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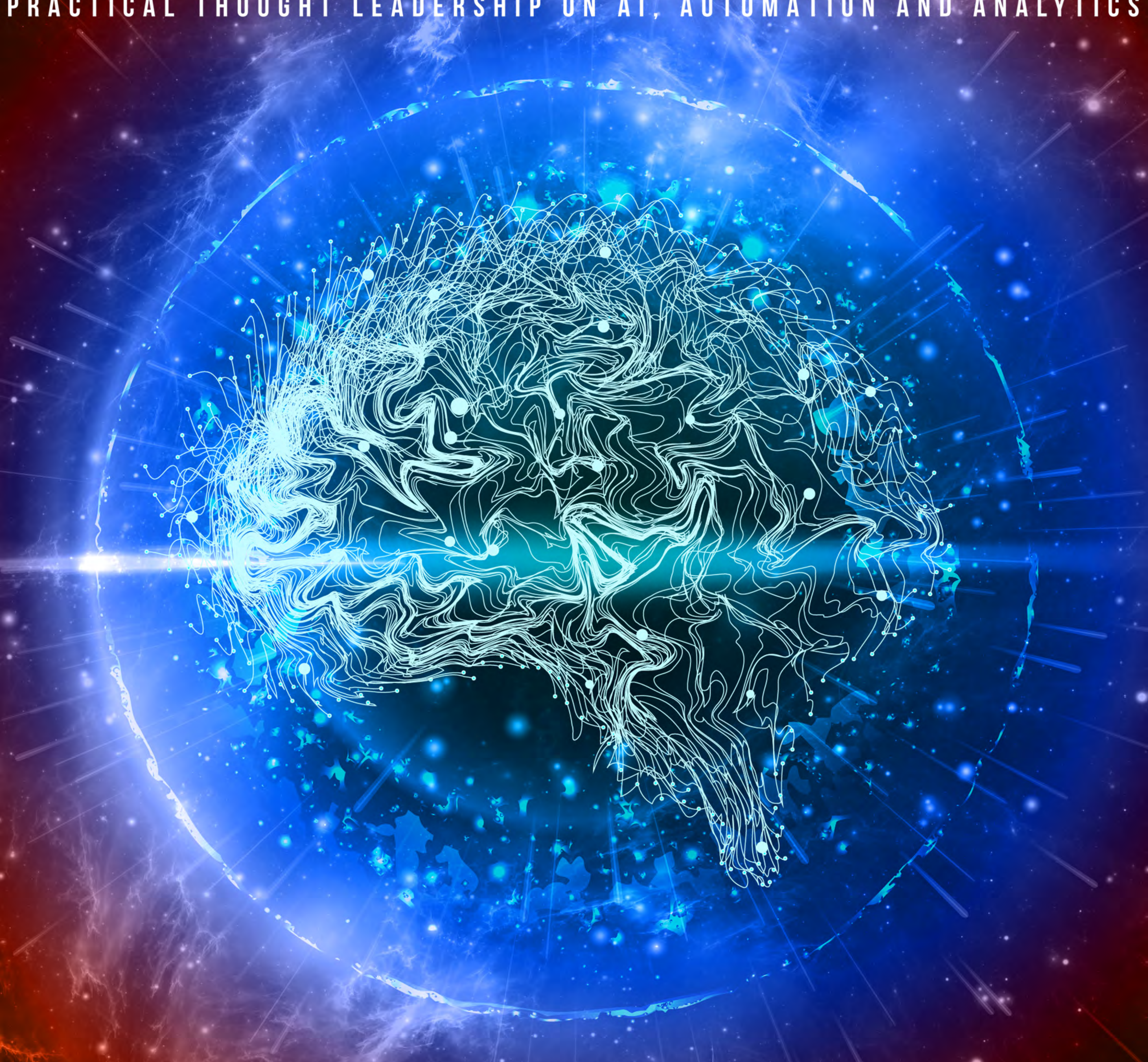
VOL 11

