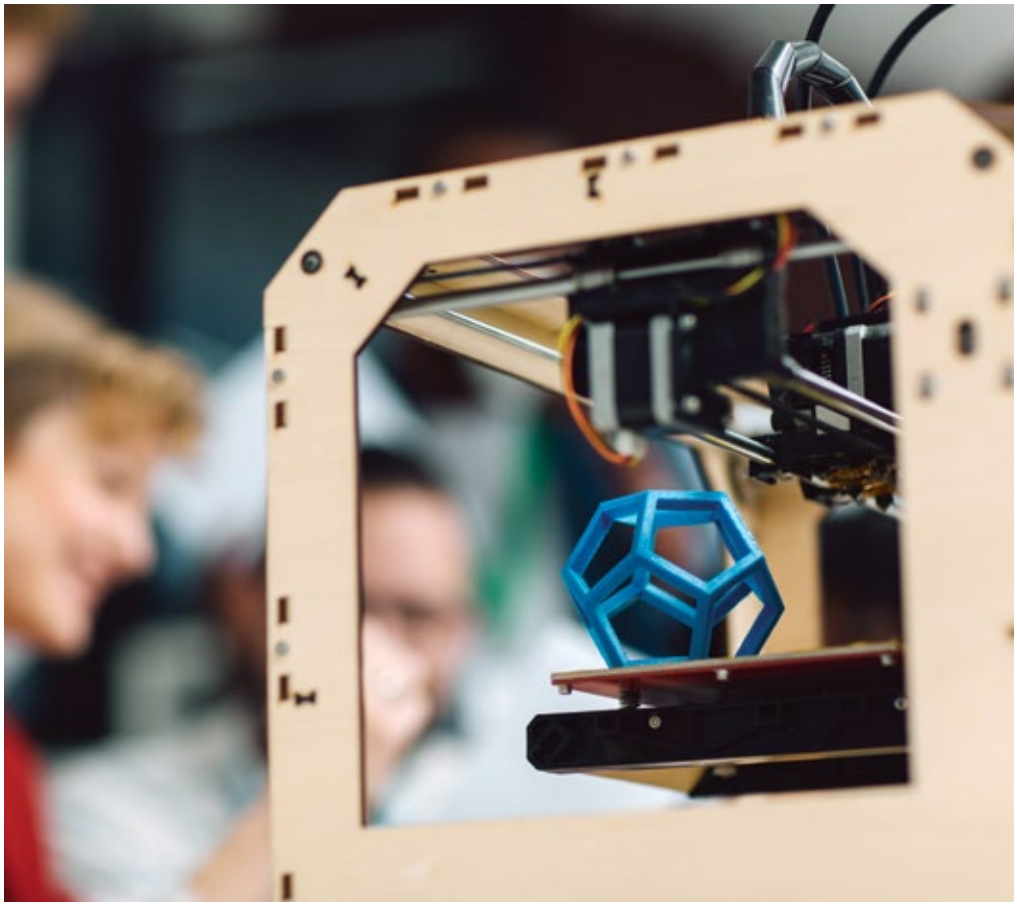
A few years back, Gartner reported that GE is looking at integrating manufacturing at an early stage of its supply chain. As a quick primer, let us recognize that Manufacturing is about three capabilities: precision, geometric complexity, and throughput speed. A natural conclusion was that a big part of this strategy would be Additive Manufacturing. Additionally, it was concluded that Additive Manufacturing is not just 3D printing (which is adding layers of multiple materials); 4D is equally important. We all know what 3D printing is; but there is confusion about what 4D is. And before the air gets cleared up, we have 5D coming in! This is what we will examine today.

At the baseline, 4D is smart or stimulus driven manufacturing. The parts/ components built using 4D can (i) assemble themselves, (ii) repair themselves, (iii) perform multiple functions, (iv) reconfigure themselves, or even (v) change shape. It is to be noted that a 4D product can do one or more of the preceding actions. Essentially, 4D adds the fourth dimension of TIME to 3D; material/ shape/ function change as the time passes or a stimulus is created. Some applications of 4D manufacturing are self-repairing pipes, self-assembling furniture, and personalized human body parts.

5D printing is evolving now; it however is not the "next" step after 4D (as 4D was over 3D). 5D is essentially taking the original 3D framework of X, Y, Z axes, and rotating the X and Y axis. This allows for curved layers to be printed. So 4D and 5D are used based on the need and can be used in conjunction.

GE has gone on to simplify the understanding of Additive Manufacturing by pointing out that Additive Manufacturing is different

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



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from traditional manufacturing in a very fundamental way. Additive Manufacturing works on the principle of adding material, while traditional manufacturing works on removing or moulding material. Both 4D and 5D rely on this principle of "adding".

As required in Additive Manufacturing, we start with a zero object and build up; it will need extensive use of CAD and/ or scanners. MIT goes on to say that the output of CAD or scanner is used to push material paste through a nozzle, OR a layer of material powder is laid out that is either melted or adhered using polymer into the desired shape (the remaining powder being simply blown away).

Additive Manufacturing technology is now leading to development/ discovery of new materials; ranging from lighter titanium to "yet to be named" alloys.

McKinsey lists the advantages of Additive manufacturing (after 40 years of R&D) as: (i) parts that cost less or perform better (an example being Airbus developing a titanium bracket that is 30% lighter and equally strong as the traditional one; and is now approved by FAA), (ii) mass customization (Mercedes can produce parts for ANY model of ANY year), (iii) elimination of time and cost of tool-making, and (iv) reduce the need for parts inventory in the field. We can add to it the advantages of (a) shortened supply chain journey, (b) functionally graded products (e.g., high conductivity surface/ material inside, strength material outside), (c) complex geometry (hitherto purely theoretical, like one-off human body parts), and (d) small lot sizes (down to one unit per lot).

Of course, nothing is "perfect". McKinsey goes on to say that the issues are (i) the time it takes to produce in Additive Manufacturing (since it is a slow and painstaking process; a problem that is the number one issue of suppliers/ manufacturers of such equipment), (ii) vendor specificity of software to run these printers (as is always the case with any bleeding technology), (iii) availability of Additive Manufacturing raw material (the powder/ paste in specific form), (iv) user support from vendors (who are focused on technology rather than usage, (v) cybersecurity, and (vi) IP. And, we add to this list the fact that almost all Additive Manufacturing requires postproduction clean-up and finishing; but that is more an operational issue that can be more easily handled than the rest of them.

One must also remember that Additive Manufacturing is not just an engineering problem. It is also a design and an IT problem in terms of how it is thought through and done. And eventually, it is a marketing challenge too; try selling a new alloy or a new geometric shape ■

SPECIAL FEATURE

By Sangeet Paul Choudary

Web3 Network Effects: Five Mental Models

Network effects powered the rise and dominance of Web2 platforms and captured the imagination of builders and investors over the past decade. Some believe that network effects will be even more powerful in Web3 while others believe that Web3 will kill network effects.

In the midst of all the hype and buzzword soup that plagues Web3 discourse today, the answer to this lies in reshaping our mental models about network effects. What we've learnt in a Web2 world - covered in my book Platform Revolution - may not apply as directly in a Web3 world. To understand network effects in a Web3 world, it's helpful to rethink network effects from first principles and understand what changes as we move from Web2 to Web3.

This article dives into five mental models, whose implications we subsequently unpack through forthcoming articles over the coming weeks.

NETWORK EFFECTS IN WEB2 VS WEB 3: FOUR KEY DIFFERENCES

To understand network effects in Web3 ecosystems, we need to first qualify the differences between Web2 and Web3 ecosystems and understand how these differences impact the creation of network effects.

First, in Web2 ecosystems, market infrastructure is created by the platform provider. In Web3 ecosystems, on the other hand, market infrastructure isn't provisioned by the platform provider, but needs to be built out by the ecosystem, both through resource commitment (e.g. commitment of storage capacity) and through infra-

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This article, published in his newsletter, Platforms, AI, and the Economics of BigTech, is being published here with permission.

structure development. As a result, creating and scaling network effects poses a unique challenge in Web3 ecosystems, which need to orchestrate not just market activity (as web2 platforms do) but also market infrastructure development.

Second, token value provides an additional value lever to kickstart and scale network effects. Market activity is managed through tokens. Producers may be incentivized to bring supply to the platform early on in exchange for tokens whose value appreciates as market activity increases. Likewise, developers responsible for building out market infrastructure may be incentivized to create core infrastructural components in exchange for tokens. Tokens provide a new incentive mechanism, absent in Web2 ecosystems.

