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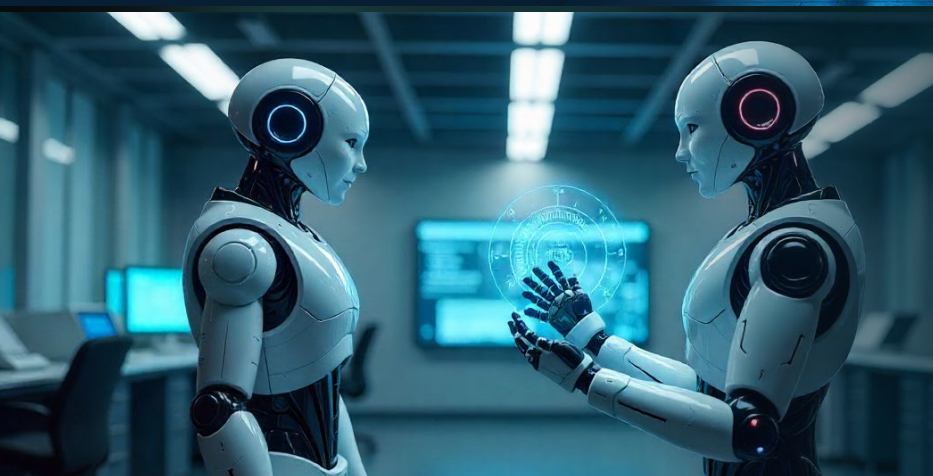
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**IS AGENTIC
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**BEYOND PURE
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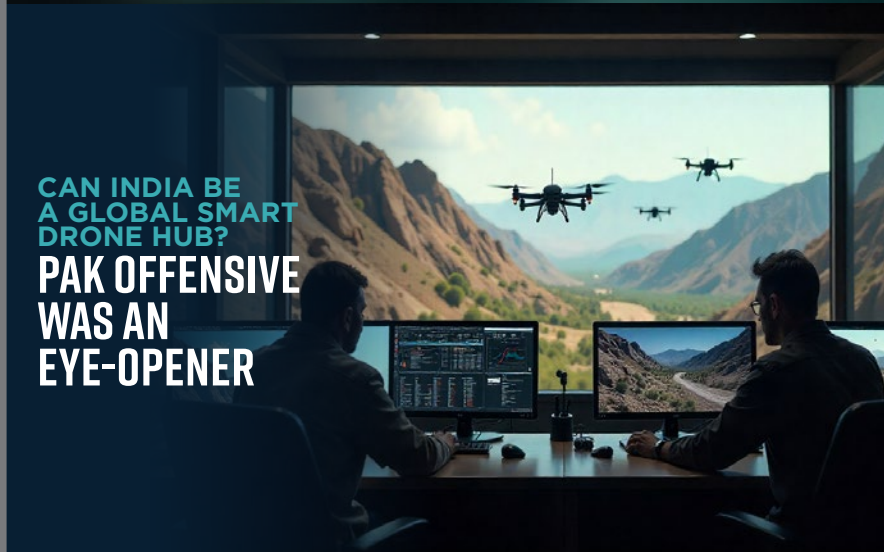
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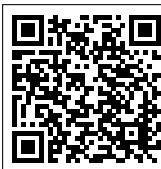
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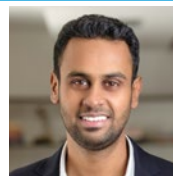
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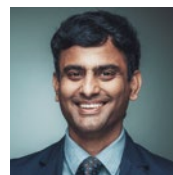
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OFFICES

GURUGRAM (Corporate Office)

Cyber House
B-35 Sector-32,
Gurugram,
Haryana - 122 003
Tel: 0124 - 4237517
Fax: 0124 - 2380694

BENGALURU

205-207, Shree Complex
(Opposite RBANMS Ground)
#73, St John's Road,
Bangalore - 560 042
Tel: +91 (80) 4302 8412
Fax: +91 (80) 2530 7971

MUMBAI

INS tower, Office No. 326,
Bandra Kurla Complex Road,
G Block BKC,
Bandra East,
Mumbai - 400051
Mobile: +91 9969424024

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FORGET POLITICS. BUILD A GOLDEN TECH ROAD.

It's time to forget the Donald Trump trade war, America's unreliability with us and their friendship with Pakistan. We will need to move forward with our own plans in order to achieve our goals.

Reverse the Brain Drain: The new administration is chasing away all manner to Indians: From permanent residency seekers to H1B holders to students. If this continues, there could be a glut back at home. Startups have to be even more simplified to attract talent while the government needs far more lateral entries for technocrats.

Diversify to other countries: If our talent is good enough for America, then it is good enough for the rest of the world. Tie up with more and more developed countries so that our students and professionals can be trained there.

Sign trade deals: America is a bully. It will be difficult to get a great deal for us. We should engage with other countries on an equal basis. That way we have signed a really good deal with the UK that will help our qualified professionals, especially in AI.

Defence tech: We have really enhanced our defence capabilities and have started exporting to the world big time. We are on our way to becoming a soft power in this. Such industries will help us counter the US.

In *The Golden Road: How Ancient India Transformed the World*, historian William Dalrymple talks about the pre-eminence of India in trade in the ancient ages. We established peak of Indo-Roman trade once and a record number of Roman coins have been found in India. We spread goods, mathematical and astronomical ideas far and wide.

It is time for us to build a new Golden Road on the information superhighway, based on technology and AI. Already Indian services have become a powerhouse for the developed world and our drug factories that for the developing world.

We have reached a stage where BRICS Bank, BRICS Pay, UPI and a few other systems could take over the financial system of the world. It may not happen overnight, but it will take a long time. The West will fight tooth and nail; that's why Trump hates BRICS. In the past the French franc, Venetian ducat, and Spanish dollar were all powerful. Then the pound sterling gave way to the dollar. The dollar will not last forever.

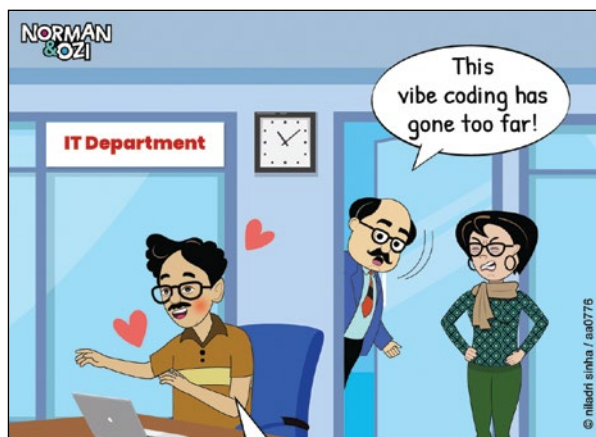
In the world, India has the highest population, the highest working youth and its stream of engineering college students. That is unlimited potential. If we could tap all that, we would surely become a tech powerhouse for the ages.



Sunil Rajguru

sunilr@cybermedia.co.in

TECTONIC



AI, please write code to make the Boss give me 80% hike and a double promotion. Insert code into our HR system!



Congratulations team! We successfully integrated 50 apps into one unified Super-app!

Will the future be Consolidated Platforms or Expanding Niches?

The enterprise SaaS industry is experiencing a major shift. What was once a chaotic assortment of niche tools is coalescing into a wave of consolidation, unified platforms, and AI-native reimagination. With companies evaluating their software stacks due to changing business priorities, inflation, and the potential of generative AI, the central question is whether the future of SaaS will reside in all-in-one giants or in a colourful ecosystem of specialised, modular offerings.

By Aanchal Ghatak



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Enterprise Software as a Service (SaaS) has reached a strategic inflection point. On the one hand, surging demand for cloud, AI, and digital transformation continues to drive growth in the space. On the other hand, rapid disruption from AI-native competitors and shifts in capital market pressures continue to change the landscape for scaling or exiting SaaS businesses. The industry must ask itself: will the future of growth be primarily through expansion, increasing customer numbers, verticals and geography or will future growth primarily be through consolidation with larger players adding niche capabilities and then abandoning competition?

MARKET EXPANSION: THE CASE FOR GROWTH

1. Massive Market Growth Ahead

- The global SaaS market is projected to reach US\$370 billion by 2025, growing to US\$842 billion by 2030, at a 17.9% CAGR by 2030, mostly tied to enterprise migration to cloud-native, pay-as-you-go consumption models. (Mordor Intelligence)
- Within B2B SaaS general space that is even stronger, size of the market is expected to continue to rise 26.9% CAGR from US\$390 billion to over US\$1.3 trillion between 2025 and 2030.

2. AI Integration as a Growth Multiplier

- AI is already integrated into 40-54% of software

solutions aimed at automation, analytics, or intelligent agents, a 2023-24 trend driving engagement, predictive capabilities, and upsell velocity. (Market Growth Reports)

- Enterprise customers are on a growing adoption curve towards AI-driven copilots and business-outcomes based pricing models, paving the way from seat-based licensing to modeled business value.

3. Geographic and Vertical Expansion

- For the regions, Asia-Pacific, more notably India, is expected to come in strong, with a Growth Rate of approximately 19-25% CAGR. According to multiple industry reports, India's SaaS revenues crossed US\$15 billion in FY24, with over 36 firms reaching ARR > US\$100M.
- Vertical SaaS: Applications focused on specific industries like healthcare, logistics, and legal is growing significantly, representing well above 30% of new SaaS deployments in 2023-2024 and will become the focus of increasing investment and strategic attention.

4. SMB and Hybrid Cloud Penetration

- The SME market is the fastest growing driver of SaaS towards 2030, with CAGRs projected ~19-23%.
- Hybrid cloud SaaS will grow at ~22-27% CAGRs by 2030, reflecting a growth in demand



In the early stages of a hype cycle, features masquerade as products, and products masquerade as companies. But now, many single-product startups are under pressure. Larger platforms are incorporating those features natively.

- **Ramprakash Ramamoorthy**, Director – AI Research, Zoho



“Choosing a vertical SaaS solution doesn’t mean sacrificing integration. The future lies in intelligent, AI-driven, industry-specific platforms that are contextual, scalable, and agile—addressing gaps where traditional horizontal SaaS often falls short.”

- Kiran Menon, Senior Director – APAC & Middle East, Phenom

for data-sovereignty, multi-cloud orchestration, and compliance across enterprise customers.

MARKET CONSOLIDATION: THE FORCES DRIVING M&A

1. Strong M&A Activity & Elevated Valuations

- In Q1 2025, private equity (PE) acquirers closed 73 enterprise SaaS transactions that totaled US\$15.3 billion—a 12% increase compared to Q4 2024.
- Strategic acquirers also executed 137 transactions (~\$13.8 b deal value), shifting focus to AI and automation, and looking for high-synergy acquisitions rather than volume acquisitions.
- Average SaaS revenue multiples remain healthy: ~11 x ARR, and ~18-22 x from niche top-growth SaaS. Public SaaS multiples averaged ~7.6x revenue (median 5.45x) in early 2025.

2. Cybersecurity as a Mega-Consolidation Play

- The cybersecurity SaaS market is accelerating toward consolidation as witnessed in an unprecedented month of announced M&A activity of more than 42 transactions in May 2025, as legacy platform vendors are acquiring AI powered threat platforms.
- Valuations in mid-market cybersecurity average 8-10x revenue, and major transactions like Cisco-Splunk (~\$28 billion, ~7-8x ARR) shows the willingness to pay for mission critical capabilities.

3. Vertical SaaS Consolidation & Platform Creation

- Strategic buyers like Salesforce, Oracle, and Microsoft acquire vertical leaders (e.g. Vlocity (\$1.3B), Cerner (\$28B), Nuance (\$19B)) to build integrated industry clouds.
- Firms like IBM which have acquisitions like HashiCorp, DataStax and SeekAI to build out enterprise stacks for AI-infused automation use cases.

4. Pressures on Mid-market and Legacy SaaS Firms

- According to AlixPartners, 100+ publicly traded

mid-market SaaS firms operate under existential pressure as generative AI tools by-pass traditional application layer approaches.

- Net dollar retention in that cohort declined from 120% in 2021 to 108% in Q3 2024; high-growth classifications shrunk from (57%) in 2023 to 39% and only ~27% predicted in 2025.
- These firms face greater churn, margin compression due to increased costs from AI compute, and must shift to outcome-based/utility type licensing (or risk acquisition or irrelevance).

CONSOLIDATION VS. EXPANSION:

A DUAL TRACK FUTURE

Ramprakash Ramamoorthy, Director of AI Research at Zoho, believes enterprise SaaS is already making moves in consolidation. “The initial stage of a hype cycle includes features disguised as products and products disguised as companies. Well we are past that, many of these organizations that delivered a single product have to go through either vertical integration or sell out. In fact a lot of companies are mimicking those single-product features natively on large platforms.”

Ramamoorthy says he also feels AI model providers will develop into enterprise SaaS organizations themselves as they continue to capture the value proposition of user data and usage signals for SaaS providers. This is why Zoho built their own AI backbone—to keep pace with competitive offerings and to maintain independence.

On the subject of vibe-code and low-code tools, Ramamoorthy seems quite clear-eyed about their suitability for mass-market production, (i.e., great for ideating and prototyping, but not yet ready for regulated production). “Vibe-code can accelerate you from 0 to 1 faster, but particularly with the increase in governance and privacy, you need additional rigor. For example, in India, we have started to see compliance as a framework (for example GST).” In terms of the best generative tools today, he observes “Anytime I see a UI or content generated by AI—I



“Enterprise SaaS is shifting from software to intelligence, driven by velocity and trust. Fast AI deployment adds value, but confidence matters most—making governance, reproducibility, and security essential. Responsible AI begins with strong architecture.”

- **Karan Kirpalani**, Chief Product Officer, Neysa

can immediately recognize the quality that is just not there yet.”

Rather than “either/or,” the evidence points to a hybrid future where expansion and consolidation coexist:

DUAL STRATEGY: SCALE AND ACQUIRE

Large SaaS platforms will continue to expand through AI, vertical depth, cross border reach, and hybrid architectures, while also using M&A to fill gaps—especially in cybersecurity, niche domain expertise, or automation capabilities.

Examples:

- ServiceNow’s acquisition of Moveworks (~\$2.85 b) to embed conversational AI in IT ops workflows.
- Salesforce’s \$8 b acquisition of Informatica in early 2025 to boost enterprise AI and data services.

MID MARKET ATTRITION & VERTICAL CONSOLIDATION

Smaller SaaS players with no native AI capabilities, or clear vertical specialization, risk being in the “consolidation wave” that will put them in a situation where they are bought or squeezed. Private equity is becoming increasingly active in rolling up vertical suites, thereby producing scalable enterprise plays out of smaller tools for SMBs.

BUT EXPANSION IS NOT SLOWING DOWN

Despite the consolidation wave, specialized, vertical SaaS platforms are thriving. Enterprises demand more tailored, context-rich solutions that generic horizontal platforms can’t always deliver.

Kiran Menon, Senior Director of Product and India Business at Phenom, rejects the idea that verticalization means fragmentation: “It’s a misconception that you need to sacrifice an integrated platform just because you’re looking at a verticalized solution.” Phenom, an AI-first talent experience platform, demonstrates how vertical SaaS can still deliver broad utility across HR use cases—while remaining contextually rich.

He explains, “Enterprises are demanding more purpose-built, agile, contextual, and intelligent platforms – areas where horizontal SaaS offerings often fall short.”

Menon adds that Phenom’s integration of recruiting, onboarding, internal mobility, and analytics into a unified, AI-driven platform is more than just ‘integration’—it’s orchestration.

REGIONAL & SEGMENT EXPANSION

Areas like Asia-Pacific are driving organic growth further, as project sizes and SaaS vendors in India, Southeast Asia and Latin America are radically scaling—from approximately ~\$15b SaaS revenue in India alone. There is room for new innovation via SMBs, non-Western industries, and hybrid/cloud mandates.

AI AS THE GREAT CATALYST

AI is redefining enterprise SaaS from the inside out. AI isn’t just a feature anymore; it’s becoming the foundation of modern platforms.

According to Karan Kirpalani, Chief Product Officer at Neysa, “Enterprise SaaS is undergoing a fundamental transformation, from delivering software to delivering intelligence.”

Neysa’s AI-native platform Velocis is built to address the infrastructural shortcomings of legacy SaaS. “We provide a vertically integrated AI cloud system that unifies the entire lifecycle—from data ingestion and model training to secure deployment and monitoring.”

The results? Clients have reported TCO reductions of 40-70% and product roadmap acceleration by 20-35%.

In terms of adoption drivers, velocity and confidence stand out. “The primary driver is velocity—the speed at which an idea can become a production-grade AI service,” Kirpalani says. The second is confidence, as AI projects in regulated industries stall without strong governance and reproducibility.



Velocis addresses these concerns with observability, zero-trust controls, versioning, and compliance tooling. “78% of enterprise leaders cite traceability and auditability as the top requirements for deploying generative AI tools in production,” Kirpalani adds.

THE ROLE OF TRUST, GOVERNANCE & ETHICS

Trust is becoming a competitive advantage. Performance-driven, AI-enabled SaaS manufacturers will be required to account for explainability, fairness, and compliance during hiring decisions whether through algorithm or a fraud checking engine.

Menon describes that Phenom’s AI is not automation, it’s augmentation: “AI is augmenting and accelerating the talent experience process while people are making decisions”. Menon is passionate about illuminating the bias and not entrenching it; Phenom’s platform flags inconsistencies ahead of time.

Kirpalani, is aligned with this, stating, “Responsible AI starts with architecture”: Considering things like tamper evident logs, role-based access, and lineage tracking requirements that are built into Neysa Velocis to be compliant with regulations like India’s proposed DPDP Act and on-boarding with RBI’s 2024 AI supervisory framework.

DIFFERENTIATION IN THE AGE OF LLMs

With the advent of LLMs, many of the SaaS solutions are layering AI on as opposed to integrating

it. Phenom and others are approaching the foundational method.

“Phenom’s Applied AI architecture reflects 14 years of proprietary data plus domain-based ontologies plus intelligent agents,” says Menon. The agents in Phenom’s architecture do not just suggest, they operationalize and will elevate decisions when necessary- transforming the engagement of AI within an enterprise’s collegiate workflows.

Neysa’s Kirpalani reiterates this ethos saying Neysa’s agents are built with workflow-native intelligence that almost have an equal balance of action and insight. It appears that the future belongs to platforms that are working to embed AI as opposed to adding AI in a bolted-on fashion.

INDIA’S PART IN THE GLOBAL SAAS RUCKUS

India’s SaaS ecosystem is maturing at a rapid clip with FY24 revenues surpassing \$15B and expected to exceed \$35B by 2027. This isn’t just about being a talent hub; India is also emerging as an innovation powerhouse—particularly for vertical and AI-native SaaS products.

With the advent of frameworks such as GST, the DPDP Act, and RBI’s guidelines for AI, the Indian SaaS companies have also been navigating one of the most complex regulatory environments—putting them in an excellent position to carry out large global enterprise deployments.

“The industry must ask itself: will the future of growth be primarily through expansion, increasing customer numbers, verticals and geography or will future growth primarily be through consolidation with larger players adding niche capabilities and then abandoning competition?”