PRACTICAL THOUGHT LEADERSHIP ON AI, AUTOMATION AND ANALYTICS



DISRUPTECH

AI & BEYOND

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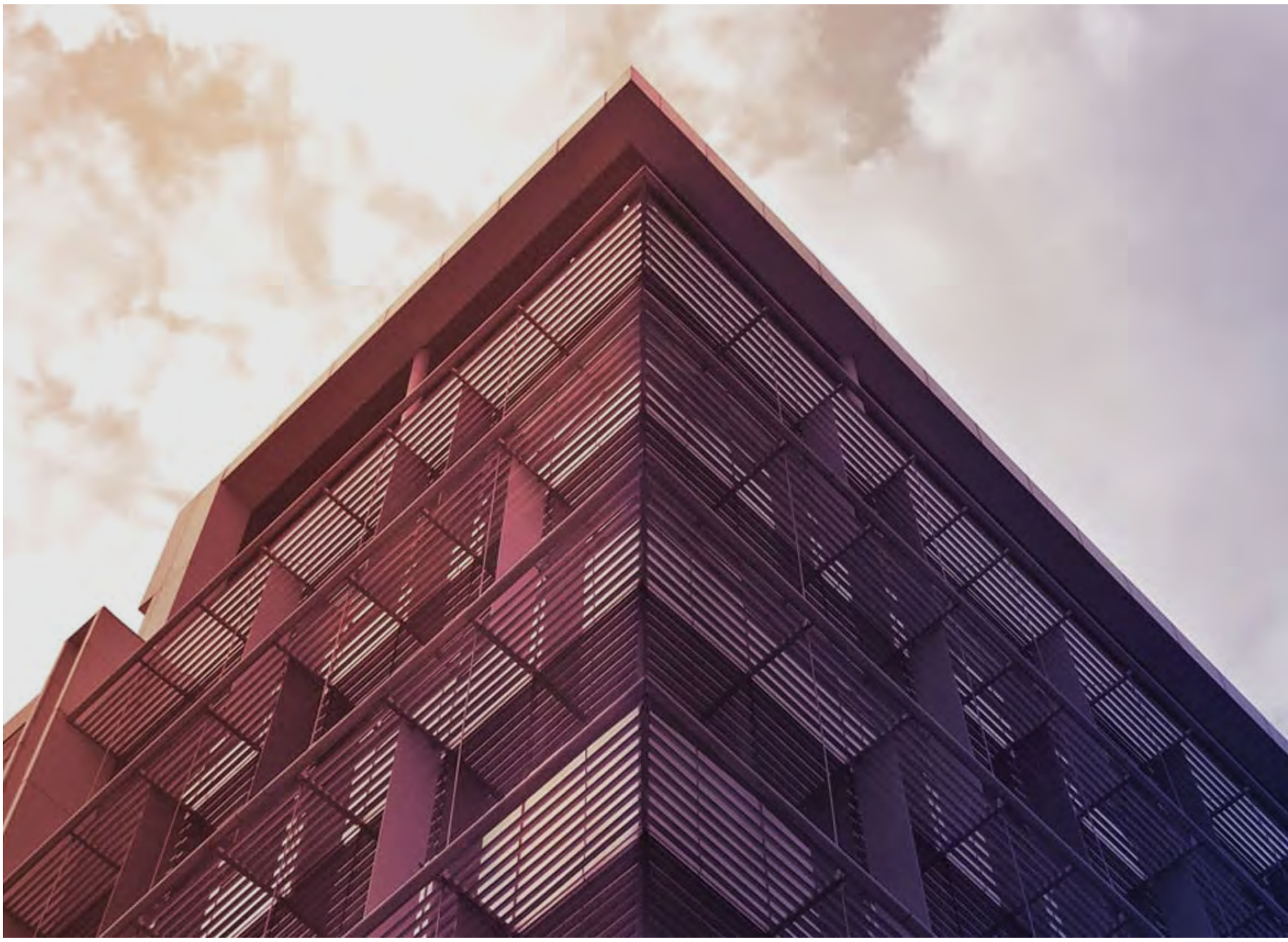

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About EdgeVerve

EdgeVerve Systems Limited, a wholly-owned subsidiary of Infosys, is a global leader in developing digital platforms, assisting clients to unlock unlimited possibilities in their digital transformation journey. Our purpose is to inspire enterprises with the power of digital platforms, thereby enabling our clients to innovate on business models, drive game-changing efficiency and amplify human potential. Our platforms portfolio across Automation (AssistEdge), Document AI (XtractEdge), and Supply Chain (TradeEdge) helps inspire global enterprises to discover & automate processes, digitize & structure unstructured data and unlock the power of the network by integrating value chain partners. EdgeVerve, with a deep-rooted entrepreneurial culture, our innovations are helping global corporations across financial services, insurance, retail, consumer & packaged goods, life sciences, manufacturing telecom and utilities, and more.