Third, data and reputation portability, combined with technology interoperability, makes network effects much less defensible in Web3. Even if Web3 ecosystems rapidly build out network effects, they cannot lock-in their users (or the supply from producers) or extract surplus value from user data the way their Web2 counterparts so effectively (and now infamously) did/do.

Finally, Web2 ecosystems primarily comprise market participants. Web3 ecosystems need to consider participants not just at the market layer but also at the infrastructure layer, the financing layer, and the governance layer. A Web 2 marketplace like Etsy is open to third party sellers but largely creates the core marketplace infrastructure internally, and manages funding and governance centrally. In contrast, a Web3 commerce protocol (e.g. Boson Protocol) needs to

1. **organize market infrastructure creation around the protocol at the infrastructure layer,**
2. **manage token liquidity to drive funding as well as token value appreciation (which in turn incentivizes all participants) at the funding layer, and**
3. **scale out governance to ecosystem participants, beyond the initial team, at the governance layer.**

Let's unpack these as we run through various mental models around Web3 network effects.

MENTAL MODEL #1: NATURE OF VALUE

Web2 networks primarily relied on two sources of value: Standalone/product value and network value. Web3 provides an additional value lever: Token value. This is a really important lever to design for, while planning for web3 network effects.

Standalone Value.

The value that exists on a platform when no one uses it and is derived solely from the underlying product is called standalone/product value. This is the value that a user experiences on the platform which is independent of the usage of the platform by other users. The first user to come onboard the platform can benefit from this standalone value. The standalone value of a platform remains unchanged as more users come on board. Standalone value typically takes the form of value delivered by the technology of the platform.

Network value.

The value that exists on the platform because of the usage by other users on the platform is called network value. This is the value created on the platform through the activity and usage of other users. When a platform starts out with no users, it has no network value. The first user to come onboard the platform does not benefit from network value. However, network value grows on the platform as the usage of the platform by other users increases.

On Web2 platforms, the community largely constitutes platform users (producers and consumers) only. On Web3 platforms, network value is turbocharged further as nearly all value creation in Web3 ecosystems is powered by the community of users.

There are many examples that illustrate the above difference. Instagram started out as a standalone app with beautiful filters before it turned on network value with a full-fledged social network. Square started out as a dongle that converted your phone into a credit card terminal before it started building out a network with the Square Cash app and other components of the Square ecosystem.

Token Value.

On Web3 platforms, value that accrues in a native token associated

with the protocol is called token value.

As explained in our foundational piece Pipelines to platforms to protocols: Reconfiguring value and redesigning markets,

"Protocols — more specifically, permissionless blockchain protocols — provide a new organizing and governance mechanism to organize actors in an ecosystem. Unlike platforms, protocols do not provide end-to-end market infrastructure nor do they internalize transaction policing and verification. Since protocols do not themselves provision market infrastructure or internalize transaction policing and verification, they need to set up the economic incentives for other ecosystem actors to provision these services. They achieve this by issuing tokens to reward desirable actions in the ecosystem. As the value of market activity in the ecosystem increases, the value of the token — tied to protocol usage — increases as well. As an example, Boson Protocol leverages commitment tokens to secure commitment of buyers and sellers to a transaction, thereby externalizing verification of the certainty of the transaction."

As usage around the protocol increases, the value of the token associated with the protocol grows as well. Early users (incentivized/rewarded with tokens) may come on board to benefit from appreciation in token value over time. Hence, token value provides an additional value lever to kickstart and scale network effects.

Tokens provide a compelling incentive to create network effects. However, as we will note in subsequent posts over the coming weeks, tokens are not a catch-all solution. Tokens need to be carefully designed to ensure they incentivize and disincentivize the core actions that impact network effects.

MENTAL MODEL #2: MANAGING MARKET ACTIVITY VS MARKET INFRASTRUCTURE

The next factor that's different about Web3 networks is the definition of what constitutes the network. Web2 networks primarily comprise market actors involved in value creation and exchange: producers and consumers. While developers may extend Web2 platforms, core market infrastructure is provisioned by the platform owner. For instance, while ecosystem actors on web2 marketplaces participated in transactions, ecosystem actors in web3 also include those who provide the core market infrastructure to enable these transactions.

In Web3, market infrastructure is created by participants. Resources (e.g. compute, storage etc) may be committed by ecosystem actors instead of being set up centrally. Developers build market infrastructure around the protocol provisioning the functionality through which producers and consumers participate in the market.

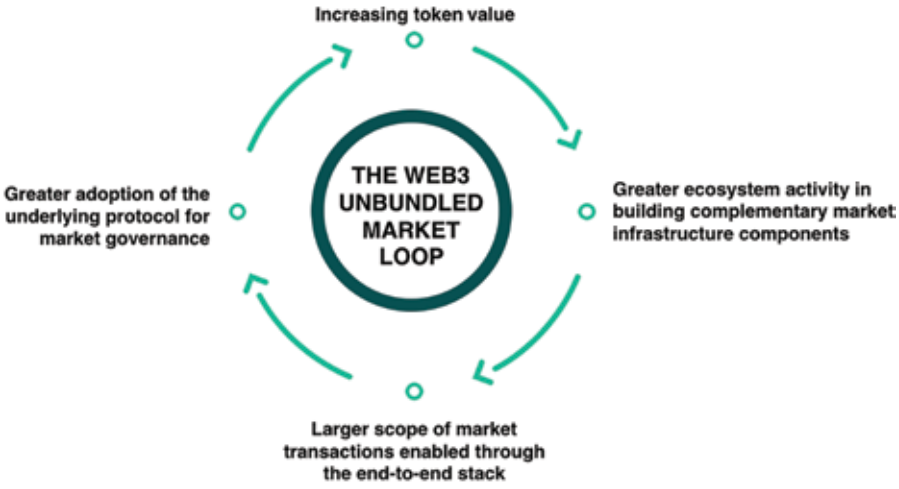
As explained in Unbundling the Unbundlers:

"In the Web2 world, market infrastructure and market governance were bundled by platforms. Amazon, Ebay, Upwork, Uber, and other such marketplaces bundle both market infrastructure (in the case of Amazon, even physical infrastructure through FBA and Amazon Logistics) and market governance.

In the Web3 world, market infrastructure gets unbundled from market governance. While the core components of market governance are encoded into the protocol layer, components of market infrastructure may be built by the ecosystem around the protocol."

Since market infrastructure needs to be built out externally, buildout of market infrastructure needs to be managed in tandem with scaling of market activity.

In managing network effects on Web2 platforms, platform managers needed to manage the overlap between supply and demand. For instance, if all listings on Airbnb in its early days were in Denver but users were searching for listings in NYC, transactions wouldn't ensue. While Web2 network effects required managing overlap between producers and consumers, Web3 network effects management requires additional coordination and overlap between market infrastructure being built out and market activity being supported. As an example, if users on a web3 platform seek a particular type of search interface the platform may need to incentivize innovation in the search interface that meets those requirements, by offering a bounty to attract developers towards that specific project.



In summary, managing Web3 network effects requires not just kickstarting and managing market activity but also managing its coordination with the scaling of market infrastructure. When Web3 ecosystems achieve this balance, they benefit from a positive feedback loop which amplifies these ecosystems further.

MENTAL MODEL #3: COUNTERING SWITCHING AND BUILDING FOR DEFENSIBILITY

One of the key differences between web2 and web3 is the relatively lower defensibility of network effects in web3.

Web2 defensibility was derived through four forms of stored/cumulative value: data captured by the platform, content committed to the platform, reputation built on the platform, and influence created on the platform.

As explained in one of my first articles back in 2012:

Creative content.

Users invest in creating a portfolio of creative content, which forms the basis of their interactions on the platform.

Reputation.

Building reputation on a platform requires consistent delivery of highly rated services and may also involve qualifying for some minimum criteria set forth by the platform. Hence, once a service provider builds reputation on a platform, it prevents her from migrating to a competing platform.

Usage Data.

The more a user consumes information through the platform, the more intelligent the algorithm becomes in recommending pertinent content to the user.

Influence.

As the user's follower count grows, so does the stored value in the network and the incentive to stay actively engaged."

All four forms of cumulative value, which were tied to a specific platform in web2, are easily transferable across platforms in web3. New marketplaces can easily aggregate available NFTs and pull users in their direction. Users can easily port their data and activity to new platforms.

While web3 has the potential to lead to an explosion in innovation, the ability for individual platforms to retain it, allowing value to sustainably accrue to them, goes down.

Any strategy for building network effects in web3 needs to account for the lack of cumulative value and the lower switching costs. As we will note in forthcoming essays, Web3 requires a new set of factors to grant defensibility to network effects.

