Decoding Retail Stock Broking: Angel One's Data-Driven Success Story p. 34

Building Enterprise Trust: Essential for Indian Businesses in the Digital Era p. 44

40+ YEARS SINCE 1982

Empowering India's Tech Future: A Deep Dive into NASSCOM's CoE Journey p. 40

Forward and Onward p. 58

www.dqindia.com

VOL XL No 6 | JUNE, 2024 | ₹100

DATAQUEST

CyberMedia

THE BUSINESS OF INFOTECH

FROM SWEAT TO SMART:

THE RISE OF INDUSTRY 4.0 AND THE CONNECTED FACTORY

A new era has dawned, driven by the transformative power of Industry 4.0. This industrial revolution leverages the Industrial Internet of Things (IIoT) to create intelligent, data-driven factories, forever changing how we manufacture.

76 pages including cover

Special Subscription offer on page 64

Apeejay Institute of Management & Engineering Technical Campus, Jalandhar | Estd. in 1997

Affiliated to I.K Gujral Punjab Technical University (IKG-PTU), Kapurthala
Approved by AICTE, MOE | NAAC Accredited

Build a successful career with AIMETC

REGISTRATIONS OPEN 2024

Programmes Offered

Management

MBA (2 years)
BBA (3 years)
B.Com (H) (3 years)

Computer Application

MCA (2 years)
BCA (3 Years/2 Years*)
(*for lateral entry)

Engineering & Technology

4 years/3 years* (*for lateral entry)

B.Tech. - Computer Science & Engineering (CSE)

B.Tech. - CSE (Artificial Intelligence & Machine Learning)

B.Tech. - CSE (Internet of Things & Cyber Security including Block Chain Technology)

Some of our Key Recruiters

Flipkart, wipro, TCS, BYJU'S The Learning App, upGrad, amazon, ICICI Bank, SBI Life Insurance, Bristlecone, Indiamart, ITC, Tommy Hilfiger, Berger, orange, EMINENCE Technology, zscaler, eNest, smartData Enterprises, jaro education ...and many more

Disclaimer: We offer only placement assistance. Placements may vary with industry requirements, market sentiment and student merit.

Scan for website

For more details, please contact us:

Apeejay Institute of Management & Engineering Technical Campus,
Rama Mandi, Hoshiarpur Road, Jalandhar -144007
Email: aim.jln@apj.edu | Phone: +91-9569-181-181

CONTENTS

COVER STORY

TALKING POINT

ISH BABBAR
CTO & Co-Founder of InsuranceDekho.com

JYOTISWARUP RAITURKAR
CTO. Angel One Limited

SAMIT BANERJEE
Division President, Cloud Operations Services & Head of Customer Service Unit, Amdocs

SANJEEV MALHOTRA
CEO- MeitY Nasscom CoE

10 | COVER STORY

FROM SWEAT TO SMART: THE RISE OF INDUSTRY 4.0 AND THE CONNECTED FACTORY

A new era has dawned, driven by the transformative power of Industry 4.0. This industrial revolution leverages the Industrial Internet of Things (IIoT) to create intelligent, data-driven factories, forever changing how we manufacture.

TALKING POINT

TALKING POINT

OPINION

INDUSTRY INSIGHT

INDUSTRY EVENT REPORT

REGULARS

DATAQUEST
THE BUSINESS OF INFOTECH
40+ YEARS SINCE 1982

OFFICES

GURUGRAM (Corporate Office)
Cyber House
B-35 Sector-32,
Gurugram,
Haryana - 122 003
Tel: 0124 - 4822222
Fax: 0124 - 2380694

BENGALURU
205-207, Sree 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

Dataquest (not affiliated with Dataquest Inc., a division of Gartner Group, USA), is printed and published by Pradeep Gupta, on behalf of Cyber Media (India) Ltd, printed at M/s Archna Printers, D-127, Okhla Industrial Area, Phase-1, New Delhi 110020, published at D-74, Panchsheel Enclave, New Delhi 110017, India. Editor Sunil Rajguru. Distributors in India by IBH Books & Magazines Dist. Pvt. Ltd, Mumbai.
Subscription (Inland): ₹1200 (12 issues)
(For subscription queries contact : rsedqindia@cybermedia.co.in)

NAVIGATING THE CROSSROADS: INDIAN ELECTIONS, MARKET TURMOIL, AND INDUSTRY 4.0

Minu Sirsalewala
minus@cybermedia.co.in

"In the corridors of power, as ballots were counted and alliances forged, the nation held its breath. But beyond the political theater, a different drama unfolded—one that reverberated through the stock market, leaving investors scrambling. The Sensex, once a symbol of bullish optimism, now resembled a roller coaster in freefall."

As the dust settles on India's Lok Sabha election results, the nation grapples with a twist n the tale. The euphoria of the previous session has given way to a bloodbath in the stock market—a shock not seen in at least a decade. The BSE Sensex plummeted 4,389.73 points (5.74%) to close at 72,079.05, while the Nifty 50 ended the day at 21,884.50, down 5.93% or 1,379.40 points. During the day, the Sensex tumbled over 6,000 points, leaving investors reeling.

THE ELECTION IMPACT

The unexpected outcome of the general election sparked fear selling in the domestic market, reversing the recent substantial rally. While Prime Minister Narendra Modi's BJP-led NDA secured a majority, it fell short of the landslide victory predicted by most exit polls. The Congress-led INDIA Alliance put up a tough fight, leading in at least 227 seats. The intense political competition led to a pronounced impact on the market, as initial optimism waned.

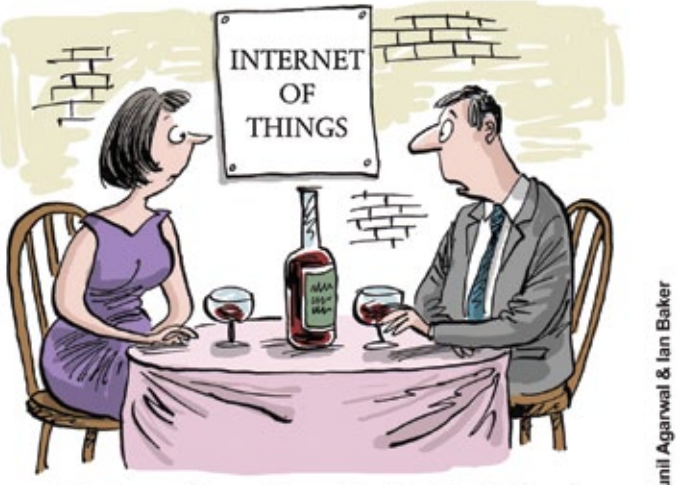
MARKET VOLATILITY AND TECH VISION

But what does this mean for India's tech vision? Amidst the political drama, the cover story of this issue delves into Industry 4.0, IoT, AI, and the role of edge computing. Sweat and steel once defined manufacturing, but a revolution is underway. Industry 4.0 represents a seismic shift, emphasizing system optimization, connectivity, and contextualizing data for enhanced efficiency.

The stock market's volatility post-election underscores the need for resilience. Industry 4.0 demands adaptability, agility, and robust tech infrastructure.

Companies must future-proof by embracing AI, blockchain, and edge computing. These technologies empower us to navigate the crossroads of change, transforming manufacturing and business processes.

In conclusion, India's election results have sent shockwaves through the markets, but Industry 4.0 remains our beacon of progress. As the factory floor evolves, we must harness the transformative power of technology to build a resilient, data-driven future.



"That wasn't me, it was the bottle talking."

Sunil Agarwal & Ian Baker

Platform Brief

Intel vPro® with Intel® Core™ Ultra Processors

A New Inflection Point in Business Computing

The Intel vPro® platform with Intel® Core™ Ultra processors changes how businesses use, secure, and manage devices

Discover the Future of Commercial Computing with Intel Core™ Ultra Processors

Unlock the potential of your business with the groundbreaking Intel Core™ Ultra processors, a pivotal leap forward in business technology. Featured in the May 2024 edition of Industry Point of View by DQ India, powered by CyberMedia, these processors redefine how businesses utilize, secure, and manage their devices.

In today's dynamic commercial PC market, businesses require premium solutions that enhance productivity, fortify security, and streamline management. With Intel Core™ Ultra processors, enterprises can empower their workforce, whether on the move or in hybrid setups, while harnessing the power of artificial intelligence to drive superior business outcomes. Additionally, sustainability initiatives across sectors receive a boost, addressing the entire lifecycle of computing fleets.

Intel Core™ Ultra processors revolutionize commercial computing in four key areas:

1. **Power Efficiency:** Experience unmatched power efficiency tailored for mobile work scenarios. With enhancements across microarchitecture, manufacturing processes, packaging technology, and power management software, enjoy up to 40% lower processor power consumption for tasks like video conferencing.
2. **Artificial Intelligence:** Embrace a new era of user experiences and commercial applications with AI-optimized architecture. The Intel Core™ Ultra processors integrate advanced AI capabilities, enabling elevated mobile collaboration and up to 2.5x better AI inference performance per watt compared to previous offerings.
3. **Platform Protections:** Enhance security with advanced features that shrink the attack surface of Intel Core™ Ultra notebooks. Leveraging Intel® Threat Detection Technology and the new Intel® Silicon Security Engine, these processors provide robust protection across the portfolio.
4. **Device Management:** Simplify device management with Intel Core™ Ultra processor-based notebooks featuring Intel® Device Discovery. This innovative approach facilitates seamless interaction with cloud services and tools, enhancing data collection for informed decision-making.

Backed by a robust portfolio of security technologies and a brand verification program, the Intel vPro® platform delivers unparalleled capabilities to organizations of all sizes. From dynamic root of trust to in-band manageability plug-ins, Intel vPro® Enterprise systems offer comprehensive features designed to meet modern business needs.

As the commercial PC market and computing architecture reach a critical inflection point, Intel Core™ Ultra processors integrated within the Intel vPro® platform promise to redefine the computing experience for commercial users and service organizations alike.

For more information, visit www.intel.com/vpro.

	Intel vPro® Enterprise			Intel vPro® Essentials	
	U-Series Type 4	U-Series	H-Series	U-Series	H-Series
Intel® Core™ Ultra 9			185H		
Intel® Core™ Ultra 7	164U	165U	165H	155U	155H
Intel® Core™ Ultra 5	134U	135U	135H	125U	125H

Table 1: Intel® Core™ Ultra Processor Family

Performance may vary based on configuration and usage. Certain Intel technologies may require specific hardware or software activation. While every effort is made to ensure security, no product or component can guarantee absolute security. Costs and results may vary.

1. Based on test results comparing processor power consumption with Intel Core Ultra 7 165H processor vs. 13th Gen Intel Core i7-1370P.
2. Based on AI inference performance per watt with Intel Core Ultra 7 155H processor vs. 13th Gen Intel Core i7-1370P using UL Procyon AI Inference Benchmark.
3. Intel vPro® platform requirements include eligible Intel processor, supported OS, Intel LAN/WLAN silicon, firmware enhancements, and other hardware/software for desired use cases. See intel.com/performance-vpro for details.
4. Feature availability may vary by PC make/model; some features require OS enabling.
5. Exclusively available with Intel vPro® Enterprise.

intel CORE ULTRA

UNLOCK THE POWER OF AI FOR BUSINESS PCs

Intel Core Ultra® processors and Intel vPro® deliver a definitive AI PC experience for business.

Give users a built-for-business PC with powerful and efficient AI performance, hardware-based AI threat detection, and out-of-band remote manageability with Intel Core Ultra processors and Intel vPro.

Learn more at intel.in/ITHeroes

From Sweat to Smart: Industry 4.0 and the Rise of the Connected Factory

Sweat and steel once defined manufacturing, but a revolution is underway. Manufacturing is undergoing a metamorphosis. The factory floor is no longer a scene of just clanging machinery and sweat. A new era has dawned, driven by the transformative power of Industry 4.0. This industrial revolution leverages the Industrial Internet of Things (IIoT) to create intelligent, data-driven factories, forever changing how we manufacture.

By Aanchal Ghatak

The landscape of manufacturing is undergoing a radical transformation driven by the transformative power of Industrial IoT (IIoT). Pravin Panchagnula, Executive Director and Head of Manufacturing at Microsoft India, emphasizes the disruptive nature of IIoT, stating, "Microsoft bets big on advanced IoT platforms and AI-driven solutions to redefine manufacturing excellence" This technology not only enhances productivity but also reduces human intervention in repetitive tasks, allowing workers to focus on higher-value activities such as creativity and decision-making.

India's rise in manufacturing is supported by government initiatives like 'Make in India' and 'Digital India,' along with the Vision 2025 plan to enhance AI adoption. Panchagnula emphasized the role of IIoT in driving efficiency and innovation, stating, "Industrial IoT is set to revolutionize the manufacturing landscape."

Microsoft bets big on advanced IoT platforms and AI-driven solutions to redefine manufacturing excellence.

- Pravin Panchagnula
Executive Director and Head of Manufacturing at Microsoft India

IoT: THE NERVOUS SYSTEM OF SMART FACTORIES

The Internet of Things (IoT) refers to a network of connected devices – sensors, machines, even products – that collect and exchange data, enabling real-time insights and decision-making. In modern manufacturing, IoT acts as the nervous system of a smart factory, providing manufacturers with the tools to optimize processes, improve efficiency, and enhance overall productivity. Marc Jarrault, MD of LAPP India, highlights that IoT is a game-changer for the manufacturing sector, allowing for real-time operational insights and process optimization. This technological advancement is crucial for staying competitive in a rapidly evolving industrial landscape.

Jarrault of LAPP India further elaborates, "At LAPP, we see IoT as the nervous system of a smart factory. It's a network of connected devices – sensors, machines, even products – that collect and exchange data. This data empowers manufacturers to gain real-time insights into operations, optimize processes, and improve decision-making."

Indeed, the global industrial automation market, driven by IoT advancements, is expected to grow significantly, reaching an estimated US$459.51 billion by 2032 with a compound annual growth rate (CAGR) of 9%, according to Precedence Research. LAPP's solutions ensure reliable data transmission, which is critical for unlocking the full potential of IoT in manufacturing.

Poornima B, General Manager and Head of Industrial and Manufacturing, and Abhijit Roy, Director and Global Head of Energy and Utilities and IoT at Happiest Minds Technologies, emphasize that IoT is a driving force behind the adoption of Smart Factories. They explain, "IoT, today, fuels the adoption of Smart Factories; these factories equipped with IoT devices and gateways communicate with machines via PLC's and DCS's systems, optimizing the entire production process and enabling flexible manufacturing. It enables remote monitoring of industrial operations, making it possible to manage facilities and equipment from any location. E.g. An IoT implementation we did for a steel manufacturing company where we were able to connect their blast furnaces and track asset health with leakages. This enabled them to perform predictive maintenance, digital twins, quality improvement and overall improve asset safety."

Aiyappan, Founder of Congruent Services and Senior Member of IEEE, offers a foundational perspective: "An early definition of IoT by IEEE states that 'it is a network of items – each embedded with sensors – which are connected to the Internet. 'The International Telecommunications Union (ITU) defines IoT as 'a global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies.'

This infrastructure consists of physical sensors or actuators with in-built connectivity, the interconnecting network, and computing facilities. These components work together in an intelligent closed-loop feedback cycle, optimizing the use of energy, raw materials, and other resources.

At LAPP, we see IoT as the nervous system of a smart factory. It's a network of connected devices – sensors, machines, even products – that collect and exchange data. This data empowers manufacturers to gain real-time insights into operations, optimize processes, and improve decision-making. It's a game-changer for efficiency, flexibility, and overall productivity.

- Marc Jarrault, MD of LAPP India

> Manufacturing not only seeks to enhance operational efficiency, product quality and customization options, reduce downtime, production costs and time to market, but also address plant safety, sustainability goals and environmental concerns.
>
> **- Poornima B,** General Manager and Head of Industrial and Manufacturing, Happiest Minds Technologies

Manufacturing aims not only to enhance operational efficiency, product quality, and customization options but also to reduce downtime, production costs, and time to market. Additionally, it seeks to address plant safety, Sustainability goals and environmental concerns. Aiyappan elaborates, "IoT enabled systems work in an intelligent closed loop feedback cycle, thus allowing optimal and precise use of energy, raw materials and other resources, which constitute a large part of their expenses."

THE RISE OF THE MACHINES

Advanced robotics and automation are another hallmark of Industry 4.0. Robots excel at repetitive tasks with unwavering accuracy, freeing human workers to focus on higher-value activities.

"Robots provide flexibility in deployment to various tasks, enhancing productivity and product quality," says Suraj Nair COE Leader of IoT and Telematics at Quest Global. However, challenges remain. The initial investment in technology can be substantial, and workforce reskilling is crucial to ensure a smooth transition.

Advanced robotics and automation are significantly transforming production lines, bringing both benefits and challenges. Marc Jarrault of LAPP India, highlights that "robots excel at handling repetitive tasks with unwavering accuracy and tireless operation," allowing human workers to focus on higher-value activities. This shift results in increased production output, improved efficiency, and safer work environments. However, he cautions that "the initial investment in technology, equipment, and worker training can be significant," and integrating new technologies with legacy systems can be complex.

Benjamin Lin, President of Delta Electronics India, states that advanced robotics "allow for seamless 24/7 operations, reducing human error and increasing output consistency." This real-time adaptability improves operational efficiency and positions manufacturers to compete more effectively in the global market.

Subramaniam Thiruppathi, Director ISC at Zebra Technologies, notes that automation "boosts production rates and output significantly by operating 24/7 without fatigue," ensuring continuous manufacturing and reducing cycle times. This leads to higher product quality and substantial long-term cost savings.

While advanced robotics and automation present challenges, their benefits in efficiency, safety, and productivity are undeniable. With careful planning and investment, manufacturers can harness these technologies to achieve a more efficient, productive, and safer future in manufacturing.

HUMAN-MACHINE COLLABORATION

Industry 4.0 doesn't replace human workers; it empowers them. As Poornima B and Abhijit Roy explain, "The role of human workers is evolving significantly. Advanced robots handle repetitive tasks, allowing human workers to focus on supervision, strategy, and innovation." This collaborative approach fosters a more dynamic

> An early definition of IoT by IEEE states that 'it is a network of items – each embedded with sensors – which are connected to the Internet.' The International Telecommunications Union (ITU) defines IoT as 'a global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies.
>
> **- Aiyappan,** Founder of Congruent Services and Senior Member of IEEE

> Advanced robotics allow for seamless 24/7 operations, reducing human error and increasing output consistency.
>
> **- Benjamin Lin**
> President of Delta Electronics India

work environment where humans and machines work together to drive growth and innovation.

Advanced robots take on repetitive tasks, as highlighted by Subramaniam Thiruppathi of Zebra Technologies, who emphasizes the importance of "human-centered automation," allowing workers to focus on higher-level responsibilities such as supervision, strategy, and innovation. Lin further emphasizes the necessity of continuous upskilling and reskilling efforts, stating that "human workers will transition to strategic roles requiring critical thinking, creativity, and problem-solving." This shift not only enhances productivity but also fosters a more dynamic and intellectually stimulating work environment, where collaboration between humans and advanced technologies drives growth and innovation across industries.

THE NEED FOR REGULATIONS

As IIoT solutions proliferate, robust regulations are essential. Aiyappan highlights the need for regulations addressing data privacy, security, and interoperability. "Permitting IoT solutions to operate on unlicensed bands with adequate safeguards" would facilitate wider adoption, he suggests.

Thiruppathi underscores the regulatory obstacles faced by companies in manufacturing, stating, "Companies deploying IoT solutions in manufacturing face regulatory obstacles that require careful consideration." Compliance with data privacy and protection laws like GDPR and CCPA is crucial, as he points out, setting the benchmark for protecting sensitive personal data collected by IoT devices. He also stresses the importance of adhering to evolving security standards to counteract cyber threats and the necessity of international collaboration to navigate the global scope of IoT regulations.

Lin further elaborates on the regulatory challenges, emphasizing the need for robust data privacy and security measures to comply with various laws and standards. He states, "Businesses encounter several regulatory challenges when implementing IoT solutions," highlighting interoperability standards, compliance with industry-specific regulations, and navigating international regulations as significant hurdles. Overcoming these challenges, as Lin suggests, requires a thorough understanding of the legal landscape, proactive compliance measures, and collaboration with regulatory bodies to shape policies conducive to IoT innovation. Thus, while Industry 4.0 technologies offer transformative opportunities, navigating regulatory frameworks is crucial for businesses to ensure compliance and successful implementation of IoT solutions.

LESSONS FROM THE LEADERS

Early adopters of IIoT have valuable lessons to share. Starting small with pilot projects to minimize risk and focusing on security are key takeaways. "The need to implement a security-first policy has been an important learning," emphasizes Nair. Additionally, staying agile and open to innovation allows companies to adapt to the rapidly evolving technological landscape.