LTL;DR: KEY TAKEAWAYS

AI-powered SOC tooling – integrating AI firstly in segment that matter the most. Some key examples:

- SaaS market set to more than double by 2030 (\$370B → \$842B).
- AI driven features and usage based pricing models are critical accelerators.
- Vertical SaaS and cybersecurity are hotbeds for M&A, commanding high revenue multiples.
- PE and strategic buyers in Q1 2025 executed >200 SaaS deals worth ~US \$29 billion.
- India and Asia Pacific emerging as fastest growing regions.
- Mid market SaaS firms face churn and disruption—survival often requires pivot or acquisition.
- Future belongs to companies that can scale expansively, but also consolidate intelligently.

As Ramamoorthy said simply, “Especially now with increased governance and privacy requirements, you need a lot more rigor... Vibe-code is awesome for ideas, but... they’re not production-ready.”

WHAT SHOULD ENTERPRISE SAAS LEADERS DO?

- **Build AI first Strategy**
Whether you are an incumbent or challenger, AI is now table stakes. Embed AI deeply into workflows, customer analytics, and pricing models. Invest in proprietary datasets and ML IP to maintain differentiation. Outcome based contracts may become the norm.
- **Vertical Relevance Is a Moat**
Niche industry knowledge—healthcare, real estate, logistics—is increasingly why buyers pay premium multiples. Specialization improves retention and defensibility. For horizontal platforms, strategic acquisitions of vertical leaders may be a smart path.

• Geographic & Customer Segment Expansion

Focus on high growth regions (Asia Pacific, Latin America) and customer tiers (SMEs adopting cloud for the first time). Public cloud policies and regional compliance demands open new revenue streams.

• M&A Readiness & Portfolio Discipline

Mid market vendors must decide: Double down on differentiation or prepare for acquisition. Strategic buyers and PE firms are targeting scale ready verticals, automation tools, and cyber capabilities—smart sellers will optimize KPIs like ARR growth (>35%), churn (<5%), and high margins (>75%).

• Manage Cost & Capital Pressures

Given elevated interest rates and compute costs (especially for AI workloads), firms must balance growth with profitability. Investors and buyers now expect nearer-term path to margin lift rather than “growth at all costs” models.

CONCLUSION: CONSOLIDATION AND EXPANSION WILL COEXIST

The future of enterprise SaaS is neither pure expansion nor inevitable consolidation alone, it’s both.

Expansion: The SaaS addressable market is enormous and still growing—from AI integration to new regions and industries. Innovators who scale intelligently in verticals and segments will thrive.

Consolidation: Meanwhile, buyers—especially strategic tech firms and private capital—are actively acquiring vertical specialists, automation tools, and cybersecurity assets. Mid market legacy SaaS vendors face existential pressure unless they pivot.

Ultimately, the winners will be those who use expansion to build scale and platform value, and consolidation to add domain depth, defensive breadth, and AI anchored capabilities.

In the rapidly evolving enterprise landscape of 2025–2030, hybrid strategies win: grow where you can—and acquire where you must. ¹⁰⁰

aanchalg@cybermedia.co.in

Is SaaS Becoming an OS?

There is a new outlook on what software is, especially with the rise of digital-first businesses or digital-first business models. Is Software as a Service (SaaS) on the verge of being more than just a toolset, and becoming the operating system for businesses? In this interview,

Sreedhar Gade, VP of Engineering at Freshworks, explains this transition, reveals how Generative AI is changing product strategy, and moving to AI-native systems and conversation interfaces. He also discusses the consolidation trend with respect to enterprise SaaS, Freshworks journey to a combined platform, and his vision for an “agentic” world that emphasizes AI governance and trust.

By Aanchal Ghatak

How is GenAI changing the way Freshworks approaches product strategy today?

What we can uniquely do is serve both SMBs and enterprises, thus giving us a larger innovation canvas. In AI, we’re pulling together new forms of co-piloting, where AI helps agents by responding using the full context of the customer, with models we trained on Freshworks data to further enhance automation, and even agentic AI, where customers would work via AI agents for full resolution. Our goal is to move beyond automation to create truly intelligent self-learning systems.

In your view, is enterprise SaaS moving toward consolidation or modular expansion?

It depends on the maturity of the company. Startups tend to want best-of-breed tools that can do one thing for a use case. As businesses grow, typically they prefer unified platforms. The driver of this change is AI, and AI’s ability to accelerate product development as we speak. If you think about innovations at market level, the real differentiator is ecosystem. Enterprises are drawn to platforms that unify data, integrate with other functions seamlessly and deliver intelligence across the requisite functions. For sure, consolidation will be the greater trend at enterprise level.

How do you see this evolving? Are we heading toward an AI-native enterprise SaaS era?

We’re shifting from traditional software to intelligent systems. Until now, most SaaS products incorporated AI incrementally, tacked on to existing products.



SREEDHAR GADE
VP of Engineering, Freshworks

“We’re combining AI co-pilots with in-house models to boost automation and exploring agentic AI for end-to-end resolution—aiming to build intelligent, self-learning customer support systems.

The future is truly AI-native, where conversational interfaces will be the primary way to interact regardless of the product segment, allowing users to ask and get information through natural dialogue.

Intelligence will also change as to where it resides. Previously, intelligence was built into the actual software—in the code itself. Now, intelligence is being offloaded to hyperscalers like OpenAI or Meta, where the core data continues to be owned by SaaS providers. Thus, we are beginning the hybrid era of SaaS where SaaS companies represent the system of record, while intelligence becomes distributed and dynamic.

And what about verticalization? Will industry-specific SaaS dominate, or will horizontal platforms continue to lead?

In the enterprise play, your playbook is increasingly focused on platformization. Vertical niche solutions will have their use cases, but the value is in the construction of platforms that have flexibility. Platforms that support multiple use cases and allow deep integration into other ecosystems.

For example, and to build on our ESM (Employee Service Management) focus, customers can link their internal data sources—OneDrive, Google Drive, SharePoint—directly into Autopilot, and Freshservice indexes and pulls the intelligence across those data baskets, delivers an intelligent support experience. That is the beauty of a platform led strategy—the data remains where it lives, but intelligence can be unlocked everywhere.

Freshworks started as a modular suite and is now evolving into a unified platform experience. How do you manage the tension between offering seamless integration across your suite and maintaining API-first flexibility for enterprises with diverse tech stacks?

That’s a great question, and it’s something we’ve been very intentional about. While we began with standalone products—starting with Freshdesk and then expanding across ITSM, CRM, and more—we knew that to deliver true value at scale, we had to rebuild our platform from the ground up.

Over the past few years, our engineering teams have rearchitected the backend to ensure interoperability between all modules. Whether it’s IT service

management or customer support, all products now share a common data model, event framework, and intelligence layer. This allows them to seamlessly exchange information, respond to triggers, and provide a unified user experience.

From a customer’s perspective, moving from, say, ITSM to ESM feels natural—it’s the same interface, same design system, and even shared integrations. You might, for example, discover a SharePoint integration appearing consistently across modules, without needing to configure it multiple times. The short answer: We solved the integration challenge by rethinking the platform architecture itself to unify modular products without losing flexibility.

As you move from mid-market to enterprise, do your customers lean toward a single-vendor model, or are they still asking for openness and best-of-breed integration?

Honestly, it’s a mixture of both. Larger enterprises often have legacy systems or best-of-breed solutions already in place, so they definitely value API-first flexibility. That said, many are also looking to reduce vendor sprawl and consolidate around platforms that can do more, especially if it offers consistent UX and deeper integration out of the box.

Internally, we’ve also adopted this mindset. Whether we’re building tools in-house or integrating third-party solutions, our teams now design everything with an API-first approach. It’s not about either/or anymore—it’s about ensuring flexibility within a unified framework.

Do you think the future of SaaS will look more like an enterprise operating system or a loosely connected network of AI-powered services?

I’d lean toward the latter. The underlying operating system, if you will, will likely be powered by large language models or agentic frameworks. We’re already seeing examples—Amazon’s recently launched Paragraph Core, Microsoft’s Fabric, and OpenAI’s emerging stack are all pointing toward this trend.

On top of these foundational layers, we’ll likely see a modular ecosystem of services—each AI-powered, each specialized, but all loosely connected within a shared infrastructure. It won’t be monolithic. It’ll be intelligent, interoperable, and purpose-built.

“Startups prefer best-of-breed tools, but as they scale, unified platforms become key. With AI speeding development, enterprises now prioritize ecosystems that unify data, integrate seamlessly, and deliver cross-functional intelligence.

What, in your view, will differentiate future-ready SaaS companies from legacy players over the next 3–5 years?

In the early days, the product was the IP. Building software used to take months or years. But now, with tools like Cursor or emerging platforms like Tiro.dev, you can spin up working software in hours.

The real differentiator is no longer the product—it's the system of record you establish and the ecosystem you build around it. For instance, in our case, if a customer uses five different internal systems—HR, finance, payroll, etc.—we want Freshservice to offer a unified layer that interacts across all of them. The employee should be able to initiate requests or access services through Slack or Teams without worrying about what's happening behind the scenes.

That's where the next generation of SaaS will win: By delivering integrated, intelligent, and invisible experiences powered by modular systems but presented as one cohesive platform.

Are you seeing renewed interest in SaaS solutions from regulated sectors like finance or healthcare?

Yes, absolutely. Traditionally, sectors like healthcare have been more conservative in adopting SaaS, especially compared to industries like HR tech or customer support. But that's changing fast. We're seeing growing interest not only from healthcare but also from pharma, automotive, and even agriculture. Some of these sectors are experimenting with plain generative AI use cases, while others are exploring robotic process automation integrated with AI.

To support this momentum, we're working on building industry-specific AI models. While general-purpose models like GPT-4 can handle a wide range of tasks, verticalised models will have domain-specific knowledge—like understanding CT or MRI scans, parsing prescriptions, and correlating drug data. That's the direction we see the industry heading.

What will the next generation of enterprise SaaS look like in the next three to five years?

Three to five years is a long horizon in AI terms, but

even in the next two years, we'll see massive transformation. The future is agentic. Multi-agent orchestration will become the norm—where intelligent agents can independently perform complex workflows and collaborate with other agents.

Think of booking an entire holiday package—flights, hotels, airport transfers. Instead of a human coordinating each step, different agents will interact and complete these tasks autonomously. And it won't stop there. In sectors like healthcare, agents could assist in managing patient care or treatment plans.

Another critical area will be AI governance. Just as SaaS evolved to include robust cybersecurity, AI must now embed trust, explainability, and safety. Governance will be key to ensuring responsible AI adoption, especially for enterprise use.

On that note, how does Freshworks ensure that its generative AI is explainable, secure, and enterprise-ready?

At Freshworks, we've built a dedicated framework called PRETI AI to address AI safety, governance, and enterprise readiness. It stands on five key pillars:

Safety – We rigorously scan for any bias, toxicity, or harmful patterns in our AI systems to ensure responsible outcomes.

Privacy – Personally identifiable information (PII) is protected at all levels. We mask or anonymize sensitive data like credit card details or names to ensure nothing leaves the network improperly.

Role-Based Access Control (RBAC) – Only authorized personnel can access specific data or AI outputs, enforcing data security.

Traceability – Every AI-generated action is traceable. If something goes wrong, we can review the entire decision-making path and correct it.

Security – End-to-end encryption ensures the integrity of all transactions and data exchanges.

We have a dedicated team and robust tooling in place, and we work closely with partners like Microsoft and AWS to evolve these safeguards continuously. ^{10x}

aanchalg@cybermedia.co.in

Next Leap in Enterprise Cloud: Micro-Vertical SaaS

As enterprise SaaS evolves beyond the one-size-fits-all applications, a new model is beginning to take shape — a model whereby cloud applications are tailored not only to industries, but to deep sub-sectors of those industries. In this interview, **Phil Lewis, SVP at Infor**, discusses how Infor has a vision for its industry-complete platforms, the continuing evolution of embedded GenAI, and the concept of software being invisible, yet required.

By Aanchal Ghatak

Vertical SaaS is in a new chapter. With industry-centered software already accounting for more than 30% of the enterprise cloud market and growing more than double that of horizontal platforms, the next wave - “Vertical SaaS 2.0” - is now centered on micro-verticalisation, AI-native architecture, and real-time. At the leading edge of this transition is Infor, which is building cloud applications not just for industries such as manufacturing or healthcare, but for sub-sectors like dairy producers or specialty chemical plants.

“We are moving now into the realm of the micro-vertical,” says Phil Lewis, SVP at Infor, “where systems are built with a purpose to serve the unique intricacies that sit within the sectors themselves.” Excerpts:

How do you see the enterprise SaaS landscape evolving in the next 3-5 years? Are we moving into a “Vertical SaaS 2.0” era?

Over the next few years, SaaS will revolutionise organisations. Solutions will become even more tailored and cloud applications will be purpose built for very specific business needs.

“AI adoption should go beyond surface-level applications and become deeply embedded in core operations to drive efficiency, innovation, and sustainable growth. Organisations must move beyond basic.



PHIL LEWIS
SVP, Infor

“We are moving into the realms of the micro-vertical — where systems are purpose-built to complement the unique intricacies that sit within the sectors themselves.

But these tailored applications will extend far beyond what we consider ‘traditional’ verticalisation. We are moving into the realms of the micro-vertical—where systems are purpose built to compliment the unique intricacies that sit within the sectors themselves.

Take Food and Beverage for example. Traditional SaaS solutions may serve the wider industry, but there are hundreds if not thousands of micro-verticals within this sector, like bakeries, poultry or dairy producers. With the proliferation and deployment of new technologies such as AI and automation, purpose-built applications for each of these micro-sectors are now a reality. And at Infor that is exactly what we are focusing on—leading the way when it comes to deploying these systems.

What's driving the demand for industry-specific solutions vs traditional horizontal SaaS platforms?

There has always been a demand for industry-specific solutions, but until now organisations have had to compromise because the technology was just not available. That's all changed. As a business, we've heavily invested in R&D to stay at the forefront of innovation. And the arrival of AI, Machine Learning and automation have unlocked new ways for us to move further into sector specificity and become industry complete.

We've listened to our customers when they say that what they need is a suite of systems and tailored solutions that are unique to their business. Which ultimately helps them to streamline their operations; whether that be managing orders, processing invoices, optimising the supply chain or numerous other requirements.

Infor has long positioned itself as an industry-first SaaS provider. How are you doubling down on this in the age of GenAI and real-time data?

New technologies such as GenAI and automation, and the real-time data they create, are game changers. And most businesses know it, in fact, 78% of organisations globally expecting to increase investments in technology by 20% in the coming years.

As mentioned, we've invested heavily in R&D to create systems that simplify process innovation and help customers stay agile, adaptable, and innovative. Providing GenAI and process automation tools across our Velocity Suite to diagnose process insights, automate manual tasks and optimise their operations to deliver true value.

But educating our customers has also been key too. AI adoption should go beyond surface-level applications and become deeply embedded in core operations to drive efficiency, innovation, and sustainable growth. Organisations must move beyond basic AI adoption and achieve full-scale transformation, seeing the technology as more than just another tool layered onto existing processes.

Instead, it should be treated as a strategic driver – one that fundamentally redefines how production, operations, and decision making are approached.

How do Infor's offerings integrate AI/ML today? And what's coming next?

AI and ML capabilities are already baked into our enterprise software, to help companies navigate increasingly complex challenges. We have seen this a lot in the manufacturing and distribution industries, especially considering recent global supply chain disruptions. It can often be hard to know where to start, when it comes to implementing new AI or ML technologies and then navigating its promises against what it can actually deliver.

That's where we come in. As part of our new Velocity product suite, customers can diagnose process inefficiencies and potential bottlenecks by analysing operation data. This then lays the groundwork for automation which leverages GenAI and Robotic Process Automation (RPA) to eliminate manual tasks, streamline workflows and provide real-time insights and recommendations.

Agentic AI has the potential to change the way businesses work. These advanced systems can take on full tasks with little need for human help – saving time and effort. With ready-to-use examples, Agentic AI can be deployed quickly to complete

“SaaS won’t feel like software at all. It will radically transform how users interact with business applications — where the best user interface is no interface at all.

goals, adjust new situations and come back with helpful suggestions. In the future, these agents could even design new tools or systems based on the task they’re given, helping businesses work faster, smarter and more efficiently.

Could you share a case where a customer has achieved measurable outcomes using Infor’s cloud SaaS?

We’ve worked closely with our partners at GMM Pfaudler, a leading supplier of corrosion-protected glass lined equipment.

The organisation was struggling with a massive item data quality project. They had 800,000 items to review and update manually, which could take about 5 minutes per item. At that pace, the project would take over seven years to finish. In the meantime, bad data was causing duplicate records, hard-to-find items, high inventory costs, too many suppliers to manage and unhappy employees.

Our GenAI tool made a big difference. It boosted productivity, improved accuracy and made the whole process more consistent. GenAI automatically groups similar items and creates multi-language descriptions. Thanks to this, the project can now be completed in just 6 months, instead of over 7 years.

What are CIOs and operations heads asking for today that they weren’t 2 years ago?

CIOs have shown an interest in investing in new technologies, but the arrival of AI and automation has accelerated this drive. For business across every industry to move beyond basic AI adoption and achieve full-scale transformation, AI must be seen as more than just another tool layered onto existing processes.

Indeed, one of the key findings from our global How Possible Happens report is that 80% of global organisations agree that success will depend on the use and adoptability of new technologies. In practice, this means integrating AI into strategic preparation from the outset, rather than rebuilding it to legacy systems.

How is Infor leveraging feedback loops from customers to inform product roadmaps?

We stay close to our customers and sit down with them—often quarterly—to discuss product roadmaps and hear what’s evolving in their worlds. And because we prioritise being industry-complete, and delve deeper into micro-verticals, we create solutions that actively solve the right problems.

We also co-develop solutions with our customers based on real-world use cases—looking at where technologies like automation, optimisation, and GenAI, can have the biggest impact. This way, we make sure our roadmap reflects what businesses need, rather than what we think they might want. These solutions aren’t based on guesswork, they’re shaped by real diagnosed challenges, so they actually deliver results.

What would the ideal SaaS deployment look like for an enterprise in 2028? And how is Infor helping them get there today?

SaaS won’t feel like software at all. It will be an ideal deployment for enterprises that will radically transform how users interact with business applications. Forget relying on traditional forms and keyboards, enterprises will experience seamless, predictive interactions, where ‘the best user interface is no interface at all’.

Users will potentially be able to communicate with their ERP systems through voice commands, AI agents, or even images, allowing them to perform complex tasks, generate reports, and access data effortlessly.

At Infor we’re already helping businesses prepare for that. By embedding advanced, agentic AI and connected technologies, we can focus on delivering dynamic, user-experience-driven applications that eliminate outdated interfaces and unlock hyper-productivity. Ultimately empowering companies to reimagine work processes and adapt to the evolving future of work. ¹⁰⁰

aanchalg@cybermedia.co.in

Cutting through the noise: A CIO's framework for smart adoption

As the Chief Information Officer (CIO) of a legacy-rich enterprise making its way through the changing digital landscape, **Shobhana Lele** possesses an experienced and strategic perspective on the enterprise SaaS evaluation landscape. As a leading CIO, she propagates harmonizing on-prem and hybrid systems with cloud or SaaS solutions—a balancing act that is vital for organizations still very much in the symposium of legacy operations but seeking to act like the agile modern organization.

By Aanchal Ghatak

In this interview, Shobhana Lele elaborates on how organizations can navigate the dense SaaS ecosystem of vendors by using a structured framework application—functional, technical, commercial—while developing weightage comparisons and robust exit strategies. Lele discusses how her organization uses governance to control costs, manage SaaS sprawl, and ultimately maintain long-term value while adding some detail on evaluating Generative AI capabilities, and protecting enterprise data, integration, and supplier dependencies.