MENTAL MODEL #4: MANAGING EXTRACTION

Defensible network effects with high switching costs enabled Web2 platforms to indulge in (and benefit from) excessive extraction (whether take rates or data) and control (through bait and switch, lock-in, commoditization etc.). With collapsing switching costs, extraction will lead to network effects unraveling in reverse.

The creation and management of network effects in Web3 requires solving for easy switching, and hence solving for extraction. This is especially important because unlike Web2, market infrastructure and resources in Web3 are provisioned by the ecosystem. In order to provide its resources and innovation capabilities, ecosystem actors need to be assured of appropriate returns on their investment and sufficient agency to protect those returns against commoditization and policy changes.

Managing extraction is key to managing network effects in Web3 ecosystems. In a world of open-source protocols, excessive extraction will result in forking and ecosystem participants shift their activity away from the original protocol. Superior coordination mechanisms in Web3 also allow ecosystem participants to abandon a protocol and organize around a forked one.

MENTAL MODEL #5: MANAGING ACTOR AGENCY AND RISK

High switching costs also allowed Web2 platforms to bait and switch, change policies, and disempower ecosystem actors.

With low switching costs in Web3, managing actor agency will be key to managing and retaining network effects.

Managing the agency of actors is key to managing network effects. Managing agency will require structuring and distributing governance tokens to allocate agency, control, and management of the platform beyond the founding team (and other insiders).

As a protocol becomes more successful, the associated governance token will likely become more valuable, strengthening network effects further, as key contributors who hold the token do not just benefit from returns but also have the power to shape future development roadmap and organize resource allocation and participation incentives accordingly.

CONCLUSION

Web3 network effects are different. They come with new coordination challenges, support new incentive mechanisms, and rewrite traditional rules of defensibility and extraction, restructuring the platform-vs-ecosystem power balance. As the 5 mental models above illustrate, Web3 network effects will require an entirely new playbook: New bootstrapping and scaling models, new governance mechanisms, new sources of competitive advantage, and new forms of value capture ■

SPECIAL FEATURE

By Prashun Dutta

AI/ML Implementation: A Systems Approach

AI/ML is surely about technology and business use cases. But a significant percentage of projects fail. The article tries to identify main points of vulnerability and deliberates on the methods to be adopted, to circumvent methodological weaknesses that give rise to these failures.

Research on successful implementation of AI/ML projects in business organisations reveal a rather dismal picture. Apocryphal estimates on the internet put it to as low as 10%. Obviously, this is most unsatisfactory and just cannot be permitted to persist. A quick survey of reasons attributed usually begin with lack of integration of such initiatives with mainstream activities, lack of communication, improper understanding, lack of collaboration, inadequacy of available data and so on. This article attempts to organise our learning on this subject, with a systems approach. The attempt here is to present approach and steps in the implementation with a systems bias and, in this process, identify main points of vulnerability and methods to be adopted, in order to circumvent methodological weaknesses that give rise to these.

INTEGRATION WITH BUSINESS

Organizations are characterised by dense interconnections between constituent elements. These include entities that make up

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A bespoke application not integrated with the rest of the work processes but aimed at improving one part of an integrated system is most unlikely to succeed. Systems approach, on the other hand, would acknowledge the pertinent context and would introduce the new system in such a manner that it integrates with the existing panorama of systems.

the organization, related strategies, structures and systems, prevalent culture, employees and so on, all of which collectively determine the behaviour of the whole. Any change that we wish to incorporate in such a system would be impacted by these existing relationships. Traditional management tends to sequester a problem situation while developing a solution and therefore does not cognize with these relationships while systems approach views the problem in conjunction with its relevant context and hence approximates reality more efficaciously. If an AI/ML project were to be introduced without cognizing with these existing interconnections it would fail and this is perhaps the most common reason for failure. A bespoke application not integrated with the rest of the work processes but aimed at improving one part of an integrated system is most unlikely to succeed. Systems approach, on the other hand, would acknowledge the pertinent context and would introduce the new system in such a manner that it integrates with the existing panorama of systems. The first step in this process is to derive a need for the technology and concomitant applications from a genuine business need and not by forcing a new technology into the organisation without adequate justification. Several steps need to be taken to achieve this integration, but the first step is to identify technology requirements deriving out of one or more business needs. The organisation first identifies its immediate and long-term objectives and derives action points. To achieve specific action points, in the process of meeting organizational goals, specific technologies would be utilised for pre-identified objectives. Naturally next steps would be to identify how this additional system would be seamlessly function within existing landscape. The example presented below elucidates the approach further.

Consider an e-commerce company engaged in selling goods and services on line. The management of this company discovers that their "conversion ratio", (that is the ratio of prospects converted to customers, to number of prospects visiting their sites) is lower than the industry average of 5% (say). Conversion ratio is a critical metric in this line of business and, in this case, business' strategic objective is to significantly enhance the conversion ratio to at least the industry average. The first and obvious step, in achieving this objective, would be improving on the portal, making it more appealing and user friendly, mobile centric and elegantly interactive. Strengthening applications to ensure minimum Turn-around-Time and augmenting back-end software to reduce delays in responses, and so on. It is at this stage that the AI/ML technology is identified as a means of enhancing performance that the earlier technology interventions cannot achieve. The AI/ML interventions will be aimed at introducing intelligence to the customer interaction process in order to facilitate improved conversion ratio.

New systems will now be based on past data of details of existing customers, their behaviour during earlier interactions with the organisation, correlate it with their possible interests in our offerings and actual transactions of goods and services

made by the customers. While these are static data elements adding study of his 'click stream' as the prospect interacts with the organisation will reveal patterns and establish links with conversion. Assuming that at this stage study of "click stream" has been newly introduced and hence past data is not available relationships, as assessed through correlation, has to be built over time and the system will need to be trained for this purpose through an authentic ML project. The system will be designed to pick up cues from the background and behaviour of the prospect and suitably guide the interaction towards conversion. However, that will be after all the learning has been incorporated in the system. Initially data science and consumer behaviour specialists may be required to establish standards and data, based on which the interaction with the prospect will be led. This is an instance of how an AI/ML initiative commences at the business level, derives from the business strategy, sits atop IT/Digital systems and directly contributes to achieving strategic objectives. In other words, it is truly integrated with the rest of the systems. An AI/ML initiative gains true legitimacy within the organization, from this action of being instrumental in achieving a strategic goal of business and is a necessary, albeit not sufficient, condition for success.

SUPPORTING ELEMENTS

The systems concept is based on the principle of holism but in different contexts holism assumes different shapes. An entity within a particular context, we have seen, is connected to other elements within its context and jointly they form a system. However, if we are studying a process then a holistic appreciation of the process is one that takes an end-to-end view. Successful completion of any process requires all elements of the process to be in place properly, and only if prerequisites are in place will the outcome of the process be satisfactory. This is a critical aspect of AI/ML projects. One of the oft-observed reasons for failure of such projects is the inadequacy of supporting elements. Often one tends to forget that AI/ML initiatives are not self-contained applications but rely, for their success, on the adequacy of certain supporting factors. If these are not addressed, mere linking to business objectives would not ensure the success of the project. In this section we shall dwell on the constituent elements in this implementation project that could facilitate or obstruct its success.

A system is constantly attempting to stabilise and create order. Often these changes are localised ones and may involve a part of the whole, but at times the entire system needs to be changed. For instance, in the case of AI/ML project either a section of the organisation is affected or it is an enter-prise wide initiative where a significant part of the system is engaged. Constant communication, extensive training and discussions on the new systems are essential for change.

DATA

First of these prerequisites is data. In most organisations IT systems are developed for specific needs arising out of the role of functions or departments and individuals and are therefore not readily available to others. For instance, data pertaining to the Finance function would not be available to others in the organization. Even within the function Treasury officials will not have access to the General Ledger or only a small number of people would know about accounts consolidation and so on. There are legitimate reasons for such an arrangement. Imagine the wrath of an Auditor if he/she realises that an employee who is unconnected with the particular process has the access/authority to alter a finance report or even 'read' accounts data before it has been brought into the public domain. However, AI/ML projects, even small ones, require data to be available to several entities across the organization often beyond the confines of any one department.