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DisrupTech: AI & Beyond

Volume 11, 30th April 2023

Technology is reshaping economies and societies worldwide, and when it comes to business competition, it's bringing more disruption than ever before. AI, once considered the stuff of science fiction, is now an integral part of many industries, from healthcare to finance, logistics to manufacturing. Automation rapidly transforms work, creating new opportunities and challenges for businesses and individuals. And supply chain technologies are driving greater efficiency and agility in a global economy that is more borderless than ever before. These trends are reshaping how we work and creating new opportunities for enterprises that adapt to the changing landscape.

In this edition of the Edge Quarterly, we look at how these technologies are changing the nature of business in various industries and explore how enterprises can use them to their advantage.

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Venkat Srinivasan
AVP, Group Manager,
Client Services Infosys

Badri Devalla
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Summary

The semiconductor industry has the potential to become a trillion-dollar industry. Despite this, several challenges must be overcome, including legacy processes, long setup timelines, and a shortage of skilled labourers. One way to address these challenges is by leveraging generative AI. The technology can help shorten production cycles, optimize costs and resources, and increase innovation velocity, which is the need of the hour for the semiconductor industry. Learn how Generative AI can deliver higher value to this industry.

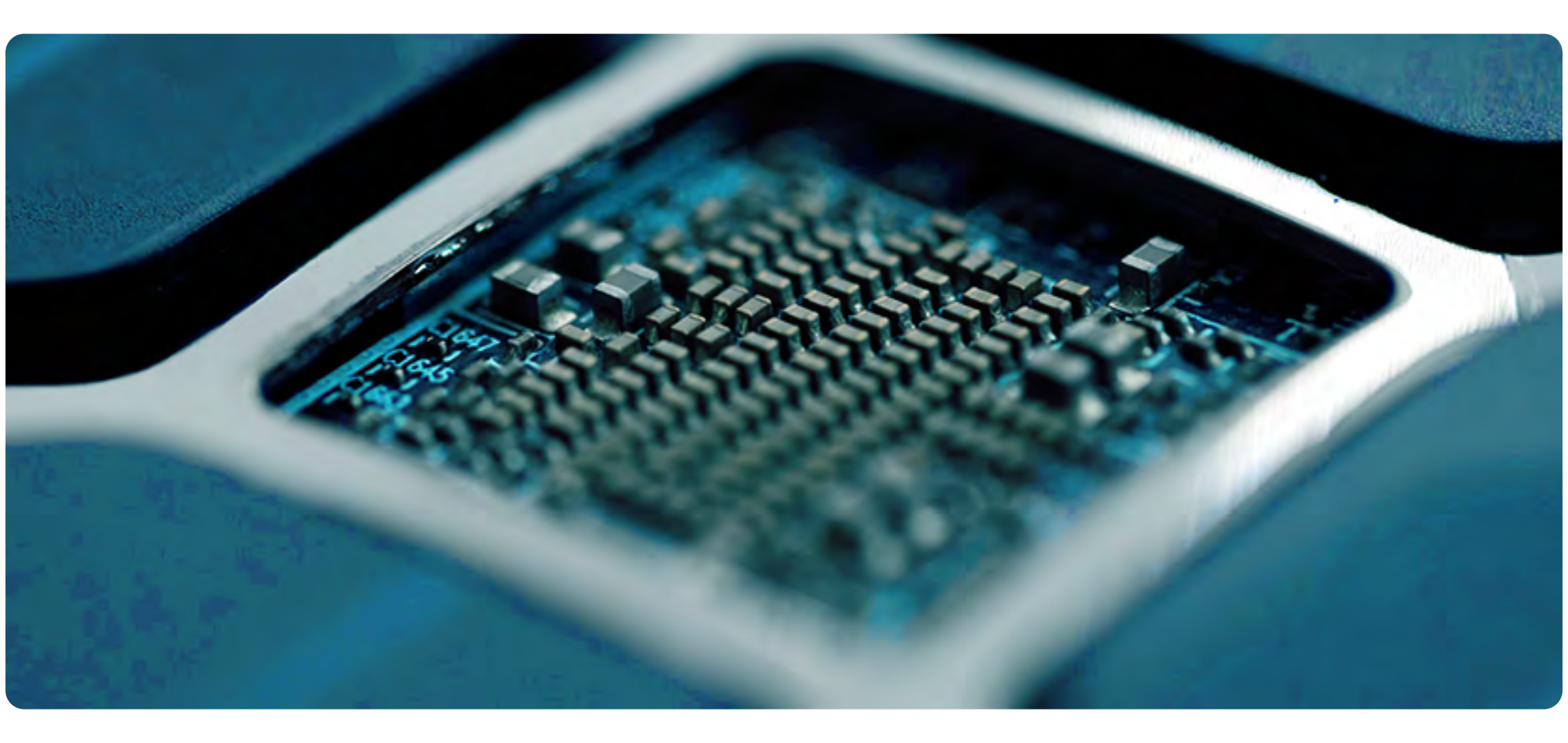
> "What crude oil was to powering 19th- and 20th-century economies, microchips are for powering 21st-century economies."
>
> **Tom Friedman**