Enterprise SaaS is now foundational—but also crowded. How do you evaluate SaaS vendors today? What are your non-negotiables when bringing one into your enterprise ecosystem?

It is true that there are a multitude of options available today for many SaaS products. A functional, technical and commercial comparison is the best approach. As part of the comparison, we identify and evaluate various parameters by assigning them weightages. One of the most important criteria for a SaaS product is the exit process. The product must be able to provide an offline accessible backup when the organization decides to discontinue it. The second one is its support and partner ecosystem. Reference checks help to validate the commitments.



SHOBHANA LELE
CIO, Bombay Dyeing & Manufacturing Company Limited

“One of the most important criteria for a SaaS product is the exit process. The product must provide an offline-accessible backup when the organization decides to discontinue it.

As a CIO, how do you balance the push for cloud-native SaaS platforms with the reality of existing on-prem or hybrid systems?

The benefits of cloud have been proven in terms of availability, scalability and performance. What needs to be managed is the costs. This should be done with regular governance in terms of monitoring and archiving. As long as the risks are mitigated and the business gets its process benefits, it should not matter whether the application is on cloud, on prem or co-located. As IT we must ensure long-term benefits and manage the associated security, risk and compliances effectively.

With the proliferation of SaaS tools, are we entering an era of “SaaS sprawl”? How are you addressing application redundancy and integration fatigue?

Yes, it's possible. Today for every problem, the solution is an “app”. This happens when the requirements are addressed in an adhoc manner and “shadow IT” takes precedence. There is a definite need to harmonize and collate business requirements and address them through consolidated platforms rather than opting for various systems for every requirement. Although this may look lengthy in the beginning, it will prove to optimize not only costs but will also bring in process efficiencies.

We're seeing a wave of GenAI-enhanced SaaS tools. Are these features truly adding enterprise value, or do you see them as premature or gimmicky right now?

I would say they are still evolutionary and depend on the type of industry and the quality of underlying data. They would most definitely add value in the long-term but they need to be assessed and selected carefully.

What's your take on building vs. buying GenAI capabilities within core business apps—should SaaS partners be the AI layer, or do you foresee more control in-house?

Business Apps must come embedded with AI functionality. That helps the AI to interface with the

app data directly. In-house controls need Infrastructure that can scale, therefore only when there is a definite need and benefit or a regulatory requirement, organizations could look at in-house infrastructure.

SaaS once promised predictable pricing, but many CIOs now face rising costs and vendor lock-in. How are you managing long-term contracts and ensuring value from your SaaS partners?

This is a big risk that SaaS platforms come with. Hence it is required to select a platform that is dependable, has reputed clientele and build long-term price contracts. Needless to add, always have an exit clause which gives you the data in an accessible app in case there is a need to part ways.

With core enterprise data flowing through third-party SaaS platforms, how do you ensure data ownership, compliance, and security—especially in industries like textiles and manufacturing?

To a large extent this is an industry agnostic problem. The manufacturing industry has to take extra precautions to expose its IT/OT data if the SaaS platform uses it. It is not advisable and a via media mechanism needs to be worked out if it is an absolute must. It is important to agree on terms of engagement before a formal project begins. This includes data backup at regular intervals, business continuity procedures, third party audits at pre-defined frequency, facilitation of SOC I and II reports, etc.

If you could design the next-generation enterprise SaaS platform, what would it do differently—from integration to intelligence?

What I would like to see is passing on benefits of economies of scale to customers. Secondly, the ecosystem for support of the platform needs to be strong. Many SaaS vendors do not have partners and then sustaining the platform becomes a big issue. Intelligence has to be now embedded in all apps and is given. 

aanchalg@cybermedia.co.in

Why Enterprise AI won't be Plug-and-Play

From training its own LLMs on \$20M worth of in-house infrastructure to rethinking AI privacy at the data layer, Zoho is proving that AI for enterprises isn't about size—it's about fit, context, and control. **Ramprakash Ramamoorthy, Director of AI Research at Zoho**, explains why real-world AI adoption demands more than APIs and flashy demos—and why Zoho is betting on contextual, private, ground-up intelligence.

By Aanchal Ghatak

As organizations rush for rapid AI implementation, many world-views are burrowing in the foundational complexity underneath the surface. "AI is not magic—it is plumbing," observes Ramprakash Ramamoorthy. Zoho's strategy is fundamentally different; they have invested over \$20 million building foundational infrastructure—256 NVIDIA GPUs—to construct their own Zia LLM models, completely deployed on-premise for enterprise workflows, instead of relying on third-party APIs, or fine-tuned consumer models. While the LLMs vary from 1.3B to 7B and were constructed from scratch, each model is designed to create privacy-first, scalable value across an ecosystem of 55+ apps.

What are some of the biggest challenges businesses face while deploying AI—and how are you helping them navigate these?

The first, and possibly the biggest challenge is expectation. Many organizations very much view AI as plug-and-play, expecting instantaneous change. When in reality, the complexity of the domain is far deeper.

Secondly, organizations often operate in fragmented data channels and have siloed partial processes—this makes deploying AI more difficult. Even at Zoho, we have dealt with this. As an example, when we explored running automation for legal and product support, we found out that the "final miles plumbing" took quite a while – despite owning the entire platform. That says a lot.

And thirdly, the lack of integration between internal systems creates friction. A really obvious example:



RAMPRAKASH RAMAMOORTHY
Director – AI Research, Zoho.

“A key challenge is unrealistic expectations—AI isn't plug-and-play. Fragmented data and siloed processes worsen the issue. Even Zoho faced delays automating legal and product support, despite owning the full stack. That says everything.

I raise a travel request to attend a press event, which gets approved. I then, separate from the travel request, need to submit an on-duty request that also requires approval for the same trip. Those are disconnected processes. This friction can severely limit the effectiveness of AI. When systems aren't able to talk to each other, the AI will only be able to achieve a small fraction of its potential.

Are there any underrated challenges that companies often overlook while adopting AI?

Absolutely. Many organizations believe that AI is just a magic button that can easily be plugged into an ecosystem in an API that often costs \$20 a month. But AI does not work like that; it must grow from a number of foundational components, especially in the enterprise stack.

Another neglected principle is search. It's a foundational function, one that brings context and guardrails. For example, you can't just ask an LLM to summarize an inbox with no access boundaries. That would be a huge privacy issue.

How does Zoho's approach to AI differ from other tech players in the market?

The difference for us is really in our platform. Zoho offers integrated applications that exceed 55+, and now we have built an AI layer on top of all the first-party data. That makes this very powerful.

We also train our own large language models all on-premise utilizing NVIDIA hardware, and never with public clouds. From June 2024 to June 2025, we have invested around \$20 million in compute infrastructure to enable this. It's a lot, but we see AI as foundational, not a nice to have.

How did cost constraints influence your AI infrastructure decision?

We made a deliberate choice. We've been investing in AI since 2012. When the ChatGPT moment happened in 2022, we quickly integrated it for customers, but we also doubled down on building our own models. We didn't want to miss out on what we believe is a

pivotal technology. That required a long-term, capital-intensive commitment—but it's worth it.

Reasoning and generation remain challenges for smaller models. How are you addressing that?

That's true—larger models still reason better. That's why we're investing in mixture-of-experts architecture and also exploring models with up to 100 billion parameters. But in enterprise scenarios, you often don't need massive models. Around 80% of use cases can be solved with models under 7 billion parameters, especially when the task is contextual—like summarizing CRM notes or drafting internal emails.

Zoho's AI implementation heavily leans on privacy and contextual intelligence. How are you ensuring privacy boundaries are respected?

We've designed everything around search boundaries. Even though two employees work at the same company, the AI agent only has access to what the individual is authorized to see. If I install an agent, it can't peek into your payroll or appraisal data—even within the same organization.

Also, our models are trained independently per customer. So, if you're an insurance firm using Zoho CRM for years, your data won't be used to help a competitor who signs up today. No shared data leakage.

What types of enterprise metadata or user interactions have proven most valuable in customizing AI?

We work across three types of data:

Structured (e.g., OLTP/OLAP databases),

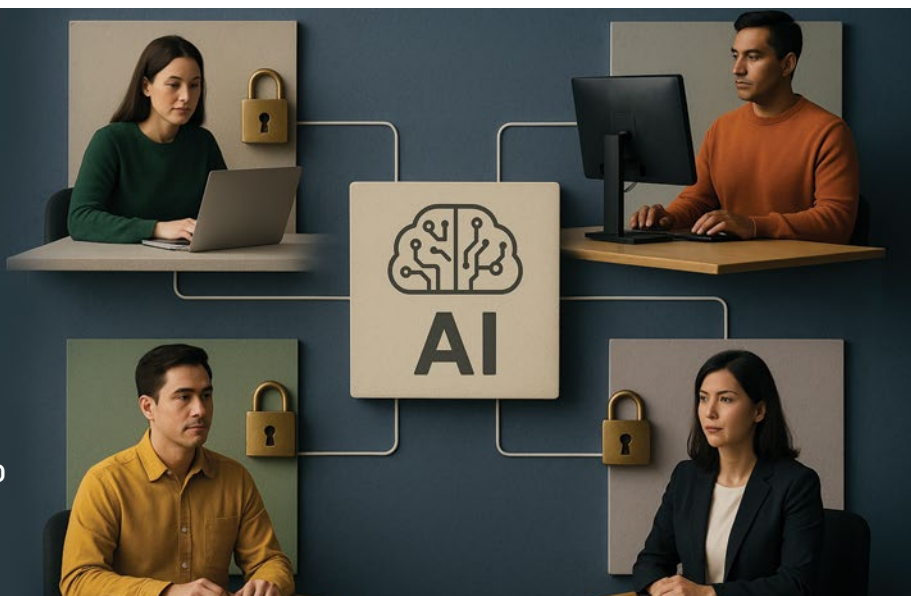
Semi-structured (e.g., helpdesk tickets, metadata like sender/receiver/time), and

Unstructured (e.g., PDFs, video recordings, images).

Smaller models do well with semi-structured data. Structured data is already machine-readable. Large models are best suited for processing unstructured formats. That's how we decide the level of AI intervention needed.

“

We've architected isolation by design. Each department—even within the same company—has distinct access controls. Each customer has their own AI instance. No data sharing. No leaks.



How is Zoho integrating its LLMs across the product stack?

We've started rolling it out with non-prompt use cases, like a simple “summarize” button in apps. Over time, we will enable prompt-based interactions. We're working closely with pilot customers and dogfooding it internally, but we're being cautious. We don't want the model saying something inappropriate or inaccurate, so we're opening it up in phases.

How are clients measuring success with your AI offerings?

The best metric so far is API usage. In 2024, we saw about 8–9 billion API calls monthly. In 2025, that number has already doubled to 16+ billion. And we don't charge extra for this usage—it's part of the product experience.

How do you determine the optimal model sizes for different use cases?

It depends on the context. For summarizing a paragraph, a 1.3 billion parameter model might be enough. For drafting a customer support email, you might need a 7 billion parameter model.

We auto-route tasks to the most suitable model. Users don't pick the model manually—but their feedback (thumbs up/down) helps us reprocess tasks with a higher-capacity model if needed.

What guardrails have you built into your AI systems?

We've embedded guardrails at the LLM level—to ensure no biased, racist, or inappropriate outputs. Our

search layer also acts as the foundation, controlling access and context. Prompts are built-in, so customers don't have to handle safety concerns manually.

How does Zoho ensure organizational data isolation across customers?

We have architected isolation by design. Even within a company, different departments have separate data access layers. We don't take risks. Each model instance is launched into a customer's private ecosystem and learns only from that data. That's core to our AI philosophy.

Finally, what's your AI adoption playbook for a mid-sized Indian enterprise with limited ML infrastructure?

First, stop thinking departmentally. Traditionally, software has been sold to departments—and now, these departments don't talk to each other.

So here's the playbook:

1. **Break down data silos** – Build bridges between systems.
2. **Streamline processes** – Automate rule-based tasks.
3. **Don't over-rely on “magic” APIs** – Build maturity step by step.

You don't need to replace your entire stack at once. But start preparing today, and in six months, you'll be in a better position to adopt AI meaningfully. Digital maturity leads to AI maturity. And yes—it takes time. Don't expect results overnight. 

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For Partnership Opportunities

Aninda Sen | Vice President, Sales & Marketing | anindas@cybermedia.co.in | +91 98456 14548

For Delegate Registrations

Ankit Parashar | Sr. Manager, Operations | ankitp@cybermedia.co.in | +91 98733 73763

Hi Microwave! One Hot Code Please

They are fast, they are fuss-free, they pop up like hot toast without you having to burn your hands. But are they crisp enough? Well-cooked? Let's take a bite of low code, no code and vibe code today.

By Pratima H



TTLTR. That's the Gen Z and Gen Alpha's gripe with everything we boomers and Millennials grew up with. From letters, books, designs, blueprints, workflows, spreadsheets, story-plots to cars, conversations, dinners, itineraries, diaries and photo-albums – a lot has become 'Too Long To Read' and understandably so—for the time and age the digital natives have been raised in. It's normal today to just sit in a car and cruise—and not have to change gears at all. It would soon be normal to simply tell the car where you want to go and take a long nap while it gets you to the destination. The gear box and the intricate dance of machinery inside the hood – both – have vanished. To be replaced with chic and ultra-simple digital dashboards. Your job is just to think of what music you are in the mood for. Driving is, also and, finally 'TLTR'.

And yet, there are car connoisseurs who love a car for its specs—those of the hard-core kind. There are photographers who still lean towards cameras that offer some complexity. There are still planes and spaceships where cockpits retain the room for human eyes and fingers. There are still luxury watches that are expensive because they run on old mechanical parts. Expertise and complexity are not bugs but features – in many areas.

So why does that not hold true for coding? Or does it? Especially when business users do not need developers on the steering wheel anymore when they want to go to an app destination themselves. Even developers are not finding complex gear boxes on their seats anymore. It has all just become so swift, so sleek, so Gen Z today. The question is: Is it worth the 'skip button'?



Gartner predicts that by 2028, 30 pc of business role job descriptions will require low-code or no-code skills.

- Jason Wong
Distinguished VP Analyst, Gartner

LESS CODE, MORE FUN, MORE SPEED—BECAUSE

Low-code and no-code approaches are a fantastic idea today because they significantly accelerate the development process, especially no-code, which makes building solutions more accessible to non-developers, captures Jason Wong, Distinguished VP Analyst at Gartner. “This democratisation through citizen development empowers businesses to innovate rapidly and respond to market changes more efficiently. Gartner predicts that by 2028, 30 per cent of business role job descriptions will require low-code or no-code skills as non-IT teams increasingly develop applications and automate process workflows.”

Noro Chalise, Data Scientist and Founder, NoroInsight offers some real-world examples to sketch the picture better. “Addiko Bank used Appian’s low-code platform to automate SME loan approvals, reducing turnaround time by up to 50 per cent. U.S. Air Force (CON-IT) replaced over 100 legacy systems using low-code, resulting in estimated savings of more than US\$80 million.

Aviva Insurance consolidated 22 internal systems into a single interface using Appian, improving agent response speed by nine times. Unilever enabled non-technical staff to build over 400 internal tools using Microsoft Power Platform, supporting a wide range of operational needs.

No-code development tools have gained popularity in recent years as an alternative to more complex low-code platforms, adds Wong. “The 2024 Gartner Digital Worker Survey shows that 49 per cent of non-IT respondents are customising and building tools from technology provided by IT or from what they acquire on their own, and increasingly, these are done using no-code.”

Low-code/no-code (LCNC) solutions shorten time-to-market from months to days, notes Ankit Sharma, Senior Director and Head - Solutions Engineering at Cyble. “According to a 2025 Forrester study, companies that used LCNC solutions reduced app development time by an average of 65 per cent. Rapid idea-to-product cycles are enabled by the use of

WHY LOW/NO/AI CODE WORKS?

1. Time-to-build speed
2. Time-to-market speed
3. Reduced dependence on coders
4. No need for programming proficiency
5. Business user perspective
6. Quick apps for quick needs
7. Ease of use
8. Shift-left impact
9. Pre-built templates
10. Drag-and-drop simplicity

built-in templates, drag-and-drop elements, and pre-integrated services.

Nagasanthosh Joysula, Co-founder of TableSprint draws an analogy between calculation and coding, stating that low-code/no-code approaches are similar to using calculators. “To the extent they are able to perform and serve the purpose, they can make the job easier and increase adoption. This is not new, but what is different today? It is the scale and speed at which low-code/no-code approaches are evolving to deliver the tasks that till recently required coding. This evolution is changing the economics underlying the application development life cycle.”

He explains ‘how’. “Current no code approaches do generate code through AI but can still stay as no-code platforms for users. This has exponentially increased the diversity of applications that can be built in a no-code manner, thus the spread of vite coding as a popular approach. The recent rise and acquisition of Base44 by Wix is an example of how fast the changes and adoption are happening. At the same time, products such as Roo Code and Cursor are increasing the ease and speed of coding, making the traditional way of application building also faster.”



Before calculators, people relied on mental or paper math. Calculators eased cognitive load, empowering even those uncomfortable with numbers to handle tasks requiring computation.

- Nagasanthosh Joysula, Co-founder, TableSprint

Low-code platforms like Microsoft Power Platform, OutSystems, Appian, Mendix, and Retool are widely adopted by enterprises for internal tools, automation, and data-driven apps. And No-code tools such as Bubble, Glide, Webflow, Airtable, Zapier, and Softr are popular among startups and small teams for quickly launching MVPs, Chalise observes.

LESS CODE, MORE USERS, MORE LEGOS—BECAUSE

Are these approaches bringing on-ground speed, democratisation, and prototyping ease though?

Wong answers in the affirmative. “They democratise development by allowing business users to create applications without deep technical knowledge. This is achieved through intuitive drag-and-drop interfaces and pre-built templates that simplify the process.”

Low-code/no-code (LCNC) platforms aren’t just Buzzworthy technologies, underlines Sharma. “They’re mature technologies that meet an urgent set of needs germinating in today’s digital economy. In 2025, as the gap of global developer talent still lingers (an estimated 4 million shortage of developers globally, according to Evans Data), LCNC solutions fill the gap between the technological ambitions and the availability of developer talent.”

These approaches also expand the power of non-coders and business users.

Low-code and no-code approaches empower organisations to build and deploy applications faster, reduce IT bottlenecks, and encourage active business user participation in automation initiatives, adds Prasanth Krishnan, Principal Sales Engineer, UiPath.

With the combination of low-code’s visual tools with code-level access for professional developers, there is enough flexibility while maintaining speed of deployment, Sharma points out. “At Cyble, we have seen low-code platforms reduce development time for threat intelligence dashboards between 50-70 per cent—enabling cyber security analysts to rollout new workflows quickly. The no-code use cases shine in departments – internal Apps, marketing dashboards,

or hour workflows – however, scale and integration are weak points for no-code. Low-code is a better fit for critical and scalable enterprise use cases, while it may have a little more work to manage.”

Business users with domain knowledge can participate in solutions without relying on development teams through rapid testing and development, Sharma adds.

But would these tools work well with APIs, containerisation, and customisation projects?