Let us consider the case mentioned earlier about using AI/ML for enhancing conversion ratio of prospects to customers. In the pre-AI/ML scenario, data of visitors to the portal would, by and large, be restricted to the marketing function. They would engage web designers and try to improve the attractiveness, usability, etc to enhance traffic to the site. The AI/ML project will change all of that. The objective here is to automate reactions to visitors' inputs based on their journey data, clickstream, etc. Such an action will make our responses more relevant in 'the then' context instead of offering a standard response based on past data for an average prospect. Such intelligence may not be possible only by taking data from one source but combining data from multiple sources like Logistics, Warehousing, Customer Relations etc. However, as mentioned earlier, typical IT systems are not designed for such sharing of data or any such integration. The original makers did not envisage such interlinkages and hence the architecture does not facilitate such integration. Now at this stage it may be difficult to redesign the entire data strategy and often the only possible

course of action, is retrofitting the systems to make sure this integration is possible. However, this is usually cumbersome besides which it introduces vulnerabilities in the process. This entire process of integration has the potential to deny success in such projects and it often does. Hence it is imperative that adequate attention is paid to this part of the system at the time of development and ensure close monitoring when it is in operation. Simultaneously the organization ought to focus on developing suitable data strategy aimed at progressively altering this scenario and moving towards tighter integration. Such a step would go a long way in augmenting the organization to absorb technology in the future.

INFRASTRUCTURE

The second crucial pre-requisite whose inadequacy can completely ruin any such initiative is the infrastructure of servers and network and all other concomitants. Requirement of infrastructure is often several notches above that which is required for IT/Digital applications. Consider the above case where in AI/ML is aimed at automating the complex interaction process, making it more on line, real time. The process of computing a response is an extremely resource-hungry transaction that is further exacerbated by the requirement of an online real time response. Appropriate infrastructure of computational and network capacity, which was not necessary so far is now sine qua non and in such cases absence of necessary infrastructure can be the single most critical factor leading to failures. Cloud is a distinct option that the organization could explore for this purpose. However, as in the previous case of data, the infrastructure has to be suitably integrated with existing infrastructure architecture keeping in mind future requirements that will inevitably arise.

SKILLS

AI/ML skills are still not as widely available as required and hence along with preparations for this type of an initiative an assessment of skills, their needs, frequency and extent, in a particular context, will have to be made. Certain skills, not available in-house, are required on a continuous basis, while some may be required on an as-and-when basis. Initiatives, such as the one alluded to in this article, requires skills that may not be in existence within an organization and hence infusion of such skills is essential. This may be achieved by hiring resources for the limited period of the project from external sources or partners. Successful implementation of such initiatives implies their continuance in future and hence there is a need to germinate the skill in house so that when the partner or external resource leaves it can be managed with internal resources. A sustainable implementation demands that the organization manage its own systems effectively.

Systems are combination of individual animate and inanimate elements that are closely interconnected. From this combination of elements, people, processes, practices, systems, management, culture, etc., emerges an internal logic which is the basis for its functioning. When any change to a system is envisaged and initial perturbations introduced, the system reacts based on its internal logic and not always intuitive logic of the implementers. Outcome of efforts is therefore unpredictable and often contrary or at least different from our initial expectations.

Herein one interesting aspect of a system -- "Equifinality" comes into play. Equifinality in a systems context refers to the fact that any task that requires us to traverse from (say) state 1 to state 2 can be completed using any one of several possible paths. This implies that any non-trivial task can be done in a variety of ways. This trait can be utilised by managers to enhance their effectiveness: as the muses point out, a smart operator does not do different things but does the same tasks differently. The hiatus between the paths is difference between efficacy of managers. In this case when deciding partners for implementation we ought to utilise this trait of systems and, along with implementation insist that the partner transfer knowledge to our in-house team. In this case the primary task is implementation of the AI/ML initiative along with which the task of building an in-house team is being effected. This particular action is bound to augment the organization and introduce long term benefits.

IMPLEMENTATION PHASE

Thus far the concentration was on planning and designing for the project. In this several tasks have been identified that, though not obvious, are necessary for successful implementation. (Appropriately strengthening the supporting elements augments the organization and builds capabilities for further absorption of equally or more sophisticated technologies.) Next is the actual implementation phase. If the activities enumerated above have been com-

Successful completion of any process requires all elements of the process to be in place properly, and only if prerequisites are in place will the outcome of the process be satisfactory. This is a critical aspect of AI/ML projects.

pleted properly, management of the implementation project is the next determinant of success.

ORGANIZATION OF THE WORK

A large initiative requires an appropriate organization of the work for smooth implementation. Systems thinking insists that probability of success is greatly enhanced when the entire system is involved in implementation. A common objective of implementing this initiative is what unites all elements of the system and needs to be communicated unambiguously. Adopting a top-down approach to the entire implementation process conveys a serious message to all members involved. This is achieved by visible participation of top management in all phases of the project with reinforced focus during implementation. In addition to individual efforts of members concerned, a multi-disciplinary organization drawn from different parts of the system that takes away narrow and parochial ownership of any one function. It is imperative that the project is viewed, not as a technology based one but as a part of business' strategic actions. Must be remembered that this is not an IT project but an organization wide initiative and has to be seen as such. In exceptionally large projects, teams of integrators are formed whose role is to integrate efforts of each team. Organizing in this manner will ensure that the system works as one united whole and not as a collection of parts.

INTERNAL LOGIC

Systems are combination of individual animate and inanimate elements that are closely interconnected. From this combination of elements, people, processes, practices, systems, management, culture, etc. emerges an internal logic which is the basis for its functioning. When any change to a system is envisaged and initial perturbations introduced, the system reacts based on its internal logic and not always intuitive logic of the implementers. Outcome of efforts is therefore unpredictable and often contrary or at least different from our initial expectations. Gaining full appreciation of the internal logic of an organization is a difficult task and problems are further exacerbated by the ever changing, dynamic nature of the logic. Hence one important act is to constantly monitor progress and highlight discrepancies. Open discussions are essential to draw meaningful conclusions in such cases and aggressive superior officials could be a major impediment to such interactions. A basic premise of systems is open flow of information throughout the system and this information is acted upon by constituents of the system. This ensures that we are in synch with any specific trend of the system.

PROJECT MANAGEMENT

As a practice this is widespread and any large project today is equipped with a PM software as well as PMO (Project Management Office). While these are critical components, they do not ensure success automatically because that will depend largely on how honestly management processes are adhered. Observations suggest that focus of the PMO is mindlessly on time and cost overruns and implementers are hauled up and paraded over the coals for deviations but actual situation on the ground is rarely discussed. Seldom does the boss attempt to ascertain causes for delay or cost excesses. These could arise for factors beyond the control of the official concerned. Honest assessment of the situation is put down forcibly and bosses appreciate "everything is fine" messages. From the systems

perspective information flow has been curtailed resulting in distortions in the functioning of the system with possible sub optimal consequences. A free discussion-based appreciation of ground realities, a collective response to solve/resolve problems is necessary for true success.

An organization wide initiative coupled with a formal project management tool would help the implementation process if accompanied by free flow of information and consequent action. Management of such projects would involve network monitoring and taking suitable corrective action as may be required. By and large the aim should be to follow Agile methodology and present a MVP (Minimum Viable Product) as the first deliverable. This would provide stakeholders the much-needed confidence to support this project and allow for adequate time for further deliverables. Success in project management can be achieved only if an atmosphere of openness prevails where honest and free discussions are possible and bosses do not intimidate presenters into stating what he/she thinks the boss wants to hear.

CHANGE MANAGEMENT

A factor that is often an impediment to smooth implementation is lack of change management. In a system, owing to constant change internal adjustments are always in progress. Accordingly, a system is constantly attempting to stabilise and create order. Often these changes are localised ones and may involve a part of the whole, but at times the entire system needs to be changed. For instance, in the case of AI/ML project either a section of the organisation is affected or it is an enter-prise wide initiative where a significant part of the system is engaged. Constant communication, extensive training and discussions on the new systems are essential for change. Using an important and vital trait of a system whereby it inherently tries to reach "order" through a process is known as "self-organisation". People are trained to utilise the new system and work on processes defined for this purpose. The involvement of significant numbers spread throughout the systems ensures participation and buy-in that are necessary for success in such cases. These teams would be in constant communication with each other, exchanging notes and sharing learning to augment capabilities and facilitate the change process. Systems thinking recommends this self- organization process for a thorough change management within the system.

IMPORTANCE OF AUGMENTING SYSTEMS

Sustainable implementation requires the process to not only implement the specific project but in the process augment organizational capabilities so that such newly introduced systems continue to function for extended periods of time. Additionally, this augmentation facilitates absorption of more sophisticated technologies, as shall be countenanced in future and extended usage of these systems will enhance organizational capabilities. In systems parlance augmenting the system is critical as it the system that delivers. As mentioned earlier every system especially large and complex ones function on the basis of logic that is internal to it. Now, augmenting organizational capabilities push the potential envelope of achievement higher. This is why it is often said that it is the system that delivers and strengthening the same is a sure path to success in future implementations.