> Companies deploying IoT solutions in manufacturing face regulatory obstacles that require careful consideration.
>
> **- Subramaniam Thiruppathi**
> Director ISC at Zebra Technologies

> While adopting these novel technologies, it is important to retain focus on the value of the solution to business, rather than just adopting the latest technology in the market.
>
> **- Suraj Nair**
> COE Leader of IoT and Telematics at Quest Global

Starting Small and Scaling Up: Successful companies often begin with small, targeted pilot projects. Nair notes, "Early adopters who have been successful have generally started small with pilot projects addressing specific bottlenecks – and then have gone on to scale implementations." This phased approach minimizes risks and helps build scalable IoT architectures.

Evolution of IoT Architectures: As IoT technologies have evolved, so have their architectures. Nair adds, "IoT architectures have evolved too over time as technology providers, especially the hyper-scalers, have competed to introduce newer services that enabled scalable and quicker deployments across industry segments." This evolution includes support for diverse operational technology (OT) protocols and integration with legacy systems, leading to innovative architectural patterns now available as open-source solutions.

Focus on Security: Security is paramount in IoT deployments. Nair emphasizes, "The need to implement a security-first policy has been an important learning – even when implementing pilot projects." Robust cybersecurity measures prevent the exploitation of vulnerabilities, ensuring data protection and operational integrity.

Value Over Novelty: Amidst the rapid introduction of novel IoT technologies, maintaining focus on business value is crucial. Nair advises, "While adopting these novel technologies, it is important to retain focus on the value of the solution to business, rather than just adopting the latest technology in the market."

Data Management and Collaboration: Effective IoT integration requires strong data management and analytics capabilities.

Lin highlights, "Integrating IoT requires strong data management and analytics capabilities; the ability to interpret and act on data insights is essential for maximizing IoT's potential." Collaboration across departments enhances these initiatives, ensuring diverse expertise and buy-in.

Continuous Learning and Adaptation: Finally, staying agile and open to innovation is essential. Lin states, "Continuous learning and adaptation are vital—IoT technology and applications evolve rapidly, so staying agile and open to innovation ensures sustained competitive advantage."

Early adopters of IoT in manufacturing have shown that strategic planning, robust security, a focus on business value, and continuous adaptation are key to successful IoT implementations.

GOVERNMENT INVESTMENT IN INFRASTRUCTURE: THE BACKBONE OF INDUSTRY 4.0

Nair, a manufacturing expert, emphasizes the critical role of government investment in digital infrastructure for a successful transition to Industry 4.0. He highlights the need for "high speed and reliable data networks and data centers across regions" to ensure seamless data transmission, the foundation for Industry 4.0 technologies. This investment will empower manufacturers to leverage the full potential of Industry 4.0 and unlock its transformative potential.

THE FUTURE IS NOW: INDUSTRY 5.0

The journey doesn't stop at Industry 4.0. The next wave, Industry 5.0, introduces even more transformative technologies like generative AI and digital twins. Generative AI can streamline production by providing solutions to complex problems, while digital twins – virtual replicas of physical assets – allow for process optimization through simulation.

The manufacturing industry is poised for significant changes as Industry 5.0 introduces innovations like generative AI, digital twins, blockchain, additive manufacturing, and mixed reality.

Embracing Industry 5.0: Poornima and Roy highlight that Industry 5.0 will empower workers through human-machine interactions, upskilling, and digital automation. They note, "Industry 5.0 will

> Automated Work: Advanced robots handle repetitive tasks, allowing human workers to focus on supervision, strategy, and innovation. Collaborative Work: Humans collaborate with robots to enhance productivity and safety, leading to upskilling and reskilling, and opening new opportunities for meaningful work.
>
> **- Abhijit Roy,** Director and Global Head of Energy and Utilities and IoT at Happiest Minds Technologies

focus on areas like empowering workers, enabling human-machine interactions, and upskilling with digital devices & automation." This phase will also emphasize sustainability by minimizing waste, reducing environmental impact, and adopting alternative energy sources.

Generative AI and Digital Twins: Technologies such as generative AI can streamline production by providing simplified responses to queries, while digital twins will optimize manufacturing processes through virtual replicas of physical assets.

Preparing for Transition: Companies should integrate these emerging technologies with their current Industry 4.0 solutions. Poornima and Roy advise, "Start planning and implementing these technologies with Industry 4.0 implementations, considering future expansion to Industry 5.0." Embracing these technologies through pilot projects ensures competitiveness and sustainability.

ROLE OF GOVERNMENTS

Governments play a crucial role in supporting this transition by investing in infrastructure, providing incentives for technology adoption, and enacting clear regulations. By embracing Industry 5.0 advancements and staying agile, manufacturers can lead the way in sustainability, efficiency, and customer experience. "Strong infrastructure is essential for seamless data transmission and effective IoT implementation." Government grants and tax breaks encourage technology adoption and clear regulations ensure data privacy and security.

Staying Agile and Adaptable: Staying agile and adaptable is key. By embracing Industry 5.0 technologies, supported by robust infrastructure and clear regulations, manufacturers can lead in sustainability and customer experience.

In Conclusion, Industry 4.0 and the impending arrival of Industry 5.0 represent a transformative era for manufacturing. By embracing these advancements, manufacturers can unlock a new level of efficiency, sustainability, and customer focus. The marriage of human ingenuity and cutting-edge technologies like IoT, AI, and robotics paves the way for a smarter, more agile, and dynamic future for the manufacturing industry.

Industry 4.0 is not just a buzzword; it's a revolution reshaping the future of manufacturing. Are you ready to join the journey?

aanchalg@cybermedia.co.in

IoT Devices and Zombie Mushrooms - It's Time

They are small, they are out there everywhere, they are supposed to help the tree trunk. But what if the tiny creatures we celebrate as IoT sensors and devices are hijacked by a mind-control fungus? Let's remove the 'if'. Here's why

By Pratima H

Ants are intelligent. That's why they thrive even in the most inhospitable environments. They have their specific jobs inside a colony. But they also know how to work together. They have two stomachs – one for the food they eat and one to share with other ants. And, of course, they are so tiny. But that's where their strength and network power lie.

That's exactly what comes to one's mind while marvelling at the ease, scale and elegance with which IoT devices and IIoT sensors have spread all around enterprises. Hard to see from the central tower, these little pixies are busy doing their work on the tiny branches and ant-hills across the forest of an enterprise's operations. They can communicate with others- and splendidly. They can stomach data for the specific spot's needs but can also help other central processes, when needed. Be it a factory, a water utility or a huge farm – these smart machines are silently doing their job of data collection

> Many IoT devices are insecure by design, lack robust built-in security features, can't be easily updated, or are sometimes abandoned by the original manufacturer which makes them susceptible to compromise and exploitation by cybercriminals.
>
> **- Fabio Fratucello,** CrowdStrike

and processing – snugly wrapped around those machines, those far-off taps and those sprinklers.

Until- they meet zombie fungi.

In other words. Cordyceps. Yes, that very specific and dangerous kind of fungus species that's known to take over an ant's body and brains- living inside them, eating them hollow and then attaching spores inside the ant's bodies so that they travel and spread the infection far and wide. The world of mycology also, sometimes, calls them 'mind-control mushrooms'. And not the ones, you get on the hills with a Brownie.

In a weird twist of fate, the small, smart and graceful; but innocent, unassuming and unprepared ants of the enterprise world have also been infected by the Cordyceps of cyber-attack fungi. If the last few months are given a gander- even if not under a microscope- it's clear how IoT devices are turning into weak, vulnerable and easy targets for cyber-attackers.

THE YEAST IS NOW THE BEAST

Imagine 6K weekly attacks targeting the manufacturing vertical alone! And education vertical witnessing a 960 per cent jump in attacks! The Zscaler ThreatLabz research team had reported that IoT malware attacks shot up by as much as 400 per cent in the first half of 2023 compared to 2022.

Recently enough, we heard the buzz about three million smart toothbrushes being reportedly converted into a massive botnet to carry out a distributed denial of service (DDoS) attack against a Swiss company. In 2023, edge network security also came to spotlight with some vulnerability discovered on compromised IOS XE devices.

As analysed by OT and IoT security firm Armis, in its 2023 attack landscape analysis- there was a 104 percent year-over-year increase in attempted intrusions; and utility-specific attempts over this same time period grew by 200 percent. The targets entail any physical and virtual assets within utilities' environments – like IT, IoT, OT, ICS, building management systems with engineering workstations, SCADA servers and PLCs spotted as the riskiest OT and ICS devices outside of the healthcare industry. Even engineering

WHY ATTACK IOT?

- It is a big, accessible and easy-to-infiltrate attack surface
- Presence of shadow IoT and unpatched devices
- The devices are small and sprawled across the IT terrain of an enterprise
- The attack can remain unexposed for a long time until the device gets a look/maintenance
- Priority is often given to uptime and data collection- security is on the back-burner
- It's easy to compromise these perimeter devices and reach the hub in a sneaky way
- Many IoT footprints still struggle with lack of standards and adequate security

> The continued proliferation of insecure communication protocols has further expanded the attack surface for malicious actors.
>
> **- Priyamvadha Vembar**
> Bosch Global Software Technologies

> BOLDMOVE is an example worth noting. It was created by Chinese espionage groups and had extra features to evade detection. They disabled critical elements of the device and included a command to manipulate memory addresses associated with these logging functions.
>
> **- Yihao Lim,** Google Cloud

workstations came up as the year's most targeted OT device.

We are talking about a fiercely-growing colony here. The global Internet of Things (IoT) market is expected to rise from about $714 billion in 2024 to some $4,062 billion by 2032 (As per Fortune Business Insights). Or from $611 billion in 2023 to about $3967 billion by 2030 (if we go by The Insight Partners).

And this colony is being attacked from multiple creatures and back-doors now.

Sandeep Hodkasia, CEO & Founder, Appsecure Security avers that there is a rise in the risks of Edge security. "With the evolving threat landscape, the number of cybercriminals and the ease of accessing hacking information online have fueled a rise in malicious activity. This translates to more attacks targeting edge devices. In addition, as more devices connect directly to the internet (IoT devices, smart sensors, etc.), managing and securing them becomes a complex task for organisations. This complexity creates vulnerabilities that attackers can exploit."

Yihao Lim, Google Threat Intelligence Lead Advisor for JAPAC, Google Cloud asserts that surge with real patterns observed. "Google Threat Intelligence has observed threat actors consistently moving to target Edge devices over the past 12 months, and the reason is largely due to the nature of Edge devices. Edge devices are challenging to monitor and may not support endpoint detection and response (EDR) solutions or methods to detect modifications or collect forensic images, further reducing the likelihood of detection and complicating attribution."

Vivek Srivastava, Country Manager, India & SAARC, Fortinet paints a grim but real picture. When organisations add security cameras, HVAC sensors, medical equipment, and thousands of similar connected or smart devices, many are IoT-enabled to help deliver better operational efficiencies for the business. But these devices also have little to no built-in security by design. Headless devices lack memory and processing. They don't have a traditional interface or operating system like those of a laptop or phone; therefore, they can't run meaningful built-in security. And some IoT devices can't even be patched or updated due to hard-coded PINs in the firmware."

It will be safe to say that with the rise in online devices means that more data is being collected, stored, and transmitted at the edge of networks, making them attractive targets for cybercriminals, avers Zubair Chowgale, Senior Technical Consultant - APMEA at Securonix

TERMITES IN THE HILLS

The reasons for IoT being exploited by the bad guys are not hard to understand. It is also because custom malware targeting edge devices prioritise several key attributes, Lim explains. "They aim to evade detection, simplify their functioning, enhance reliability, tailor its capabilities as per the target device and minimise their footprint on the system. This combination makes it challenging for analysts to attribute the malware to a particular source."

For example, small office home office (SOHO) routers are being used in a different manner than the zero-days in other edge devices, Lim illustrates. "They are exploited to create botnets which are then used to mask attacker origins. The attacker will compromise many of these routers then route traffic through them. This way they can come from systems near the target and they can constantly refresh the infrastructure that might be used to attribute or track them."

Malicious actors can exploit weaknesses in edge devices to gain a foothold and infiltrate the core network, potentially deploying ransomware or building botnets, tells Priyamvadha Vembar, Senior Director, Cyber Security Practice, Bosch Global Software Technologies. "These attacks target vulnerabilities across devices, IT infrastructure, applications, and network layers. A single weakness in any of these areas can expose the entire organisation and its data."

> We must assume that all devices at the edge and the core are vulnerable, regardless of how effective we view our defences to be.
>
> **- Vivek Srivastava**
> Fortinet

Fabio Fratucello, Field CTO, International, CrowdStrike echoes that argument of sheer volume, access and variety that IoT offers. "Each connected device serves as a potential entry point for adversaries to gain initial access and move laterally across networks, accessing critical assets and data. The variety of IoT devices, protocols, and obscure supply chains also create major visibility and monitoring gaps that can prevent timely threat-detection within IoT ecosystems."

The rise of AI capabilities has equipped attackers to craft more sophisticated malware attacks that can bypass traditional security techniques, adds Vembar.

Then there is the big gap in standardisation that gives more speed and ammo to attackers.

"With different vendors involved in developing these devices, each infrastructure varies significantly. Creating unified security protocols for these diverse devices remains a challenge. This absence of standardisation makes it difficult to ensure consistent security practices across different fields and types of IoT devices." Argues Mathivanan Venkatachalam, Vice President, ManageEngine.

Vembar also reminds of the increasing pressure that businesses are under to deliver features faster to remain competitive. "This often involves working with a network of subcontractors for development, integration, release, and operation of products. All this proportionally increases the risk of vulnerabilities within the supply chain due to the increased frequency of deployments."

Many of these devices handle sensitive data and may not have robust security measures in place, making them attractive targets. Additionally, they may not receive updates as frequently as traditional IT infrastructure, leaving them vulnerable to attacks that exploit unknown vulnerabilities, points out Anshuman Sharma Director - VTRAC, Cybersecurity Consulting Services, Verizon Business.

WHAT CAN BE DONE?

- Air-gapping devices and network segmentation
- Use of stronger security safeguards
- Shutting down options - Redundancy and resiliency measures
- Mitigation of insecure network communication vulnerabilities (e.g., BlueBorne)
- Use of strong authentication and authorization mechanisms
- Best practices for logging
- Adherence to all security best practices by manufacturers
- Centralized monitoring of the entire IoT ecosystem and network traffic
- Signature- and anomaly-based detection methods
- Firmware Over-The-Air (FoTA) updates for timely security updates
- Automated security tests in a DevSecOps environment
- Zero-trust network access (ZTNA)
- Consistent awareness across device users, administrators, and developers

As shared by various experts

> Organizations need to ensure that they invest in IoT-specific tools that utilize lightweight security protocols like CoAP (Constrained Application Protocol) and Zigbee specifically designed for these unique IoT environments.
>
> **- Mathivanan Venkatachalam,** ManageEngine

> Many of these devices also lack strong security measures, leaving them open to exploitation.
>
> **- Zubair Chowgale**
> Securonix

Often, security teams don't even realise that these devices are IoT-enabled or that the existing security infrastructure can't protect them. And these same problems exist with other headless devices, such as industrial control systems (ICS) and programmable logic controllers (PLCs), dissects Srivastava. "While securing IoT we must accept that when there is no clear delineation between the network and the outside world, everything that touches the network must be visible."

In 2023, Google Threat Intelligence identified a concerning trend where attackers linked to China were exploiting vulnerabilities, especially zero-day, to gain access to edge devices. These attackers deploy custom-made malware ecosystems specifically designed for the compromised edge device and its operating system, Lim drills into some details. "These ecosystems often consist of multiple, distinct malware families that work together to achieve the attackers' goals. Since they do not have dedicated indications of malicious activity, they have high chances of going undetected."

WHERE IS THE MAGIC MUSHROOM?

Solutions are possible. But guarding ant-hills is always better than fighting predators.

It's both a surprise and an epiphany to observe that 34 of the 39 most popular IoT exploits – as reported in the Zscaler report- were aimed at vulnerabilities that have existed for over three years. Looks like, visibility and quick action – they just cannot be sidelined in the rush to deploy IoT.

The power – as always- lies in the cohesive strength of not one factor but many- and defences at many points. There are many measures that could and should be taken for protecting IoT from attackers and their real-covert intentions.

"It is essential to have a security engineering process that incorporates 'chip to cloud' security throughout the product development lifecycle and operations. Hardware should be equipped with a hardware 'root of trust' that provides the environment to execute all security operations. Data security must be ensured both at rest and in transit." Vembar recommends. "There is 'No Security without an Effective Key Management System'. It is crucial to secure the cryptographic material used to activate security measures."

What should be taken care of – very specifically and strongly – is the weak spot of visibility.

As Lim reminds, threat actors take advantage of another vulnerability: the tendency for users to neglect rebooting edge devices like VPNs for extended periods, sometimes years. "Because these devices remain unmonitored for long stretches, attackers can exploit existing vulnerabilities within the system and operate unnoticed. THINCRUST is one such example. What made it particularly stealthy was its ability to disguise its communication with the attackers' control center as regular interactions with the device's own API. By cleverly exploiting built-in features of the devices, UNC3886 kept their malware relatively simple while ensuring its operation is ongoing."

> Edge devices often process sensitive data close to its source. This proximity makes them attractive targets for data breaches.
>
> **- Sandeep Hodkasia**
> Appsecure Security

Segmenting networks is another important step. Firewalls and access controls can be used to enforce network segmentation, which helps contain threats and prevents them from spreading to other parts of the network, in case of a breach, adds Venkatachalam.

To reduce risks, organisations should use encryption, two-factor authentication, and strong logging practices, Chowgale suggests. "However, the complexity and interconnected nature of edge devices make them attractive targets for attacks."

WAKE UP QUEEN ANT

It's not impossible to evade the bugs but time is everything.

In the last few months, we notice a trend where specialised devices in the healthcare industry are being targeted by threat actors, as Venkatachalam informs. "Due to the high-demand for healthcare data in the dark web and the critical nature of medical services, it is crucial for the organisations to invest in robust security."

IoT devices are emerging as an area of hot interest and that's exactly why they need urgent attention on security. "An attacker who gains access to one compromised edge device can easily use it as a pivot point to infiltrate into other parts of the network. More so, as these devices are generally deployed across diverse locations, and unless centrally monitored and managed using appropriate IoT-specific tools, they present a wide scope for initial access to the network to launch further attacks." Cautions Venkatachalam.

Hodkasia echoes that concern. "Once compromised, an edge device can serve as a gateway for attackers to infiltrate deeper into the network, accessing more sensitive systems and data. This makes it essential for enterprises to extend their security measures comprehensively across all network edges."

The potential impact of a successful cyberattack on an IoT ecosystem can result in failure in critical services and industries and even physical danger to individuals and the environment, warns Srivastava.

The good news is that ants are still ants. That means we should not forget the fact that ants are the strongest creatures. They can lift so much more than their own body weight. And can live really long. They may not have eyes and ears but the chemicals or pheromones they use to communicate with other ants are extraordinarily sharp and fast. They can also pick vibrations from their feet on the ground. Most importantly, ants are survivors. They may not know how to swim but they can even survive floods. If IoT devices are made to do all that – they can still stay ants. But can turn into something ferocious- Fire ants.

Definitely not the ones to be messed with.

P.S. We have not even talked about slave-making ants yet. What if IoT devices turn attacks into slaves or use them the way ants farm aphids. Just saying!

pratimah@cybermedia.co.in

Time for Good Voodoo Dolls! Time for Digital Twins!

Why waste resources, material, experts, downtime and effort in actual machines, processes or systems? Why not use some digital Juju?

By Pratima H

It's a world where people don't think it stupid to mummify kings. It's a world where a child bawls with pain when someone kicks his pup. It's a world where we all would run to first save a seemingly-silly object (like a Teddy or a favourite book or a picture-frame or a pair of sneakers) before a wallet or a property-papers when a fire-alarm goes off. It's a world where men still talk to, and pet, their cars. And now, it's also a world where the essence of machines and processes can be replicated in digital twins.

Not exactly for the same reason. But by the same logic. One's life is hinged closely to the other.

Enter the world of digital clones. Shall we take you a bit closer?

NOT WITCHCRAFT BUT WIZARDRY

In an era where creating products or controlling processes is, often, laden with costs, complexity and chaos – it is a much-needed marvel to have a virtual counterpart handy – one that works well. With this

> Almost every manufacturing customer in the enterprise space is interested in adopting digital manufacturing, Industrial IoT (IIoT), and digital twin use-cases.
>
> **- P K Gupta**
> Dell Technologies

digital replica – a company can design as well as monitor, repair, correct and improve the product or process without tweaking anything physically. That saves money. And also spares everyone the irreversibility of mistakes.

What a doozy! Digital twins provide that extraordinary comfort. They can simulate many characteristics of their physical counterparts. And since these models process, and react to, various stimuli (as per the data representing the external environment) – making any change is both safe and timely. With the approximation of a real object that they bring in- they go way beyond erstwhile simulation techniques and whiteboards. Companies not only have a chance to exponentially improve productivity and Time-to-Market windows but also the powerful button to completely augment operational processes and avoid losses.