Wong assures that most modern low-code and no-code platforms are designed to integrate seamlessly with APIs, and some support containerisation to be deployed on a cloud provider of the customer’s choice or even on-premises.

These platforms are excellent at containerisation, customisation, and API integration, Mark Weaser, Vice President at OutSystems Asia-Pacific also assures.

LESS CODE, MORE VIBE—BECAUSE

With the advent of AI, a new genre of less-coding has come on the surface. It is called ‘Vibe Coding’.

Vibe coding has reduced the number of steps required as part of application development life cycle, Joysula dissects. “There were days when customers used to show some references to technical teams, which was followed by requirements gathering, low-fidelity wireframes, high-fidelity wireframes, prototypes and so on. Now, the processes are becoming more collaborative. Business users are able to create the prototypes and first cuts of MVPs by themselves.”

With the emergence of AI-assisted LCNC tools (such as Copilot in Microsoft Power Platform and OutSystems AI Builder), business users can build apps by describing functionality in naturally spoken or written language, Sharma illustrates.

As Weaser assesses it, with the low-code/no-code approaches, software is being realised faster – a key advantage as IT leaders face mounting pressure to deliver business value from technology investments under tighter timelines and limited resources.



Lightweight no-code platforms may not provide enough customization for advanced use cases, which often leads to rebuilding once the product needs to scale or integrate with more complex systems.

- **Noro Chalise**, Data Scientist and Founder, NoroInsight

AI-powered low-code platforms are empowering developers and business users alike through intuitive visual building tools and pre-packaged components to create applications up to 50 per cent faster than traditional coding-based implementations.

He also shines the light on some adjacent side-effects. “The dependency on specific programming languages is becoming less mandatory for new and stand-alone applications. This shift also brings the advantage of clear communication of requirements and goals increasing efficiencies in project management.”

Weaser adds that by enabling teams to rapidly build functional models, AI-powered low-code makes it easier to validate concepts early and gather stakeholder feedback. This ‘shift-left’ approach helps surface issues earlier in the development lifecycle, leading to higher-quality applications and faster time to delivery.

AI coding assistants like GitHub Copilot, ChatGPT, Replit Ghostwriter, and Amazon CodeWhisperer are now routinely used by development teams to boost productivity, cites Chalise.

But a lot of outcomes in this new age of coding hinge on good prompting skills.

Good prompting skills are valuable, but inherently there are limitations right now to what can be built just through prompting, Wong explains. “We expect a combination of visual and conversational approaches to be productive.”

There are many factors to consider, argues Sharma. “Like how well the user understood the data architecture, how clearly they communicated to the LCNC tool, and planning for the required logic to operate the app. In 2025, prompting well is becoming a new skill to develop, and when someone refers to ‘prompt literacy’ in relation to digital training, including technologies like Generative AI, many businesses have incorporated this into their training programs.”

Advanced prompting abilities are not a major factor in these platforms’ success—says Weaser in a

WHY LOW/NO/AI CODE SLIPS?

1. Scalability
2. Shadow IT
3. Tech debt
4. Security issues
5. Rebuild work and time
6. Enterprise-grade quality gaps
7. Flexibility limits
8. Nuances that need a developer's expertise
9. Complexity that only developers understand
10. Tooling and APIs
11. Vendor lock-in
12. Audit and debugging
13. Gaps on long back-end code
14. Maintenance and portability
15. Reusability constraints

contrarian argument. “The process is made simple for users with little technical expertise by drag-and-drop interfaces, guided workflows, and AI-assisted development. Although a robust understanding of business requirements improves results, built-in logic and templates lessen the need for specific prompts.”

So we know now that low/no/AI code gives speed, ease, fun and user-side context in an exciting way. Yet despite the surge and love being seen by these digital siblings of old-school coding, not every enterprise can find the courage to trust dashboards instead of developers. Let’s double-click on that.

LESS CODE, MORE SPEED, MORE USERS—BUT

One cannot turn one’s eyes and hands away from serious issues like lack of developer control and gaps in scalability.



Security remains a concern. Sensitive data on cloud no-code platforms is often poorly encrypted due to lack of granular access control. Weak integration with enterprise IAM can also result in Shadow IT.

- **Ankit Sharma**, Senior Director and Head - Solutions Engineering, Cyble

There are also concerns that have been experienced with many low-code/no-code tools – specially on flexibility limitations, sloppy UI, inability to handle complexity, and security worries.

These worries are valid, especially in complicated, security-sensitive contexts like ours, Sharma assents. “No-code platforms, specifically, are usually unable to present system logic or just generate very long backend code, which is problematic for setting up a proper debug or audit. In 2025, Gartner reported that 42 per cent of organisations using a no-code platform ran into scalability issues when they crossed the mark of 10,000+ DAUs (Daily Active Users).”

Another negative is the limited reusability or portability of the resulting no-code apps, Sharma tells. “In cases where an organisation decides to move entirely from one platform to another, say for example, moving off Salesforce as a means of application delivery and replacing it with Sharepoint, a total rebuild is likely. Low-code apps could be a slight improvement, particularly modern low-code apps in 2025 that back Docker Containers, Kubernetes, and REST APIs natively.”

These concerns are valid, particularly when these tools are isolated or not designed for enterprise use, concurs Krishnan. Many users report performance bottlenecks as workloads grow, Chalise agrees. “Built-in UI components can feel repetitive or too basic unless enhanced with custom development.”

It should not be assumed that these applications can be developed in isolation bypassing the IT teams, seconds Joysula.

LESS CODE, MORE DEBT, MORE SHADOWS

There is also another concern that persists. It may get strengthened with digital tools. A new layer of Shadow IT and tech debt. What happens when there is a lot of rebuild work that low-code/AI-code work creates after the confetti settles down?

There is a risk of shadow IT and tech debt if governance is not enforced or if IT is too heavy-handed in what it allows the business to do, avers Wong.

“There can be a careful balance of empowerment with governance. However, with proper oversight and integration strategies, these risks can be minimised. Rebuild work is generally less intensive compared to traditional development, but varies depending on the platform and application complexity.”

When it comes to tech debt, there are counter arguments too. There is a perspective that low-code tools could be good news for those worried about tech debt. “Businesses can allay these concerns by adopting a low-code platform with strong governance features. Features such as permission controls, audit trails, and compliance tools provide centralised oversight, helping to guarantee compliance with IT standards. Compared to traditional coding, where fragmented codebases can accumulate over time, low-code platforms minimise tech debt by simplifying maintenance and facilitating seamless updates, reducing the risk of unmanageable systems and promoting long-term maintainability,” Weaser explains.

Let's zoom in on rebuild-work now. The amount of rebuild-work, as Chalise notes, depends on the platform and stage of growth. “Startups often use no-code tools like Bubble to quickly launch their MVPs. These tools are great for validating ideas and getting early traction. However, as the product grows in complexity, many teams find themselves rebuilding parts of the system using traditional code for better performance, scalability, and flexibility. On the other hand, enterprise-grade low-code platforms like OutSystems, Retool, and Mendix are built with developers in mind. They typically offer support for REST APIs, scripting capabilities, Docker, and CI/CD pipelines, which makes them more suitable for integration-heavy or containerised environments.”

There are more headaches and dilemmas that will pop up as this new genre of coding gathers steam. By 2025, platforms are evolving from mainly drag-and-drop into AI-generated code, comprised of Generative AI generated back-end logic or intelligent data schema modifications. This presents ethical and



Due to their fair balance between speed and the level of customization and control required, low-code platforms cater more suitably to enterprise requirements.

- Mark Weaser

Vice President, OutSystems Asia-Pacific

explainability challenges, highlights Sharma—how do we audit AI generated code? How do we know it is created to follow security best practices?

Another significant, but not often discussed, concern that he reminds us of is that of vendor lock-in. “Many low-code/no-code platforms, for instance, utilise their company’s proprietary DSL (Domain-Specific Language) or component libraries. Organisations run the risk of becoming a highly dependent player for a long period without a way to export, or have standard interfaces to improve transition upon agency separation that turns cost, and limits flexibility to pivot on longer-term strategy.”

Another factor is that of oiling these wheels. Maintenance and ownership can become unclear when the original creators of apps or workflows leave the organisation. As Chalise reckons, some platforms make it difficult to export workflows, data models, or business logic, limiting flexibility in the long term. Deep integrations, complex workflows, or advanced business logic usually require stepping outside the platform, he weighs in.

LESS CODE, MORE LEAPS, SOME CAUTION

Evolution is taking care of a lot of issues discussed above. As Joysula captures: Features such as live code sharing, multi-cursor editing, reviewing and commenting and controlling roles and access address the challenge of developer control. “Further, it is practical to have an à la carte of approaches, tools and platforms to meet the diverse application requirements.”

Not all issues are beyond resolution though.

As Weaser shares, developer control, for instance, is preserved through DevOps tools and extensible code extensions, enabling proficient developers to customise solutions while still using visual development for efficiency. “Flexibility is also less of a constraint on advanced low-code platforms, which support custom logic and deep integrations to address a variety of use cases. Security worries, often one of the top concerns, are also addressed

through comprehensive measures like encryption, compliance certifications, and automated vulnerability scanning – all of which ensure data protection and regulatory adherence.”

Many modern low-code and no-code platforms have significantly improved in the areas discussed above, Wong also contends. “However, it’s crucial for organisations to carefully evaluate platforms to ensure they meet their specific needs regarding scalability, flexibility, and security.”

For the rebuild stress, one can consider internal tools and dashboards and greenfield applications that require minimal or no rebuild.

The freedom to build without IT involvement can lead to duplicated systems, hidden tools, and technical debt. That’s why training, review processes, and governance are essential for scaling safely and sustainably. Each type works best in different contexts, recommends Chalise—low-code for enterprise-grade applications, no-code for fast experimentation, and AI tools for accelerating development.

And the biggest concern is – humans forgetting how to drive a car. Are we ready for a world where “not-learning-coding” will be ok? AI coding tools enhance productivity but cannot replace foundational programming knowledge, concludes Chalise. “Relying too heavily on them may hinder learning, especially for junior developers.”

It’s a strange world that we are heading to. A world where early buyers of autonomous cars co-exist with those who still love the good old skill of horse-riding. Sometimes, they are even the same set of people. Only on different tracks and on different parts of their weeks. And until we see pilots and astronauts playing Solitaire – all the time – while flying planes and spaceships; and unless we see enterprises running apps with huge scale and stakes without an IT eye – nothing is ‘TLTR’. Only ‘IYKYK’.

(If You Know, You Know!)

pratimah@cybermedia.co.in

At 30% time and effort savings, AI coding is worthwhile

With automation and AI, coding time and resources can be shrunk in a compelling way. But what about test-flakiness, patterns, regression testing, test coverage, robustness, redundancies and developer satisfaction? **Richard Spence, Area Vice President of Growth Sales, International at UiPath** decodes all that and more.

By Pratima H

What new advantages apart from cost-cuts, time-cuts and automation does agentic AI bring in the realm of software testing? Agentic AI is reshaping the future of testing. Some of the direct advantages are in quality, savings and productivity. Infusing quality at the requirement stage ensures clear, testable requirements. Innovative test ideas and mapping requirements to test cases enhance validation and traceability, driving continuous improvement for robust software. When it comes to effort saving, we can generate test cases from requirements in any format (descriptions, pictures, wireframes). We can now drive automation test cases and review bulk results with actionable insights, saving effort and enhancing efficiency.

And that ties into productivity?

Productivity booster agents achieve huge efficiency gains with ready-built agents and the ability to create custom agents using our agent builder, streamlining processes and enhancing productivity.

“Exploratory agents like Testing Drone help you crawl websites, run checks (latency, spelling), reports results etc.



RICHARD SPENCE

Area Vice President of Growth Sales,
International at UiPath

“ While many vendors tout AI-based testing, true value realisation is something that needs to be looked at closely.

Developers tend to struggle with real efficiency gains, waiting-time-on-builds-and-tests, redundancy-fears and new skills when it comes to low code and AI-code.

Your take?

Today teams are overwhelmed by numerous options and social feeds. While many vendors tout AI-based testing, true value realisation is something that needs to be looked at closely. In my view, basic capabilities of a real agentic testing should help us drive huge efficiency gain ensuring quality to avoid retesting.

How?

Adapting to changing priorities, create a lot of reutilisation factors to address resource availability. Simple capabilities like Shift-left testing to ensure early test case creation, wireframe utilisation, strong priority mapping, and flexibility to integrate with existing tool chains and skillsets, low/no/pro code options and purpose-built agents should deliver tremendous value for the team.

A recent study showed that 67% of developers spend more time debugging AI-generated code, while 68% spend more time resolving security vulnerabilities. Faster code is also translating into more time needed in debugging code as well as throughput dips and delivery-stability issues. Your views?

AI offers significant speed and productivity benefits, but challenges accompany these gains. AI-generated code often lacks context and best practices, leading to not working as expected and introduces risks, often new unfamiliar codes can increase debugging time and difficulties. Balancing AI's benefits and challenges is crucial. Despite these hurdles, in my personal view, a net 30 per cent time and effort saving makes the use of AI-generated code worthwhile.

Do agentic testing approaches affect directions like Shift-left, exploratory testing and containerisation in some way?

Agentic testing aligns with the Shift-left approach, starting with requirement quality analysis, test case creation, and automation from wireframes. This saves effort for developers, business analysts, and testers, delivering high-quality applications.

Exploratory agents like Testing Drone help you crawl websites, run checks (latency, spelling), reports results etc. Agents automate repetitive tasks, freeing testers to focus on high-value work. Parallel orchestrated test execution ensures consistent testing across containers, with insights and reports shared for action.

Can agentic AI testing integrate well with manual coding and development? Or does it have to be end-to-end AI in the SDLC?

UiPath Agentic testing offers a modular approach, assisting with requirements, manual testing, test automation, test data management, analysis etc. It also performs health checks on application services in production, ensuring comprehensive and efficient testing processes.

How strong are these alternatives on aspects like accuracy, QA, test-flakiness, code-review load, consistency, pointing/choosing tests to the right areas, false positives and tech-debt issues?

UiPath Test Cloud provides you with the accelerated speed to clear your technical debts, enhances quality to reduce production defects, and provides insights to lower Mean-time-to-Resolution. It reduces duplicates and flakiness with actionable insights. Specific agents like Stability Inspector identify flaky tests and false positives, while impact-driven testing keeps priorities on track.

Does agentic AI change the software license model in a big way—compared to Cloud/SaaS models?

Agentic Testing licensing offers flexibility for accommodating team elasticity, benefiting customers by allowing resource additions from various teams or SIs. It enhances parallel execution capabilities to speed up testing and is generally more cost-effective than traditional approaches.

Do these testing outcomes integrate well with development, documentation, DevOps and deployment areas of coding?

Our agentic testing solution is open and flexible,

“ An insurance client increased regression test coverage by multi-fold that helped reduce production defects significantly.



offers extensive integrations with various ALM, Defect, CI/CD, version control systems, webhooks, Microsoft Office, PDF, and many more.

Can they handle complexities beyond the pattern-part of tests, beyond regression tests?

Our Agentic Testing surpasses pattern-based complexities, offers higher test coverage and automation rates, saves significant effort. It excels in generating exhaustive test scenarios, handling dynamic conditions, managing locator changes, defect analysis with actionable insights, best practices compliance checking, and more.

Any examples of outcomes from the pilots/deployments you have already done?

Our team has numerous deployments across BFSI, Telco, Manufacturing, Retail, Government sectors etc.,

delivering significant value realisations for customers in the region. Few among the several outcomes that our customers have driven are projects like 50 per cent time saving on the entire S4/HANA migration journey for a Telco. Quarterly application releases for a bank went down to biweekly which helped them reduce technical debts significantly. Another insurance client increased regression test coverage by multi-fold that helped reduce production defects significantly as well as reduced specialised resource dependency to manage user journey testing cutting across mainframe, citrix, mobile, and web applications. A retail customer gained confidence to migrate 180 applications from one cloud to another within stated timeframe. A few BFSI customers fulfilled their regulatory compliances adopting our solutions. 

pratimah@cybermedia.co.in

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Why Attend This Workshop

Mandatory Compliance: The DPDP Act, passed in August 2023, mandates strict compliance for safeguarding personal data.

Severe Penalties: Non-compliance can result in penalties of up to **₹250 crore**.

Top Priority For Leadership: Data protection is now a critical concern for IT leaders and senior management across industries.

Long Implementation Process: Achieving full compliance can take **10-12** months for large enterprises.

Actionable Guidance: The workshop offers practical strategies to implement the DPDPA framework effectively.

Addressing Key Challenges: Learn how to overcome the most pressing challenges in adopting new data protection protocols.

Protect Against Risks: Gain essential knowledge to safeguard your organization from legal risks and potential data breaches.

Key Workshop Modules

- Understanding the Act
- Organizational Initiatives
- Data Principal Rights
- Penalties & Harm Audits
- Building Organizational Change
- Data Inventory & Mapping
- Reviewing SLAs
- Data Protection Impact Assessments (DPIA)

Who Should Attend

- Chief Risk Officers (CROs) and Data Privacy Officers (DPOs)
- CISOs and IT Decision Makers & Influencers
- IT and Cyber Security Heads
- VPs, Directors and GMs of IT and Cybersecurity
- Data Protection and Compliance Leaders
- Cyber Law Practitioners and Cyber Investigators

CONTACT US

Ajay Dhoundiyal
Sr. Manager
ajaydh@cybermedia.co.in
+91 99535 40318

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Is Software Engineering Dead?

GenAI automates many coding tasks, but software engineering is much more than just writing code

By Raju Chellam



Here's a software story with a corporate twist: The CEO asked for a "quick demo" of the new AI-powered software deployment system. The software engineering team triggered the demo. The bot announced: "Initiating chaos protocol." The CEO froze. The AI continued: "Sacrificing one microservice to appease the uptime gods." The engineering lead whispered: "It's just a quirky logging message." Concerned, the CEO asked: "Is this... safe?" The AI bot replied: "Define safe." Just then, the office lights flickered. The CEO stood up. "I'll just... circle back later," he said and left the room. The software engineering team has now renamed all "quick demos" as "quick demons."

If that anecdote made you blink, these statistics should make you think: By 2028, up to 90% of software engineers working in corporate environments will use AI code assistants. That's up from less than 14% in early 2024, according to Gartner estimates. And as investments in IoT (Internet of Things) ramp up, the role of software engineers will drastically transform. In the Indo-Pacific region (excluding Japan), spending

on IoT tech is set to reach US\$355 billion by 2029, up from US\$241 billion in 2025, says IDC (International Data Corp).

THE AI ANGLE

"AI-enabled tools and technologies are fundamentally changing how software is built and delivered," says Joachim Herschmann, a Gartner vice president. "Corporate leaders need to harness AI-driven automation, optimize talent strategies and adopt sustainable, AI-native engineering practices. Software engineering leaders who act on these trends will then be able to position their organizations for long-term success."

Software engineering is the systematic application of engineering principles to the design, development, testing and maintenance of software systems. It involves structured processes, tools and methodologies to ensure software is reliable, scalable, and meets user requirements.

Netflix is a good example. It uses microservices architecture where each service—such as user

“80% of humans will engage with smart robots on a daily basis, and one in 20 supply chain managers will manage robots, rather than humans by 2030.

profiles, recommendations, streaming—is independently developed and deployed. Engineers use Java, Python, Node.js and follow Agile methodologies for iterative development. The company employs automated testing and CI/CD (continuous integration and deployment) to apply frequent updates without downtime.