FEEDBACK

While our discussion so far has been exclusively on implementation an important point to be borne in mind is the need for smooth continuance of the project post implementation. To that end a healthy feedback system is essential as systems approach avers. The following paragraph elucidates this point further.

A prerequisite for the proper functioning of a system is the free flow of information through the system. This entire free flow is facilitated by the existence of a surfeit of interconnections between constituent elements. These influencing links also provide a two-way path for information. This can be a vitally important resource if used in constructive manner. Quite naturally a system houses sensory sub-systems to recognize these and initiate appropriate corrective action in functioning.

The machine learning model developed at the initial stages would, after some time, need to be modified to accommodate environmental changes that would inevitably arise. This inadequacy would be reflected in the outcomes and would call for improvement of the original model. Thus institutionalising a holistic approach towards feedback gathering from the environment needs to be in place so that feedback driven by relevant changes and processes are captured and the model goes through a cycle of continuous improvement. This institutionalising would require the operationalization of the criticality of feedback through organisational limbs, with responsibility assigned to certain qualified and suitable people.

ENDNOTE

The article has tried to present the multifarious aspects of actual implementation of AI/ML projects. As has been emphasised, there are several points of vulnerability and "proper" management of all of these is quintessential to success. This explains the extremely low rate of success in such projects throughout the world. If, as has been stated in this article above, adequate measures are adopted chances of success would be appreciably higher ■

Distributed Cloud: Why It Is A Priority Tech Trend

Many organizations are gradually moving towards distributed cloud systems, wherein centralized clouds are augmented with the help of intermediate clouds and edge clouds.

By Jagannadh Kanumuri

The dynamics of how firms function have changed as a result of Covid-19. It's all about remote work these days, and it's here to stay. We will most likely never work exclusively from a shared workplace again. Instead, most businesses will use a mixed approach, commonly known as a hybrid model. The cloud has played a critical role in making this possible.

According to research by Gartner, by 2024, most major cloud service platforms will provide at least some distributed cloud services that execute at the point of need. They can significantly enhance the overall performance and enforce better security without compromising financial and operational dynamics.

The traditional centralized cloud approach is now altering with the growing demand for sophisticated data analytics, real-time web-based services, complex mobile applications, etc. Many organizations are gradually moving towards distributed cloud systems, wherein centralized clouds are augmented with by intermediate clouds and edge clouds. With AI, ML, and other advanced data-backed software solutions dramatically rising, there will be a pressing need for distributed cloud-based services.

The cloud model is hybrid, just like the new work model. Businesses are using public cloud resources, and private cloud data centers are located within organizations. However, the correlation between private and public clouds is fragile. Monitoring, orchestrating, and provisioning are managed differently in public and private clouds. Such a distributed system offers more incredible speed and efficiency reduces latencies and gives an execution-rich working atmosphere. In a distributed system, the data processing is done near the origin rather than on a remote cloud, which increases overall operational efficiency. Such systems also help deliver video content faster, as they can plug in geographical distances more effectively.

Extensions for cloud service providers

Today's leading cloud service providers (CSPs) offer cloud service extensions that can be deployed at your company's periphery. Outposts are a feature of Amazon Web Services. Anthos is a Google Chrome addon. The Azure Stack is provided by Microsoft. Although each CSP solution is unique, they all seek to coordinate cloud and on-premises installations.

APIs, a uniform workload deployment methodology, and tools for centralized management and monitoring across on-premises and cloud systems enable synchronization. Consider using these CSP-provided technologies to govern your hybrid cloud workloads, whether on-premises or in the public cloud. The shared responsibility paradigm of the cloud provider must enable dispersed cloud governance, which is currently not feasible.

Reduced IT expenditure, better network scalability

In the current times, businesses need to be agile, resilient, and flexible. In a volatile and complex business environment, organizations have to constantly scale up, scale down, rework business models, and fine-tune their go-to-market strategy. Adopting a distributed cloud network, wherein different applications are run on various servers, are more suited for scalability and give additional layers of resilience to business to cope with changing environment.

In such systems, if there is a change, the specific server can be modified accordingly without interfering much with the central server. If a crash occurs, it won't affect the entire system. In contrast, in a centralized cloud, a possible crash or showdown can reverberate across the entire system, creating a huge bottleneck.

Compared to a centralized cloud, a distributed cloud is more cost-effective as it requires limited infrastructure investment, lower maintenance costs, and fewer overheads.

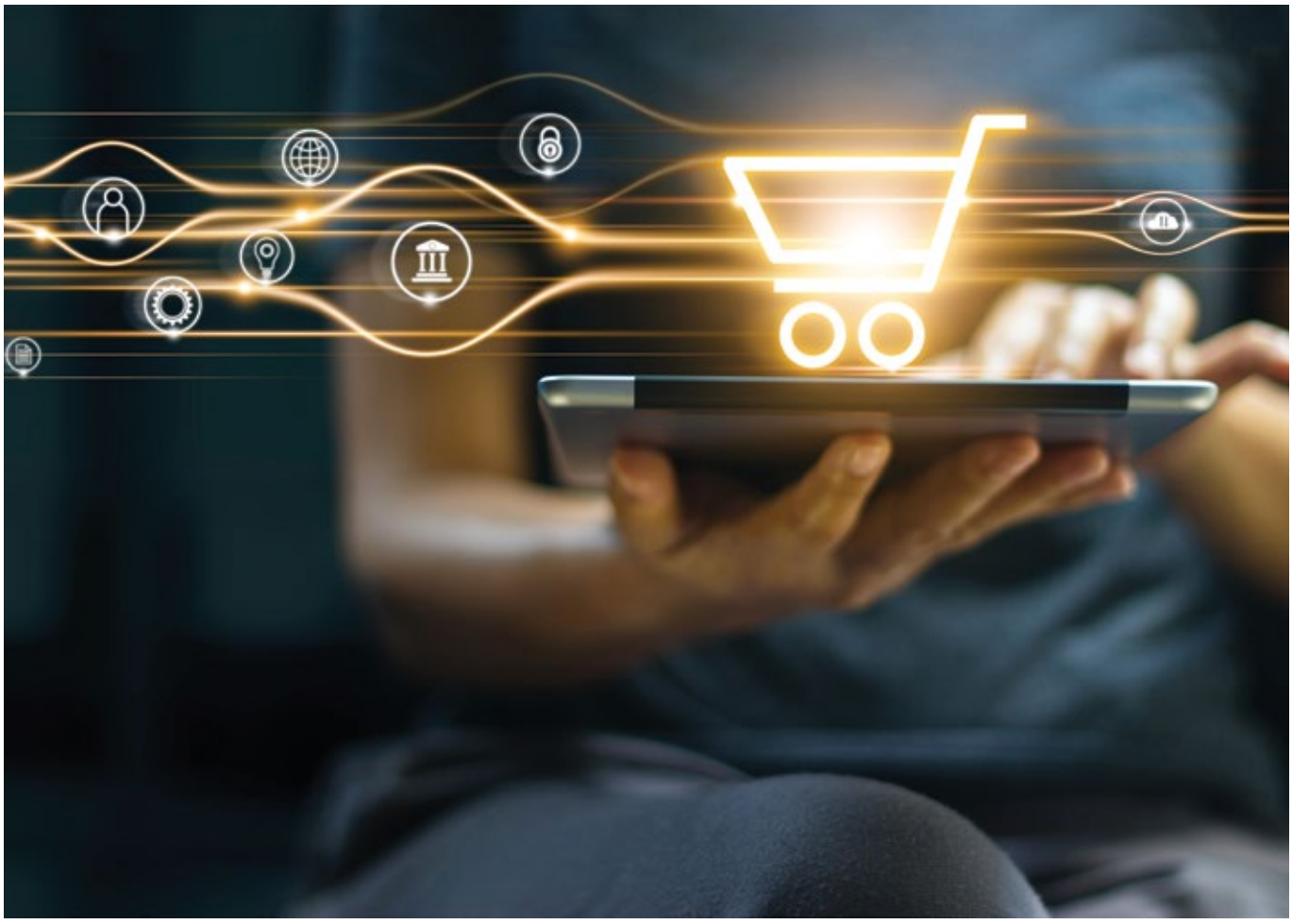
The cornerstone of 5G

In the wake of the 5G deployment, the overall data traffic will proliferate massively. 5G will drive the usage of smartphones, wearables, and sensors, and there will be an increased appetite for high-bandwidth real-time applications. However, the centralized cloud approach can add latency and impede high-data-centric real-time applications. A possible alternative will be distributed clouds with an increased focus on edge computing. With the advent of distributed clouds, computing can be conducted within office premises or nearby locations rather than on centralized clouds, thereby optimizing the last-mile bandwidth issues.