Not surprisingly, one big area for use of Digital Twins is product development. As McKinsey estimates, over the next five years, about $30 trillion in corporate revenues may depend upon products that have not yet reached the market. How do you make these products compelling! By staggering performance improvements and features that will make jaws drop and also very happy. But all that would require the integration of complex and novel technologies. Also, the growing spotlight on personalisation and sustainability completely changes the way companies look at material and component selection, repairability, and end-of-life considerations. So keeping R&D costs low while innovating with mind-blowing products would be a tough juggling act without the help of Digital Twins.

Digital Twins would help to nail this tough balancing dance and accelerate design and engineering cycles – and at the same time give more-than-ever choices on design as well as more prototypes. This gets even more helpful when a company is creating products that are manufactured in small volumes or as big-ticket items or exclusive ones. In fact, 75 percent of product development executives reported further digitisation as a key priority for them- as seen in a Research and Markets Forecast for 2027. Specially in advanced industries, where almost 75 percent of companies had been observed to have already adopted digital-twin technologies that have achieved at least medium levels of complexity. The use of Digital Twins is more advanced in verticals like automotive, aerospace, defense, logistics, infrastructure, and energy – for understandable reasons.

That explains the growth lined up ahead for this technology wonder.

NOT SO TINY AN USHABTI

The Digital Twin market was somewhere at $9.9 billion in 2023 and can rise to about $125 billion by 2032 -as per Global Market Insights. As per Grand View Research, the global digital twin market size was around $16 billion in 2023 and is projected to grow at a compound annual growth rate (CAGR) of 35.7 per cent from 2024 to 2030. In the estimates of Fortune Business Insights, this space was at roughly at $17 billion in 2024 and can surge to some $259 billion by 2032.

PK Gupta, APJ Presales Lead & Global CTO, Global Alliances Presales, Dell Technologies explains that Digital twins are transforming industries by creating virtual replicas for optimisation. From factories to hospitals and cities, these digital shadows are driving innovation and efficiency. Almost every manufacturing customer in the enterprise space is interested in adopting digital manufacturing, Industrial IoT (IIoT), and digital twin use-cases."

The potential for Digital Twins in India is vast, driven by complex supply chains and deep technology entrenchment across the country, opines Ashwin Kumar, Partner - Solutioning and Growth at MathCo.

And what kind of enterprises are tapping these twins?

"Applications for Digital Twins span industries but

> Industries like manufacturing, where precision and efficiency are paramount, embrace Digital Twins to optimise production processes and enhance product quality.
>
> **- Ashwin Kumar**
> Partner - Solutioning and Growth, MathCo

Supply Chain, Last mile delivery, Manufacturing, and Product Design have significant opportunities, for adoption. Industries like manufacturing, where precision and efficiency are paramount, embrace Digital Twins to optimize production processes and enhance product quality. In healthcare, Digital Twins facilitate personalised treatment plans and predictive modeling for improved patient outcomes. Likewise, in retail and FMCG, Digital Twins optimise inventory management, streamline logistics, and enhance customer experiences. The versatility of Digital Twins ensures their relevance and applicability across the entirety of India's economic landscape." Dissects Kumar.

Gupta also points out which areas are leaning heavily towards this concept. "The healthcare industry has shown significant interest in utilising digital twins for medical research purposes, particularly in areas like COVID-19 and cancer studies. Digital twins are gaining traction in urban planning within digital cities, where they are applied for managing construction sites, optimising smart buildings, monitoring traffic, mitigating noise pollution, and simulating flood scenarios.

ABRACADABRA AT WORK

Let's enter the premises of a huge energy company in the USA. When you are serving more than five million customer accounts or an estimated 10 million+ people across the state, operating 11 fossil fuel power generation plants- you have to take care of critical assets being Gas Turbines, Generators and Steam Turbines. Before it thought of Digital Twins, the operations and maintenance process of each plant was being carried out locally. And then it decided that there can be a strong way to increase reliability of power and reduce operational costs by centralisation. They wanted to redefine fleet monitoring and centralisation of operations and maintenance activities. As shared by Happiest Minds, this company made a shift to a better and digital way of doing many things with the P&ID Digital Twin. The initiative it took care of also entailed providing deep-dive details on Fossil center of work excellence (FCWE) Daily and Outage processes. It also began the use of AI/ML models for optimising work orders and improve data quality for validation, prioritisation and scheduling FCWE Daily and outage work.

Gupta also gives a peek into some work happening in this space. "We have successfully deployed several projects in the automotive and healthcare sectors. "These projects aim to optimise production processes and solve factory issues virtually by offering extensive 3D simulations for design and process improvement. For instance, in the automotive sector, we've observed a significant reduction in car production time (from 48 months to 12 months) along with a 50 per cent cost reduction. Moreover, it has significantly decreased safety certification timelines."

Then there is the case of a US-based retailer that adopted a digital process twin to tackle critical challenges that stemmed after the establishment of a new e-commerce fulfillment wing at their primary US-based center. The new facility provided additional capacity but the increased volume exposed inefficiencies in the sequence of the products that were picked, and grouped into

TWINS - THE GOOD SPELL

- Save costs in design and repair which usually take a lot of resources with actual product or prototype
- Reduce the risks of accidents or damage by trying everything on simulation first
- Give real-time data and visibility – driving efficiencies
- Improve time to market cycles and cut down on wastage as well
- Easy for collaboration, high-stake innovation and new ideas

> DIGITAL TWINS REQUIRE IN-DEPTH PROCESS UNDERSTANDING AND SYSTEM DESIGN TO TRANSLATE REAL-WORLD PARAMETERS INTO SIMULATIONS.
> ASHWIN KUMAR, MATHCO

TWINS - THE TRICKY PART

- Legacy issues
- Inability to simulate details
- Compatibility issues
- Data hurdles
- Security exposure
- Easy attack surfaces

respective orders. This led to decreased fulfillment SLAs in terms of orders serviced – as shared by Mathco.

MathCo built and implemented a digital twin to replicate the picking and grouping process, offering three distinct features: real-time scheduling, simulations, and optimisations. Simulation of the process allowed analysing the critical SKUs and their demand, sizes, frequency, etc. to iterate over multiple sequences. Process changes in terms of sequences were simulated to analyse the potential impact and reconciled with historical performances, explains Kumar. "With optimisation of the layer based on the constraints; SLAs were performed to recommend the best-fit sequence to maximise the number of orders fulfilled. The recommendations were tracked in real-time in terms of throughput, accuracy, and efficiency of pickings."

As he shares further, the initial pilot phase was rolled out in 4 months followed by a period of testing and fine-tuning over 3 months. Post enhancements, the system was completely rolled out in 3 months. This initiative enabled the center to increase the number of orders fulfilled by 20 per cent over the next six months leading to increased customer satisfaction and brand value enhancement. The solution was modularised to scale it across multiple facilities in a manner - achieving 50 per cent efficiencies in time and investment.

As further illustrated by Manoj Karanth, Vice President, iNXT, LTIMindtree, Industrial Digital Transformation has been a key theme across the industry. At the same time, there has been a lot of uncertainty across supply chains, variation in demand to name a few. Getting a real time view of the Business and empowering teams to take decisions has emerged as a real need. Digital Twin has emerged as a lever to enable this visibility.

LTIMindtree cites the example of a Mid-Stream Oil Major in the US. They have 6000 miles of pipelines with 40-50 processing plants and is one of the largest producers of natural gas liquids. They source the gas from the producers, treat and clean to make it available to actual consumers. They needed a view of the business in real time so that people could take informed decisions to improve productivity and realise commercial value.

This required a complete process digital twin which gathered data in real time from multiple sources, including IIoT sensors, commercial contracts, market prices and KPIs to comprise a single source of truth. Real-time value chain optimisation uses live process-simulations to maximise productivity. The single digital twin hub allows operators, engineers and business analysts to coordinate decisions, operate plants remotely and receive performance alerts.

Just within the first year this initiative realised $50M in net income and 13M margin improvement with a four per cent increase in commitment accuracy. It matched production to demand in real time, thus, bolstering supply chain resiliency.

WHEN THE POPPET POPS

Digital Twins are not without their share of painful needles though.

A lot of challenges exist before their true magic can be tapped. Specially if a company already has a monkey sitting on its shoulder in the form of heavy legacy systems.

Kumar outlines that successful implementation of digital twins faces challenges in terms of

Technology and Process Design. "Digital twins require in-depth process understanding and system design to translate real-world parameters into simulations. They also necessitate a sophisticated IT infrastructure capable of facilitating seamless connectivity and communication. Legacy systems, prevalent in many organizations, pose a hurdle in terms of data collection and integration with modern digital twin technologies. Ensuring compatibility between existing infrastructure and digital twin solutions becomes imperative to unlock their full potential."

Kumar also points out the torn parts of security here. "Additional cyber security oversight would be required to ensure protection of sensitive business process parameters and design. Overcoming these challenges requires concerted efforts and strategic investments in upgrading IT infrastructure and implementing robust cybersecurity protocols to enable the widespread adoption of digital twins in India."

GET YOUR BONSAI

The future of Digital Twins is great with more and more industries and governments adopting to it by bring Physical and Digital (Phygital) worlds together. "A thriving ecosystem of homegrown Indian Independent Software Vendors (ISVs) and innovative startups are fueling advancements in this domain. The adoption of IIoT and digital twins in India is experiencing a significant momentum," Gupta reckons. "This momentum is further supported by the recent establishment of an India branch by the 'Digital Twin Consortium', a global organisation promoting industry standards and education. The 'Sangam initiative' by the Department of Telecommunications (DoT) fosters collaboration between public entities, infrastructure planners, tech giants, startups, and academia. This collaborative approach positions India to become a major player in developing and deploying next-generation IIoT and digital twin solutions."

Digital Twins are full of many good omens. However, they should be deployed and used with comprehension, clarity, caution and care. It is a good time to consider their advantages as well as pragmatic hurdles with specific context to Indian conditions, limitations and possibilities. And also of the vertical or industry one operates in.

As John Naka advises right- "The object is not to make the tree look like a Bonsai but to make the Bonsai look like a tree."

Next time there is a fire alarm, you may want to save your Bonsai/digital twin first and that machine in the glass house later. And not only because you can actually run with it.

pratimah@cybermedia.co.in

Edge Computing Elevating Telecom's Realm Beyond IoT

Edge computing heralds a new era in telecommunications, propelling the industry toward unprecedented levels of efficiency, reliability, and innovation. And, the rapid integration of Internet of Things (IoT) devices in telecom industry is reshaping industries. Yet, the surge in IoT adoption brings forth a pressing challenge: the imperative for low-latency processing. Enter edge computing, a pivotal solution offering the infrastructure necessary to power real-time applications and elevate the performance of telecom networks.

By Aanchal Ghatak

At its core, edge computing entails processing data closer to its origin – at the network's edge – rather than relying on centralized cloud systems. This strategic shift significantly reduces data travel distances, slashing latency and bolstering application responsiveness.

Implementing edge computing in telecom networks offers a multitude of advantages over traditional centralized architectures.

ADDRESSING LATENCY CHALLENGES

Latency, the delay before a transfer of data begins following an instruction for its transfer, is a critical factor in the performance of IoT applications. Traditional cloud computing models, which process data in centralized servers often located far from the data source, can introduce significant delays. Edge computing addresses these challenges by enabling:

1. **Proximity to Data Sources:** By processing data near the IoT devices that generate it, edge computing reduces the distance data must travel, cutting down on transmission delays.
2. **Reduced Network Congestion:** Offloading data processing to the edge reduces the burden on the central network, decreasing traffic and improving overall network performance.
3. **Faster Data Processing:** Localized data processing allows for immediate analysis and response, which is crucial for applications requiring real-time decision-making.

Piyush Somani, the Founder, CMD & CEO of ESDS Software Solution Limited and President of CCICI, emphasizes the transformative potential of edge computing: "Edge computing reduces data travel distances and substantially mitigates latency by relocating data processing closer to the source. This directly addresses the latency challenges encountered by IoT devices in telecommunications networks."

Somani underscores the explosive growth of the global edge computing market, projected to reach $274 billion USD by 2025. This meteoric rise mirrors the escalating utilization of edge computing for network optimization, particularly in latency reduction efforts. Telecommunication giants stand poised to deliver unparalleled low-latency experiences by leveraging local data processing at the edge. Notably, applications like online gaming, real-time video analysis, and autonomous vehicles stand to benefit immensely. The resultant swift response times not only elevate user satisfaction but also unlock novel use cases once deemed impractical.

KEY BENEFITS FOR TELECOM NETWORKS

Implementing edge computing in telecom networks offers a multitude of advantages over traditional centralized architectures. Somani emphasizes several significant benefits. "Edge computing, first and foremost, substantially reduces latency," he asserts. "Critical applications can respond immediately when real-time processing takes place locally."

He highlights that "processing data locally increases bandwidth efficiency and frees up core network resources for other uses." He underscores the importance of reliability, noting that "edge architectures are more reliable since edge devices can continue to operate independently for a while during network disruptions, ensuring uninterrupted service."

Somani also emphasizes the scalability of edge computing, stating, "We can quickly adjust the processing capacity at various points in the network to suit particular requirements." Additionally, he points out that "processing sensitive data locally and according to data regulations improves privacy and data security."

He further highlights the agility edge computing offers to operators. "Due to edge computing's scalability and flexibility, telecom operators can swiftly roll out new services and effectively handle fluctuating loads," he adds.

While acknowledging initial setup costs, Somani notes, "there are long-term savings in central processing and data transfer, which makes it cost-effective." He stresses that "it facilitates the development of novel, latency-sensitive services that improve user engagement and innovation."

REAL-TIME DATA PROCESSING FOR IOT APPLICATIONS

Edge computing is particularly beneficial for IoT applications that demand real-time data processing. In the telecom industry, these applications include:

Smart Cities: Traffic management systems and public safety applications rely on real-time data to function effectively.

Healthcare: Remote monitoring and telemedicine services require immediate data analysis to provide timely medical interventions.

Industrial Automation: Manufacturing processes and supply chain management benefit from instantaneous data processing for efficient operation.

Piyush Somani notes, "The full potential of IoT data in telecoms can be tapped via real-time processing. The global deployment of 15 billion edge devices highlights the demand for effective data processing solutions, such as edge computing. For instance, network equipment sensor data can be used to anticipate and prevent failures before they occur or dynamically modify network resources in response to actual traffic patterns to maximize efficiency."

Edge computing opens up new possibilities for user experiences, such as latency-sensitive services like connected automobile applications or augmented reality. It provides a local source for data processing and storage requirements for the Internet of Things. Machine learning and analytics algorithms facilitate timely decision-making, local data processing, and data aggregation.

The edge computing industry is projected to expand at a compound annual growth rate (CAGR) of 34.1%,

> Telecom providers must ensure edge deployments comply with applicable data privacy laws. Strong data encryption is advised for every device in the network, from the edge to the core.
>
> **- Piyush Somani,** Chairman & MD, ESDS Software Solutions Ltd

from USD 3.6 billion in 2020 to USD 15.7 billion by 2025. The demand for real-time data processing in various IoT applications fuels this increase.

BEYOND IOT: BROADER APPLICATIONS OF EDGE COMPUTING IN TELECOM

Edge computing extends its benefits beyond IoT applications, offering valuable solutions for various other use cases in telecommunications:

Content Delivery Networks (CDNs): By caching content closer to users, edge computing reduces latency and improves user experience. Piyush Somani explains, "Think about CDNs or content delivery networks. Edge caching transmits content closer to users. It speeds up upload times and enhances streaming quality."

Augmented and Virtual Reality (AR/VR): Low-latency processing is crucial for delivering seamless and immersive AR/VR experiences.

5G Networks: Edge computing supports the low-latency requirements of 5G applications, enhancing the capabilities of next-generation mobile networks.

ENHANCING NETWORK EFFICIENCY AND RELIABILITY

Edge computing significantly enhances the efficiency and reliability of telecom networks. By processing data locally, edge computing conserves bandwidth and reduces operational costs. Somani highlights, "Edge computing decreases the pressure on core networks by processing data locally, which has several benefits. This increases network efficiency and reduces traffic congestion, enabling faster data flow and reaction times." Furthermore, the distributed nature of edge computing infrastructure makes networks more resilient, capable of maintaining high performance even if individual nodes experience failures.

SECURITY IMPLICATIONS: DATA PRIVACY AND COMPLIANCE

Deploying edge computing in telecom networks also offers substantial security benefits:

Data Privacy: Processing data at the edge reduces the need for extensive data transmission, minimizing the risk of exposure to cyber threats. "By minimizing the need to send sensitive data over the network, edge data processing improves data privacy and lowers vulnerability to potential cyber risks," Somani notes.

Compliance: Localized data processing helps telecom operators adhere to data sovereignty laws and regulations, ensuring that sensitive information is managed according to local standards. "Telecom providers must ensure edge deployments comply with applicable data privacy laws. Strong data encryption is advised for every device in the network, from the edge to the core," adds Somani.

LEVERAGING EDGE COMPUTING FOR NEW SERVICES

Telecom operators are increasingly leveraging edge computing to optimize network resources and deliver innovative services. By deploying edge nodes, operators can offer:

Local Content Caching: Enhances user experience by reducing access times for frequently requested content.

Real-Time Analytics: Provides valuable insights for better decision-making and operational efficiency. He mentions, "Edge processing facilitates almost fast data analysis that provides insightful information for network optimization and service enhancement."

Advanced Security Measures: Improves threat detection and response times, enhancing overall network security. "Because edge computing allows for real-time threat detection and mitigation at the network edge, it guarantees the reinforcement of security postures," explains Somani.

Telecom operators are poised to innovate their services with edge computing, projected to reach $445 billion by 2030. "Operators who use this technology can set the standard for new developments in real-time data processing, network efficiency, and focused customer innovation," Somani emphasizes. At ESDS, we believe edge computing will greatly impact how communications evolve in the future.

aanchalg@cybermedia.co.in

Ish Babbar from InsuranceDekho.com, Maps the Future of Insurance.

A Conversation with **Ish Babbar,** CTO & Co-Founder of InsuranceDekho.com. In this insightful interview, Ish Babbar provides an in-depth analysis of the current market trends and challenges within the insurance industry. From emerging technologies to shifting consumer preferences, Ish Babbar shares his expertise on navigating the complexities of the market and positioning InsuranceDekho.com for success in an ever-evolving landscape.

By Aanchal Ghatak

What emerging technologies do you see as having the most potential to transform the insurance industry in the next five years?

There are several emerging technologies that have the potential to transform the insurance sector-

Artificial Intelligence (AI) and Machine Learning (ML) have emerged as pivotal tools in transforming various facets of the insurance industry. With GenAI, tasks across industries are simplified as it swiftly analyzes documents like medical records and invoices for streamlined operations. In insurance, it speeds up claims processing by extracting key details from accident reports. Healthcare benefits from GenAI's ability to digitize health records, aiding faster diagnoses.

> IN AUTO INSURANCE, THE INTEGRATION OF TELEMATICS DEVICES IN VEHICLES HAS OPENED AVENUES FOR INSURERS TO GATHER VALUABLE INSIGHTS INTO DRIVING BEHAVIOR, PAVING THE WAY FOR USAGE-BASED INSURANCE MODELS AND INITIATIVES THAT PROMOTE SAFER DRIVING PRACTICES.

ISH BABBAR
CTO & Co-Founder of InsuranceDekho.com

> WE PRIORITIZE INVESTMENT IN TECHNOLOGY INFRASTRUCTURE, ENSURING ITS CONTINUOUS EVOLUTION TO SUPPORT THE SEAMLESS INTEGRATION OF EMERGING TECHNOLOGIES WHILE BOLSTERING OPERATIONAL EFFICIENCY.

Additionally, GenAI facilitates underwriting by processing images to assess risk and refining premium determinations. Overall, GenAI's adaptability makes it a valuable asset, automating processes and driving efficiency.

Blockchain technology presents a revolutionary opportunity within insurance, particularly in areas such as smart contracts, real-time tracking of claims, and fraud prevention, thanks to its immutable and transparent record-keeping capabilities.

Internet of Things (IoT) has empowered insurers to access real-time data from insured assets, thereby facilitating more precise risk assessment, personalized products and pricing strategies, and proactive risk mitigation measures.

In auto insurance, the integration of telematics devices in vehicles has opened avenues for insurers to gather valuable insights into driving behavior, paving the way for usage-based insurance models and initiatives that promote safer driving practices.

Along with these big data, predictive analytics, chatbots, cloud computing will also play an important role in gaining deeper customer insights, predicting customer needs and market trends thereby providing insurance companies with agility, scalability and cost efficiency.

How do you balance the adoption of new technologies with ensuring data security and regulatory compliance within the company?