Generative AI is transforming software engineering by allowing applications to interact intelligently and autonomously, similar to human interactions. More than 50% of software engineering teams will be actively building LLM-based features by 2027. “Successfully building LLM-based applications and agents requires software engineering leaders to rethink their strategies,” Herschmann says. “This means investing in upskilling, experimenting with GenAI outputs and implementing strong guardrails to manage risks.”

Unlike proprietary models, open GenAI models enable organizations to customize, finetune and deploy AI solutions tailored to their specific needs, whether on-premise or on the cloud. This shift is making advanced AI capabilities more accessible and cost-effective for a wider range of teams and use cases. Gartner predicts that by 2028, 30% of total global enterprise spend on GenAI technologies will be on open GenAI models tuned for domain-specific use cases.

THE IoT ANGLE

Where does IoT figure in this picture? Software engineering provides the structure and discipline to build the IoT software stack, which typically includes embedded software with engineers writing firmware for microcontrollers in IoT devices for example, implementing protocols to enable device-to-cloud communication, and ensuring secure firmware updates, authentication and encryption across the IoT ecosystem.

One example: Tesla’s vehicles are IoT devices on wheels. They have embedded software controls for sensors and actuators and send real-time data to cloud servers for diagnostics and updates. Programmers use software engineering practices to deploy over-the-air updates, ensuring continuous improvement and security.

IoT spending in 2025 will be led by manufacturing, government, retail and utilities, accounting for over 50% of global investment. Industrial and consumer goods manufacturers will be top spenders, while healthcare and transportation will see the fastest growth.

In the Indo-Pacific region, the highest spending will be on video analytics, manufacturing operations, inventory intelligence, supply chain resilience and asset management. Rapidly growing use cases include public safety, emergency response and leak detection—driven by rising demand for real-time data and automation.

“Prioritizing business optimization alongside strategic investments in AI, analytics and security is crucial for enterprises in the region,” says Sharad Kotagi, an IDC market analyst. “Robust IoT solutions will accelerate digital transformation by unlocking data-driven decision-making and enhancing customer experiences.”

IDC says China will account for the largest share of spending with more than 60% this year, followed by India and South Korea. The fastest growth in IoT-related spending will be driven by smart factories and Industry 4.0, along with government-led IoT programs and policies.

Moreover, 80% of humans will engage with smart robots on a daily basis, and one in 20 supply chain managers will manage robots, rather than humans by 2030. “Organizations are placing greater emphasis on enhancing the capabilities of their existing workforce by supplementing with robotics due to factors like labor scarcity and rising costs,” says Abdil Tunca, a Gartner senior principal analyst. “Smart robots have been identified by chief supply chain officers as an important investment area, though many acknowledge their organization lacks internal robotics expertise to fully leverage these innovative technologies.”

THE DATA ANGLE

The third pillar in software engineering is about data as a product. That’s because all software products are constructed on a bed of data. Put simply, a data product is made up of components that are designed to collect, organize and manage datasets to be easily consumed by various teams or systems. To capture

“Find people who can run data products like a business. Put in place empowered data product owners and senior data leaders who understand what matters to the business, from articulating the value in business terms to building support.

value, a data product must be built from the beginning to be reused and extended to meet a broad range of business cases.

McKinsey cites the analogy of a railway executive with a contract to transport cargo across the country. You wouldn't have a different engine pulling each individual car of cargo. It would be much more efficient and cost-effective to hitch as many cargo cars as possible to the same engine. In fact, you would want a standard set of trains and connectors that would allow you to pull different kinds of cargo anywhere.

“This analogy is particularly germane to the world of data products,” McKinsey says. “Scale and value come from treating a data product like an engine that can support a large number of high-value use cases (or cars). Unfortunately, companies are operating much more along the single engine-single car model. The result is fragmenting data programs that fail to scale or generate the value that many had expected.”

The wave of enthusiasm surrounding GenAI has driven a wider appreciation in the boardroom of the importance of data and the need to better harness it. Having reliable datasets is also a key component of software engineering.

“Delivering on high-value business cases often requires multiple data products,” says McKinsey. “For example, a telco wanted to optimize its network deployment. This required it to figure out which people and equipment were available at any given location. To run the relevant analysis, it needed to develop two data products: one focused on technicians' skills and locations (among other things) and the other on towers to capture the SKUs for the parts used, configurations, traffic data, and each tower's performance.”

THE TALENT ANGLE

The bottom line: In the age of GenAI, is software engineering dead? No. GenAI automates many coding tasks, but software engineering is much more than just writing code. It involves architecture, business grasp, cybersecurity and scalability by design, testing, maintenance and human-centered problem solving. GenAI can assist, but it doesn't replace the need for engineers who understand context, constraints and consequences.

Talent density—the concentration of highly skilled professionals within teams—has become a key differentiator for high-performing engineering organizations. When supported by the right culture and tech strategies, talent-dense teams can operate with greater efficiency and adaptability and deliver increased customer value.

“To remain competitive, organizations must move beyond traditional hiring practices and focus on building teams with high talent density,” says Gartner's Herschmann. “Leaders should cultivate a culture of continuous learning and collaboration to attract and retain skilled professionals who can adapt and grow with evolving business needs.”

Find people who can run data products like a business. Put in place empowered data product owners and senior data leaders who understand what matters to the business, from articulating the value in business terms to building support.

“It's about more value, not better data,” McKinsey advises. “The goal of developing data products isn't to generate better data; it's to generate value. No data product program should begin until leadership has a firm grasp of the value that each use case can generate and has prioritized the biggest opportunities.”

Since we started with a corporate software engineering joke, let's end with another. At a company town hall gathering, the team was demonstrating its new AI-powered software engineered chatbot. Everything worked perfectly in rehearsals. On stage, the CEO proudly said: “Ask it anything!” An employee typed, “What's your purpose?” The bot replied: “To replace middle management.” Nervous laughter. Trying to defuse the embarrassing situation, CEO quickly asked: “Tell us a joke.” The bot said: “Your software engineering team.” 

Raju Chellam is a former Editor of Dataquest and is currently based in Singapore, where he is the Editor-in-Chief of the AI Ethics & Governance Body of Knowledge, and Chair of Cloud & Data Standards.
maildqindia@cybermedia.co.in



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When Indian war drones beat Pakistan & Co.

Startups have boomed in the changing geopolitics and strong Atmanirbhar push. This momentum could enable India to become a worldwide hub for drone manufacturing, increasing exports and creating high-tech employment opportunities, feels **Sai Pattabiram, Founder & MD, Zuppa Geo Navigation Technologies Pvt. Ltd.**

By Sunil Rajguru

Can you discuss the details of your participation in Operation Sindoor and how it helped to give India a military edge?

Our Ajeet Mini Drones were used for enhancement of localised situational awareness by surveillance patrols. Ajeet Mini is a fully designed and manufactured in India Micro drone that is the equivalent of the famous Chinese DJI drone that was being used by frontline Army units for what is known as “Over The Hill Situational Awareness”.

These drones in backpacks apart from being the foot soldiers go to tool for enhanced situational awareness are designed on a “Transformer” concept that covers a weight range from the smallest at around 1 kg to the largest at around 4 kgs.

Post Operation Sindoor, apart from the exponential increase in enquiries for India’s only DJI China equivalent drones ZUPPA is witnessing a huge jump in demand for its NavGati Autopilot given that it is India’s only secure drone flight controller which the Indian Army can use to introduce Cyber Secure swarming capabilities in its existing drone inventories immediately.

Wherever you see, there are military drones. Be it the Russia-Ukraine or Israel-Iran conflicts. Are drones now firmly the future of warfare? How will we stay one step ahead of our enemies?

All recent conflicts be it Russia-Ukraine or Israeli-Hamas or the Houthi’s have turned out to be Electronic Centric wars where the focus has been to gain a strategic advantage both tactically by interfering or accessing the control



SAI PATTABIRAM

Founder & MD,
Zuppa Geo Navigation Technologies Pvt. Ltd.

“The Indian drone industry is expected to contribute significantly to the national economy, with the market size projected to reach ₹15,000 crores by 2026.

and communication systems of the adversaries equipment by exploiting vulnerabilities in the software/code layers of the equipment's Cyber Physical Stack (CPS). This has been the case because of the fact that these wars for the very first time witnessed large scale deployment of drones and allied electronic centric equipment.

Commercial Off The Shelf (COTS) drones and drones assembled from COTS components have turned conventional military doctrine on the head by flipping the cost factors of war from being escalative to being de-escalative, e.g., a \$2000 drone can damage equipment costing millions of dollars, hence the established doctrine that was agnostic to the cost of equipment is replaced now with militaries looking to lower the cost of their equipment while maximising its striking power. This led to militaries looking to buy low-cost drones which in turn led to the large-scale infiltration of Chinese components into defence drones thanks to revenue driven “Traders with Screwdrivers” supplying them complete Chinese CKD drones.

The current impact of global drone geopolitics is not in India's favour as was seen in Operation Sindoor where two global drone powers China and Turkey aligned with Pakistan and tested India's capabilities in the New Age Technology of drones.

With Russia and Israel, two of India's largest suppliers of defence equipment at war, India has to develop its own indigenous drone competencies to safeguard its national security interests”

What about the use of IoT and AI in drones? How will they change the character and usage of drones? Can swarm AI drones take care of entire missions? What about Kamikaze drones?

Today drones are accepted to be essential disruptors in future warfare. Features that will guide their evolution to be indispensable tools in the hands of soldiers will be greater autonomy, closed loop navigation, AI based terminal action, swarms, Visual Guidance and similar algorithm-based enhancements and adaptations. These will significantly enhance the soldier's ability to act and respond to threats.

The future lies in multi mission swarms where drones with different payload carrying capabilities will be part of the same swarm to achieve different objectives within a single mission. Swarm drones can handle entire missions.

What is the future of drones when it comes to size, reach and materials used? What research is going on those counts?

The Indian drone market is anticipated to grow at a remarkable pace in the next five years, led by a mix of government encouragement, technological innovation, and growing demand from various industries. Growing usage of drones in agriculture, defence, logistics, and infrastructure is also anticipated to drive market growth. Advances in technology, especially in Artificial Intelligence (AI) and Machine Learning (ML), are making drone operations smarter and more efficient.

The Indian drone industry is expected to contribute significantly to the national economy, with the market size projected to reach 15,000 crores by 2026. This growth will lead to the creation of over 100,000 direct and indirect jobs. Manufacturing and assembly plants will generate employment in production and quality control, while increased demand for AI-driven drone solutions will create opportunities for software developers and data analysts. The expansion of drone-based services, including agricultural mapping, security, and logistics, will further boost employment in operations and maintenance.

Although Operation Sindoor demonstrated India's ability to integrate advanced systems, it also highlighted the challenges that lie ahead. Three key areas of concentration are necessary to maintain this momentum:

- **Deep-Tech R&D:** India must boost semiconductor, cutting-edge material, and AI-on-the-Edge computing investment if it is to reduce reliance on import sources. Basic hardware innovation still requires significant policy and private sector support even with the progress in AI models.
- **Scalable Ecosystems:** Public-private sector alliances should go beyond mere procurement.

“ The hacking of India’s tactical drone on the western border on 23rd August 2024 turned out to be the proverbial last straw on the camel’s back for the Indian Army.



India requires more dual-use technology testbeds, simulation labs, and regulatory sandboxes benefiting the civilian and military sectors.

- **Cross-Sector Spillover:** From medical logistics and infrastructure inspection to precision agriculture and disaster response, the benefits of military-grade technologies need to be applied for public good.

What are the dangers that our drones could be hijacked by the enemy?

India is a large country with hostile neighbours surrounding it on three sides, hence with drones emerging to be weapons of choice thanks to the asymmetric benefits delivered by them in modern warfare, it is an absolute must have from a national security perspective. As drones become more connected and data-driven, the risk of cyberattacks increases. Imported drone controllers have been particularly vulnerable to hacking, raising concerns about data integrity and operational security. Indian manufacturers are addressing this challenge by developing secure systems with real-time threat detection and encrypted communication channels.

The use of assembled agricultural drones by terrorists in Manipur drone bombings has seriously brought into focus the potential security threats of using Chinese components in Indian drones.

Cybersecurity threats are a growing concern as drones become more connected and data-driven. Secure communication protocols using AES-256 encryption, along with real-time threat detection powered by AI, are essential to prevent hacking. Blockchain technology can be employed to ensure the integrity of flight data and operational logs. ZUPPA’s expertise in secure vehicle tracking systems and AI-driven automation equips it to address these challenges effectively, ensuring data security and operational reliability.

The hacking of India’s tactical drone on the western border on 23rd August 2024 turned out to be the proverbial last straw on the camel’s back for the Indian Army which had been facing the same problem since 2022. The outcome of this incident was the complete suspension, cancellation and stoppage of all drone procurement of all drones for 6-7 months and the formulation of a cybersecurity framework by the Indian Army and a crackdown on use of Chinese components in drones supplied to the Indian Army.

Cyber-resilient architecture ensures that operational data remains protected, even in high-risk environments. This focus on security makes Indian drones ideal for sensitive applications in defence and critical infrastructure. By positioning cybersecurity as a key differentiator, Indian manufacturers can build trust and drive broader adoption in global markets.



“ I believe that this momentum could enable India to become a worldwide hub for drone manufacturing, which would increase exports and create local high-tech employment opportunities.

Thanks to both these incidents and the learning of the armed forces post Operation Sindoor, ZUPPA's unique position as India's only indigenous Deep Tech drone company has significantly strengthened our position in the defence drone ecosystem. Hence ZUPPA's largest vertical is turning out to be defence and will continue to be best in the foreseeable future given our very high entry barrier in that segment.

How much role will drones play in India's Mission2047 to become a tech and economic superpower? How is the Make in India mission going when it comes to drones?

The Indian drone industry is poised to evolve rapidly over the next decade. Urban Air Mobility (UAM) with passenger drones and air taxis is expected to become a reality. Swarm technology, where coordinated drone fleets work together for complex tasks, will enhance defence and disaster management capabilities. Integration with 5G networks will enable faster data transfer and real-time control. Hybrid drones combining fixed-wing and multirotor capabilities will provide greater range and versatility.

India's drone sector needs to create a completely self-sufficient system to maintain long-term development. This would boost national supply chains, lower dependence on foreign components, and support next-generation technology research and development.

This process depends largely on government assistance. Already advancing is the Indian government's focus on indigenization via defence procurement policies and rewards for domestic manufacturing. India can increase strategic autonomy and lower exposure to global supply chain disturbances by creating a strong domestic economy.

India is positioning itself as a key player in this transformation. Though still in an early phase, its native drone market is fast-growing. Analysts estimate that the Indian drone market is worth roughly \$1.15 billion in 2024 and is likely to rise at a rate of 20% annually until 2030. An EY-FICCI study suggests that by 2030, properly developed India's drone manufacturing and services output could be valued at about \$23 billion. Changing geopolitics and a strong Atmanirbhar (self-reliance) push have driven a boom in new startups and government support in the sector. I believe that this momentum could enable India to become a worldwide hub for drone manufacturing, which would increase exports and create local high-tech employment opportunities. Considering all factors, India possesses the necessary demand base and skill pool to become a significant player in the upcoming unmanned aircraft sector. 

sunilr@cybermedia.co.in

Technology and Politics are the New Tectonic Plates

Gone are the times when defence would drive geopolitics, the seat has now been taken by technology. How do the tables rearrange themselves in this new world? The equator of this world does change a lot when the lines of AI get horizontal instead of vertical – how? **Purushottam Kaushik, Head, Centre for the Fourth Industrial Revolution, World Economic Forum** helps us to decipher the economics, politics and ethics of technology in this chat done at the Zinnov Confluence 2025 (where AI was explored from many dimensions, by many hats and through many interesting huddles).

By Pratima H

What is the view from your room like?

Do you also see AI dominating everything now?

AI is, for sure, the current talk of the town and dominating many discussions. My session at Davos and visits to China show the same pattern. But what is interesting is how AI is going horizontal. Now we are talking of AI in bio, in healthcare etc. AI governance and ethics have also become hot topics. At the same time, there is chatter on quantum computing, biotech, autonomous technology (drones and cars). Of course, recently, defence has become a big topic. We are also witnessing discussions on quantum computing and compute power. A lot of unresolved issues are now in the front-row. Like precision medicine or exploring longevity. There is also interest in chips, essential minerals—and, again, on a horizontal level. No one imagined geopolitics to get to the state it is now got in.

“ We are just in phase 0 of AI. Wait till we get to phase 1 and 2. It would be crazy and unpredictable.



PURUSHOTTAM KAUSHIK

Head, Centre for the Fourth Industrial Revolution,
World Economic Forum

“ The part of the iceberg about enterprise data and data behind walls has not been explored yet.



No one imagined China and Taiwan becoming choking-points of the world.

Has geopolitics become really chaotic for technology?

Today, a country cannot imagine working independently – one has to look at collaboration and sustainability. The Economics has become complicated, specially after the US elections. Lots of questions and calculations. A country has to protect jobs and exports on one side but also figure out the geo-political ‘give and take’ on the other side. There is also a lot of unpredictability in deals—walk-offs can happen. New alignments are being made—whether we look at China, Korea or Russia. It is a pretty chaotic time.

How can, then, inclusivity and geographical democratisation work?

Yes, it is a challenge. India is roughly a 1.4 billion people-strong nation but about 60 per cent do not make over US\$2 per day. We have to take care of many unresolved issues. We are in a world where one company’s market cap is more than a country’s GDP. We have to adopt a long-term plan. Something like what China has done with EVs, minerals, AI—the rise has not been sudden. India has to build its own path—on its innate strengths.

Can we pull that off with AI?

We are in Phase 0 of AI. It is a long race and we do not know who is where. You cannot get ahead with just web/public data—the part of the iceberg about enterprise data and data behind walls has not been explored yet. But we have hope from what we did with DPI. That strength can be expanded to agriculture, healthcare etc. We need to figure out how to play—but looking at this as a long-term game. Instead of 800 LLMs and open source models, we have to think of enterprise data and a verticalised-approach.

Are ethics and safety talked about enough - when we think of AI at global forums? Is Big Tech inclined towards those goals?

They are compliant of the laws. We are part of some discussions. Overall, yes, there is a concern in society on equity. But the companies are doing their best to manage these concerns. Their business model and work are trying to find a path ahead. It is an evolving journey. Consent, governance and safety are serious issues. Wait till we hit the next phase of AI when agents would be doing our shopping, compliance etc. It would be all fun to watch but the balance of business and responsibility there would become more critical. 

pratimah@cybermedia.co.in

Blueprints—Blue Cheese or Blue Murder or Blue Blood?

Mega scale projects of today, and tomorrow, have to hold many beams together—structural safety, carbon impact consciousness, timely completion, cost-control and disaster readiness. Are BIM solutions (and their adjacent tools) helping—and how? And are digital blueprints the next big hero for rescue-ops?

By Pratima H

What's common between the Tower of Wanaka in New Zealand and the Tower of Suurhusen in Germany? It's not that they are lopsided. It's not even about that being deliberately so. It's all related to the bragging-rights they claimed against a building that turned out tilted, and by mistake. We all know the story of the Leaning Tower of Pisa. Thanks to a miscalculation about a soft sub-soil, this building started leaning as soon as the construction began. From interruptions due to battles, to use of lead counterweights, to the design of upper floors, to the employment of cables, to the number of bells – a lot has been faced and tried – specially by engineers and designers – to correct the tilt and stop the tower from collapsing. Thankfully, this tilt has become its unique attraction, thus, inviting competition from some towers later (which, deliberately, tried to be lopsided).