Distributed clouds will also usher in a new era of high-speed AI/ IoT/ML-based applications. It will enable business owners to adopt advanced and robust applications. It will contribute to the further evolution of multiplayer gaming and remote meeting software. In the foreseeable future, distributed cloud-based systems have the potential to reshape how data is stored, run, and retrieved. As the future will be marked by a steep hike in the adoption of sophisticated analytics, proliferation in connected devices (smartphones, smart watches, wearables, etc.), flexible working systems, and bombastic growth in video consumption, distributed systems will become very popular ■

—The author is President & CEO, ACI Infotech

How automation and AI are giving a boost to Indian retail sector



Automation is making it easier for businesses to run their operations more efficiently.

By Vinay K Mayer

With the world already heading towards a more digital and omnichannel approach to connecting with customers, retailers inevitably have to start employing technology in the most effective possible way to take things forward.

By 2026, the global retail automation market is expected to reach a value of $24 billion and still rise further, fueled also by rapid advancements of artificial intelligence as well as innovative technologies revolutionizing various industries such as banking, healthcare and more so all other sectors are bound to follow suit.

Technology has become increasingly important for retailers as it allows them to run their business more efficiently and effectively. There has been an exponential rise in the popularity of these automated retail solutions, although this is not a new phenomenon. Let's look at how automation can be used to bolster the growth of retail in India.

Significant transformation

The growth of e-commerce has given a major boost to the growth of online retailers in India. Indian eCommerce is expected to reach $75 billion in 2022, according to statistics.

This growth is due to two factors – first, the increasing affordability of smartphones and internet access. Second, the rising trends towards consumerism and buying experiences that are available through e-commerce platforms.

Automation is making it easier for businesses to run their operations more efficiently. Increasing automation has also led to cost savings for businesses, enabling them to grow more rapidly than their offline counterparts.

Apart from cost savings, automation also enables businesses to better focus on their core competencies. In this way, online retailers can focus on marketing their products rather than having to deal with the logistics involved in operating a physical store.

The rise of automation and its impact

Automation has made the retail industry more efficient. Retailers have been able to improve their operations and increase profits as a result of using these technologies, which include inventory control, order processing, and customer service. These innovations are among those that let companies take full advantage of the versatility offered by automation!

In addition, online retailers are now using automated systems and softwares to handle customer orders efficiently. This ensures that customers receive the items timely.

And with the world already heading towards moving towards a more digital and omnichannel approach to connecting with customers, retailers inevitably have to start employing technology in the most effective possible way to take things forward.

Chatbots, for example, are improving how retail professionals interact with customers. This is because they can better serve their queries or make suggestions regarding merchandise based on a deeper understanding of what they're looking for.

Improving customer experience leveraging AI and ML.

AI can be used to identify customer needs and preferences, recommend products and services, and even automate customer service.

In addition to automating customer service, AI can also help retailers improve customer loyalty by personalizing experiences and recommendations. It helps to foster relationships with customers.

AI can also help retailers improve their marketing campaigns by using data to target potential customers with the most relevant offers.

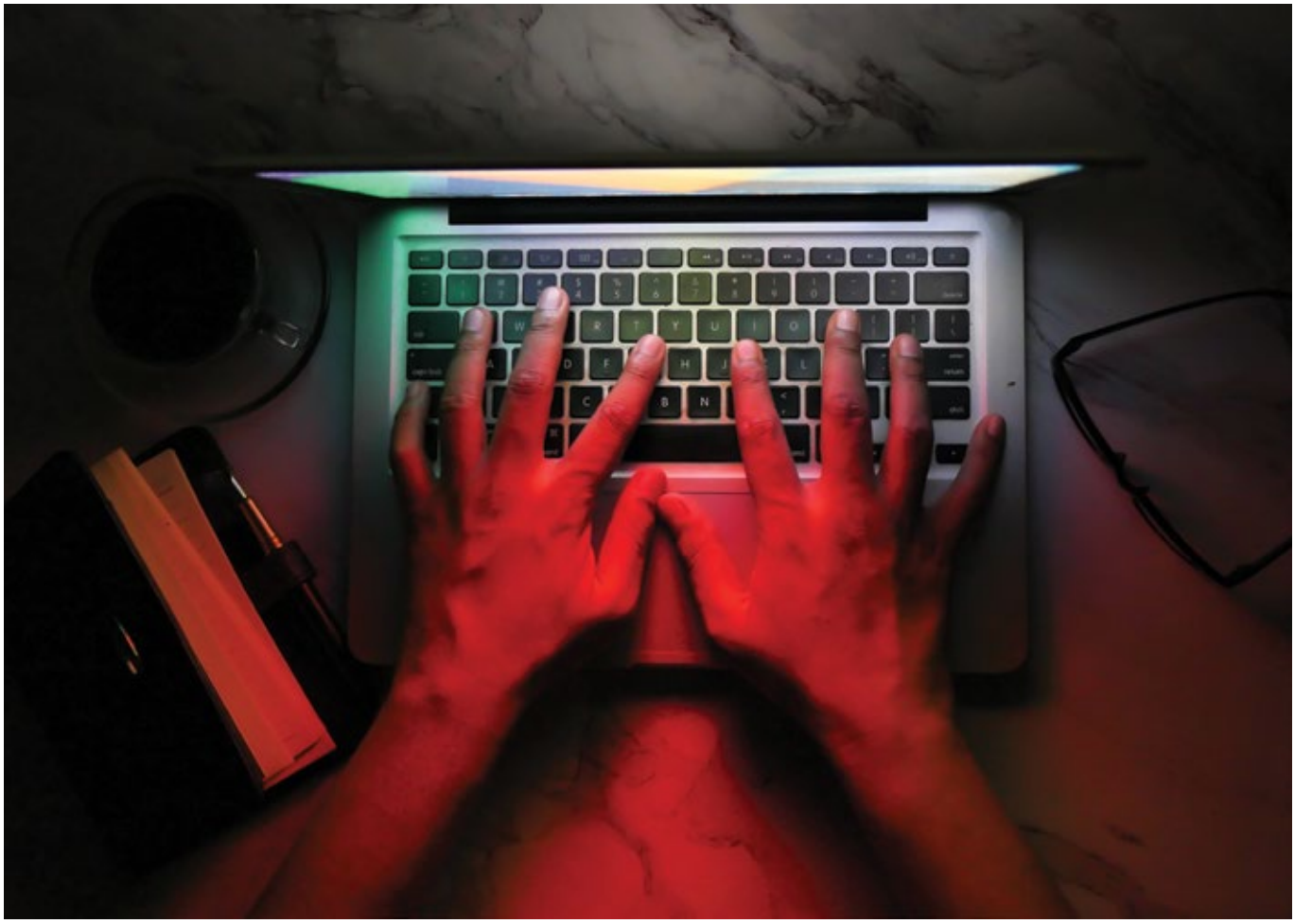
Overall, these technologies are providing a wealth of opportunities for Indian retail businesses to keep up with the competition and deliver seamless customer experiences across multiple touch points.

Bottom line

Indian retail is taking a big step in advancing and modernizing, specifically when it comes down to integrating technologies like IoT and AI (Artificial Intelligence) into their business. It will become increasingly digitized as India continues to integrate new technologies. So, by utilizing these developing technologies, Indian retail businesses can provide their customers with seamless experiences ■

—The author is Director, Market Research & Consulting at Asia Research Partners LLP

To pay or not to pay ransom settlements



Payment does not guarantee files will be recovered. It may also embolden adversaries to target other organizations, encourage other criminal actors to distribute ransomware, and fund illicit activities that could potentially be illegal.

By Vishak Raman

Ransomware is one of the top threats facing organizations and individuals today. In fact, according to a recent survey, 85% of organizations are more worried about a ransomware attack than any other cyber threat. Anyone can unwittingly initiate a ransomware attack by simply clicking a link or downloading a malicious file. And while often someone may feel desperate and want to pay the ransom or a ransomware settlement to regain access to critical data, it is a decision that should be considered very carefully.

Should You Pay Ransomware Attackers?