In order to uphold the integrity and trust within the insurance industry, robust data security measures are paramount. This involves implementing encryption protocols, access controls, and conducting regular security audits to fortify defenses against cyber threats and safeguard sensitive customer information. Concurrently, compliance frameworks play a pivotal role, necessitating adherence to industry regulations like GDPR and HIPAA, while also staying abreast of evolving data protection laws to ensure legal compliance. Furthermore, ethical AI practices are imperative, ensuring transparency, fairness, and accountability in AI algorithms, and integrating ethical considerations throughout the development and deployment of AI systems. Complementing these efforts, investing in training and awareness initiatives is essential, empowering employees with data security best practices and regulatory insights to cultivate a culture of compliance within the organization.

What are the biggest barriers to the widespread adoption of disruptive technologies in the insurance industry, and how is InsuranceDekho working to overcome them?

In the insurance industry, the widespread adoption of disruptive technologies faces formidable barriers. Outdated legacy systems present a significant obstacle, impeding the seamless integration of new technologies and demanding substantial resources for upgrades or replacements. Moreover, stringent regulatory requirements, particularly in tightly regulated areas like data privacy and security, pose additional challenges, necessitating meticulous compliance to meet regulatory standards. Adding to these complexities is the resistance to change entrenched within organizations and among stakeholders. Cultural reluctance and concerns regarding job displacement or unfamiliarity with new processes can hinder the adoption of disruptive technologies, slowing down innovation within the industry.

InsuranceDekho is actively tackling these barriers through a multifaceted approach. We

> OUTDATED LEGACY SYSTEMS PRESENT A SIGNIFICANT OBSTACLE, IMPEDING THE SEAMLESS INTEGRATION OF NEW TECHNOLOGIES AND DEMANDING SUBSTANTIAL RESOURCES FOR UPGRADES OR REPLACEMENTS.

prioritize investment in technology infrastructure, ensuring its continuous evolution to support the seamless integration of emerging technologies while bolstering operational efficiency. Additionally, the company fosters collaboration with regulatory bodies, engaging closely to ensure compliance with industry regulations while simultaneously seeking opportunities for innovation within the regulatory framework. Furthermore, InsuranceDekho places a strong emphasis on employee training and development, offering comprehensive programs designed to equip staff with the requisite skills and knowledge needed to embrace new technologies and adapt to evolving business practices. Through these concerted efforts, InsuranceDekho strives to surmount obstacles and drive forward momentum in the adoption of disruptive technologies within the insurance industry.

What advice would you give to other companies in the insurance industry looking to embrace innovation and leverage disruptive technologies for growth?
For companies in the insurance industry seeking to embrace innovation and harness disruptive technologies for growth should first and foremost establish a clear strategy. Developing a roadmap that delineates how technology adoption aligns with business objectives and customer needs ensures a cohesive approach. Secondly, investing in talent is crucial; recruiting and retaining individuals with expertise in emerging technologies can drive innovation and spearhead digital transformation initiatives. Thirdly, fostering collaboration with insurtech startups presents invaluable opportunities; partnerships with these entities provide access to cutting-edge technologies and cultivate a culture of innovation within the organization. Lastly, prioritizing customer experience is essential; leveraging technology to offer personalized, convenient, and transparent insurance solutions enhances overall satisfaction and loyalty. By adhering to these principles, insurance companies can navigate the complexities of innovation and thrive in an ever-evolving landscape.

As the insurance landscape evolves, what role do you envision emerging technologies playing in reshaping traditional business models and driving customer engagement and satisfaction?
Emerging technologies will play a pivotal role in reshaping traditional business models and driving customer engagement and satisfaction in the insurance industry. These technologies will enable insurers to offer more Personalized products and services, streamline processes, and deliver seamless omnichannel experiences, ultimately fostering deeper relationships with customers and enhancing overall satisfaction. Being an insurtech company ourselves, we positively see technologies like GenAI ML, Blockchain and IoT revolutionize how we approach insurance. Emerging technologies are set to transform the insurance industry by making it more customer-centric, efficient, and transparent.

aanchalg@cybermedia.co.in

DATAQUEST 40+ YEARS SINCE 1982
THE BUSINESS OF INFOTECH

CMR
Insights powered by research

T SCHOOL 2024

HIGHER EDUCATION CONFERENCE & AWARDS

Learn, Innovate, Collaborate & Transform

Coming soon

New Delhi

Follow us: @dataquestindia
#DQTSchool24

With the rapid advancement of technology and the need for a transformation of engineering education has become crucial for the engineers. The emergence of new technologies such as AI, big data, and IoT are changing the way engineers and engineering students approach their studies.

Dataquest is organising a full day conference on changing landscape in the higher education followed by awards recognition to the colleges who have created a milestone & innovated the process of engineering education in India.

[KEY CONFERENCE HIGHLIGHTS]

- 1 Day forum & awards
- 6+ Sessions
- 20+ Speakers & panellist
- 150+ Targeted attendees
- Meet the key decision makers
- 360+ minutes of networking sessions
- Demo Zone & Networking lounge
- Feedback, quiz, polls
- Live social feeds

[AWARD CATEGORIES]

- Top engineering colleges (National Ranking)
- Top engineering colleges (Zone wise)
- Industry engagement
- Centre of excellence
- Employability index
- Campus placement
- Infrastructure
- Digital Index
- Innovation & CSR

Join us and be a part of annual conclave designed for top engineering colleges, ed tech organizations and higher education ecosystem in India. Network with the largest pool of policy makers, business and technology decision makers, educators, HR and Talent leaders, Ed Tech experts and more.

For further information, write to
Rajiv Pathak I Sr. Manager, Marketing
rajivp@cybermedia.co.in I +91 8010757100

Decoding Retail Stock Broking: Angel One's Data-Driven Success Story

Exploring the dynamic retail stock broking sphere, Angel One Limited, under the leadership of Chief Technology Officer(CTO) **Jyotiswarup Raiturkar,** thrives within a vast market domain. With the industry witnessing rapid expansion driven by technological innovations, Angel One's strategic prowess has secured a prominent position within this flourishing market. He discusses how Angel One's innovative approach has not only reshaped its operational framework but also cemented its presence within the expanding retail stock broking market.

By Aanchal Ghatak

Can you provide an overview of the technological transformation at Angel One under your leadership?
Angel One has undergone a comprehensive technological transformation to revolutionize its operational framework and customer experiences. This transformation involves system ruggedization, performance improvements, new features, building the SuperApp, and process automation, among other things. A critical component of this transformation was restructuring how our data is managed. This restructuring is vital for data security and advanced analytics and enables us to build more delightful experiences for our customers.

How has the integration of TradingView enhanced the user experience with advanced charting and market analysis?
Angel One has enhanced its user experience by partnering with TradingView to integrate our real-time charts with advanced features. This collaboration has elevated the sophistication of our platform, primarily through the introduction of advanced charting and market analysis tools. TradingView offers a comprehensive suite of technical indicators and chart types, empowering traders to conduct detailed market analyses and make well-informed trading decisions. This integration enables users to visualize market trends and patterns more effectively, thereby gaining a competitive edge in their trading strategies. In addition, we have worked with TV to optimize the performance and reliability of the integrated charts

JYOTISWARUP RAITURKAR
CTO. Angel One Limited

experience. This has resulted in a richer overall trading experience, marked by higher user satisfaction and engagement levels.

What role do AI and machine learning play in Angel One's smart portfolio analysis tools, and how do they benefit users?

Our Portfolio analyzer tools help customers with insights and actionable for the portfolio. These systems take in a varied set of signals—from market conditions and customer risk concentration to company-specific business climate changes. This product boosts engagement by providing relevant and timely advice. Ultimately, this leads to better investment outcomes for our users, solidifying their trust in our platform.

What insights can you share about the future roadmap for the Angel One Super App and upcoming enhancements?

The vision for the SuperApp is to provide "navigation" for the customer through their overall financial journey. This involves more intuitive product offerings and timely surfacing of opportunities to guardrails for various journeys. This will involve us building systems to better understand both customers and opportunities and do match-making between the two. We aim to provide an efficient, highly engaging, and user-friendly trading environment by staying ahead of industry trends and technological advancements.

How does Angel One ensure the security and reliability of its technological and digital innovations?

At Angel One, the security and reliability of our technological and digital innovations are paramount. We have established a robust infrastructure that includes private data centers for low-latency trading services and public clouds for other services. Our comprehensive security measures encompass encrypted data transmission, extensive firewalls, and real-time monitoring through Security Information and Event Management (SIEM) systems. For reliability, we work on multiple fronts—from precision engineering and fault injection tests to a disaster recovery architecture with bounded guarantees.

We do regular drills to gauge our posture on both fronts. These measures are designed to protect user data, ensure continuous service availability, and maintain the trust and integrity of our platform.

Can you discuss any specific challenges you've faced while implementing these technological advancements and how they were addressed?

We had to keep delivering features while completing the underlying transformations. This "engine overhaul" necessitated meticulous architectural planning, defining/reviewing crisp milestones, and aligning stakeholders on business definitions and KPIs. This comprehensive approach ensured a smooth transition and successful implementation, effectively overcoming the inherent complexities of such a large-scale transformation.

How do you see the role of technology evolving in the retail stock broking industry in the coming years?

Technology is poised to play an increasingly pivotal role in the retail stockbroking industry, driving significant changes and advancements. In the coming years, we anticipate technology enabling hyper-personalization, with AI and machine learning providing tailored investment advice and support. Enhanced customer support through AI-driven tools will become more prevalent, offering users real-time assistance and insights. Advanced analytical capabilities will empower users to make better-informed decisions, while seamless digital experiences will become the industry standard.

Overall, the continued evolution of technology will transform the industry, making it more user-centric, efficient, and responsive to market dynamics. At Angel One, we are committed to leading this transformation by continually innovating and adapting to new technological developments.

What are some key metrics or success stories that highlight the impact of these innovations on Angel One's users?

Key metrics and success stories demonstrate the impact of our technological innovations. One notable metric is our substantial user base, which is approximately 3 million daily active users on the Super App. Innovations like multi-leg orders, trailing stop-loss features, and live portfolio views have significantly enhanced user experience and engagement.

These features have improved trading efficiency, allowing users to execute complex trading strategies quickly and precisely. Additionally, the positive feedback and increased user retention rates demonstrate the success of our innovations in meeting user needs and expectations. These advancements have contributed to overall business growth and solidified our position as a leader in the industry.

aanchalg@cybermedia.co.in

Amdocs' GenAI Innovations

In an engaging conversation with Dataquest, **Samit Banerjee,** Division President of Cloud Operations Services & Head of Customer Service Unit at Amdocs, reveals how Generative AI is not just transforming telecom operations but also redefining customer service experiences.

By Minu Sirsalewala

Imagine a world where your telecom service provider anticipates your needs, resolves issues almost before they arise, and personalizes your experience in ways you never thought possible. In this exclusive interview with Minu Sirsalewala, Executive Editor at Dataquest, Samit Banerjee shares how Amdocs is making this a reality. By leveraging the power of Generative AI, Amdocs is pioneering new solutions like bill-assist tools and intelligent customer interaction insights that address the evolving challenges of communication service providers (CSPs). Banerjee delves into how GenAI enhances operational efficiency and customer satisfaction, offering a glimpse into the future of telecom shaped by cutting-edge technology.

SAMIT BANERJEE
Division President, Cloud Operations Services & Head of Customer Service Unit, Amdocs

Can you elaborate on how GenAI-powered solutions like bill-assist and customer interaction insights are specifically tailored to address the current challenges faced by communication service providers (CSPs)?
GenAI-powered solutions like bill-assist and customer interaction insights are designed to help CSPs improve their customer experience, operational efficiency, and profitability. Bill-assist helps CSPs better solve customers' billing-related inquiries and recommend alternative products or add-ons, increasing call deflection rates and reducing average handling time of assisted calls. Customer interaction insights leverage large language models (LLMs) and machine learning (ML) to generate summaries and insights from channel interactions, enriching customer profiles and providing highlights to customer service representatives. These solutions help CSPs reduce churn, increase sales, and boost customer satisfaction.

With the integration of GenAI into telecom operations, how have you observed changes in customer touchpoints, and what strategies have been implemented to optimize these interactions?
With the integration of GenAI into telecom operations, we have observed significant changes in customer touchpoints, such as chatbots, voice assistants, self-service portals, and social media. These touchpoints have become more personalized, relevant, and timely, providing customers with seamless and consistent experiences across all channels. Some of the strategies that have been implemented to optimize these interactions include using GenAI to generate natural and human-like responses, leveraging telco-specific data and taxonomy to ensure accuracy and context, and providing transparency and explainability in AI decision-making processes.

In what ways does the partnership between GenAI and Amdocs contribute to driving innovation and efficiency

for telecom operators?
The partnership between GenAI and Amdocs contributes to driving innovation and efficiency for telecom operators by providing them with a purpose-built GenAI platform for telcos, amAIz, that offers a rapid, secure, and cost-effective approach for CSP GenAI journeys. amAIz features an open architecture, industry-standard APIs, and an expanding library of pre-built use cases that can overcome specific business challenges. amAIz also integrates GenAI capabilities throughout Amdocs' portfolio, offering copilots that enhance the productivity of users and customers. Moreover, amAIz leverages the expertise and innovation of GenAI industry leaders like NVIDIA, Microsoft, and AWS, while maintaining compatibility with diverse GenAI foundation models.

With the evolving landscape of telecom services, how does Amdocs envision the future role of AI, particularly GenAI, in shaping the industry's trajectory?
Amdocs envisions the future role of AI, particularly GenAI, as a key driver of transformation and differentiation in the telecom industry. GenAI holds the power to introduce transformative change in the communications industry – from simplifying the operations of networks to streamlining customer care interactions, and more. GenAI can help CSPs deliver superior customer experiences, optimize their operations, accelerate their innovation, and increase their profitability. GenAI can also help CSPs differentiate themselves from their competitors and create new value propositions and business models. Amdocs is committed to empowering CSPs to seamlessly integrate GenAI into their strategic portfolios and revolutionize industry practices.

Data security and privacy are paramount concerns, especially when dealing with sensitive telecom data. How does Amdocs address these concerns when implementing GenAI solutions for CSPs?
Amdocs addresses data security and privacy concerns when implementing GenAI solutions for CSPs by following robust encryption, data anonymization, and privacy compliance measures. Amdocs also adheres to responsible AI principles, ensuring fairness, inclusivity, and ethical guidelines in its AI models and algorithms. Amdocs also provides transparency and explainability in its AI decision-making processes, as well as audit and accountability mechanisms. Furthermore, Amdocs ensures data sovereignty and compliance with CSP-specific regulations by exclusively storing and accessing operator-specific data within the amAIz, CSP's dedicated tenant.

Can you provide insights into how GenAI enables CSPs to adapt to market shifts and emerging technologies swiftly? Are there any examples of how GenAI has helped CSPs stay ahead of the curve?
GenAI enables CSPs to adapt to market shifts and emerging technologies swiftly by providing them with the ability to generate, understand, and optimize any type of content, code, or data, in any language, domain, or format. GenAI can also integrate seamlessly with any existing system, platform, or tool, and leverage any available data source, whether internal or external, structured or unstructured.

GenAI can also scale easily and efficiently to meet any demand, complexity, or volume, and provide high-quality and reliable outputs and outcomes. GenAI can also adapt and learn continuously from feedback, data, and results, and improve its performance and accuracy over time. GenAI can also enable collaboration and co-creation among human and machine agents and empower users to control and customize their experience and results.

Some examples of how GenAI has helped CSPs stay ahead of the curve include using GenAI to create personalized and relevant offers, recommendations, and promotions, leading to a contextually aware, guided sales process; using GenAI to predict and prevent churn, as well as to enhance customer loyalty and satisfaction; and using GenAI to automate and optimize their tasks, processes, and workflows, as well as to eliminate errors and inefficiencies.

Looking ahead, what developments or innovations can we expect to see from Amdocs in the realm of AI and data-driven solutions for telecom operators?
Looking ahead, we can expect to see Amdocs continue to lead the way in the realm of AI and data-driven solutions for telecom operators, by expanding its portfolio of GenAI use cases, copilots, and services, as well as by enhancing its amAIz platform with new features and capabilities. Amdocs will also continue to collaborate with its GenAI partners and customers to deliver cutting-edge solutions that address the evolving needs and challenges of the telecom industry. Amdocs will also continue to invest in research and development, as well as in talent and expertise, to stay at the forefront of AI and data innovation.

minus@cybermedia.co.in

IoT Security Best Practices

With increasing integration of IT and OT systems, organizations must develop a comprehensive IoT network strategy to safeguard themselves

By Anil Chopra

Investments in IoT are increasing at a rapid pace, with experts predicting over 13% CAGR growth for it between 2020 to 2025. In fact, IoT remains among the top 3 technologies that deep-tech startups are focusing on, with AI and Blockchain being the other two areas. IoT is also among the topmost priorities among enterprises after AI, thanks to the need to embed sensors in most devices. All this is happening due to the growing need of capturing real-time data for crucial, on-the-spot decisions for a range of applications. No wonder the number of IoT devices is expected to cross 29 billion by 2030, double what it was in 2020. As the number of IoT devices increases, so does the need to protect them against security threats. In fact, according to reports, India is among the top 3 most vulnerable nations in the world when it comes to malware infections of IoT devices being used in smart cities, financial services, and transportation systems. Another key reason for rising attacks is the integration of IT and OT systems, which if compromised could cause serious damage. Organizations therefore can't afford to take IoT security lightly. What's needed is a comprehensive approach to enabling tighter IoT security, starting from govt. policies to build a strategic framework and IoT architecture, to finally seamless tech deployment and management.

HOW SERIOUS CAN IOT ATTACKS BE?

IoT attacks increased by 311% last year according to a report by Sonicwall, while another report cited a 400% increase against IoT and OT devices. Many of these were high-grade attacks aimed at causing severe damage. Take for instance, the malware attack on Nuclear Power Corporation of India's Kundankulam Nuclear Power Plant. The malware managed to infect the Internet-connected systems in the plant. Luckily, they were only administrative systems, which were not connected to the plant's control and instrumentation

systems. Due to this, thankfully, the malware could not gain access to the plant's controls. Just imagine the outcomes if it did! Now imagine the damage that could happen in chemical plants, transport networks, railway networks, industrial manufacturing, etc. that are integrating IT with OT. As more operational technology (OT) platforms converge with information technology (IT) systems, evolving threats like website intrusion, malicious code, distributed denial-of-service (DDoS) attacks, unauthorized network scanning or probing, malware, ransomware, phishing, data breaches, etc., will happen and cause grievous harm – both on the operations and company reputation.

Even everyday Internet-enabled devices with sensors are a target--Security cameras, Wi-Fi routers, fax machines, smart TVs, smart bulbs, microphones in smartphones, printers, smart speakers, Internet-connected gas stations, and even the humble coffee machine or fridge. All these devices could be hacked for malicious intent—spying, stolen credentials for financial fraud, intrusion of privacy for extortion, to name a few. So, the question now is, what should be done about it?

IoT SECURITY POLICY FRAMEWORK

At the topmost level, the govt. has to step in to build a governing policy around IoT, like the IT ministry's draft roadmap for IoT security released earlier this year. It aims to develop an indigenous security eco-system for IoT, develop AI-powered self-adapting IoT security, an IoT sandbox, and collaborate with IoT security working groups to constantly update IoT security policies to name a few. Two years from today, i.e. by 2026, the govt. also wants to develop an IoT device lifecycle certificate system.

While the govt. is doing its part, enterprises must also develop an IoT security policy by taking a comprehensive view of their overall IoT footprint and then devise a security strategy for it.

DEVELOP AN IoT ARCHITECTURE

IoT implementations can be complex, comprising of sensors, analytics, networks, security tools, and the cloud. Laying out the IoT network correctly is essential not only for security but also to get optimum results. Such a network will enable organizations to identify their IoT weak spots whose security must be strengthened.

MONITOR AND PLUG ALL IoT DEVICES

The IoT devices at the edge must also be strengthened, which starts by monitoring, discovering, tracking, and managing all of them to gain better insights into your IoT inventory, remove unused ones, etc. The active ones must be plugged in with the latest updates to remove potential vulnerabilities so that the network edge remains safe. Change the passwords on all connected devices instead of leaving the default ones supplied by the vendor.

ENCRYPT AND SEGMENT THE NETWORK

Besides the devices, unsecured communication between them is another major risk to be addressed. Use the latest encryption protocols to encrypt all data flowing over the IoT network so that it can't be sniffed out. Another method that should be followed is to segment the network into sub-networks and ensure that the IoT devices are isolated from critical systems and data. This will help you identify unauthorized users trying to gain access from other subnets.

IMPLEMENT ZERO-TRUSTY POLICY

Once you've grouped the IoT devices into a manageable number of groups, create zero-trust policy rules, which should be defined based on the observed device group's behavior and activities.