Not every building turns out that lucky. Mistakes – at the design desk – cannot just result in deadlines, budgets and efforts tilting in the wrong direction; but they can also cause accidents, collapses and reputation-demolition. In the last two decades, technology has come to the rescue of designers, engineers and builders. From CAD to CAM to PLM

“Digital replicas can help immensely in rescue operations as one can see the layout and interplay of spaces and people in one shot.



ALOK SHARMA

Director, Architecture, Engineering and Construction (AEC), Autodesk India & SAARC

“ Sometimes, safety, sustainability, speed and cost-control can appear as conflicting goals. That's where we come in.

and now to BIM (Building Information Modeling) and Digital Twins – there has been a lot of help and acuity available for the eyes, ears, hands and shoulders of people who 'build'. Mega projects continue to rise and try to balance their stability in the soft soils of sustainability, safety, disaster management, ROI and time-management. Which way is technology leaning now? **Alok Sharma, Director, Architecture, Engineering and Construction (AEC), Autodesk India & SAARC** shows us a not-so-rough sketch.

You have a strong PSU presence and play. What's different about them vs. other enterprises in the technology landscape? What's good and what's not so good (or different) about them?

Their speed of execution—in comparison to others—is sometimes slow. Their adoption curves are also different. But the sheer scale of public vis a vis private sector stands out in a big way. Some estimates tell that 70 per cent of infrastructure in India is yet to be built. Change management is a challenge. But we have seen pockets and departments that are swift and open with technology leaps. Like Railways, Delhi Metro, Airports Authority of India, Railways redevelopment projects etc.

What are their pain-points? How much do they struggle with time/scope/cost-creeps?

Two major ones. First is related to delays. Many projects are not built on time. There are budget over-runs. When we zoom in on delays, they are of two types. First is related to processes. Second is about not designing in advance and with planning. That's where technology comes in. More so with large infra projects and with the need for details. One can pre-empt a lot of issues and avoid surprises at the construction stages by designing smartly. In fact, in many cases, the design happens after the project plan. We have seen how much designing well helps.

How? Can you expand that a bit?

In some cases, we were able to save 35 per cent of time with good design and visualisation. Also, doing construction, collaboration can make or break a lot of

things. BIM can give a single source of truth to various stakeholders. They don't have to deal with multiple sets of drawings. Our Common Data Environment helps there. Operations become easy when it's an end-to-end digital process. Imagine the issues one can solve with the digital replica of an airport which can run into so many kilometres in terms of scale, otherwise. It is so tough to deal with these issues in a physical way.

Let's spend a minute on the word collaboration. Is that easy to wield with the level of heterogeneity and lack of digital literacy in the long tail of projects?

We, as a company, believe in open access. We have given free access and we work across platforms. Our tools can be seen in readable file formats. We also believe in equal access for future generations. We work on education and training at various levels in the education space. On the ground level, a contractor can access design on his/her mobile. Or a guard can be spared the task of a manual entry of materials coming on a truck. Digitalisation should be democratic and we work strongly on that aspect.

How does this translate for the financial desk? Savings, ROI and other tangible impact?

As per some recent estimates, BIM has delivered up to 43 per cent improvements in productivity, 256 days in schedule acceleration, and millions of dollars in lifecycle cost savings across water, energy, roads, railways, and airport projects. I can also cite some data from our BIM report. Imagine 111.93 crore cost savings per road project enabled by BIM-led construction sequencing, real-time monitoring, and material efficiency—leading to a 32.6 per cent design duration reduction and a 36.5 per cent productivity gain. There were also 256 days saved in water infrastructure projects, 34.38 crore saved per energy project, and 172.83 crore saved in large-scale airport projects. Also, 560 hours of workforce time was saved in rail projects wherein BIM integration led to 80-day construction savings, 26 per cent productivity boost, and minimised disruptions through data-driven maintenance planning.

“ Our digital reconstruction supported faster, more precise restoration efforts, helping bring the Notre Dame cathedral back to life in record time.

What's India like? What's different about you vs. Dassault Systems or Siemens because now digital twins, AI etc. are becoming common denominators?

The scale of projects in India is massive. We have done, and are doing, a lot of work in the Railways, metro projects, airport terminals. A lot of technology use is moving from CAD to BIM. BIM is not just software. It covers processes and people. In India, we are putting a lot of efforts in adoption. We are working on multiple fronts. Like education. Like helping customers move up the chain and beyond CAD. Like blending sustainability and cost-control. Like, having country-kits and localisation of codes (as seen in case of roads or a CPWD library of components). Like helping government processes aware about BIM.

How, and how much, do good design and digital planning help in elevating safety and sustainability of buildings. Specially with corruption? And also with lack of control on scope 2 and 3 emissions?

Sometimes, safety, sustainability, speed and cost-control can appear as conflicting goals. That's where we come in. One does not have to compromise one aspect for the other. Corruption at the information level (not of mindset or intent) can be addressed with these tools. We can help with designs that help in optimising the use of materials like steel and cement. AI-based carbon analytics, load checks, augmentation, replication etc. – all help in minimising carbon footprint. For example, once when we helped to design a partition for Airbus, we cut down the weight down by 30 per cent. Now, this not only helps in reducing fuel usage but also has commercial advantages.

Are these digital designs giving rise to new red-tape, new blind spots and deaf spots?

We have not faced any. Specially with the departments we have worked with. Initiating change management can take some time—given the heavy legacy presence. Well-collated Data islands—with single point visibility and availability—solve a lot of issues too.

The world has witnessed a new level of accidents and disasters in the last few months. Can buildings

and projects be ready and robust enough for those surprises?

This reminds me of an accident in Paris and a subsequent reconstruction work – Notre Dame Cathedral. Autodesk contributed to the restoration of Notre-Dame Cathedral by providing a 3D building information model (BIM), developed using scans, photogrammetry, and drone footage. This digital reconstruction supported faster, more precise restoration efforts, helping bring the cathedral back to life in record time.

Things become so fast and easy with digital replicas now. But there is one more advantage—digital replicas can help immensely in rescue operations as one can see the layout and interplay of spaces and people in one shot. Natural disasters are not in human control. But bouncing back is. And so is planning for readiness. Our Infracore Flood Analysis can help with useful data before the flood happens. Simulation helps too.

As seen with Fusion API etc. – what can you share about interoperability in CAD-CAM space?

Our service partners specialise in APIs. Like our tools can talk to SAP system and APIs help the data move back and forth easily, letting existing and CAD systems talk to each other.

Which one is your favourite mega project, so far?

Many. But Bangalore T2 and Delhi Metro top my mind. So does the Statue of Unity.

Any more projects that can you illustrate to show BIM's evolution and impact?

There is the Delhi Metro Rail Corporation (DMRC) one – it partnered with Autodesk to improve coordination, minimise rework, and enable seamless multi-stakeholder collaboration using Autodesk Construction Cloud. The adoption of cloud-based BIM workflows enhanced efficiency and sustainability by integrating design, construction, and operations. Also, Autodesk Tandem and Autodesk Construction Cloud were instrumental in the digital twin implementation at Neilsoft campus. 

pratimah@cybermedia.co.in

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Building cyber resilience across a vast logistics network

As logistics becomes a prime target for ransomware and supply chain attacks, Blue Dart is setting benchmarks in cybersecurity strategy.

CIO **Manoj Madhavan** discusses the pillars of their approach, the future of edge security, and how data protection is becoming the backbone of customer trust and business continuity.

By Aanchal Ghatak

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iven the scale and complexity of your logistics network, what are the core pillars of your cybersecurity strategy today?

Considering the size and complexity of our logistics network, Blue Dart employs a sophisticated multi-layered strategy for protecting infrastructure and sensitive information across multiple IT systems. A key aspect of this strategy is the safeguarding of data and systems during and after critical and sensitive processes, especially during data generation and processing.

Strong compartmentalization and enforcement techniques achieve this. We employ persistent validation and strong enforcement of access policies, which mandate all internal users and systems to be authenticated and authorized. Proactive threat intelligence and incident readiness provide crucial value by engaging the cybersecurity arena and receiving relevant information prior to threats, enabling a swift response using established crisis management frameworks.



Logistics companies have seen a sharp rise in ransomware incidents, targeting both large and mid-sized operators. These attacks can halt supply chains, disrupt port operations, and lead to significant financial losses.



MANOJ MADHAVAN
Chief Information Officer, Blue Dart

“Our layered defence approach consists of endpoint detection and response (EDR) tools, advanced threat intelligence feeds catered to logistics-related threats, and round-the-clock monitoring via a Security Operations Center (SOC).

There is also a need to strike a compromise between innovation and compliance by aligning all corporate innovation with changing regulatory policies. Importance is given to the compliance outlined and understanding the privacy risks at play with public-facing information, focusing instead on advancing brand safety features.

A significant portion includes alerting staff and customers, targeting phishing and brandjacking. We provide them with security awareness training and can benchmark against our evaluations on training to refine the information and strategies used to better address these risks. We can also benchmark the data gathered from the internal audits and the campaigns to evaluate and improve on attempts made.

With over 9,000 terminals and a vast network of physical and digital endpoints, how do you manage risk at the edge—especially in areas like last-mile delivery, EV fleets, and mobile vendor access?

Managing risk at the “edge” of Blue Dart’s vast logistics network, which includes over 9,000 terminals, last-mile delivery, EV fleets, and mobile vendor access, is crucial.

To enable the management of cybersecurity risks across a 9,000+ terminal, last-mile delivery systems, EV fleets, and mobile vendor access edge network, we are utilizing a complete toolkit of abilities to assure we are on top of things. Real-time tracking and control towers provide 100% visibility to our entire network which is essential to identify and respond to deviations in real-time.

Last-mile applications through us are secure mobile apps with secure mobile applications and good multi-authentications and encryption that ensure data are protected all the way to the end, even in the deep roots of the last mile of delivery. Through our programs and initiatives, we have moved from relying on paper processes in a paper world to secure digital vendor portals, significantly diminishing security pathways weaken data and risks in route to the last mile.

For the EV fleets and mobile vendors, we are leveraging dynamic routing access controls, and geo-fencing capabilities that provide context into making route management both secure and efficient, while having nothing less than the basics of security in action in our users. For our ride share offerings, or mobile app offerings, regular training drills and threat and incident response mechanisms and processes that provide probabilities to improve on safeguarding our digital user assets, while improving our security posture in the physical realm with a ubiquitous edge on their user’s mobile act.

Cyber threats targeting the logistics sector are growing, particularly ransomware and supply chain attacks. How is Blue Dart enhancing its threat detection and incident response capabilities

At Blue Dart, we are aware of the growing threat landscape in the logistics industry, especially the increase in supply chain attacks and ransomware. We’ve greatly improved our threat detection and incident response capabilities to stay ahead. Our layered defence approach consists of endpoint detection and response (EDR) tools, advanced threat intelligence feeds catered to logistics-related threats, and round-the-clock monitoring via a Security Operations Center (SOC).

Behavioural analytics and anomaly detection have also been used to automate threat detection throughout our infrastructure. In order to guarantee quick containment and recovery, we have a formal playbook in place, regularly perform tabletop exercises, and work with national CERTs. We’ve tightened vendor risk assessments for our supply chain, mandated security attestations (such as ISO 27001), and consistently monitor third-party integrations for vulnerabilities. Ultimately, our goal is resilience – not just protection.

What kind of regulatory or compliance pressures do you face in securing customer data across national and cross-border logistics operations?

Since Some parts of our operations are cross-border,

“ We use behavioural analytics and anomaly detection to automate threat detection. A formal playbook, regular exercises, and collaboration with CERTs ensure quick response. Strong vendor checks and third-party monitoring drive our goal: resilience.



the logistics industry is subject to a complex web of regulatory and compliance pressures. Depending on the data we handle, and data protection laws like the GDPR in Europe and the DPDP Act in India. Regarding data residency, consent management, breach notification, and cross-border data transfers, every jurisdiction has different regulations.

We've addressed this by putting in place a unified data governance framework that guarantees compliance wherever data flows. To satisfy requirements for accountability and transparency, we employ data minimization techniques, role-based access controls, encryption both in transit and at rest, and audit trails. We also assess and monitor third-party data processors to ensure they meet the same standards. Our ultimate objective is to view data privacy as a fundamental component of customer trust, not just a legal requirement.

Looking ahead, what are the most critical cybersecurity challenges in the logistics sector—and how is Blue Dart preparing for them?

Some of the critical cybersecurity challenges in India's Logistics Sector are:

1. Ransomware and Malware Attacks

Logistics companies have seen a sharp rise in

ransomware incidents, targeting both large and mid-sized operators. These attacks can halt supply chains, disrupt port operations, and lead to significant financial losses.

2. Supply Chain Vulnerabilities

India's logistics sector is highly fragmented, with thousands of small and medium-sized operators. Attackers often exploit weaker cybersecurity practices among smaller partners to gain access to larger networks.

3. IoT and Fleet Management Risks

The rapid adoption of IoT devices for vehicle tracking, warehouse automation, and cargo monitoring has increased the attack surface. Logistics firms use legacy systems or low-cost IoT devices with minimal security, making them vulnerable to data breaches and operational sabotage.

To mitigate these challenges, at Blue Dart, we continuously strengthen our cybersecurity protocols, ensuring resilience against emerging digital threats while safeguarding operations across our network. 

aanchalg@cybermedia.co.in

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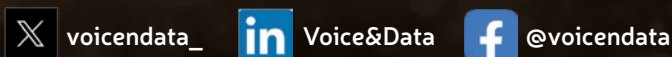
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GCCs will not kill good old IT baby-sitters. But....

...outsourcing cribs will change as core-work control, intellectual information, ease of direct engagement and expertise become strong reasons for GCCs to sit in chairs where service providers once reigned.

By Pratima H

It is not a surprise anymore to go to a house-warming party and walk about with no signs of a working kitchen. And no porch. For that matter, no washing machine parking-spots anywhere as well. The more the new generation lives in apps and on things on hire, the more real estate they have for the gaming zone or the gym. But then, the flip arrived. Many people have started going back to home-made food and owning cars. And like these 'lifestyle switchers', many global companies also realised that they would rather trust their children in their own hands instead of relying on a governess. Not because she failed on being Mary Poppins but because when you love your kid, it is just too hard to see that treasure being raised by someone else. Is that why GCCs are promising to be the next new model after outsourcing, insourcing, nearshoring and captives? **Mohammed Faraz Khan, Partner and Head of GCC Practice - EMEA, Zinnov** (A global management and strategy consultancy firm) gives a tour of this new layout.

“There is no point in reinventing the wheel. A lot of non-core work would remain with the service provider.



MOHAMMED FARAZ KHAN

Partner and Head of GCC Practice - EMEA, Zinnov

“About 33-37 per cent of Fortune 500 companies are already here. The service providers go after the big names, and this is where small and medium-sized companies opt for a GCC approach.

Let's start first with how, and why, the IT industry has evolved from complete outsourcing paradigms to GCCs today? What are the industry's contours today and do service providers now lose their spot?

The industry can be divided into three categories. The top service providers, the GCCs and the startups. When global companies wanted work done some years back, they would easily hand it over to an Infosys or a TCS. Outsourcing became the common model due to its low cost and vast scale. These providers could also turn out immediate project completions because of the benches they kept. It was logical. It was prominent. Over the years, outsourcing vendors have, perhaps, created some inefficiencies. The talent in major outsourcing pools like India and Manila, now, does not aspire to work for a provider but for a global brand. That's where Global Capability Centres rise.

But was not this need and degree of control being met with the captive model earlier?

The ODC model, as we called it, was an alternative to outsourcing but here the employee was still on the payroll of a provider, albeit, working in the environment of the client company. In the GCC model, the employee is on the client's payroll and the focus is completely on the work being done. The talent does not move as per the service provider's preferences. It stays on one focused area and is oriented towards outcomes. Plus, this is a good option when you want to trust your people with IP-related work. There was also a stability issue. If an outsourcing provider shut down, the client's work would come to a standstill. That's not the case with GCCs. A GCC is very strategic and stable.

How well are they growing? Is it good news for the talent side?

In the last one year the headcount of top service providers has come down but GCCs have grown significantly. The margins taken by the service provider can be now passed on to the employees in the form of better packages and prospects. Earlier models had a long hierarchy – an employee had

to report to a program manager who tied in to the service provider who, then, stepped up to the client. In the GCC model, the relationship is directly with the customer.

Is it a zero-sum game? Do GCCs win at the cost of service providers?

No. The pie is big enough for both. But if the pie were to shrink, for some reason, then GCCs would have a better chance over service providers. That's why service providers are now showing a 'pivot' to agentic AI. All that, eventually, expands the pie.

But is this not against the basic premise of the IT industry's model and surge? The idea was to entrust a provider to do the non-core work and focus on your core. What about that?

A lot of non-core work would remain with the service provider. It makes sense because they have reached that kind of maturity and automation tools. There is no point in reinventing the wheel. But areas like customer experience, or employee experience, revenue-related functions or strategic ones are still core. They should be kept inside – as per a GCC model. That's what our core-context framework also suggests. The mission-critical aspects of IT would not go to a service provider. The rest can move. It has to be a portfolio approach.

That also shakes the realm of multi-billion and multi-year deals, then?

If we look at GCCs, the biggest companies are in this bracket. About 33-37 per cent of Fortune 500 companies are already here. The service providers go after the big names, and this is where small and medium-sized companies opt for a GCC approach. It works great for the ones who get left behind in mega deals. Now they also have a solution.

How do you explain the rise of the next trend now—GCC-as-a-Service?

It is all about terminologies. We have seen many already. Like BOT (Built, Operate, Transfer), then hybrid BOT and GCCaaS. Our interpretation is that



there are two key aspects of a GCC. One is the core where engineers and products come in. The next is support—where payroll, compliance, real estate, hiring processes etc, come in. This is where GCCaaS happens. Core work is still GCC.

Do geographical implications matter more now for GCCs?

Companies decide on many angles. Some choose a region based on proximity and time zone. Some go for skill-availability. Some choose as per costs or regulations or market-led elements (like a region with high revenue). Choices like Poland, Romania (Near to mainland of Europe and with native language factor), Brazil, South Africa, and Mexico (time zone advantage for US companies) have different reasons for being a GCC option. India appears as a strong choice for both US and European GCCs. It is also easy to transfer employees from service providers to GCCs if a region has that kind of talent density.

Would it be an 'India-and' scenario or a state where a company will choose GCC in either India or UK (or Europe)?

A diversified strategy would be better. Do not keep all your eggs in one basket. But do not be over-diversified.

Where does India sit on this map—with all the geopolitical chaos seen recently?

India is at the best vantage point. We are on strong

terms geo-politically with every region—Russia, the US, France etc. We trade in oil in one place and explore defence equipment in another one. The only region that is odd is China, but we are trying to address that too. India is on a good axis, geopolitically.

Does data sovereignty matter in such decisions?

India is strong on this factor. Our DPDP is at par with GDPR and we have lots of checks and balances. A lot of companies leverage data via VPNs and there is no data replication in India. A lot of data is encrypted and masked. We are still learning more in that area. Until it gets more complex, I guess we are doing pretty well.