Whether you should pay the ransom, in either case, comes with the fear that you won't get your bookbag back or the encryption key after paying. It is hard to put any faith in the goodwill of bullies or cybercriminals. Instead of returning your stuff (information) you likely want to keep private, they could simply empty your "bookbag" and all of its contents, including sensitive data, on the internet for all to access and use.

Or they could give your data to another bully or criminal to do what they will with it. In this instance, paying doesn't solve your problem and makes you considerably poorer. In other words, paying the ransom could mean your organization has no "bookbag" and no "money for lunch". And perhaps, worst of all, you now have a reputation as an easy mark and a "payer" that can be easily and frequently bullied.

Is paying ransom illegal?

Victims of ransomware attacks who feel compelled to pay cybercriminals often wonder if it is illegal. There is no law against paying the ransom when an organization's data and systems are taken hostage. However, it is strongly discouraged by those of us in the cybersecurity industry to pay cyber ransoms or succumb to extortion demands.

Payment does not guarantee files will be recovered. It may also embolden adversaries to target additional organizations, encourage other criminal actors to distribute ransomware, and fund illicit activities that could potentially be illegal.

Can law enforcement help?

The mission goals of legal authorities and your organization may not entirely align in all cases when enforcement might be prioritizing an investigation, and your organization may prioritize a return to business processes and tasks. Regardless, law enforcement can be a great asset, but they should be part of your organization's incident response plan, not in place of one your executive leaders have considered, IT and InfoSec staff, and legal teams, among others.

Looking for help after an attack is a key problem and the definition of "reactive." You never want to get to the point where you must pay the ransom. The best way to avoid ransomware attacks is to have a good defense.

How to prevent ransomware attacks

The best practice for organizations and individuals to protect themselves from ransomware attacks is to incorporate these actions into your cybersecurity defense posture:

- Take cybersecurity training seriously and encourage employees to do so as well
- Avoid clicking on suspicious links and practice good cyber awareness
- Download only from trusted sources
- Scan emails for malware
- Employ firewalls and endpoint security products that are integrated with actionable threat intelligence
- Back up important data
- Use a VPN when on public Wi-Fi
- Have an incident response plan in place

What to do if you are the victim of a ransomware attack

Organizations can limit ransomware's impact by taking quick action. First, you must isolate the ransomware. This can prevent horizontal attacks, where the ransomware spreads from one device to another via network connections.

To isolate the ransomware, you must shut down the infected system. Then disconnect anything that links the infected machine to the network or other devices on the network. By "pulling the plug" on the system, you can stop the further spread of ransomware. This is when the initial implementation of segmentation is really helpful to make this process a lot easier and more effective.

Next, you need to figure out what malware has infected your system with ransomware. It's typically not just a ransomware attack. Ransomware is usually the last part of a bigger attack. Understanding what kind of malware is involved can assist the security incident response team in crafting a solution or, in some cases, use a decryption key already available for certain malware.

Data recovery

To successfully recover data, your organization needs to have a data recovery program set up before an attack. If backups are scheduled for several times a day, a ransomware attack might only cost your organization a few hours.

Whether you use cloud services or on-premises hardware to make copies of your data doesn't matter. It doesn't matter. You just need to be able to access the backup files from an unaffected device ■

— The author is Vice President of Sales, India, SAARC, and Southeast Asia at Fortinet.

AI Powered Claim Processing Through Chatbots

The AI-powered tool can simplify the entire expense management – from tracking to controlling all expense related issues.

By Abhinay Deshmukh

Customer Servicing is one of the great challenges the insurance industry is facing today. The digital customers of today expect transparency and better experiences on any end-to-end transactions like expense claim, its quick approval and payment processing.

In any organization, if employees travel for work, they need to submit expense receipts to claim reimbursement. Keeping track of all expenses that employees incurred is crucial to managing the cash flow. Also, any slip-ups in this process could lead to problems such as inaccurate claims, unclear policies, and even fraud. These are some of the common expense reporting issues that organizations face.

AI enabled chatbots for addressing the challenge

Chatbot is an intelligent, lightweight, and rich user interface software which offers a real-time conversational experience using artificial intelligence and natural language processing to mimic conversations with real people. Chabot is an advanced real-time software that learns from past conversations, trains itself and gives excellent and accurate responses to the user queries.

The AI-powered tool can simplify the entire expense management – from tracking to controlling all expense related issues such as detecting policy violations, suspicious expenses and inadequate bills in an automated way. Some of the key factors that are driving the adoption of AI-powered chatbots for claim processing are:

User friendly and quick resolution

Due to the rapid spread of 4G and 5G telecom services, it's easy-to-get access to the various websites and platforms via chatbots over the internet. Also, the chatbot design or User Interface is the most important factor. UI is the most sensitive and key element where the customer knows the definition, role and expectations of your chatbot user interface. The chatbot UI and its response to resolve the customer query are the key factors for which the customer wants.

No geographical boundaries

As With increasing travel & commuting and expanding geographical boundaries, restrictions on where customers can file the claims may not be the best experience insurance companies can provide. It has been said that the language keeps changing every 150 KM you travel, irrespective of your demographics or direction. When it comes to expanding your business globally, we need to be capable of communicating in multiple languages no matter what your geographical location is, and our solution is capable enough to access from anywhere any time. Due to increasing travel & commuting and expanding geographical boundaries customers can claim reimbursements from anywhere.

Personal data security

Chatbots are often used for lead generation and collect information like names, emails, phone numbers, etc. Rule-based chatbots are a great example of such: they ask simple questions and accept inputs just like a regular website form. GDPR requires companies to explain how this data will be used. (GDPR) is a set of rules that gives citizens of the European Union legislative control over sharing, editing, and removing their personal data online

Faster payments and quick settlements

This factor is the heart of the claim processing. If customers feel the claims settlement process is lengthy and time-consuming, it contributes to dissatisfaction. All the claim processing activities need to be taken care of in the backend with very minimal time. The whole business depends upon how fast you finish them and final reimbursement amount transfer to the user bank account.

24×7 customer support required

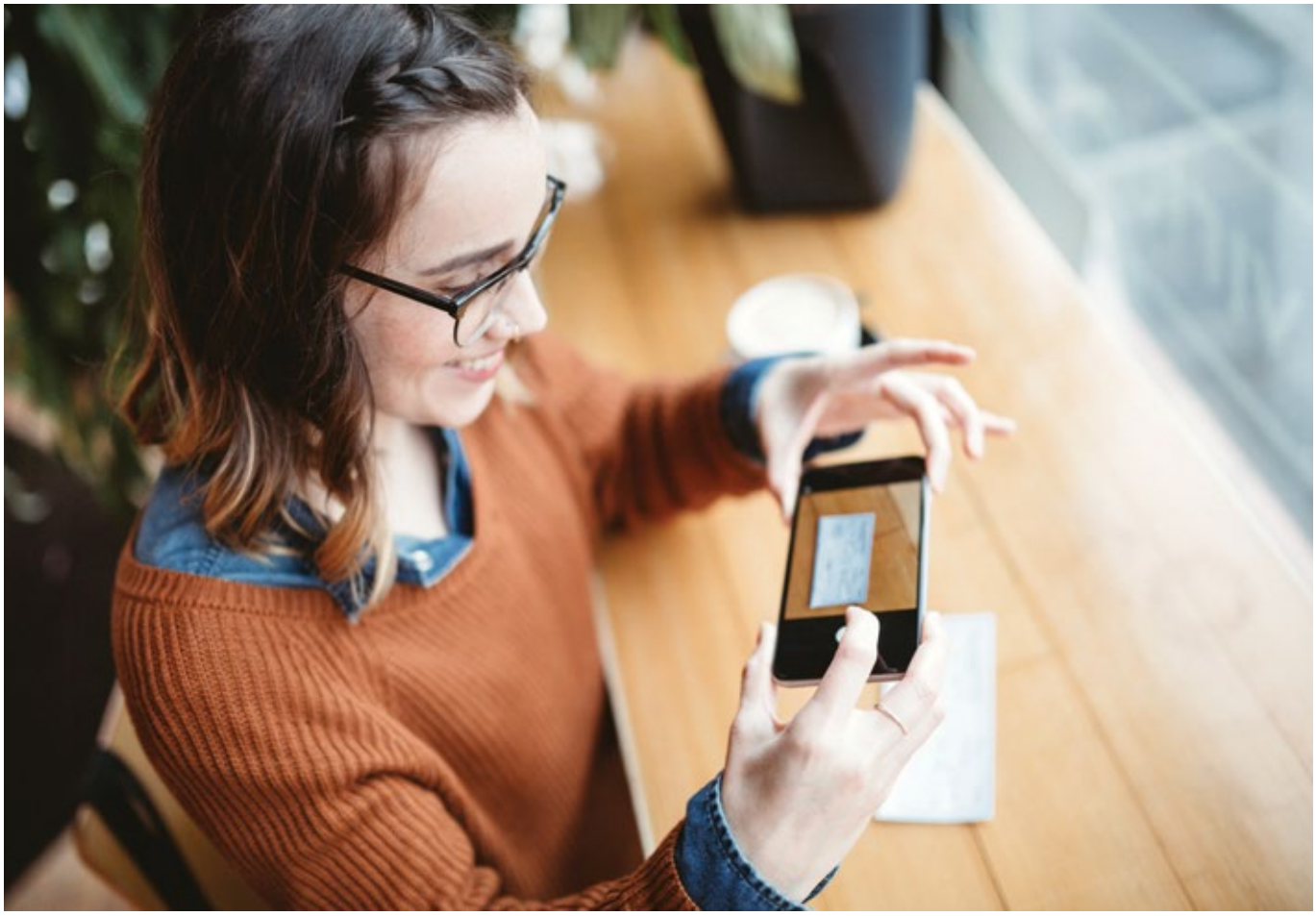
Chatbots can answer customer queries 24/7. So, once you deploy one on your website, you can expect it to solve customers' fundamental problems round the clock. Customers can request his claim anytime, anywhere from the globe. The 24*7 customer service chatbot improves efficiency across the claim value chain and helps the companies to empower their customers in a way that inspires loyalty and advocacy.