CONDUCT REGULAR PENETRATION TESTING

Lastly, a sure-shot way of testing your IoT network is to evaluate its strength with penetration testing. It will help you identify potential vulnerabilities, test your security policies, regulatory compliance, and risk response speed to name a few.

With the proliferation of IoT devices, it's no longer enough to protect devices being used by humans. IoT devices that are all doing machine-to-machine communication require equal attention if not more. This will happen only if organizations develop a proper IoT architecture and keep it updated to ensure all new types of devices being introduced are incorporated and provisioned for.

Cybersecurity has become more important than ever before and requires a proactive approach instead of a reactive one. After all, in today's real-time world, preventive measures are more valuable than doing the clean-up act after a breach has occurred.

Anil Chopra is Research Editor, Dataquest.

maildqindia@cybermedia.co.in

Empowering India's Tech Future: A Deep Dive into NASSCOM's CoE Journey

MeitY Nasscom CoE, is revolutionizing India's IoT and AI landscape. From empowering startups to spearheading global collaborations, discover the visionary initiatives driving India's technological future.

By Minu Sirsalewala

India is emerging as a powerhouse of innovation in IoT and AI. At the forefront of this transformation is the MeitY Nasscom Centre of Excellence (CoE), a beacon for startups and tech entrepreneurs. Led by Sanjeev Malhotra, CEO- MeitY Nasscom CoE is not just fostering innovation but also reshaping the tech landscape of the nation. In a chat with Minu Sirsalewala, Executive Editor of Dataquest, Malhotra shares the CoE's remarkable journey, its mission to democratize deep tech and the groundbreaking strides it is making towards a digitally empowered India. Dive in to uncover the strategies, successes, and future aspirations that are setting the stage for India's ascent as a global tech leader.

Can you walk us through the journey of NASSCOM's Centre of Excellence for IoT and AI? What inspired its establishment, and how has it evolved since its inception?

The Centre of Excellence for IoT & AI was established with the goal of catalysing

> OUR CORE GOAL IS TO FOSTER INNOVATION DEMOCRATIZATION IN EMERGING TECHNOLOGIES SUCH AS THE INTERNET OF THINGS & AI.

SANJEEV MALHOTRA
CEO- MeitY Nasscom CoE

> OUR STARTUPS HAVE STREAMLINED MANUFACTURING PROCESSES THROUGH INTELLIGENT AUTOMATION, ENABLING AUTOMATED VISUAL INSPECTION, ANOMALY DETECTION, AND PREDICTIVE MAINTENANCE.

indigenous solution by enabling startups in emerging technology and build a strong and inclusive ecosystem for innovation and entrepreneurship in India. It was launched as part of the Digital India Initiative by MeitY with state governments & Nasscom to jumpstart the IOT and AI ecosystem by using India's IT capabilities and assisting the country in achieving a leading role in the convergence of hardware and software.

Over these years, the center has successfully enabled development of unique solutions by harnessing the innovative character of the startup ecosystem and helped in the adoption of these solutions with corporate. This initiative has expanded to four strategic locations including Bangalore, Gandhinagar, Vizag, and Gurugram and have emerged as a pivotal resource for entrepreneurs navigating the realm of emerging technologies. Many startups who have been nurtured that are across various sectors, with a particular emphasis on manufacturing, healthcare and enterprises.

What is the core mission of the Centre, and how does it aim to impact India's technology landscape? Could you share some key milestones or achievements that highlight its contribution to the ecosystem?

Our core goal is to foster innovation democratization in emerging technologies such as Internet of Things & AI. Through the development of prototypes and creation of solutions tailored to sectors vital for India's progress, including healthcare, energy, manufacturing, the Center aims to address the nation's specific needs. We have established ourselves as a frontrunner as enterprise innovation partner and as one of the most extensive deeptech startup ecosystems. There are over a thousand startups collaborating with us and benefiting from access to labs and industry partnerships. In these years we have successfully co-created indigenous solutions through collaboration between startups, industry partners, and governmental bodies.

CoE Labs operating at full occupancy helping startups in prototyping and testing their products. We have demonstrated domain expertise in Healthcare, Manufacturing, and Enterprise technology and built a robust industry connections, encompassing over thousand enterprises and SMEs.

Apart from this, CoEs are advocating the India Innovation Story, hosting hundreds of delegations at the Center thus serving as an international platform to showcase technological prowess of India and foster global collaborations.

With hubs in multiple cities across India, how does the Centre foster collaboration among startups, innovators, enterprises, and the government? What kind of support does it provide to these stakeholders to drive innovation in deep tech?

We have played a critical role in facilitating collaboration among entrepreneurs, innovators, businesses, and the government by establishing easily accessible labs and enabling system to grow.

We function as hubs, providing a variety of services such as mentorship, funding assistance, and networking platforms.

We promote information exchange, idea development, and partnership formation among different stakeholders by fostering businesses and establishing collaborative ecosystems. We have effectively engaged relevant players and are facilitating focused collaboration within those industries. Overall, we've built an ecosystem that brings together startups, businesses, government agencies, and academics to collaborate on solutions, drive innovation, and promote economic development.

One of the important topics is harnessing IoT and AI for growth and innovation in India, particularly for MSMEs. How is the Centre facilitating this empowerment, and what role do these technologies play in enabling small and medium-sized enterprises?

SMEs can use technology to digitize their operations

> WE'VE HELPED FARMERS INCREASE THEIR CROP PRODUCTIVITY BY PROVIDING CROP INSIGHTS USING DRONE-BASED HYPERSPECTRAL IMAGING TECHNOLOGY.

to monitor downtime, quality control, automation, energy savings etc and overall improve their efficiency. As a Centre of Excellence (CoE), we play a crucial role in facilitating the adoption of new technologies by SMEs (Small, and Medium Enterprises developed by our startups. We have initiated the UDYAM 4.0 Smart Manufacturing Forum with the aim of promoting the adoption of digital technologies among micro, small, and medium enterprises (MSMEs) in the manufacturing sector. Through this we are helping these enterprises to start, scale, and sustain their digital transformation by overcoming roadblocks such as restricted budgets and lack of expertise, thereby enhancing their global competitiveness.

Our efforts are focused on several key areas: conducting extensive research on emerging technologies to understand their potential applications and guide startups through different programs; providing them with information on technical solutions, best practices, leadership support, and management guidance. We help companies solve problems and set up development phases for new technology implementation by serving as a platform for knowledge exchange and capacity building for industry stakeholders; engaging in co-innovation activities to identify new solutions and test use cases; and collaborating with industry partners, research institutions, and government bodies to transfer advanced technologies, conduct research, and develop innovative solution.

Edge computing is gaining prominence, especially in applications requiring low-latency processing like IoT. How is the Centre exploring the potential of AI at the edge, and what opportunities does this technology unlock for various industries?

For years, the cloud computing revolution has forced businesses to consolidate more of their data and processing power in massive, remote data centres run by corporate behemoths. However, the pendulum is beginning to swing back towards a more decentralised computing model, at least for a few essential applications. Edge computing, which processes data locally at the "edge" where it is generated, is rapidly gaining popularity as a viable alternative to clouds. It has the potential to drastically reduce latency and bandwidth costs by evaluating data at the source rather than transferring it across the internet to centralised data centres, while also safeguarding data privacy and improving digital experiences. This distributed computing paradigm is poised to spark the next wave of innovation across industries. A substantial number of organisations are installing or exploring edge computing efforts during the next years, with many preparing to invest heavily in these projects. We are working with startups working on Edge technology and are helping them to connect with companies looking for such solutions.

Could you share some success stories of startups incubated at the Centre? How are these startups leveraging IoT and AI to bring transformative solutions to market, and what impact are they making in their respective domains?

Many startups using technologies from cutting-edge AI to computer vision technologies have benefited from the CoE programs. These solutions have optimized operations and boosted productivity. We enabled the implementation of predictive maintenance systems that use real-time sensor data to identify wear and tear, monitor tire pressure, and forecast future breakdowns, therefore improving safety and lowering costs.

Our startups have streamlined manufacturing processes through intelligent automation, enabling automated visual inspection, step verification, anomaly detection, automated assembly, defect detection, 3D vision monitoring, and predictive

> INDIA HAS ALREADY MADE A MARK IN DIGITAL, AND GOVERNMENT PROGRAMS ON DPI (DIGITAL PUBLIC INFRASTRUCTURE) HAVE BEEN A CATALYST.

maintenance, leading to improved efficiency, reduced costs, and higher product quality.

There are success stories across sectors from Healthcare to Manufacturing to Agritech. For example, we've helped farmers increase their crop productivity by providing crop insights using drone-based Hyperspectral Imaging technology. This technology allows for a detailed analysis of plant health, enabling farmers to make informed decisions about irrigation, fertilization, and pest control. In another domain, a solution was deployed for digitized policing that ensures effective police patrolling, thereby reducing crime. This solution leverages AI and data analytics to predict crime hotspots and optimize patrol routes.

Additionally, in the healthcare sector, we have implemented vision AI systems for accurately detecting vision impairment. Another startup was enabled that uses AI in screening cervical cancer. All these solutions have made life easier for the citizens by delivering affordable healthcare.

By fostering innovation in these areas, not only the startups thrive, there is a significant impact on the lives of everyday people.

What are some of the key challenges facing India's deep tech ecosystem, and how is the Centre addressing them? Additionally, what opportunities do you see for further advancement and growth in this space?

One significant challenge is the lengthy gestation period necessary for their very sophisticated and advanced technology. These startups may take couple of years to get a right prototype in place. This prolonged duration makes collecting financing, particularly post-seed funding, and maintaining operations difficult. Investors are unsure of the full potential and capabilities of deep tech

developments, which might make it difficult for these firms to get funds. Acquiring the multitude of skills and experience is another hurdle that deep technology firms encounter – an hardware startup may not have the necessary AI skills and vice-versa. There are some government grant programs to help technology startups and we see growing maturing in VC ecosystem that is looking at tech ecosystem. We are engaging with VCs through pitch sessions to help them gain a better knowledge of products, which will lead to higher investment. We see a strong network of research institutions, incubators, accelerators, and industrial collaborations emerging, which will enable India to fully realise the promise of its deep tech startup ecosystem.

Looking ahead, how do you envision the future of tech, particularly in terms of deep tech innovations shaping India's landscape? What role will NASSCOM's Centre of Excellence play in driving this future, and what are your aspirations for its continued impact?

India has already made a mark in digital and govt programs on DPI (digital public infrastructure) have been a catalyst. Deep tech in India is on a upward trajectory, thanks for more multinational companies and newer startups and more investments. Artificial intelligence and machine learning are at the forefront, with AI-powered insights and predictive analytics increasing operational efficiencies across multiple industries. The rise of generative AI, blockchain technology, Quantum computing, will be transforming industries, and reshaping many fields.

The centre will continue to enable more solutions, create more use cases and help enterprises to adopt newer technology and strengthen aim to boost investment, ecosystem support, and cooperation among business, academia, and government in these areas, allowing us to promote newer solutions, strengthen industries and create global partnerships.

minus@cybermedia.co.in

Building Enterprise Trust: Essential for Indian Businesses in the Digital Era

As Indian businesses navigate a rapidly evolving landscape, the importance of building and maintaining enterprise trust has never been more critical. In this piece, we explore why trust is paramount, the factors eroding it, and actionable steps organizations can take to foster trust, leveraging data and analytics for greater transparency and accountability.

By Minu Sirsalewala

Trust is the cornerstone of long-lasting institutions, and for Indian businesses on a growth trajectory, nurturing this trust is vital. The benefits are manifold: enhanced financial performance, brand protection, improved employee morale, and customer loyalty. Highly trusted entities gain a 'trust premium,' influencing consumer decisions significantly. For instance, over 80% of consumers in the consumer industry view trust as a deciding factor when making purchase decisions, according to Deloitte US's "The Four Factors of Trust." In the realm of digital operations, trust becomes even more crucial due to compliance requirements with data protection laws and the heightened expectations around the responsible use of third-party data. Stakeholders today seek sustainable growth with greater resilience and credibility, shifting away from short-term, ad hoc growth.

In an insightful conversation with Minu Sirsalewala, Executive Editor at Dataquest, **Sriraman Parthasarathy,** Partner at Deloitte India, elaborates on why trust is essential for Indian businesses now and how they can proactively build and maintain it to position themselves for the next level of growth.

SRIRAMAN PARTHASARATHY
Partner, Deloitte India

Why is managing "enterprise trust" critical for Indian businesses now? How have stakeholder expectations changed?

Trust is critical for building institutions that are long-lasting. India is on a growth path, and this is an opportune time for Indian corporates to nurture trust to their advantage since it enhances financial performance, protects the brand, improves employee morale, and builds customer loyalty. Highly trusted entities gain the trust premium compared to others. For example, over 80% of consumers in the consumer industry view trust as a deciding factor when evaluating a potential purchase decision, according to "The Four Factors of Trust" by Deloitte US. In digital operations, the importance of trust is very high given the compliance requirements with data protection laws and the heightened expectations around the responsible use of third-party data. With changing dynamics, companies are witnessing a change in stakeholder expectations, and short-term and ad hoc growth no longer matter to the stakeholder community. They are keen on sustainable growth with greater resilience and credibility. Organizations

now more than ever need to think differently and proactively build greater trust, not only within their country but also abroad, positioning themselves for the next level.

What factors erode enterprise trust today (data breaches, ethics, transparency)? How do social media and "conscious consumers" impact trust dynamics?

Poor communication, lack of transparency, inconsistency in service delivery, not addressing gaps in stakeholder expectations, and inadequate focus on culture and diversity are some factors eroding trust in enterprises today. In light of the significant influence of social media, reputations painstakingly built over time can be tarnished in mere moments if trust issues are not promptly and effectively addressed. The pervasive reach and impact of social media highlight its critical importance, making it imperative for organizations to actively engage with it. Furthermore, an unhappy customer can now wield greater influence over the trustworthiness of a product or service, given the rise in consumer activism. Whether stemming from perception or reality, individuals and organizations alike bear the responsibility of transparently monitoring and addressing incidents that erode trust. In today's interconnected world, this cannot be overlooked, regardless of an entity's position or market dominance.

What key steps can organizations take to build strong enterprise trust? How can data & analytics be used for transparency and accountability?

Engage with internal stakeholders (employees) and assess the extent to which they trust the organization; if employees do not trust the organization, the same will mirror externally as well. An organization's talent is its most important asset, and equally significant is how the internal workforce perceives leadership and their role in cultivating trust and fairness within the organization.

Periodic external sensing of social media, news, blogs, and microblogs to assess the level of trust across several domains—be it customer satisfaction, cybersecurity, or financial performance—since external perceptions have a direct impact on customer and brand loyalty and also how regulators perceive the organization.

Benchmarking with industry peers across various areas to assess the level of trust of an organization compared to the industry.

Making trust a key agenda of the Board/CEO and putting a framework to measure and monitor trust periodically, taking the required actions swiftly.

Data and analytics play a significant role in converting subjective elements into objective and measurable metrics. With the power of large language models and Generative AI, the barrage of information collected from various segments can be easily interpreted and converted into measurable metrics. What gets measured gets done, and this is absolutely true for trust as well. The myth of trust being an abstract concept is no longer relevant these days with the power of technology, and smart use of data and analytics can support leveraging trust for greater transparency and accountability.

How does Deloitte help Indian businesses build trust? Can you share success stories?

At Deloitte, we help corporates set up and drive their trust agenda by measuring trust through a time-tested assessment framework that can be leveraged for continuous monitoring of trust. In addition, we also help corporates carry out independent trust assessments using our proprietary Trust IQ framework, which not only provides a trust score across various domains and drivers but also identifies actionable insights to enhance and nurture the trust quotient in specific areas.

What emerging trends or challenges will impact enterprise trust? What advice do you have for Indian business leaders?

Leveraging data with the power of AI is poised to be a game-changer in the field of trust assessment. As we accumulate and interpret increasingly large datasets, the potential for deeper research in the field of trust significantly expands. With a focus on comprehensive metrics encompassing both financial and non-financial aspects, there is growing interest among C-suite stakeholders in consolidated assessments.

Having a comprehensive trust framework to assess various core areas such as governance, compliance, sustainability, and cybersecurity is particularly impactful for Indian boards.

When responsibility is shared across everyone, effectively measuring and monitoring it, as with trust, can be challenging. Therefore, a dedicated focus on trust with a clear monitoring framework is invaluable. Given that the concept is new and emerging, increasing awareness among Indian corporates is essential. As everyone recognizes the importance of trust, now is the opportune time to leverage it for improvement.

minus@cybermedia.co.in

Faultless Edge: Stratus Powers India's Industry 4.0

As India accelerates towards Industry 4.0, the demand for robust and reliable computing solutions has surged. Edge computing is expected to reach $4 billion in the Indian market by 2025, driven by industries such as oil and gas, pharmaceuticals, and manufacturing. Stratus Technologies, a leader in fault-tolerant computing, is at the forefront of this transformation, ensuring continuous operation and efficiency in remote and critical environments.

By Minu Sirsalewala

In a candid conversation with Minu Sirsalewala, Executive Editor of Dataquest, Stratus Technologies' leadership team Lin Hoe Foong, Managing Director, Asia South, Stratus Technologies, Monish More, Sales Director, India, Stratus Technologies, and Sreedhar Varma, Director - India Operations, Stratus Technologies shed light on their strategic initiatives and advanced technological offerings aimed at revolutionizing industries in India. The discussion centered around the launch of their latest platform, ztC Endurance, and how Stratus is leveraging Edge Computing to facilitate digital transformation in the context of Industry 4.0 & delivering availability up to 99.99999% to ensure continuous operations.

How is Stratus leveraging Edge Computing to support the digital transformation of industries in India, particularly in the context of Industry 4.0?

Stratus has firmly established itself as a key player

LIN HOE FOONG
Managing Director, Asia South,
Stratus Technologies

MONISH MORE
Sales Director, India,
Stratus Technologies

SREEDHAR VARMA
Director - India Operations,
Stratus Technologies

in both Edge Computing and Enterprise IT. Over the past forty years, we have expanded our presence in India, engaging with various sectors including banking, financial services and insurance, oil and gas, pharmaceuticals, tire manufacturing, metals, metro , rail & airports. Some of these industries often operate in remote locations, far from their main offices, making Edge Computing crucial for their digital transformation.

Our products are designed to be simple, protected, and autonomous. They are easy to deploy and manage, delivering up to 99.99999% availability and featuring predictive and self-healing capabilities. This ensures continuous operation and supports the increased automation seen in Industry 4.0. By virtualizing and consolidating workloads, we help industries transition from standalone physical systems to more integrated and virtualized environments, ensuring reliability and efficiency even in remote locations.

Can you elaborate on the predictive fault tolerance capabilities of this new platform, and how it differentiates from your previous generations of fault tolerance systems?

Our new platform leverages advanced features in modern processors, memory, and other hardware components, building on 40 years of fault-tolerant computing experience. By analyzing extensive metrics and patterns, we can anticipate potential hardware failures. Our architecture includes dual modular components for the processor, I/O, storage and power supply; operating in mix of active/active and active/proactive mode. When a potential failure is detected, we perform a "smart exchange," transferring workloads to the proactive standby node seamlessly. This ensures continuous operation and contributes to our seven nines (99.99999%) availability.

The Automated Uptime Layer (AUL) enhances this by providing real-time predictive features, ensuring that even in the event of hardware faults, the system self-heals by replacing faulty components autonomously. This approach significantly differentiates our platform from other platforms in the market.

How is this platform contributing to sustainable operations for enterprises?

Our ztC Endurance platform is designed with sustainability in mind. It consumes approximately 40-45% less power than regular servers and emits 48-49% less thermal load. The compact design reduces rack space requirements, further optimizing the footprint needed when ztC Endurance is deployed.

We achieve fault tolerance with reduced power consumption by using smart exchange technology, which ensures that only one node is actively consuming power at any given time unless a fault is detected. This makes our new product more efficient and sustainable, aligning with the growing emphasis on green operations.

What are the emerging trends in computing and fault tolerance systems that Stratus is focusing on for future development?

As automation and consolidation progress in edge environments, the need for reliable computing grows. We see a robust demand for IT-OT integration, especially in operational technology (OT) environments. Our simple to deploy, easy to manage products, like ztC Endurance, offer significant benefits to OT environment with limited IT resources and can cater to hybrid cloud environments, supporting both on-prem and cloud-based computing.

ztC Endurance is equip with AVX processing capability – a feature ideal for entry-level on-prem AI workloads.

We are also focusing on developing GPU processing capabilities for increasing AI analytic algorithm, enhancing our support for edge and core computing solutions that manage the majority of data locally before sending it to the cloud. This is particularly important for industries with limited IT infrastructure at remote sites.

How does Stratus address the challenge of managing unstructured data at the edge, especially with the increasing volume facilitated by AI?

Stratus has a longstanding collaboration with major OT and OEM players. As these partners integrate AI into their operations, we support them by ensuring reliable and seamless data connectivity from sensors to SCADA and MES systems. Our virtualized platform, ztC Endurance, is capable of running on various hypervisors, making it well-suited for environments with increasing workloads and unstructured data on-prem.