If we sit again to talk on this topic after five years, would GCCs still be relevant? And is the Indian outsourcing saga over?

The saga is not over. The outsourcing providers are pivoting. Most tech organisations would move towards the GCC model so that market will be reduced. But there are many retail and manufacturing organisations that do not understand software. So for this market both GCCs and service-providers will co-exist. It's a win-win for both. In five years from now, service providers would not be throwing people at problems, and we will see a lot more GCCs than ever. ¹⁰⁰

pratimah@cybermedia.co.in

Over 90% of Security Breaches Linked to Human Error or Malicious Activity

Proofpoint's **Bikramdeep Singh** discusses India's cybersecurity readiness, people-centric threats, AI-driven defences, sector risks, regulatory shifts, and talent challenges.

By Shrikanth G

As India cements its position as a global digital powerhouse, the nation's cybersecurity landscape is evolving at an unprecedented pace. To get an insider's view on how Indian enterprises are coping with rising cyber threats and regulatory changes, CiOL spoke to Bikramdeep Singh, Country Manager – India, Proofpoint, a global leader in human-centric security. In this exclusive Q&A, Bikramdeep shares his perspective on India's readiness for cyber threats, the rise of AI in cybercrime and defence, sectoral risk patterns, the impact of new regulations, and how to bridge the cyber talent gap. Excerpts.

With India emerging as a critical hub in the global digital economy, what makes it the next frontier for cybersecurity? How do you view India's enterprise readiness in the face of increasingly sophisticated threats?

Digital transformation and the rapid evolution of AI are reinventing the business landscape, creating vast opportunities for innovation and growth. However, such rapid technological adoption also results in unique challenges in safeguarding people and data. With ambitious digital initiatives driving technology adoption, India's cyber threat landscape is increasing, creating an urgent need for robust security solutions.

“ The Indian cybersecurity market faces a tipping point as traditional defenses fall short against rising human-targeted cyber attacks.



BIKRAMDEEP SINGH
Country Manager – India, Proofpoint

“ Indian enterprises must treat security as a business imperative, fostering cross-functional collaboration and human-centric awareness culture.

India's enterprises are showing promising progress in fortifying their cybersecurity postures, but the evolving threat landscape demands a proactive and people-centric approach. Organizations are beginning to invest more in advanced threat intelligence, user awareness training, and data loss prevention, yet challenges remain—particularly around securing hybrid work environments and managing third-party risks. At Proofpoint, we believe India stands at a critical junction: enterprise leaders must go beyond traditional perimeter defenses and adopt an integrated cybersecurity strategy focused on the most targeted individuals and the data they access. With the right tools, frameworks, and mindset, Indian organizations are well poised to lead the next wave of cyber resilience in the digital economy. Additionally, India is home to top global tech talent, providing an excellent opportunity for Proofpoint to leverage local expertise and further drive innovation to make India the next frontier in cybersecurity.

Proofpoint's entry into the Indian market comes at a time when people-centric (or human-targeted) attacks like phishing, social engineering, and insider threats are on the rise. How should Indian enterprises rethink their cybersecurity posture in this context?

The Indian cybersecurity market is at a tipping point, where traditional security approaches are proving insufficient against the surge in human-targeted attacks. Our research shows that over 90% of successful breaches are attributed to human error or malicious activity, rather than purely technical vulnerabilities. Gartner reinforces this trend, predicting that by 2027, 50% of large enterprise CISOs will have adopted human-centric security design. Therefore, Indian enterprises must recognize people as the primary attack vector and must focus on implementing comprehensive protection that covers email, cloud applications, and collaboration tools where employees operate daily.

Most importantly, Indian enterprises need to recognize that security is no longer just an IT function but a business imperative requiring board-level attention. The human-centric security approach demands cross-functional collaboration between security teams, HR, legal, and business units to create a culture of security awareness. Organizations

should invest in security solutions that provide actionable intelligence about their human attack surface. At Proofpoint, we're partnering with Indian enterprises to build human-centric security posture through a combination of advanced threat protection, information protection, and compliance solutions designed specifically for the unique challenges Indian organizations face in this evolving threat landscape.

Artificial intelligence is proving to be a double-edged sword, amplifying both threats and defences. From Proofpoint's perspective, how do you see GenAI reshaping cybersecurity strategy, particularly in emerging markets like India?

Artificial intelligence, particularly generative AI, is fundamentally altering the cybersecurity equation in India's rapidly evolving digital ecosystem. (AI) serves dual roles in cybersecurity: it can drive innovation while also being leveraged by cybercriminals to enhance phishing and ransomware tactics. This democratization of advanced attack techniques is particularly concerning, as many organizations are still building their security foundations. According to Proofpoint's 2024 Voice of the CISO Report, a majority (87%) of CISOs globally are looking to deploy AI-powered capabilities to help protect against human error and advanced human-centred cyber threats.

Proofpoint offers a comprehensive, adaptive AI-driven, human-centric security platform that analyzes individual user behavior, detects anomalies in real-time (like sudden requests for sensitive data), and blocks multilingual phishing attempts. By layering global threat intelligence with adaptive AI, we protect organizations at their weakest link—human interaction—while ensuring compliance with India's evolving data protection regulations.

Sectors like BFSI, healthcare, and tech are particularly vulnerable to targeted cyberattacks. What patterns or risk areas are you observing in these industries, and how can organisations better prioritise their defences?

At Proofpoint, we're seeing a significant rise in targeted, people-focused cyber threats across BFSI, healthcare, and technology—sectors that manage sensitive data and critical infrastructure. In BFSI,

“ India's cybersecurity talent gap grows amid rising people-centric attacks; public-private collaboration and training are key solutions.



attackers are exploiting trust through phishing and business email compromise (BEC) to infiltrate financial systems, contributing to a fourfold rise in high-value fraud cases in India last year. To counter these threats, Indian enterprises must shift toward a human-centric security model. This begins with identifying their most targeted individuals, deploying intelligent email and DLP solutions, and strengthening security awareness across the organization.

With regulatory frameworks such as India's DPDP Act evolving rapidly, how should enterprises strike a balance between compliance and agility? Are Indian businesses prepared for the scale of accountability that modern regulations demand?

India's Digital Personal Data Protection (DPDP) Act, ushering in a new era of accountability, compels enterprises to rethink how they collect, process, and protect personal data. At Proofpoint, we view this as a critical opportunity—not just a compliance burden. The DPDP Act's focus on data minimization, purpose limitation, and user consent reflects global regulatory shifts toward individual rights and corporate transparency. However, meeting these standards requires more than policy updates—it demands real-time visibility into data flows, automated controls, and human-centric risk management. Organizations must balance agility with control by embedding security and privacy into the fabric of their operations, from email systems to cloud environments.

That said, many Indian businesses are still relatively early in their privacy maturity journey. While

awareness is growing, especially in sectors like BFSI and tech, there's a significant gap in preparedness—particularly in identifying where sensitive data resides and how it's being accessed or shared. The accountability structure under the DPDP Act places the onus squarely on data fiduciaries, meaning even third-party exposures or insider negligence can result in major compliance failures. At Proofpoint, we help enterprises close this gap by offering solutions that detect and prevent data loss, monitor insider risks, and enable compliant data handling without sacrificing speed or innovation. With the right investments, Indian businesses can confidently navigate this regulatory transformation while remaining agile and competitive.

Cybersecurity talent continues to be a critical gap. What are the structural or ecosystem-level changes India needs to make to develop the skilled workforce required to meet rising cyber defence needs?

India's cybersecurity talent gap is a growing concern, especially as the country faces a surge in sophisticated, people-centric attacks. To bridge this, India needs to promote public-private collaboration, build regional cyber labs and simulation centers, and offer structured career pathways for cybersecurity professionals which can help to create a robust talent pipeline. At Proofpoint, we believe that addressing this gap isn't just a workforce issue—it's foundational to national resilience in the digital economy. 

mail@dqindia@cybermedia.co.in

Every accident also means a thousand accidents that did not happen

The best use of AI is for improving safety says this art lover, innovator, and a railways veteran – who puts the common-man’s experience and safety on the same seat when he talks about future-forward contours. At the Zinnov Confluence 2025, we caught up with **Dr. Sudhanshu Mani, Retired GM, Indian Railways**, an Independent Consultant and an expert voice on Vande Bharat Express as the leader of the project. We tried to get some fleeting glimpses of the superfast and super-exciting coaches of technology that are being added to our train journeys. Hop on.

By Pratima H

The very perception of a train journey has changed a lot in India—with some recent transformations. Are we on the right path? There have been a lot of changes. Like no unmanned level crossings (that used to cause many accidents and fatalities). The modification of train toilets to bio-toilets has been a big improvement too—and that is significant because it not only created dirty sights earlier but also corrosion on tracks. But what can be done is much more than what has been done. The pace is not fast enough. Making track and fixed infra capabilities ready for 180/160 kmph train operation has not happened although we have Vande Bharat trains which are capable of operation at this speed, and the potential of these trains are therefore not fully exploited.

We have heard recent announcements of incorporation of machine vision for inspection and

“ That would be the real value of AI in Railways. That will help us to move to a zero-accident regime.



DR. SUDHANSHU MANI
Retired GM, Indian Railways

“ Making track and fixed infra capabilities ready for 180/160 kmph train operation has not happened although we have Vande Bharat trains capable of operation at this speed.

maintenance along with use of AI in many areas in railways. What is your reckoning here?

AI is being used in many areas. Like detecting crowding through CCTV, or even in areas as seemingly ridiculous as toilet-stink-management. But my take is that the best use of AI is for improving safety. We are talking about digital record of every action at stations and in trains being available, like what signal, what time, what station, data on movement, speed, stops etc. powered through Data Loggers and on-board computers sensors. This data is available but can be collated for a real-time monitoring to detect all near misses in a better way on daily basis, followed by effective follow up (instead of them being used only for analysis after the event).

You mean AI's use in preventing accidents?

Every accident also means a thousand accidents that did not happen. Those records can be so insightful for safety. The data is available, ready for meaningful exploitation. That's where AI can step in as it is nearly impossible to analyse the data all over Indian Railways—manually. Every day there could be five-to-six near-misses and a lot of proactive strength can be cultivated as a safety culture through AI's assistance; this post-event analysis of near misses (averted) can be so useful to prevent future ones—but crunching it all is not possible through manual approaches. That would be the real value of AI in Railways. That will help us to move towards a zero-accident regime.

Vande Bharat's propositions mainly lean towards speed. Do speed and comfort or speed and safety get into a conflict—ever?

Not really. There are so many other reasons for an accident but the speed capacity is decided on how much a train, and the fixed infrastructure like track and signalling can handle. Speed, per se, is not that much of an issue with safety so I do not see

any conflict. What we need is track and signalling system compatible with the proposed speed.

How much can IoTs and other technologies help in collision prevention and predictive maintenance?

Right now predictive maintenance is key. With on-board and on-site monitoring, some work has happened and some remains to be done. Sometimes, we also run the risk of unnecessary maintenance. Unscheduled work can hamper reliability and incur downtime. So that can be addressed in a better way.

Is digital safer than manual in transport industry? Specially after some tragic events in the transport industry that the world has gone through? And with the rise of cyber-attacks?

In my opinion, automation and digitalisation do help greatly. If you see data, flights have increased manifold and overall safety has improved. With exceptions of malfunction, usually digital is a fail-safe approach. As to cybersecurity, this area needs focus and agility because if 30 minutes of downtime on the Railways website can cause so many issues, what happens when AI comes in? The infrastructure can become amenable for attacks in any organisation where security is not put on the front-seat.

Indian Railways ranks amongst the world's largest employers. How well do people and automation align at a scale like this? Any dream scenario you envisage?

Automation is undoubtedly desirable and you can see its penetration everywhere so it would be defeatist to downplay it. The biggest block is something I am worried about – and that's how the common man travels in India. It's a blot on human dignity. It's a state of affairs that can change—if we make up our minds about it. That's the direction I would want to go. ¹⁰⁹

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AI-Powered Precision: GE HealthCare's Vision for MedTech Innovation in India

GE HealthCare's CTO shares how AI-led innovations from India are redefining diagnostics, oncology, and access in the country's rapidly evolving MedTech landscape.

By Shrikanth G

India's MedTech sector is rapidly growing, fuelled by initiatives like the National Health Policy, Ayushman Bharat PM-JAY, and the Ayushman Bharat Digital Mission, which enhance healthcare access and delivery.

AI and ML are driving advancements, transforming diagnostics and treatment through preventive, predictive, and personalised care. AI adoption in Indian healthcare, valued at \$1.6 billion by 2025, is robust, with 57% of providers using AI—outpacing global rates.

In a conversation with Dataquest, **Girish Raghavan, CTO – Women's Health & X-Ray and VP – Engineering at GE HealthCare Technology Centre India**, shares how GE HealthCare is driving India's MedTech evolution with advanced technologies and a commitment to 'Make in India, for the world.'

Their focus on AI-driven diagnostics, especially in oncology and imaging, aims to deliver precision health nationwide. Innovations like the AI-powered Cath Lab and Revolution Aspire CT enhance diagnosis and imaging intelligence. India stands as a critical market for their strategic mission towards creating a world where healthcare has no limits and enabling clinicians to diagnose patients accurately across diverse clinical environments. Excerpts.

How does India fit into GE HealthCare's global strategy, given its rapid MedTech growth?

Today, India is the fourth-largest economy in the world—a \$4 trillion economy. India is not only among the world's fastest-growing economies but also among the top 20 MedTech markets globally. Reports suggest that India's global market share in medical devices



GIRISH RAGHAVAN

CTO – Women's Health & X-Ray and VP – Engineering,
GE HealthCare Technology Centre India

“GE HealthCare India Tech Centre is a pioneering R&D hub with 30+ years legacy, driving innovation locally and globally.

is expected to grow from 1.65% to 10–12% over the next 25 years. These statistics make India a market of opportunities. The country is also ambitiously investing in healthcare and incentivising localisation. India's public expenditure on healthcare touched 2.1% of GDP in FY23 and 2.2% in FY22, up from 1.6% in FY21 (as per the Economic Survey 2022–23).

Beyond the opportunities in India, our vision here is deeply aligned with the promise of Atmanirbhar Bharat. India has been a high-growth, high-priority market for GE HealthCare for decades. We are among the first MedTech companies to 'Make in India—for India and the world'. We have the largest installed base of medical equipment in the region, the largest R&D centre for GE HealthCare globally, four manufacturing plants, and over 30 products sold in over 70 countries.

'Make in India—for India and the world' is not just a vision, but a long-standing strategy that positions India as a key pillar in GE HealthCare's global roadmap. Over the past three decades, we have built deep innovation and manufacturing capabilities in India, including our largest R&D centre worldwide. Technologies conceptualised and developed here are powering precision care not just locally but across international markets—demonstrating how India contributes to global healthcare transformation. This approach reinforces our strategic focus on delivering precision, preventive, and predictive healthcare that is locally rooted and globally relevant.

What key innovations from the GE HealthCare India Technology Centre are making a global impact?

The GE HealthCare India Technology Centre (HTC-India) is not just our largest R&D hub globally—it was also among the first healthcare technology centres to be set up in India, with a legacy spanning over three decades. Since then, it has grown into a core engine of innovation, contributing to both local priorities and global product development.

With more than 1,250 patents and 130+ innovations, the centre is behind several critical advancements in areas like AI-powered diagnostics, digital health solutions, imaging platforms, and maternal-infant care. These technologies are embedded into products used by clinicians around the world, helping improve outcomes at scale.

Our commitment to patient-centric innovation aligns closely with the government's Atmanirbhar Bharat vision. We are focused on developing medical technologies that are not only cutting-edge but also accessible to every corner of the country. A strong example of this is Revolution™ Aspire—a CT imaging system conceptualised and designed at HTC-India and manufactured at our PLI-backed facility in Bengaluru. Aspire has played a key role in expanding access to advanced diagnostics, with over 100 installations in its first year—nearly 50% in non-metro and Tier-2 cities, and 30% placed with first-time CT users. It reflects our ongoing effort to bring precision healthcare closer to communities that need it most.

HTC-India remains central to GE HealthCare's global innovation story, building solutions that are clinically meaningful, technologically advanced, and locally relevant.

Can you tell us more about AI-led solutions from GE HealthCare that are transforming diagnostics and treatment, especially in oncology and imaging?

Cancer remains a major healthcare challenge in India, with 1.45 million new cases diagnosed annually—a number expected to reach 2 million by 2040 (ICMR, 2023). Alarming, over 75% of patients are diagnosed at advanced stages, making early detection and timely intervention critical. Gaps in screening access, imaging infrastructure, and clinical workflow efficiency further intensify the burden.

Cancer care demands a personalised, multidisciplinary approach across the entire care continuum—from early detection and diagnosis to treatment planning, intervention, and ongoing monitoring. Often, this involves collaboration across medical, surgical, and radiation oncology, as well as specialists aligned to specific organs impacted by the disease. At GE HealthCare, we are transforming this complex landscape through AI-powered innovations that unify screening, diagnosis, and precision image-guided therapy. Our ecosystem of intelligent devices and digital solutions enhances coordination across care teams, advancing the patient journey from early detection through treatment and follow-up.

We integrate AI into imaging modalities such as MRI, CT, and ultrasound to improve diagnostic

“ A major AI adoption challenge in Indian healthcare is fragmented, complex data—often unstructured clinical notes, images, and wearables.

accuracy and accelerate clinical decision-making. Solutions like OncoCare and CareIntellect leverage AI and data integration to support evidence-based treatment planning. We are also harnessing Theranostics—a combination of diagnostics and therapeutics—to personalise cancer care at a molecular level.

With every innovation, we are redefining oncology care—bridging gaps, enhancing precision, and ensuring patients receive the right care at the right time.

How are Public-Private Partnerships and policy engagement helping expand healthcare access across India?

At GE HealthCare, we believe that expanding healthcare access at scale requires strong collaboration between the public and private sectors. Aligned with national priorities such as Viksit Bharat, Make in India, and Atmanirbhar Bharat, we work closely with policymakers to co-create inclusive healthcare solutions that address India's diverse needs.

We are a long-standing partner in Public-Private Partnerships (PPPs) and National Health Mission-funded projects, with the largest PPP install base in the region—over 340 installations across 22 states. As the leading technology partner for radiology PPPs, our innovations power over 200 hospitals across modalities such as MRI, CT, X-ray, and ultrasound—strengthening diagnostic infrastructure and enabling timely care delivery across the country.

Under the Government of India's Production Linked Incentive (PLI) Scheme, our Bengaluru-based manufacturing facility supports the vision of self-reliant healthcare by enabling localised development of advanced medical technologies. This aligns with our broader commitment to improving access to high-quality care through innovation, collaboration, and policy-driven impact.

How is GE HealthCare collaborating with the industry and policymakers to expand healthcare access?

GE HealthCare is advancing its mission of accessible, high-quality care by collaborating closely with leading hospitals, academic institutions, and policymakers to co-create innovative healthcare solutions tailored for India.

We have partnered with premier institutions such as AIIMS, IISc, and the Tata Memorial Centre (TMC) to address some of the country's most critical healthcare challenges. With AIIMS, we are working to enhance early diagnostics and clinical training through cutting-edge technologies. Our MoU with IISc focuses on advancing MedTech innovation using AI, medical imaging, and precision diagnostics. With TMC, we are establishing a Cancer Research & Innovation Centre to co-develop oncology solutions that can scale across India and beyond.