Conclusion

Rapid advances in technologies over the next 15 years will lead to disruptive changes in all the industries. Companies that adopt new-age tech to develop innovative products like chatbots. This is the one solution that can easily be shaped into rapid customer needs and satisfies the modern customer needs, and which is applicable across all the industries and functions. We can harness its cognitive learning insights from a variety of data points, streamline processes, and more importantly, personalize the entire customer experience will be the winners in the AI Space. Hence its popularity has drastically increased day-by-day ■

—Abhinay Deshmukh is RPA Consultant at Atos India

How Refyne Is Harnessing AI -ML To Drive Payroll Innovation



The company's platform enables enterprises to provide their employees access to the earned salary any time before payday

By Jatinder Singh

Refyne, which claims to be India's first and Asia's largest earned wage or on-demand-pay platform, says it plans to use deep-tech capabilities to scale, develop more products and make its solution available to a larger pool of salaried people.

The Bengaluru-based startup allows businesses to give their employees access to their unpaid wages at any time before payday, providing them more financial flexibility. By leveraging its analytics-based AI engines, employers can get real-time insights into employee usage of their earned salary and operate and monitor workforce financial offerings.

"Compared to the traditional pay cycle, employees can access their earned salaries at any time before payday at a nominal transaction fee. This gives greater financial flexibility to employees, enabling them to meet their expenses and attend to medical and other emergencies, but it also helps enterprises offer a stress-free work environment," says Apoorv Kumar, CTO & Co-Founder, Refyne.

Leveraging AI, ML, and DevOps

Refyne is exploring the potential of AI, machine learning, and DevOps to grow its user base from 1 million to over 3 million in the next twelve to eighteen months.

"We have been leveraging deep-tech capabilities such as AI & ML to enhance the Optical character recognition (OCR) to categorize and identify data type and correctness while capturing data from photographs of documents such as Aadhar, DL, PAN, and Voter ID. This eases the process of signing up for KYC for users. It also enables us to build technology that helps partner firms not tech-savvy optimize processing structures," says Kumar.

The fintech solution provider says it has built a real-time KYC system and AI-driven underwriting algorithms. "At Refyne, we are also building a new layer on top of AI and ML capabilities commoditized by Google and Amazon to help us capture revealing data on user behavior that we can use to optimize our technology further," Kumar adds.

Its platform can automatically track real-time salary updates that enable employees to access their earned salary any time before payday. The company says that it relies on a super lean team and extensive automation with DevOps.

But does it impact the enterprise payroll management system? "No, our plug-and-play solution works in tandem with the employer's attendance and payroll management system, allowing employees to view their earned salaries in real-time. The employer's working capital situation remains unchanged. Refyne fronts the withdrawal and credits the money to the employees' salary accounts without affecting the organization's payment process," Kumar updates.

The big challenge

According to a research study by EY, employee liquidity crisis has far-reaching effects. It says that 81% of Indian employees have faced a financial shortfall between pay periods, and 72% resorted to alternate finance options to access liquid cash, while 42% expect their employers to secure their financial well being

"Due to various macroeconomic changes, employees' worklife is challenged by increasing job insecurity. There are several instances where employees are unable to fund emergencies, creating a stressful financial situation for themselves. In such a scenario, employers can ease their employees' financial stress by helping them manage their personal financial obligations better. This can be achieved if employers increase liquidity for employees and facilitate access to continuous cash flow to meet unexpected expenses. EWA is one such benefit that addresses these financial problems," the study notes.

Even though the EWA concept has seen widespread adoption in the United States and many areas of Europe, few employees and organizations in India are aware of the full range of benefits.

"There are some initial challenges in creating awareness about this progressive concept amongst organizations. People are usually set in their ways when managing finances and may shy away from trying new things, especially a new financial tool like EWA. Our efforts are channelled towards educating organizations and people about the benefits of employee financial well-being and benefits associated with earned wage access," explicates Kumar.

Refyne's core model for Earned Wage Access (EWA) has been designed to collect data in a consent-oriented way. It says that when it integrates with employers to extend EWA to their employees, data only on those who have agreed and consented to be users of Refyne is collected and not the entire employee base.

What's ahead

The Tiger Global and QED Investors-backed firm launched in December 2020, claims to have worked with over 200 companies and served over 1 million employees. The clientele brands include Rebel foods, Acko, Practo, Café Coffee Day, Cars24, Epigamia, and Car Dekho, among several others.

The company is also working towards developing analytics-based intelligent proprietary products such as Refyne Score and its proprietary integration framework that works across ERPs, HRMs, and accounting systems ■

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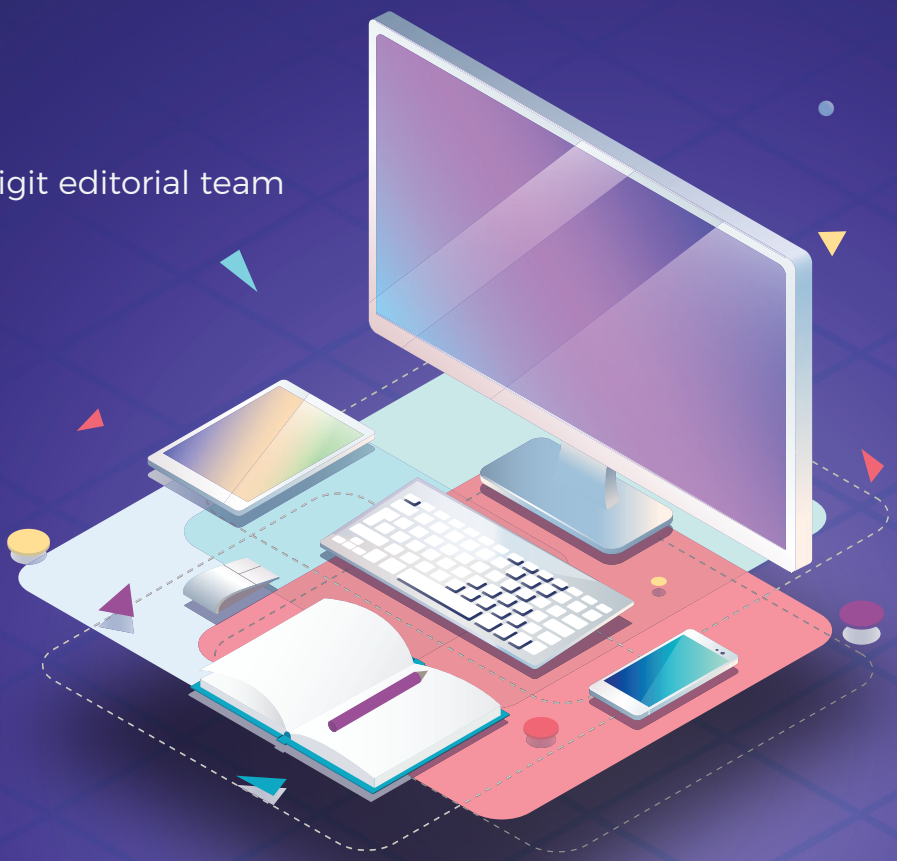

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