Could you provide insights into the current trends in the Indian market, particularly in terms of sector-wise traction and growth?

In India, we have seen significant traction across

various sectors, including space research, metals, pharmaceuticals, transportation, and government. For example, in metals, we support digital transformations by ensuring the reliability of critical applications like MES and ERP integration. In the pharmaceutical sector, our solutions help consolidate data from multiple vendors, ensuring regulatory compliance.

Our presence in transportation, particularly in metro and railway systems, highlights our role in ensuring the smooth operation of mission-critical applications. We are also active in oil and gas, providing reliable solutions for refinery operations and terminal automation in remote locations.

Moreover on the BFSI side, today's retail banking, corporate banking and capital markets customers expect immediate, uninterrupted access whether on site, online, or through a mobile app. Delivering a smooth, consistent, and valued experience anywhere, anytime can be data and infrastructure intensive, but can nonetheless be achieved with our fault tolerant solutions like ztC Endurance complementing the high availability computing platforms within their data centers with availability level of 99.99999%.

USE CASE - NATIONAL STOCK EXCHANGE OF INDIA (NSE)

Ensuring Uninterrupted Operations in High-Stakes Environments

CHALLENGE:

- The National Stock Exchange of India Limited (NSE) ranks among the largest globally by trading volume.
- Even a few seconds of downtime could result in millions of dollars in losses and numerous dissatisfied customers.
- NSE's system lacked inherent horizontal distribution for clustering-based fault tolerance, which would have required extensive software modifications and could lead to performance overheads.

SOLUTION:

- NSE partnered with Stratus to implement the most straightforward, continuously available solution on the market.
- Stratus' hardware fault tolerance provided high reliability without sacrificing computational efficiency.
- Advanced engineering capabilities were leveraged through hardware solutions, challenging to develop independently.

OUTCOME:

- **Robust Reliability:** Since partnering with Stratus, NSE has experienced strong and cost-effective reliability.
- **Simplified Management:** Applications can be deployed confidently, free from concerns about hardware failures.
- **Continuous Availability:** Ensuring uninterrupted operations in the dynamic Indian market prevents significant financial losses due to downtime.
- **Excellent Support:** Stratus's excellent onsite support has contributed to a smooth and efficient operational journey.

Any customer feedback from the Indian market that has influenced the development of the ztC Endurance platform?

Customer feedback has been instrumental in shaping our ztC Endurance platform. We ensure our platforms remain competitive by incorporating the latest technology, processors and memories; offering three variants tailored to diverse applications. We support multiple operating systems and provide flexibility through bare metal and hypervisor virtualization options. Our collaboration with partners and distributors ensures that we meet specific industry needs and maintain production continuity, which is crucial in markets like India with high transaction volumes.

What are the future growth plans for Stratus in India?

With the push for manufacturing and "Make in India," we see significant OT growth. Our ztC Endurance product will be a game changer, offering a choice of advanced technology chipsets that benefit many clients in India. We aim to simplify availability and ensure operational continuity, be it for OT or IT applications. We already have successful implementations globally and are confident in replicating this success in India across various sectors.

Stratus Technologies is committed to driving digital transformation and sustainability through advanced Edge Computing solutions. As industries in India continue to evolve and embrace Industry 4.0, Stratus stands ready to support them with reliable, efficient, and sustainable computing platforms.

Fault tolerant computing solutions for BFSI and Enterprise IT sectors are other industries that Stratus would continue to grow in the India market.

minus@cybermedia.co.in

PCQUEST
TECH TODAY & TOMORROW

CyberHoax

CyberMedia

"STAY AHEAD OF CYBER THREATS AND PROTECT YOUR DIGITAL WORLD"

Digital threats are ever-evolving, knowledge is your best defence. **Join PCQuest Cybersecurity Webinar Series: CyberHoax** to gain insights from top cybersecurity experts.

#PCQWebinar

Follow us: @pcquest

PCQuest webinar will equip you with the knowledge and strategies you need to overcome security challenge.

Hear from leading experts in the field as they share their insights and best practices.

- Increased Awareness
- Develop Best Practices
- Identify Gaps in Security
- Stay Ahead of Threats

Webinar is curated for the CXO's, IT / Security / Networking / Software developers / technology geeks, Policy Makers / Regulators, Opinion Makers & Tech Influencers

Don't miss out on this opportunity to fortify your digital defences.

For further information, write to Rajiv Pathak I Sr. Manager, Marketing

rajivp@cybermedia.co.in I +91 8010757100

The People Paradox

With a relatively young workforce, India will add 160m new workers over the next 20 years

By Raju Chellam

Here's an amusing anecdote: During an academic discussion, the moderator asked three professionals their take on which kind of engineer must have designed the human body. "It must be a mechanical engineer," the first panelist said. "Just look how well all the joints are perfectly designed."

"I beg to differ, it has to be an ICT engineer," the second panelist said. "Just look how minutely the nervous system with millions of networked connections are intricately aligned."

"You're both wrong; it's none but a civil engineer," the third panelist quipped. "Who else would run a toxic waste pipeline through a recreation place?"

With due apologies to civil engineers, will AI replace tech jobs? According to the World Economic Forum's 2020 Future of Jobs report, new opportunities spawned by the expected growth of the AI industry will eventually outnumber the jobs that will be lost. The WEF's head of AI, Kay Firth-Butterfield, thinks that not all technical professions will be spared.

"It's more important for people to do more complex roles because computers will be more and more able to do the basics," says Firth-Butterfield. "There will always be opportunities for people who have PhDs, people who are thinking about new ways of developing tools or starting businesses that will use AI to solve various problems. Those jobs will survive. Jobs that involve basic coding probably not so much. Ultimately, AI will usher in the golden age when engineers will be able to focus on the fun things, and AI will support them."

ASIAN FIVE

The moot question for us in Asia: Should we worry? Yes, because working populations in the five largest economies in Asia—India, China, South Korea, Australia, and Japan—are more at risk due to physical robot automation than Europe and North America.

> DESPITE THE CREATION OF NEW JOBS IN AREAS SUCH AS THE GREEN ECONOMY AND ICT INDUSTRIES, 13.7 MILLION JOBS WILL BE LOST TO AUTOMATION ACROSS WHOLESALE, RETAIL, TRANSPORTATION, ACCOMMODATION, AND LEISURE SECTORS.

"By 2040, 63 million jobs are expected to be lost to automation," says a Forrester study published in August 2022. "More than 247 million jobs are expected to be in jeopardy across industries that are more susceptible to automation, such as construction and agriculture."

The five countries will create 28.5 million new jobs in renewable energy, green buildings, smart cities and smart infrastructure, and professional services by 2040. Despite the creation of new jobs in areas such as the green economy and ICT industries, 13.7 million jobs will be lost to automation across wholesale, retail, transportation, accommodation, and leisure sectors.

"With a relatively young workforce, India will add 160 million new workers over the next 20 years, reaching a working population of 1.1 billion by 2040," Forrester notes. "Although 69% of India's jobs are under threat from automation, the country's main priority will be job creation to accommodate new workers entering the workforce."

NATURE OF WORK

How many jobs are at high risk of being replaced by AI over the next decade? According to a McKinsey report, AI might replace 2.4 million jobs in the US alone by 2030, with an additional 12 million hit by occupational shifts. Globally, about 400 million people may lose their jobs due to AI.

"If GenAI can now take care of rote tasks and even complement some complex knowledge work, the nature of work is poised to change for millions of people, not just tech workers," McKinsey says. "Employees across industries and roles can be freed up or redeployed to focus on work that involves judgment, innovation, creativity, and collaboration—work that is more human."

Take coding for example. If two computer programmers are working on a new feature, does it matter if they're measured on lines of code written, keystrokes logged, or hours worked? Does it matter if the code is written at home, in a café, or in the office? If one coder writes 10,000 lines of code and another writes 1,000, which code is more effective for the new feature and backend integration?

"The answer has to do with the outcome, not the activity," McKinsey says. "If users prefer the 1,000-line code because it is simpler and more elegant, that is the better work product—even if it was written in one-tenth of the time." The assembly-line approach, which largely inspired modern-day management and current work policies (the 40-hour workweek is a prime example), is now redundant.

ARTIST OR ATHLETE?

What approach should organizations instead take? An artist or athlete approach. This means that first, people need to be at their absolute best to be effective. Second, different people may take different paths. Third, some artists and athletes may opt for non-traditional training approaches to get to peak performance. And finally, most artists and athletes are self-motivated, work alone, and may exhibit eccentricities as well. In most corporate environments, such unorthodox behavior won't be tolerated.

"As long as there is accountability for timelines and quality of work, the outcome is what should matter," McKinsey advises. "If a programmer used AI to do some of the coding and finetuned the rest but the result was a more user-friendly product, that should be celebrated. Under this approach, employees are pushed to be innovative, creative, and collaborative; the organization supports their use of the available resources to generate the best output."

Do managers in organizations understand and appreciate such workers? Only 46% of employees feel motivated and supported in trying to grow their careers, according to a September 2023 survey of 3,500 employees by Gartner. When an organization closes the gap on employee career growth expectations, it can obtain up to 45% positive impact on employees feeling supported.

"Most organizations provide managers with resources to support employees and implement processes to monitor the execution of career development activities in an effort to meet employees' expectations for growth," says Keyia Burton, a senior principal in Gartner's HR practice. "Yet, organizations fall short in meeting employees' expectations due to a mismatch between what they can feasibly provide and what employees expect."

> GENAI ISN'T REPLACING PEOPLE, BUT PEOPLE WHO USE GENAI ARE REPLACING PEOPLE WHO DON'T.

Why the mismatch? Three reasons: One, employees believe they should be growing faster than they are—and will pursue jobs elsewhere when their expectations aren't met. Two, rapid changes in organizational structures make it tough to design stable career progressions. Three, an increase in AI use and digitalization have forced employees to learn skills outside of their immediate job function.

TEN TIPS

GenAI isn't replacing people, but people who use GenAI are replacing people who don't. "GenAI is redefining every job and every task—from entry level to the executive suite," reports a CEO study published by IBM IBV (Institute for Business Value). "Anchoring on human talent is essential. Help your people understand what they need to do."

Here are ten tips—in alphabetical order—to consider resolving the people paradox:

- **A**ccept GenAI upskilling as an opportunity to advance for everyone, especially top performers. GenAI can't augment or improve poor performance. GenAI is a revolution, not an evolution. Pioneer the use of GenAI in the C-suite and at managerial levels.
- **B**eware of buyers' remorse if your organization has invested in GenAI solutions. Ensure you have a model for the ethical use of GenAI, with clear standards, guidelines, and expectations and share these with your people across the enterprise.
- **C**rystalize a culture of curiosity in your staff. Make GenAI central to team building. Use GenAI to create clear feedback loops where they don't exist. Distribute learnings and insights that previously sat on a shelf in a binder.
- **D**evelop a formal, transparent, people-focused change management initiative that identifies where GenAI testing and adoption is underway. Provides continuous feedback across the enterprise about use cases, successes and failures, and lessons learned.
- **E**levate HR from being a purely administrative function. Your HR team must have a strategic role in building the GenAI-enabled workforce of the future. Start by reskilling HR professionals who need to lead this effort.
- **F**oster an iterative approach to GenAI roll-out that encourages risk taking and failing fast. Let teams find and test their own GenAI opportunities. Start with HR to get HR fully engaged.
- **G**enerate performance-based compensation and rewards that align with business goals to maximize GenAI readiness among your staff.
- **H**old leaders from business, IT, and HR jointly accountable for GenAI outcomes. This will help amplify teamwork and underscore the strategic importance of GenAI adoption across the enterprise.
- **I**terate ways of working by using GenAI-augmented process mining to analyze how work is done, where bottlenecks and inefficiencies exist, and how to remediate them—including how decision making can be accelerated and improved at scale.
- **J**ustify creativity and innovation. Creative people will find productive ways of interacting with their GenAI "assistants" and add novel enhancements to how they interact with their human colleagues. Teambuilding and collaboration skills are as important as software development and coding, and ahead of analytics and data science. Let creativity lead the way.

"Leading organizations are acting now to rethink strategy and actions around talent and skills," the IBM IBV study notes. "GenAI can become a new tech co-worker. Enterprises that succeed will be ones that build a flexible, thoughtful approach that encourages creativity, experimentation, and innovation, overcoming anxiety, rewarding enthusiasm, inclusivity, and optimism."

Since we started this column with an amusing note, let's end with an ominous one: What's the difference between mechanical engineers, ICT engineers, and civil engineers? Mechanical engineers build weapons. ICT engineers build guidance trajectories. Civil engineers build targets.

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

6th edition

VOICE&DATA

TELECOM LEADERSHIP FORUM

CyberMedia

5G+

CONFERENCE

IGNITING INNOVATION, EMPOWERING ENTREPRENEURS, DRIVING GROWTH

#TLF5G+ , #VoiceandData5G+

Follow us: @voicendata_

VOICE&DATA 5G+ CONFERENCE ON 5 SEPTEMBER 2024, WILL EXPLORE THE TRANSFORMATIVE POWER OF FUTURE TELECOM STANDARDS, PROMISING CONNECTIVITY SPEEDS THAT SURPASS THOSE OF 5G.

Uncover the Potential of 5G+ | Fuel Entrepreneurial Spirit
Drive Growth Strategies | The Connected Ecosystem
Deep-Dive on Complex Issues | Tech & Business Workshops
Datacentre Zone | Networking lounge | Live across social channels

For queries, write to

Rajiv Pathak I Sr. Manager, Marketing I rajivp@cybermedia.co.in I +91 8010757100

Navigating Chaos: Ensuring Trust in Digital Communication

Amid Escalating Fraud Risks, CPaaS Tools Emerge as Crucial Allies. SMS, Despite Vulnerabilities, Retains Vital Role in Real-Time Alerts within a Turbulent Digital Landscape

By Nitin Singhal

The perception of risk in the conventional enterprise-customer paradigm has reached unprecedented levels. Previously, banks, telecom operators, and retailers viewed communication platforms as avenues for enhancing cross- and up-selling prospects. However, today, the role of these platforms has evolved significantly.

A digitally savvy populace is increasingly vulnerable to fraudsters armed with sophisticated technologies like Artificial Intelligence and machine learning. In this scenario, Communication Platform as a Service (CPaaS) tools emerge as indispensable assets, bolstering security and trust. While the widespread adoption of mobile banking has fostered financial inclusion, it has also exposed users to a surge in online scams. The lure could be as innocuous as a restaurant discount, a job offer, or a second-hand iPad advertised on an online classifieds portal. For brands, maintaining a comprehensive understanding of their customer journeys is imperative.

Yet, deciphering customer behavior poses a formidable challenge for enterprises. WhatsApp, a coveted platform for customer engagement, witnesses the exchange of 140 billion messages daily. On Twitter, approximately 500 million tweets are posted daily, while Snapchat logs 4 billion. Many brands also rely on SMS, with a staggering trillion messages transmitted worldwide annually, and India stands as the second-largest market, accounting for 120 billion messages.

REGULATORY OVERSIGHT

The proliferation of communication platforms has raised concerns among banks, insurers, retailers, e-commerce entities, and regulators alike. The escalating internet penetration has heightened risks for online consumers. The Reserve Bank of India

> COMMUNICATION PLATFORMS LIKE SMS HAVE BECOME DEEPLY INGRAINED IN INDIA, TO THE EXTENT THAT EVEN AN AADHAR CARD IS AUTHENTICATED THROUGH THIS CHANNEL.

(RBI) reported 7,382 fraudulent card and internet-based transactions within just six months of FY24. The surge in losses attributed to 'card and internet-based' frauds, from 1% in FY21 to 76% in the first half of FY24, alarms banking authorities.

A decade ago, banks levied monthly fees for SMS alerts and updates. However, contemporary industry trends incline towards revising pricing structures or offering these services free of charge as a security measure. Furnishing customers with transaction details via SMS alerts signifies proactive fraud detection, fostering transparency, reliability, and enhanced customer service. Besides banks, numerous retailers and financial institutions are embracing communication platforms through channels like WhatsApp.

Regulators such as the RBI, TRAI, SEBI, and the Finance Ministry are actively addressing concerns regarding communication chaos. While emphasizing user vigilance and awareness, brands are rightfully apprehensive about the repercussions of any mishap. SMS has entrenched itself in India's digital framework to the extent that even Aadhar card authentication relies on this channel. To mitigate misuse, telecom regulators mandate the deployment of AI/ML-based technologies by telcos to counter fraud and unsolicited messages. Service providers are also obligated to adhere to prescribed SMS templates, with non-compliance risking suspension and potential SIM blocking for sending unsolicited messages.

SMS: PROS AND CONS

SMS remains a deceptively simple yet potent tool in the arsenal against banking fraud and enterprise communication needs. Enjoying universal reach, SMS facilitates communication even in areas with limited network access. Enterprises leverage SMS to dispatch real-time transaction alerts, empowering customers to promptly identify and report unauthorized activities. By verifying user locations during login attempts, SMS aids in pinpointing potential breaches across disparate geographic regions. This capability enables banks to scrutinize transaction patterns and trigger SMS alerts for suspicious activities, such as high-value purchases from unfamiliar locations.

However, SMS's efficacy hinges on its correct utilization. Vulnerable to interception and spoofing, SMS is susceptible to phishing attacks and scams. Moreover, SMS delivery reliability is as dependable as the weather, contingent upon network availability. Network congestion or technical glitches may impede message dissemination, leading to failed deliveries. Although SMS benefits from direct delivery by telecommunication companies to mobile SIM cards, inadequate security practices by CPaaS providers pose security risks. Furthermore, the proliferation of over-the-top (OTT) messaging apps offering end-to-end encryption, such as WhatsApp and Signal, has diminished SMS's relevance for secure communication.

OPTIMIZING SMS DELIVERY

Despite its vulnerabilities, SMS remains a preferred choice for enterprises, albeit with evolving considerations regarding simplicity and deliverability. The proliferation of service providers and the advent of new AI tools have introduced complexities, challenging operational efficiency for financial institutions. Nevertheless, SMS continues to serve as a vital communication platform, facilitating the cultivation of trust amidst chaos.

With 800 million smartphone users, India boasts the second-largest mobile subscriber base in the APAC region. However, this vast user base also exacerbates delivery challenges, contributing to chaos. Although CPaaS solutions empower businesses and aggregators, a Sinch study reveals that 48% of enterprises lack comprehensive insights into SMS delivery processes and potential impediments.

The enactment of the Digital Personal Data Protection Act in India has prompted marketers to seek solutions offering transparency and reliability. Implementing opt-in verification, prioritizing responsible data practices, and obtaining detailed delivery reports empower businesses. However, effecting such measures in a chaotic internet environment necessitates a transformative shift. DQ

Nitin Singhal is the Managing Director of Sinch India.

maildqindia@cybermedia.co.in

Transforming Your Flying Experience with AI

Are you still flying the old way? Check out AIonOS, and see how it's going to transform your regular flying experience.

By Punam Singh

In an exclusive interview with **C.P. Gurnani,** Executive Vice Chairman of AIonOS, we delve into the transformative vision and strategic initiatives driving AIonOS forward. Gurnani discusses the company's commitment to enhancing customer experiences, redefining the aviation industry's offerings, and the pivotal role of the IntelliOS platform. He also addresses the challenges posed by the current GPU shortage and shares insights on how AIonOS plans to attract and upskill a diverse and innovative workforce.

This interview sheds light on AIonOS's mission to leverage AI not just for efficiency, but to create more personalized, human-centric solutions across industries.

> THE EXTENSIVE CLIENT NETWORK OF AIONOS ENHANCES OUR PARTNERSHIPS WITH TOP GPU AND CLOUD PROVIDERS, ENABLING US TO NAVIGATE THE RISING COSTS AND ACCESSIBILITY CHALLENGES OF GPUS.

C.P. GURNANI
Executive Vice Chairman of AIonOS

> INTELLIOS SEAMLESSLY COORDINATES CRITICAL OPERATIONS ACROSS APPLICATIONS, SUCH AS DATA LABELING, MODEL TRAINING, AND SYNTHETIC DATA GENERATION.

How will AIonOS improve customer experience?
At AIonOS, we're deeply committed to enhancing customer experiences by resonating with them on a personal level. We understand that each individual is unique, with their own set of preferences and needs. That's why we've invested in AI-powered solutions that allow us to tailor every aspect of our service, from recommendations to support, ensuring that each interaction feels like a thoughtful gesture rather than a generic response. By leveraging AI, we're not just making things more efficient; we're making them more human.

How will AIonOS redefine the aviation industry's offerings?
Our vision for AIonOS is to not only modernize the aviation industry but to redefine it entirely. We recognize the challenges that airlines face, and we're determined to provide solutions that enhance both operational efficiency and the passenger experience. Whether it's through AI-based pricing strategies or next-gen cargo solutions, our goal is to equip airlines with the tools they need to thrive in a rapidly evolving landscape. And by introducing innovations like AI-led customer service centers, we're ensuring that passengers receive the support they need, whenever they need it.