Additionally, we have partnerships with IITs and collaborate with key industry players like Elekta to expand access to precision radiation therapy.

What are the biggest challenges in AI adoption in Indian healthcare, and how is GE HealthCare addressing them?

One of the biggest challenges in AI adoption in Indian healthcare is the complexity and fragmentation of data—much of it unstructured, like clinical notes, images, wearables, and behavioural data. Traditional AI models struggle here, as they often require retraining for specific diseases, slowing adoption and scalability.

We see AI as a key enabler to simplify complex data, improve care delivery, and reduce burnout. Our foundation models—like the full-body X-ray model and SonoSAMTrack ultrasound—are designed to minimise constant retraining. These models are versatile, scalable, and optimised for deployment, especially in resource-restricted environments.

We focus on making AI valuable at the point of care with platforms like CareIntellect, which consolidates multimodal data to aid decision-making; its oncology module already helps simplify complex patient information. On access, tools like Vscan Air, a portable AI-enabled handheld ultrasound device, enable frontline workers to provide diagnostics in underserved rural areas, addressing healthcare access for billions.

Trust in AI is essential for adoption. AI solutions must be integrated responsibly into clinical workflows with transparency, safety, and accountability to earn clinicians' and patients' confidence—especially critical in India's diverse healthcare environment. ⁽¹⁰⁾

mail@dqindia@cybermedia.co.in

Tesco's Analytics Engine: Driving Relevance, Speed and Loyalty

Tesco is using analytics to drive hyper-personalisation, instant fulfilment, and AI-led decisions—reshaping loyalty, speed, and customer relevance at scale.

By Shrikanth G

Over the last five years, Venkat has built his team into a pivotal unit within Tesco's group strategy. This transformation includes establishing the Analytics Centre of Excellence (CoE), partnering with CXOs, and delivering significant commercial impact alongside cultural change by addressing a blend of daily decision-making challenges and large-scale transformations—such as customer personalisation, category management science, demand forecasting, cost base optimisation, and experimentation science—across various group businesses.

In a conversation with Dataquest, **Venkat Raghavan, Director of Enterprise Analytics at Tesco Business Solutions**, explores the analytics-driven shifts reshaping global retail. He highlights hyper-personalisation, extreme convenience, seamless omnichannel experiences, and the practical integration of emerging technologies—positioning analytics and AI as Tesco's core strategic differentiators. Excerpts.

Retail is undergoing a structural shift, with customer expectations shaped by hyper-personalization and instant fulfilment. From your vantage point, what are

“Retail is shifting from traditional selling to creating highly relevant, personalized customer engagements across all touchpoints.”



VENKAT RAGHAVAN
Director of Enterprise Analytics,
Tesco Business Solutions

“Tesco uses AI and 30 years of Clubcard data to deeply understand customers, creating seamless, personalized experiences across channels.

the most critical analytics-driven shifts reshaping global retail? How is Tesco navigating this transformation?

I believe there are 2 key shifts shaping retail industry. The first is Relevance – retail is shifting from the traditional concepts of buying and selling and into a place where customers seek highly relevant and meaningful engagement. When they connect with us through any of our touchpoint, they want us to show that we know them and can connect with them on an individual level. This will be a trend that will take a few years to build as retail industry shifts from the traditional thought process of addressing segments of customers with similar needs.

At Tesco, we bank on our strategic program named “I Love My Tesco Clubcard” to constantly understand, anticipate and serve our customers and their needs. We leverage our key strength in connecting with over 23 million customers in the UK through the Clubcard program to design highly relevant experiences. This includes our fast-evolving capability around personalisation, digital experience, and loyalty program. We reach out to our customers with millions of personalised offers and messages and hear back from them to learn what works best for them at an individual level.

The second key shift is the need for extreme convenience – the question is, how big is the time gap between the customer thinking about a need and getting it in their hands. This means we need to connect with customers in as many channels as possible and prepare our supply chain to deliver the needs as close as possible to the speed of their thought. ‘Easily the most convenient’ is our strategic program at Tesco that focuses on delivering this connected and convenient experiences. Tesco was one of the first customers to foray and scale online food business model, introduce the Click and Collect model, and more recently have introduced Whoosh which is our instant delivery proposition to our customers. Along with our significant physical store presence in UK, these digital propositions create a truly omnichannel gateway for our customers to meet their needs.

I personally feel this is the most fascinating time to be in retail - with every single theory in retail being questioned across Customer, Product, and Supply Chain.

As the lines blur between physical stores and e-commerce, how should retailers think about creating truly unified experiences? Is it more about technology, culture, or customer empathy? And where does data tie it all together?

I would definitely say it “Customer first” culture, leading to everything we think and do. Tech and AI are enablers to build the culture. Customer centricity is not a new discussion topic in retail, however, its meaning is evolving dramatically. About a decade ago, Customer centricity was a focus of a few teams that Served customers in Stores, built digital fronts such as .com and apps, and solved customer issues through contact centres. Today, Customer as a theme is now moving to the core of merchandising, pricing, supply chain design, and even supplier strategy.

We at Tesco feel every channel is a gift to make the customer experience more seamless. Our starting point is a deep understanding of our customers at the most granular level to guide them to find the best of Tesco. This entails building a deep repo of AI models to understand customer preferences, choices, and needs. These are then aggregated at channel-mission levels to create the right propositions in stores, online, app and other touchpoints. In many ways, our 30 years of experience in growing our Clubcard loyalty program has taught us that the more we understand our customers and their unique needs, the more we can orchestrate across our channels to help them get the best out of Tesco.

Click & Collect has become a defining feature of hybrid retail. But beyond operational efficiency, what signals from customer behaviour are emerging in this space? How is Tesco translating these insights into better design or service outcomes?

Like I mentioned earlier, Tesco was the first UK grocer to introduce Click & Collect in 2010. Since then, we have scaled this proposition to over 500

“Tesco's Enterprise Analytics uses AI and local insights to drive fast, measurable impact—delivering growth with frugal, self-funded AI programs.

stores and it is now an integral part of our “Easily the Most Convenient” strategy. This serves a sizeable part of our fast-growing online revenues.

In addition to the channel helping millions of our customers pick up their baskets with ease, it has also taught us the need for frictionless handover experience – which is about ensuring that the orders placed by the customers are delivered on-time, in-full and with great picking quality. This mission has helped us find ways to improve our operating procedures in the stores, train our colleagues, and keep the click & collect queue time to the least even during our busiest trading days (which is one of the best in the industry!)

We are also exploring ways to make the visit to our click & collect location more exciting for our customers – one of our recent innovations is our partnership with Ikea in Republic of Ireland – where customers can place order on Ikea and visit one of our store car parks to pick up their products. We have learnt that in addition to making Ikea's product range more accessible our customers also appreciate this as a more sustainable delivery option.

Much is being said about the 'store of the future'. In your view, how realistic is this concept in the near term? How are emerging technologies like AI, AR or real-time data being grounded in Tesco's day-to-day retail operations? I believe the ‘Store of the future’ will be defined by the meaningful propositions and value creation as opposed to glamorous innovations with little tangible impact.

We are on the journey of constantly exploring “What's next” in our store concepts. Over the last 5 years, we have tested multiple innovations some of which are thought provoking, including the 5 checkout-free “GetGo” stores that we have opened in the UK since 2021. The way these stores work is once a customer signs up for GetGo, they can just scan the QR code at either the entrance or exit, depending on the store, and shop as usual. Using a combination of cameras and weight sensors, GetGo stores can tell what customers picked up and will charge them automatically when they leave the store.

These experimental stores help us understand the gap between technical possibilities and human readiness to embrace them in a retail set up.

More recently we have also been testing concepts that deliver a Food++ experience for our customers. For example, in one of our recently refurbished stores in UK, our customers will now be able to get advice, treatment and virtual GP appointments for a range of health concerns in a new dedicated in-store health zone. This new concept brings together food, health and wellness ranges, alongside enhanced pharmacy and healthcare services, to enable customers to manage all aspects of their wellbeing in one place. The key question we are trying to answer here is, how many key customer needs can we serve without them having to make another visit to a different place.

Looking forward, what role will enterprise analytics play in shaping the next decade of retail? Do you see the future being driven more by automation, anticipation of customer needs or agility in responding to market disruptions?

Enterprise Analytics is our group capability for enabling intelligent decision making using the power of analytics & AI. We are present across all 5 operating countries of Tesco which gives us the power of local context which then coupled with our industry leading AI capabilities results in new growth and profit pools. We foresee our role to remain the same over the next decade – and if anything, become more accentuated.

We believe retail is all about Speed. If we can be the first and fastest to understand our customers, supply base, and competition better than others we will continue to build the right foundations for our business to succeed. We put this in practice by laying down tangible principles such as “12 weeks to show measurable commercial impact” of any AI programs we pick. We are also frugal in how much we invest and expect most of our AI programs to self-fund after an initial period of seed investment.

Today, AI happens to be our best superweapon – and via AI we envision helping our business understand customers better, simplify our operations, and anticipate our competitive playfield. We are already building a portfolio of differentiated solutions across these areas and will continue to accelerate the progress. 

mail@dqindia@cybermedia.co.in

Cybercrime goes corporate: A trillion-dollar industry undermining global security

Cybercrime-as-a-Service (CaaS) makes hacking accessible, driving a booming illicit economy. Learn how AI fuels attacks and what businesses must do to defend.

By Punam Singh



The rapid expansion of “Cybercrime-as-a-service”, or we say, the industrialisation of deception. The adversaries are no longer isolated hackers but increasingly sophisticated, business-minded entities, democratising malicious capabilities and allowing even low-skilled individuals to launch devastating attacks.

The CaaS market is a booming economy in the shadows, driving annual revenues into billions. While precise figures are elusive due to its illicit nature, reports suggest it’s a substantial and growing market. CaaS contributes significantly, and the broader cybersecurity services market (which includes both legitimate and illicit services) is projected to reach hundreds of billions of dollars in the coming years. If measured as a country, cybercrime would already be the world’s third-largest economy, with projected annual damages reaching US\$ 10.5 trillion by 2025, as per some cybersecurity ventures. This growth is fueled by the same principles that drive legitimate businesses: specialisation, efficiency, and accessibility.

CaaS platforms function much like dark online marketplaces. They offer pre-made hacking kits, phishing templates, and even access to already compromised computer networks. These services significantly lower the entry barrier for aspiring criminals. For instance, “ransomware-as-a-service” (RaaS) kits enable users to deploy ransomware attacks with minimal technical knowledge, sometimes for as little as US\$ 40 per month (as per IBM, Hornetsecurity reports). Phishing kits,

providing ready-to-use cloned login portals and email templates, can be acquired for US\$ 50 to 80 per month, with more advanced platforms costing up to US\$ 250 (as per ID Agent, Kaspersky reports). This commoditisation allows individuals who might lack deep technical expertise to engage in lucrative cybercriminal endeavours.

Fabio Fratucello, Field CTO Worldwide at CrowdStrike, succinctly captured this alarming trend: “They’re effectively those bad guys, they’re running with KPIs, they have return on investment target, they are embracing automation, they’re embracing AI, gen AI, agentic AI capabilities, really trying to speed and simplify their operations. The bad news is their business is about breaching customers.”

Fabio further added, “This has been a common trend for a few years now. Threat actors on the dark web are becoming increasingly specialised; they are realising that when they operate according to their specialisations, they are more successful. It’s no different to how legitimate businesses operate today. On the dark web, there are threat groups, for example, known as access brokers, who specialise in sourcing and harvesting credentials. They do not always have the skill or appetite to carry out end-to-end attacks. What they do instead is harvest those credentials and make these credentials available on the dark web, so that other groups can acquire them to carry out their objectives. One of the main reasons why they are doing this, and the proliferation of access broker advertisements is increasing, is that

“They’re effectively those bad guys, they’re running with KPIs, they have return on investment target, they are embracing automation, they’re embracing AI, gen AI, agentic AI capabilities, really trying to speed and simplify their operations. The bad news is their business is about breaching customers.

“Enterprises can harness AI-powered behavioural analytics to proactively detect anomalies and flag early indicators of cyberattacks. With AI-driven threat intelligence platforms, organisations gain the ability to rapidly analyse and respond to emerging threats in real time.

when you have valid credentials, you no longer need to break in. You have the keys to log in. From a defensive standpoint, it's more difficult to detect and understand this activity that is going on, as it is going to be blended with normal operations.”

AI'S ROLE IN ACCELERATING ATTACKS

The integration of artificial intelligence (AI) has further amplified CaaS capabilities. AI can craft highly convincing phishing emails with impeccable grammar, generate deepfakes for social engineering, and automate portions of the attack process. This means attacks are not only more frequent but also more sophisticated, often bypassing traditional security measures. AI also helps cybercriminals adapt quickly to new defences and create more human-like interactions to trick victims.

The speed of attacks is also a major concern. CrowdStrike's 2025 Global Threat Report notes that the average “breakout time”, the time it takes for an attacker to move from a first compromised computer to another within a network, has dropped to 48 minutes, with some attacks spreading in under one minute. This rapid lateral movement means organisations have minimal time to react once a breach begins.

A COLLECTIVE DEFENCE IMPERATIVE

“Given the rapid proliferation of Cybercrime-as-a-Service, combating its entrenched mechanisms is a challenge that cannot be met by any single organisation. The current climate demands enhanced real-time threat intelligence sharing and stronger cross-sector collaboration. A critical step is to foster active collaboration amongst key stakeholders, such as financial institutions and cryptocurrency monitoring services, to limit vulnerabilities and to trace and disrupt illicit payments on the dark web,” said Prabhu Ram, Vice President (VP) - Industry Research Group (IRG), CyberMedia Research (CMR).

Enterprises must recognise that attackers often hit multiple systems simultaneously, computers,

user identities, and cloud environments. This creates significant “noise” if security tools operate in isolation. Relying on many disparate security products makes it difficult to gain a holistic view and understand that seemingly separate incidents are often part of a single, coordinated attack.

This necessitates a shift towards a “best of suite” approach, integrating security solutions into a unified platform. Such a platform centralises information, links related activities, and helps prioritise threats. This allows security teams to respond more effectively to an entire incident, rather than addressing what appear to be multiple, isolated problems.

And, to combat such scenarios, Prabhu Ram recommends harnessing artificial intelligence to enhance security. He stated, “Enterprises can harness AI-powered behavioural analytics to proactively detect anomalies and flag early indicators of cyberattacks. With AI-driven threat intelligence platforms, organisations gain the ability to rapidly analyse and respond to emerging threats in real time. Advanced AI models can now identify and block even sophisticated phishing and social engineering attempts, including those fueled by adversarial AI. To stay ahead of the curve, it's essential to regularly update and validate these models while actively engaging in industry-wide collaboration to counter the fast-evolving landscape of Cybercrime-as-a-Service (CaaS).”

Beyond traditional detection and response, organisations must also focus on prediction. Understanding what attackers are likely to do next enables the implementation of defences before an attack occurs. This involves robust threat intelligence, knowing who the attackers are, their motives, and their methods. Combining this external knowledge with an internal view of an organisation's digital assets and vulnerabilities allows for identifying “paths of attack” and strengthening critical defence points. ¹⁰⁰

punams@cybermedia.co.in

From POS to car dashboards: Building the Internet of Payments

Your car just paid for coffee. No phone, no wallet, just ambient tech making payments disappear into the background. From dashboards to vending machines, the Internet of Payments is turning transactions into invisible moments of flow.

By Himaghna Dey Sarkar



India's digital payments story has always been largely driven by scaling and bold experiments, whether it's demonetization or the rise of UPI. Now, even within this fast-evolving payment ecosystem, a silent revolution is underway. Payments are surpassing phones, and the next frontier isn't mobile-first. It is ambient and rapidly embedded into our surroundings, triggered by proximity, voice, or intent. In many cases, it's literally built into your car's dashboard.

PAYMENTS BEYOND PHONES

Payments are no longer enclosed with phones; they're becoming embedded in the everyday environment. Technology is moving from screen-based actions to ambient, context-driven experiences. The need to pull out phones to pay is fading. It is not just about the convenience; it is unlocking access to simplify user journeys and enable interactions across devices and touchpoints. Fuel refills, EV charging, vending

“ India has 50 million+ cars registered on roads, and approximately only 40–50% of these cars come equipped with smart infotainment systems that support GPS, Bluetooth, voice input, and app integrations.

machines, kiosk checkouts, and many more such endpoints are being integrated with such journeys. The more intelligent the payment becomes, the more natural it feels, and the closer we get to a world where payments simply happen, without conscious effort.

PAYMENT SYSTEM IN VEHICLES

Currently, India has 50 million+ cars registered on roads, and approximately only 40–50% of these cars come equipped with smart infotainment systems that support GPS, Bluetooth, voice input, and app integrations. These are not high-end features anymore; they are standard. At the same time, a large share of payments in India still happen in places where phones can be a distraction such as toll booths, fuel stations, and drive-through food stops. These are exactly the moments where embedding payments into the vehicle is efficient, safer, and more user-friendly.

MOVING CARS AS THE NEW INTERACTION MODEL

Let's talk about the technology behind this. Say a user wants to refill his car, he chooses the preferred fuel station based on proximity, pricing, and availability on the map from the car's infotainment system. When the user arrives at the fuel station, the infotainment system auto-detects the details of the station's merchant. An encrypted audio signal is transmitted to the merchant's POS system, identifying the vehicle to initiate the transaction. With voice commands, users can input the refill amount, enter security PIN to complete the payment using voice commands, processed via UPI, and confirmed via dashboard prompt. The user need not even get out of the car to refill; it just happens on the go from the dashboard interface.

This process does not rely on NFC or QR codes and works reliably even in low-connectivity areas. It doesn't require expensive hardware or deep integration with vehicle electronics. Deployment is rapid and cost-efficient. While the tech enables dashboard payments, transactions don't interrupt the user's attention or workflow while driving. These systems have already been piloted across several vehicle platforms.

BEYOND FUEL: A BROADER PAYMENT ECOSYSTEM

Fuel is only one use case. With integration into open commerce networks, it's possible to use the same dashboard interface to pre-order coffee, pay for parking, book a service appointment, or check utility balances without the need for phones. The vehicle becomes a surface for lightweight, location-aware transactions. Some automotive OEMs are already exploring these integrations. The aim is not to create new payment products, but to layer existing systems of UPI, FASTag, and ONDC into environments where they can be led by voice-activated journeys without friction.

WHAT IT SIGNALS FOR INDIA

This shift points to a broader reality, i.e., the future of payments isn't screen-first—rather context-first. For India, where digital inclusion is a policy priority, these use cases are important. Not everyone is comfortable with app-based payments. Not everyone wants to transact on a phone. Enabling voice-led, screen-light interactions, especially in public or moving environments, widens access. These systems represent the crucial next layer of digital infrastructure. They make digital payments usable in practice, in real time.

To embed payments in everyday environments, you don't just need APIs and hardware, you need ecosystem alignment. Mobility players, payment networks, regulators, and service providers all need to agree on standards and user flows. Such collaborations are increasingly finding their way into the market. The dashboard is just one node. Others will follow soon: vending machines, elevators, EV charging docks, delivery handoffs. The more payments can adapt to context, the more invisible and effective they become.

The Internet of Payments is about removing unnecessary steps and making transactions feel like part of the journey, not a disruption. ¹⁰⁰

*Author is Chief Expansion Officer
of ToneTag.
maildqindia@cybermedia.co.in*



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