What role does the IntelliOS platform have to play in AIonOS?
IntelliOS is a sophisticated integration framework within an AI-driven enterprise architecture. It seamlessly coordinates critical operations across applications, such as data labeling, model training, and synthetic data generation. This layer optimizes workflows, enhances monitoring capabilities, and streamlines interactions between AI-centric applications, significantly boosting operational efficiency and effectiveness.

How is the current GPU shortage impacting AI adoption, and what strategies are you employing to overcome this challenge?
Demand for GPUs has certainly increased costs and raised accessibility issues for companies seeking AI innovation. However, the extensive client network of AIonOS enhances our partnerships with top GPU and cloud providers, enabling us to navigate the rising costs and accessibility challenges of GPUs. We further optimize AI deployment by using smaller, efficient models like phi3-mini and applying techniques like transfer learning with pre-trained models, which significantly reduces the dependencies on GPUs to achieve the optimal level of cost, latency, and accuracy in our solutions.

As AIonOS embarks on its journey, how will it attract and upskill the necessary workforce to drive innovation and sustain its mission?
At AIonOS, building and nurturing the workforce is our top priority. The company strongly believes in the power of diversity and inclusion, and we are committed to attracting individuals with diverse backgrounds and experiences. Whether recruiting fresh graduates or experienced professionals, AIonOS is dedicated to providing opportunities for growth and development. Through mentorship programs and training initiatives, we equip our team with the skills necessary to drive innovation and sustain their mission. AIonOS recognizes that success is not solely determined by technology but by the individuals responsible for its development and implementation.

punams@cybermedia.co.in

Forward and Onward

Jigar Mehta, Managing Director, Onward Tech in conversation with Minu Sirsalewala, Executive Editor, Dataquest, elucidates why Onward Technologies has placed its bets on a pure-export business strategy, the no-IP stance and on that big chunk of huge R&D contracts of global companies that are waiting to be tapped. And how being a young company is helping with advantages and challenges unique to that stage. Global Vision, Local Talent: Onward Technologies' Strategic Pivot to International Markets"

By Minu Sirsalewala & Pratima H

Onward Technologies has undergone a significant shift since 2016, focusing on 3 core verticals. What prompted this strategic decision?
The strategic decision to focus on 3 core verticals and pursue an international market was driven by a confluence of factors. Upon assuming leadership, we prioritized the transformation from a family-run business to a professionally managed organization.

A strategic review identified a high-growth market with substantial outsourcing budgets and significant room for expansion. While our existing mechanical engineering business in Pune served a valuable purpose, we agreed to pursue a more ambitious strategy. This involved pivoting entirely towards the USA and European markets. In 2016, industry analyst Zinnov had projected the global addressable R&D services market to reach USD 289 Bn by 2020—USA & EU-based companies being

> WE HAVE ACHIEVED A STRONG AND CONSISTENT REVENUE STREAM, CROSSING INR 470 CRORE IN FY 2024 WITH DOUBLE-DIGIT EBITDA MARGIN, WHILE REACHING A MARKET CAPITALIZATION OF INR 1000 CRORE+ FOR THE FIRST TIME.

JIGAR MEHTA
Managing Director, Onward Tech

> EARLY IN OUR STRATEGIC DEVELOPMENT, WE MADE A DELIBERATE DECISION TO HAVE ALL CLIENT INTELLECTUAL PROPERTY (IP) RESIDE WITH THEM. THIS FOSTERS A STRONG FOUNDATION OF TRUST, AS WE HAVE NO INTENTION OF ENCROACHING ON THEIR CORE BUSINESS OPERATIONS.

the largest spenders. Our pivot to those markets offered compelling growth drivers and has been instrumental in propelling Onward Tech onto a new trajectory, positioning it for sustained growth in the global marketplace.

What happened next?

Our execution strategy was multifaceted. We prioritized building a robust export business, with the planned phase-out of domestic operations following a predetermined growth trajectory. This process was instrumental in uncovering exceptional talent within the organization. These individuals, now holding key leadership positions in the USA and Europe, continue to be the cornerstones of our success.

The strategic shift has yielded significant financial rewards. We have achieved a strong and consistent revenue stream, crossing INR 470 Crore in FY 2024 with double digit EBITDA margin, while reaching a market capitalization of INR 1000 Crore+ for the first time.

Building on this momentum, we've identified strategic investment areas in cutting-edge technologies like embedded systems and digital services. Furthermore, leveraging our experience, we've chosen to specialize in the high-growth verticals of industrial equipment, heavy machinery, transportation, mobility, and healthcare. By collaborating with marquee original equipment manufacturers (OEMs) in these sectors, we are solidifying our reputation and building strong credentials. Today, Onward Tech works with 8 of the global top-10 automotive companies and 5 of the global top-10 industrial equipment companies. Our rail transportation and newly created healthcare verticals also continue to make great progress in North America. Our global footprint has expanded considerably, encompassing 13 offices strategically located across key regions in the US and Europe, with offshore delivery centers across 5 locations in India.

What's the future looking like?

To further solidify our position as a global delivery hub, we are actively strengthening our teams, particularly in Pune and Chennai, where we have a highly specialized ER&D delivery team of more than 1000 engineers each. We envision Bangalore and Hyderabad as the next key growth centers, strategically positioned to cater to a wider range of international clients.

What's the niche in terms of competition?

Our competitive advantage lies in a compelling combination of cost efficiency and a robust global delivery model. This enables us to deliver technically proficient solutions, significantly reducing client rejection rates. Our value proposition hinges on a trifecta of cost competitiveness, a reliable supply base, and demonstrable technical expertise. Today, clients trust our speed, efficiency, and agility to rapidly ramp up their engineering teams on complex projects delivered out of USA, Canada, the UK, and Germany. This targeted approach has been instrumental in our successful scaling globally, where we have now crossed 150 full-time employees outside India. Furthermore, we possess a best-in-class ecosystem and infrastructure, further solidifying our position as a preferred partner.

Are you looking at taking your IP out to the market?

While we accelerate innovation for large global OEMs, early in our strategic development, we made a deliberate decision to have all client intellectual property (IP) reside with them. This fosters a strong foundation of trust, as we have no intention of encroaching on their core business operations. This unique value proposition has been a marker of our success. Furthermore, to ensure complete transparency and client confidence, we operate with a direct business model supported by a robust professional service automation (PSA) software for real-time, online project management. Our rigorous client

> FOR THE NEXT THREE YEARS, WE ARE LASER-FOCUSED ON MAXIMIZING OUR POTENTIAL WITHIN OUR EXISTING VERTICALS. THESE INCLUDE TRANSPORTATION AND MOBILITY, COMPRISING AUTOMOTIVE AND RAIL.

onboarding process incorporates pilots, reference checks, thorough financial assessments, and comprehensive site visits. Having established this solid foundation, our primary focus for the next three to five years will be on driving digital and ER&D innovation with flawless execution for North American and European companies in our focused industry verticals.

How do you envision scaling the company further, considering the challenges of talent pool scarcity and your focus on high-profile clients?

Our growth strategy leverages the immense potential within our existing client base. These clients typically allocate multi-billion-dollar budgets for R&D, and we currently capture less than 0.1% of their outsourced projects. This represents a vast untapped market brimming with opportunity. Our established reputation, positive word-of-mouth, and demonstrable expertise position us for continued success.

On the talent front, we possess a strong foundation with over 2,450 engineers. Our strategic vision involves investing and growing our international presence to 300+ employees collaborating with offshore development centers (ODCs) driving delivery excellence.

This also provides the clients with a highly competitive blended rate-card. Furthermore, we are committed to international transfers and continuous development of our key personnel, ensuring they possess the expertise to excel in this evolving market.

Going by the recent client wins, opportunities to work with the biggest brands in our focused verticals and industry accolades—the past three years have undeniably been the most exciting in our company's history.

While cost remains a factor for some clients, is it still your primary target market? Are you pursuing multi-million-dollar contracts?

Our target market extends beyond companies solely focused on cost reduction. We understand that we are a relatively young company, and our strategy is designed for sustainable, long-term growth. We are actively attracting large companies as clients and bidding for multi-million-dollar contracts.

Are there any plans to diversify into additional industry verticals soon?

For the next three years, we are laser-focused on maximizing our potential within our existing verticals. These include transportation and mobility, comprising automotive and rail. Industrial products and heavy machinery, including off-highway, construction, mining, agricultural equipment. And healthcare, comprising medical devices and technologies, and life sciences. Client demand for solutions that encompass all three areas is rising steadily. To address this, we've strategically invested in hiring specialists and subject matter experts (SME) from each of these industry verticals.

Can you elaborate on your current key areas of focus?

Our primary focus revolves around flawlessly executing our export-driven strategy. This goes beyond just operational excellence. We are actively cultivating a culture that prioritizes attracting and retaining exceptional talent. Recognizing the importance of proximity to our clients, we are establishing a presence in key locations. This not only fosters stronger client relationships but also allows us to deliver impactful solutions that resonate with their specific needs.

minus@cybermedia.co.in

CyberMedia

DOMINATE EVERY MARKET.
BE A THOUGHT LEADER WITH CYBERMEDIA 365° GTM STRATEGY

Orchestrate a flawless market reach with CyberMedia comprehensive Go-To-Market strategy.

#GTMwithCyberMedia

Leave no stone unturned. Reach your target market with our strategic 365° Go-To-Market (GTM) approach. We orchestrate a seamless Thought Leadership Campaign, ensuring your reach across decision makers across strategic and functional verticals.

- Comprehensive coverage across CyberMedia brands
- Unique & innovative content experience in technology & innovation
- Focussed on Sustainability, Reliability and 40+ years of market leadership.

We don't just create campaigns; we craft cohesive experiences. Our GTM strategy integrates all touchpoints – from targeted CXO connects to Data-Driven measurable results.

Redefine your market presence with innovation and Out of the Box approach.

For further information, write to
Rajiv Pathak I Sr. Manager, Marketing
rajivp@cybermedia.co.in I +91 8010757100

Illuminating the Path: Generative AI's Ascendancy in India

Praveen Sridhar, the Head of Partner Business at AWS India and South Asia, in an exclusive tête-à-tête with Prabhu Ram, Head- Industry Intelligence Group at Cyber Media Research conducted on the fringes of the AWS Summit 2024 in Bengaluru, Praveen elucidates AWS's pivotal role in nurturing GenAI adoption, its profound ramifications for businesses, and the transformative journey that lies ahead.

By Prabhu Ram

Over the past year, Generative AI (GenAI) has captured the imagination of businesses, moving from pilot experimentation to large-scale impact. There has been tremendous growth in enterprise GenAI adoption, experimentation, and large-scale pilots. This surge has fuelled a growing belief that GenAI can significantly augment, or even replace, human efforts in complex and unstructured areas of value creation. Praveen Sridhar, Head of Partner Business, AWS India and South Asia spoke with Prabhu Ram on the sidelines of the AWS Summit 2024 in Bengaluru. Excerpts from the interview:

Paving the Way for Generative AI Adoption

Leveraging its expertise in cloud computing, AWS empowers businesses of all sizes to harness the potential of generative AI. The company recognizes

> AMAZON WEB SERVICES (AWS) ANNOUNCED THE GENERAL AVAILABILITY OF AMAZON BEDROCK, IN THE ASIA-PACIFIC REGION (SPECIFICALLY MUMBAI).

PRAVEEN SRIDHAR
Head of Partner Business, AWS India and South Asia

> AWS MARKETPLACE ALLOWS INDIAN INDEPENDENT SOFTWARE VENDORS (ISVS) TO LIST THEIR GENERATIVE AI SOLUTIONS, GIVING THEM THE OPPORTUNITY TO REACH A GLOBAL AUDIENCE.

the importance of a comprehensive stack, offering a complete set of tools to facilitate success.

- **Infrastructure:** Efficiently running Generative AI models requires significant computing power. AWS's custom-designed chips, Trainium and Inferentia, further optimize performance for generative AI workloads. Additionally, tools like SageMaker provide a comprehensive platform for training, building, and deploying GenAI models.
- **Model Marketplace:** AWS offers pre-trained large language models (LLMs) through a service called Bedrock. Amazon Web Services (AWS) announced the general availability of Amazon Bedrock, in the Asia-Pacific region (specifically Mumbai). Launched in 2023, Bedrock offers a diverse selection of foundation models from leading companies like Anthropic, Meta, Cohere, and AWS itself. This empowers customers to build secure applications leveraging these models, ultimately enhancing user experiences, boosting productivity, and streamlining operations.Bedrock also provides customization features like Guardrails and Knowledge Bases, enabling users to tailor the models for specific applications.
- **Applications:** At the top layer, AWS goes beyond just the infrastructure and tools. They integrate GenAI capabilities into various AWS services, making it easier for users to leverage this technology. For instance, Amazon QuickSight provides user-friendly interfaces for data visualization tasks powered by Generative AI. Additionally, AWS is exploring consumer products like Rufus that could potentially utilize Generative AI functionalities.

Partner Ecosystem: A Force Multiplier

Partners play a critical role in accelerating Generative AI adoption. AWS fosters a comprehensive partner ecosystem with different competency levels, including a specific Generative AI competency. This ensures partners have the expertise to build and deliver effective Generative AI solutions. Additionally, AWS supports partners through training programs and marketplaces. These programs equip partners with the skills they need, while the marketplaces allow them to showcase their Generative AI solutions and reach a wider audience.

Generative AI in Action: Real-World Examples

The impact of Generative AI is already being felt across India. Companies of all sizes are leveraging AWS to create innovative solutions.

Shellcode, for example, uses Generative AI to automate tasks and streamline invoice processing. HCL Technologies employs it to enhance developer productivity. Even the sports industry is getting a makeover with Tech Mahindra's use of Generative AI to create immersive fan experiences.

Mindtickle, a data dumping platform, empowers sales organizations with Generative AI tools, while Freshworks, an Indian software company, utilizes Generative AI to improve customer journeys.

Empowering Small and Medium Businesses

AWS is particularly committed to making Generative AI accessible to small and medium businesses (SMBs) in India. They offer specific programs like AWS Activate, which provides resources and support for experimentation and adoption. Additionally, the AWS Marketplace allows Indian Independent Software Vendors (ISVs) to list their Generative AI solutions, giving them the opportunity to reach a global audience.

The future of Generative AI in India looks bright. AWS is actively contributing to this growth by providing the infrastructure, tools, and support needed for established players and emerging SMBs alike. This collaborative effort has the potential to unlock a new wave of innovation and productivity across various sectors in India.

maildqindia@cybermedia.co.in

DATAQUEST 40+ YEARS
THE BUSINESS OF INFOTECH

CyberMedia

BRINGING THE LATEST INFORMATION & TRENDS IN INDIA SINCE LAST 4+ DECADES !!

DATAQUEST 40+ YEARS CELEBRATIONS: GET 40% EXCLUSIVE DISCOUNT ON DATAQUEST PRINT SUBSCRIPTION

OFFER LIKE NEVER BEFORE DATAQUEST DIGITAL SUBSCRIPTION AT FLAT Rs. 400/- ONLY

DIGITAL SUBSCRIPTION AVAILABLE ON MAGZTER, ZINIO, READWHERE & READLY

Web: subscriptions.cybermedia.co.in/Dataquest.aspx, **For Digital subscription Contact:** Aalove Thakur
Email: aalovet@cybermedia.co.in, **Call:** 7993574118

Yes! I want to subscribe to Dataquest

Scan QR Code & Subscribe now...

SPECIAL RATES ON SPECIAL OCCASSION

Subscribe to Digital Edition @ ₹420/-

ON DATAQUEST 40+ YEARS CELEBRATION

	Period	Issues	Print Subscription Rate		Digital Subscription Rate (plus 5% GST)
			New	Renewal	
☐	1 year	12	₹ 960/-	₹ 890/-	**₹420/-**
☐	2 years	24	₹ 1920/-	₹ 1780/-	**₹840/-**
☐	3 years	36	₹ 2880/-	₹ 2670/-	**₹1260/-**

or Subscribe online: subscriptions.cybermedia.co.in/dataquest

Please tick your subscription choice above, fill the form below in CAPITAL LETTERS and mail it to us at rsedqindia@cybermedia.co.in

☐ I want to avail premium service of receiving my copy by courier. Tick which ever is applicable.

☐ ₹600/- 1 year ☐ ₹1200/- 2 years ☐ ₹1800/- 3 years

Name [•]: Mr/ Ms _____ **Date of Birth:** M M Y Y Y Y

Organisation: _____ **Designation:** _____

Delivery Addess: _____

_____

City: _____ **State:** _____ **Postal Code:** _____

Mob [•]: _____ **Tel:** _____ **Email [•]:** _____

GST No. [•]: _____ **PAN No. [•]:** _____

☐ **I am paying ₹** _____ **by DD/Cheque No.:** _____ **Dated:** M M Y Y Y Y

Payable at (specify bank and city) _____

OR

☐ **Please Remit for ₹** _____ **Through RTGS/NEFT to our A/C details given below:**

Bank Name: ICICI Bank Limited, A/c no. 017705000132, Branch & IFS Code: Gurgaon, ICIC0000177

[•] Essential fields

Signature _____ **Date:** M M Y Y Y Y **Subscription No. (for renewal)** _____

Order form can be mailed with payment (cheque/DD) to:
Cyber Media (India) Ltd, Cyber House, B-35, Sector 32, Gurgaon - 122003
Contact: Alok Saxena, Tel: 0124-4822222 (Extn 347), 91+9953150474, Email: aloksa@cybermedia.co.in

Terms & Conditions:

• This offer is valid for a limited period. • Rates and offer valid only in India. • NEFT/UTR No., Email & Mobile number mandatory • Please allow 4-6 weeks for delivery of your first copy of the magazine by post. • Send crossed Cheques in favour of Cyber Media (India) Ltd.• Please write your name and address on the reverse side of the cheque or DD. All outstation cheques should be payable at par. • Cyber Media (India) Ltd. will not be responsible for postal delays, transit losses or mutilation of subscription form. • Cyber Media (India) Ltd. reserves the right to terminate or extend this offer or any part thereof. The decision to accept or reject any or all forms received is at the absolute discretion of the publishing company without assigning any reason. • Please include pin code for prompt delivery of your copy. • In case payment is through credit card, date of birth must be mentioned. • All disputes shall be subjected to Delhi jurisdiction only.

Can Technology kill the Toss in Sports

"He will win who knows when to fight and when not to fight." Sun Tzu's 'The Art of War' lays down many secrets that fighters can tap. And in every secret, there is a glimpse of the difficult but inevitably, the winning formula of 'knowing something'.

By Pratima H

Interestingly, today's warriors, in the battlefield of many Sports, have that advantage. But is that advantage easy, usable, ethical, accessible, fair and applicable? Does it help sportspeople as much as it helps the people who make money from Sports? Does it help all kinds of sportspeople? In all kinds of Sports?

Let's check this scoreboard with the help of Megha Gambhir, CEO and Co-Founder, Stupa Sports Analytics where we swing the bat towards many corners like ethics, the charm of unpredictability and not knowing. We also shine the torch on the rise of brands, OTT and AI as some new cheerleaders and a lot more. Let's get the ball rolling.

What areas of the Sports industry are ripe and ready for use of technology- especially, AI, VR, Drones, Analytics, and Blockchain?

While each of these technologies offers unique opportunities, their integration into sports opens up exciting possibilities for enhancing the fan experience, improving

> TECHNOLOGY, FAR FROM DIMINISHING THIS UNPREDICTABILITY, ACTUALLY ENHANCES THE EXCITEMENT OF SPORTS WHILE PRESERVING ITS THRILLING SPONTANEITY.

MEGHA GAMBHIR
CEO and Co-Founder, Stupa Sports Analytics

> ATHLETES OFTEN GRAPPLE WITH QUESTIONS SURROUNDING WHO OWNS THE DATA GENERATED FROM THEIR PERFORMANCE, HOW IT'S INTERPRETED, AND WHETHER THEY HAVE THE RIGHT TO OPT OUT OF DATA COLLECTION.

athlete performance, and boosting operational efficiency. Through AI algorithms and VR integration, Stupa's technology creates dynamic graphics overlays during live broadcasts, giving fans immersive visualizations of game data for a better viewing experience. Furthermore, Stupa's exploration of VR technology offers new opportunities for immersive training, allowing athletes to simulate real-world scenarios and improve their performance.

Can Sports Tech help in expanding the audience base (like fans from other sports or segments like females or Baby Boomers)?
Sports technology holds immense potential to broaden the audience base and rejuvenate lesser-known sports. In our journey of finding the right product-market fit, we learned that the initial step towards commercializing sports lies in efficient data management. This involves not only performance data but also fundamental data required by federations and clubs for organizing tournaments and managing player memberships.

Can it give a fillip to out-of-spotlight games that have struggled against mainstream favourites like Cricket, Football, or Baseball?
Stupa Sports Analytics actively explores the possibilities of technology to extend the reach of less-commercialized sports like table tennis, badminton, padel, and pickleball. Providing a comprehensive solution for sports organizations through a centralized platform, Stupa aims to streamline administrative processes within governing bodies responsible for fostering the growth of sports. By enhancing fan engagement through captivating graphics, personalized content, and immersive experiences, Stupa seeks to attract diverse audiences to sports events.

How can technology keep a good score on ethical areas- especially with the rise of online gambling, abuse of/too much availability of real-time player data, match-fixing, and use of biometric surveillance of players (ex; NFL's sharing of RFID data of players)?
Stupa Sports Analytics prioritizes ethical practices and actively addresses these concerns through rigorous data protection measures and responsible use of technology. Through its integrity services, Stupa collaborates with sports organizations and regulatory bodies to promote transparency, fairness, and integrity in sports.

The fun of any game is in the uncertainty - and the 'anything can happen' adrenaline - will technology take that away?
The essence of sport lies in its unpredictability, which distinguishes it as the ultimate form of entertainment. Technology, far from diminishing this unpredictability, actually enhances the excitement of sports while preserving its thrilling spontaneity. With access to data and advanced technology for player performance analysis, athletes gain valuable insights into their opponents' patterns and tendencies, allowing for more strategic preparation.

For instance, a competitive badminton player armed with such tools can identify opponent patterns and preferences, thereby optimizing their own gameplay strategies. Additionally, virtual reality (VR) tools enable athletes to simulate match scenarios, refining their skills and decision-making abilities in a controlled environment. Similar simulations have long been utilized in sports like racing and Formula 1, and their integration into racket sports promises to elevate players' competitiveness and uncover areas for improvement.

Ultimately, these advancements contribute to the overall quality of competitive sports, enriching the experience for fans while preserving the essence of excitement and unpredictability that defines the sporting spectacle.

How has Sports Tech played out in the OTT space- especially in India?
The rise of OTT platforms has provided sports enthusiasts with unprecedented access to live

matches, highlights, and exclusive content, enriching their engagement with their favorite sports. In India, where cricket dominates, sports tech has diversified content offerings, spotlighting lesser-known sports and catering to diverse audience preferences. By integrating real-time statistics, interactive features, and personalized content streams, Stupa's solutions enable rights-holders to captivate viewers and cultivate a loyal fan base.

How do you use AI here?

Stupa's OTT solutions support organizations as well as players in their journey through AI-driven features to easily package full match footage into customizable highlights and key moments. Social media integration enhances player-audience connectivity, creating new avenues for monetization such as memberships, ad revenue, and sponsorships.

What are the unique challenges and possibilities that a market like India presents?

With a large and diverse population passionate about sports, there's a huge audience eager for personalized and engaging content. However, cricket's dominance in the sports landscape makes it tough for lesser-known sports to gain attention. Moreover, infrastructural limitations and varying levels of tech adoption across regions pose hurdles in delivering seamless digital experiences nationwide. Stupa prioritizes customization, localization, and user-centric design to navigate these complexities and establish itself as a leader in sports technology innovation.

What new opportunities and dangers can advertisers/ brands watch out for with the availability of real-time data and interactive marketing- Ex: The Uber Eats' retraction of its ad in Super Bowl?

Real-time data and interactive marketing offer advertisers and brands new chances to connect with people in a more personal way. With real-time insights, brands can make their messages more relevant to specific groups, which makes them more effective. Interactive marketing, like games and immersive experiences, really grabs people's attention and keeps them engaged.

But, there are also some big challenges and risks. Having access to real-time data brings up concerns about user privacy, data security, and regulatory compliance. It's important for data owners to work with sports organizations and brands to prioritize user privacy and data.

If performance-enhancing substances are wrong in Sports - does the same lens apply to performance-enhancing technology for players?

The practice of recording live matches and training sessions has long been standard in the sports industry to analyze player performance, pinpoint strengths and weaknesses, and strategize for improvement. Stupa was founded with the vision of using technology to streamline this process, making it more efficient for coaches and players alike. Previously, coaches would spend countless hours manually reviewing match footage, lacking intuitive tools to swiftly process vast amounts of data and extract meaningful insights. Handling a mix of players across different age groups like juniors, youth, and seniors made things even more difficult for coaches. Imagine, if a coach had to sift through five or ten matches from a single tournament for just one player, it could take up a good two to three weeks of their time. That's where Stupa stepped in with smart solutions which made it easier for coaches to gather and analyze data quickly, giving them better insights into player performance. This meant coaches could plan their training sessions more effectively and address players' needs with more precision.

Stupa's innovation empowers coaches and players to quickly identify areas for development and fine-tune their strategies. In today's data-driven world, information is a valuable asset utilized to enhance efficiency and gain a competitive edge. Stupa prioritizes fairness and transparency, ensuring that athletes have access to such information through ethical tools that support performance improvement.

What has been your best use-case so far?

A notable example of Stupa's innovative approach to sports technology is its collaboration with Manav Thakkar, a talented table tennis player, in 2019. Despite his considerable skill, Thakkar faced challenges in performing at the international level. Recognizing his potential, Stupa developed a tailored player performance tool to address his specific needs. Through detailed analysis of Thakkar's gameplay and training routines, Stupa pinpointed areas for enhancement and provided personalized insights. As a result, Thakkar significantly improved his performance and achieved the prestigious World #1 ranking in the under-21 category.

> WE ARE CURRENTLY DEVELOPING HARDWARE CAMERA SOLUTIONS THAT ARE DESIGNED TO MAKE COURTS SMARTER AND ENHANCE THE PLAYING EXPERIENCE FOR AMATEUR PLAYERS.

Witnessing firsthand the transformative impact of their technology on an athlete's performance inspired the founders to establish Stupa Sports Analytics and they registered the company in 2020. Since then, numerous success stories within their network have further validated the effectiveness of their approach.

Thinking of Sports Analytics from a sportsman's point of view: are there concerns around ownership of data, the gaps between what the data is and how it is interpreted, opt-out policies, invasiveness of data collection, unethical use by competition, etc.?
Athletes often grapple with questions surrounding who owns the data generated from their performance, how it's interpreted, and whether they have the right to opt out of data collection. Additionally, there's apprehension about the invasiveness of data collection methods and the potential for unethical use by competitors or third parties. These concerns highlight the need for transparent policies and safeguards to protect athletes' rights and privacy while harnessing the benefits of sports analytics. At Stupa, we prioritize data ownership and transparency. Stupa Sports Analytics' solutions empower athletes to maintain control over their performance data. Moreover, Stupa collaborates closely with sports organizations to establish ethical guidelines for data collection and usage, fostering trust and integrity within the sporting community.

Can self-regulation be enough - Ex: the Voluntary Code of Ethics signed by online gaming players?
Self-regulation can indeed play a crucial role in maintaining ethical standards within various industries, including sports. The effectiveness of self-regulation, however, depends on several factors such as industry collaboration, transparency, and enforcement mechanisms. While initiatives like the Voluntary Code of Ethics signed by online gaming players demonstrate a willingness to adhere to responsible practices, they may not fully address the intricate ethical challenges present.

What else should we be talking about/thinking of when we think of Sports and Technology especially Analytics?
While much attention is often given to professional leagues and elite athletes, the potential for analytics to revolutionize the grassroots level should not be overlooked.

At Stupa, we understand the importance of democratizing access to advanced analytics tools, even at the grassroots level. We are currently developing hardware camera solutions that are designed to make courts smarter and enhance the playing experience for amateur players. By capturing data on player movements, shot placements, and game dynamics, these solutions provide invaluable insights that can help amateur athletes refine their skills and compare their data with their friends.

What's the big picture here?
The use of analytics in grassroots sports extends beyond the immediate benefits for individual players. It also plays a crucial role in capturing player performance and match data from early in their careers. By documenting historical patterns, playing styles, and trends from the grassroots level, athletes can build a comprehensive profile of their development trajectory. This data serves as a valuable resource as they progress to higher levels of competition, providing coaches, scouts, and analysts with rich insights into their strengths, weaknesses, and areas for improvement. Stupa aims to achieve the above through its association with grassroots competition platforms such as Sports For All (SFA) which are great opportunities for technology to integrate with grassroots and provide athletes of all backgrounds with access to the tools and insights they need to thrive.

pratimah@cybermedia.co.in

Multimodal AI for Media and Entertainment: Transforming Creativity and Engagement

Multimodal AI sets new standards in personalization and interactivity within the digital media landscape.

By Priya S Kumar

Artificial Intelligence has ushered in a new era in the media and entertainment industry, fundamentally transforming how content is created, customised, and consumed. Multimodal AI, which integrates data from diverse sources such as text, audio, images, and video, is at the forefront of this transformation. This technology enhances creative processes and deepens audience engagement, setting new standards for personalisation and interactivity in digital media.

INNOVATIVE CONTENT CREATION AND DYNAMIC MODERATION

Leveraging AI, creators can now delve deeper into audience data, uncovering trends and preferences to craft content that resonates. AI tools, utilising advanced techniques from natural language processing to computer vision, enhance creative processes. They automate scriptwriting, enrich visual effects, and create captivating virtual environments. This not only accelerates production but also elevates narrative depth and visual storytelling.

CUSTOMISING VIEWER EXPERIENCES THROUGH AI

AI's ability to analyse viewer data transforms how content is personalised. It refines metadata and synopsis generation, aligning content recommendations closely with individual preferences. This personalisation extends to advertising, making promotions more relevant and effective.

AI-powered chatbots and virtual assistants are improving customer engagement by providing instant support and personalised recommendations, which

> BY INTEGRATING OBJECT DETECTION AND IMMEDIATE PURCHASING LINKS, ADVERTISERS NOT ONLY ENHANCE THE VIEWER'S EXPERIENCE BY MAKING IT INTERACTIVE BUT ALSO CAPITALISE ON IMPULSE BUYING TENDENCIES, THEREBY BOOSTING AD REVENUE AND CONVERSION RATES.

can also be in the form of their favorite characters. These chatbots can understand natural language queries, offer relevant suggestions, and even anticipate users' needs, leading to higher levels of satisfaction and loyalty. Recommendation engines powered by Gen AI further enhances the experience through gamification and hyper-personalisation based on the context of a movie or a character.

ROLE OF AI IN INCREASING AUDIENCE ENGAGEMENT AND RETENTION

Leveraging augmented and virtual reality, AI enhances the immersive quality of digital experiences by introducing innovative narration and interactive storytelling. These technologies track user gestures and movements, allowing the narrative to adapt in real time to audience interactions. This dynamic approach significantly deepens engagement and delivers a uniquely memorable and personalised viewing experience.

AI enhances audience engagement and retention by delivering personalised content recommendations, optimising streaming experiences, and enabling targeted advertising campaigns.

AI algorithms go further by shaping dynamic game environments, tailoring gameplay to individual player behavior, and creating responsive NPCs (non-player characters) that adapt to player actions.

For example, diffusion models, power tools like DALL-E and Midjourney are instrumental in generating realistic game assets and interactive environments that mimic human creations. These AI-generated elements not only enrich the gaming experience but also foster deeper immersion and interaction, making each gaming session unique to the player. This use of AI in creating and modifying game scenarios and interactions opens new avenues for more engaging and personalised gaming experiences.

AD SENSING, ADVERT AND MONETISATION

Virtual product placement offers a non-intrusive advertising approach, facilitated by AI. Today, various AI-driven productivity tools are reshaping content creation. This opens a new set of opportunities for monetisation.

Imagine a viewer is watching a popular TV series and notices a beautifully designed lamp in the background of a key scene. With AI-driven object detection technology, the system identifies the lamp and other identifiable objects in the scene in real-time. As these objects are recognised, the AI can generate clickable links or overlays that appear discreetly on the viewer's screen or companion device app. These links can direct the viewer to a webpage where they can view details about the lamp, read reviews, or even purchase it directly.

By integrating object detection and immediate purchasing links, advertisers not only enhance the viewer's experience by making it interactive but also capitalise on impulse buying tendencies, thereby boosting ad revenue and conversion rates.

Additionally, content creators are leveraging virtual influencers for promotion. These influencers' content can be effortlessly translated and subtitled into multiple languages, further enhanced by the capabilities of generative AI.

ETHICAL CONSIDERATIONS IN AI'S IMPACT ON MEDIA CONSUMPTION

AI profoundly shapes how we consume media and entertainment, but it also raises significant ethical concerns. One such concern revolves around the potential bias in AI algorithms, which may perpetuate stereotypes or discriminatory content recommendations. A careful consideration of data sources and algorithm design combined with continuous monitoring and evaluation to reduce the instances of biases can go a long way.

Where AI poses risks, it also becomes a harbinger of positive change. Leveraging AI to look at user patterns in data monitoring saves time. Moreover, it also helps simplify validating processes across regional regulations and norms, further solidifying AI's optimistic approach towards its use in media and entertainment.

Priya S Kumar is General Manager and Head of Media & Communication Business, Tata Elxsi.

maildqindia@cybermedia.co.in

Industry Leaders Convene to Overcome Data Hurdles: Highlights from Protiviti and Alteryx Symposium Discussions

Experts at Dataquest roundtable, emphasize the need for flexible, secure, and cost-effective data solutions to drive business success amidst stringent data privacy laws.

By Aanchal Ghatak

During a recent roundtable discussion organized by Dataquest, industry leaders gathered to explore the challenges and opportunities in data management. Guided by Minu Sirsalewala, Executive Editor of Dataquest, the event focused on the strategic collaboration between Protiviti and Alteryx. Key speakers such as Varun Sharma, Jo Goh, Vincent Toh, and Sauma Das discussed Protiviti's partnership with Alteryx to foster innovation in data management and analytics.

Varun Sharma, Managing Director at Protiviti Data and Digital, opened the discussion by providing an overview of Protiviti's two-decade journey and its expanding global footprint, including new operations in Ahmedabad, India. He highlighted the critical role of data in driving business transformation and the importance of strategic partnerships in navigating the complexities of the current data landscape.

Jo Goh, Head of Partners & Alliances, Asia Pacific and Japan from Alteryx emphasized the significance of digital transformation in the Asia Pacific and Japan regions, underscoring Alteryx's commitment to driving business solutions through analytics automation. This was further elaborated by Sauma Das, Alteryx's Country Manager, who highlighted how Alteryx's analytics automation empowers organizations to leverage data effectively for business solutions.

Vincent Toh, Field and Partner Sales Engineering Leader for APJ at Alteryx, provided insights into

> LAKSHMANA VADAGA, CIO OF ADLABS ENTERTAINMENT LTD, HIGHLIGHTED THE IMPORTANCE OF AUDIT TRAILS AND LEVERAGING DATA TO ENHANCE CUSTOMER EXPERIENCE AND OPTIMIZE PRICING THROUGH PREDICTIVE ANALYSIS.

the current business landscape, noting the growing interest in achieving more with fewer resources amid economic and social fluctuations. He discussed the potential of generative AI to enhance business operations, particularly in data analytics. Toh cited successful collaborations, such as helping Costco overcome supply chain issues and supporting SPA, a European retailer, in transitioning to a hybrid model during COVID-19. He identified key challenges like skill gaps, data silos, and data quality issues, proposing solutions such as empowering non-technical professionals with user-friendly tools and establishing robust security frameworks.

The discussion also addressed various data management challenges faced by different industries. Sunil Sonare, Head IT and CIO of ITD Cementation India Ltd, shared the significant challenges associated with migrating from SAP S/4HANA to the RISE with SAP platform, emphasizing the extensive customization and migration complexities. Purushottam Solanki, Head IT at KIMS Hospitals, highlighted the critical need for careful downtime management during hospital integration system migrations to avoid disrupting operations.

Lakshmana Vadaga, CIO of Adlabs Entertainment Ltd, focused on the importance of audit trails and leveraging data for enhancing customer experience and pricing optimization through predictive analysis. Meanwhile, Minoo Titina underscored the importance of data safety and expressed a willingness to invest in further research on the product to ensure data integrity and security.

Shankar Jadhav, Senior Partner & CIO at Singhania & Co, expressed concerns about AI reliability and data protection under the DPDP Act. He suggested data classification and cohort-based analysis as measures to enhance data privacy and compliance. Ralman Pereira, Sr. VP at Yes Bank, discussed the challenges of obtaining and analyzing data within regulatory confines, emphasizing the need to guide regulators with effective guidelines based on valuable insights from structured and unstructured data.

Suhas Mhaskar, Group CTO and CIO at Octave Group, raised concerns about integrating Alteryx with various ERP systems, especially in manufacturing sectors that use custom ERP solutions. He stressed the importance of secure and private data handling, particularly for sensitive manufacturing data. Milind Khamkar, Group CIO of Super-Max, identified the critical area for improvement in ensuring robust internal controls and minimizing risks associated with inadequate segregation of duties.

KEY TAKEAWAYS

1. **Partnerships and Market Presence:** Protiviti and Alteryx highlighted their strategic partnership and role in driving digital transformation.
2. **Platform Capabilities:** Alteryx offers a low-code/no-code platform, integrating with various data sources and supporting extensive functionalities.
3. **Business Applications:** The platform is used for audit analytics, customer segmentation, demand forecasting, and more, supporting both on-premises and cloud solutions.
4. **Challenges and Solutions:** Key challenges include skill gaps, data silos, and data quality issues, addressed through user-friendly tools and robust security measures.
5. **Generative AI and Automation:** Integration of generative AI enhances decision-making and operational efficiencies.
6. **Industry Insights:** Industry leaders shared experiences, emphasizing data security, effective utilization, and automation.
7. **Case Studies and Real-world Applications:** Examples like Costco's supply chain management illustrate Alteryx's impact on business operations.
8. **Customer Empowerment:** Alteryx democratizes data access, enabling employees to perform meaningful analyses and enhance productivity.

> DHAVAL PANDYA, CIO OF PIRAMAL ENTERPRISES LIMITED, EMPHASIZED THE NEED FOR ROBUST DATA INGESTION, STRINGENT QUALITY CHECKS, AND EFFECTIVE GOVERNANCE TO ENSURE DATA AUTHENTICITY AND BALANCE ACCESSIBILITY WITH CONTROL.

Tejas Shah, Head IT Infra and Info Security, CIO at Prince Pipes and Fittings Ltd, discussed challenges in data transfer optimization, reducing cloud costs, and minimizing coding efforts for report generation. Vincent and Jo emphasized that Alteryx is user-friendly for both IT and business users, offering starter kits and flexibility in tailoring solutions. Ashwin highlighted Alteryx's accessibility for various user roles, emphasizing its low-code/no-code platform for easy workflow creation and analytics.

Dhaval Pandya, CIO of Piramal Enterprises Limited, raised practical concerns about implementing a data platform, particularly regarding data ingestion from diverse sources and ensuring data authenticity. He emphasized the need for robust ingestion capabilities, stringent data quality checks, and effective governance to balance accessibility and control.

Lalit Trivedi, Head Information Security Global at FlexM Global Pte Ltd, shared insights into the significant struggles in data migration within the steel industry, highlighting the complexities involved in streamlining data from various third-party applications. Vijay Kumar, CTO of Xanadu, expressed concerns about the high cost of deploying data solutions, robust security measures, and compliance with data privacy laws.

WAY FORWARD

The discussions emphasized the need for flexible, secure, and cost-effective data solutions that accommodate diverse business needs while adhering to stringent data privacy laws. The roundtable provided valuable insights for overcoming data hurdles, fostering innovation, and driving business success in today's dynamic environment.

aanchalg@cybermedia.co.in

VOICE&DATA

CyberMedia

IN ITS MAY 2024 EDITION, VOICE&DATA IS FOCUSSED ON THE TELCO'S BIGGEST CHALLENGES ON CAPEX.

ALSO READ MORE ON

- Urban Evolution: unpacking NEC's vision on next gen smart cities.
- Unleashing India's broadcasting power
- MSS serves a variety of segments with varied data rates
- Reshaping India's digital shopping landscape

Scan QR Code
& Subscribe now...

VOICE&DATA IS OFFERING SPECIAL DISCOUNTS FOR NEW SUBSCRIBERS AND ITS READERS. AVAIL THE OFFER NOW

Link: *https://bit.ly/3i8FPSQ*

FOLLOW VOICE&DATA FOR REGULAR AND LATEST UPDATES ON THE TELECOM ECOSYSTEM

voicendata_ | Voice&Data | @voicendata

Leverage Voice&Data platform & network:

Rajiv Pathak | rajivp@cybermedia.co.in | +91 8010757100

RNI No. 40432/82. Published on 1st of every month. DL(S)17/3159/2021-23. Licensed to Post WPP. U(SE)26/2020.
Posting Date: 11&12 of every month. Posted at Lodi Road HPO.
Advance Payment Facility Customer ID # 3000052249. Dataquest Magazine Post. DL (DS)-59/MP/2023-24-25