The global semiconductor industry is sitting on a goldmine of growth with prospects of becoming a trillion-dollar industry by 2030[1]. In the US alone, the enactment of the CHIPS and Science Act in August 2022 has seen a mammoth $210 billion in private investment announcements across 19 States. The domestic semiconductor industry in the US is also set to receive $76 billion in subsidies[2]. Semiconductor companies like TSMC plan to triple their investment[3] to build manufacturing facilities and hire aggressively to address the increasing demand for chips and plug the demand and supply gap. Not to be left behind, the European Union is planning to invest €43 Bn[4] to double the bloc's share of global chip output. These figures leave no room for doubt that we will witness massive growth in this domain in the US and globally.

While growth is happening in all aspects of the semiconductor industry (See Box), in this article, we will explore what the next few years have in store for semiconductor fabs in the US. Essentially, US-based semiconductor manufacturers need to focus on how to set the proper foundation for the future. And finally, the role generative AI will play in this journey.

The Halo Effect

The new foundries for the future will have a Halo Effect on the entire semiconductor value chain. As foundries build efficiencies and agility with new technology, the designers, fabless semiconductor firms, integrated device manufacturers, and other ecosystem players will also benefit. Collectively the ecosystem will be able to move away from the inertia of manual processes and synergize better outcomes. For instance, generative AI may lower the barrier for complex chip designers by giving design options to choose from or codifying best practices to build, for instance, an amplifier. Synopsys[5], for example, is working on design space optimization (DSO) that can autonomously search design spaces for optimal solutions enabling massive scaling in the exploration of choices and automating less consequential decisions.



Legacy Challenges Playing Spoilsport

A trillion-dollar semiconductor industry is terrific news, but this silver lining comes with a few spots of grey that need ironing out. The elephant in the room is the traditional chip manufacturing approach, which must scale to deliver for the future. The breakneck speed of technology evolution for all things that consumers demand - heavily dependent on the semiconductor industry - needs constant innovation, high quality, and rapid time to market with new products and materials. Yet, existing systems and processes need help to keep pace with increasing design complexity and reducing chip sizes leading to rising costs and defect rates.

Intel predicts that by 2030, microchips will have ~10x more transistors or one trillion transistors per chip[6]. Designing and fabricating these complex chips with increased functionality, diverse applications, and heterogenous architectures will not be child's play. At least not with the way things are at present. Several challenges are putting the brakes on players' ability to aggressively exploit the semiconductor industry's growth potential. Some of these include:

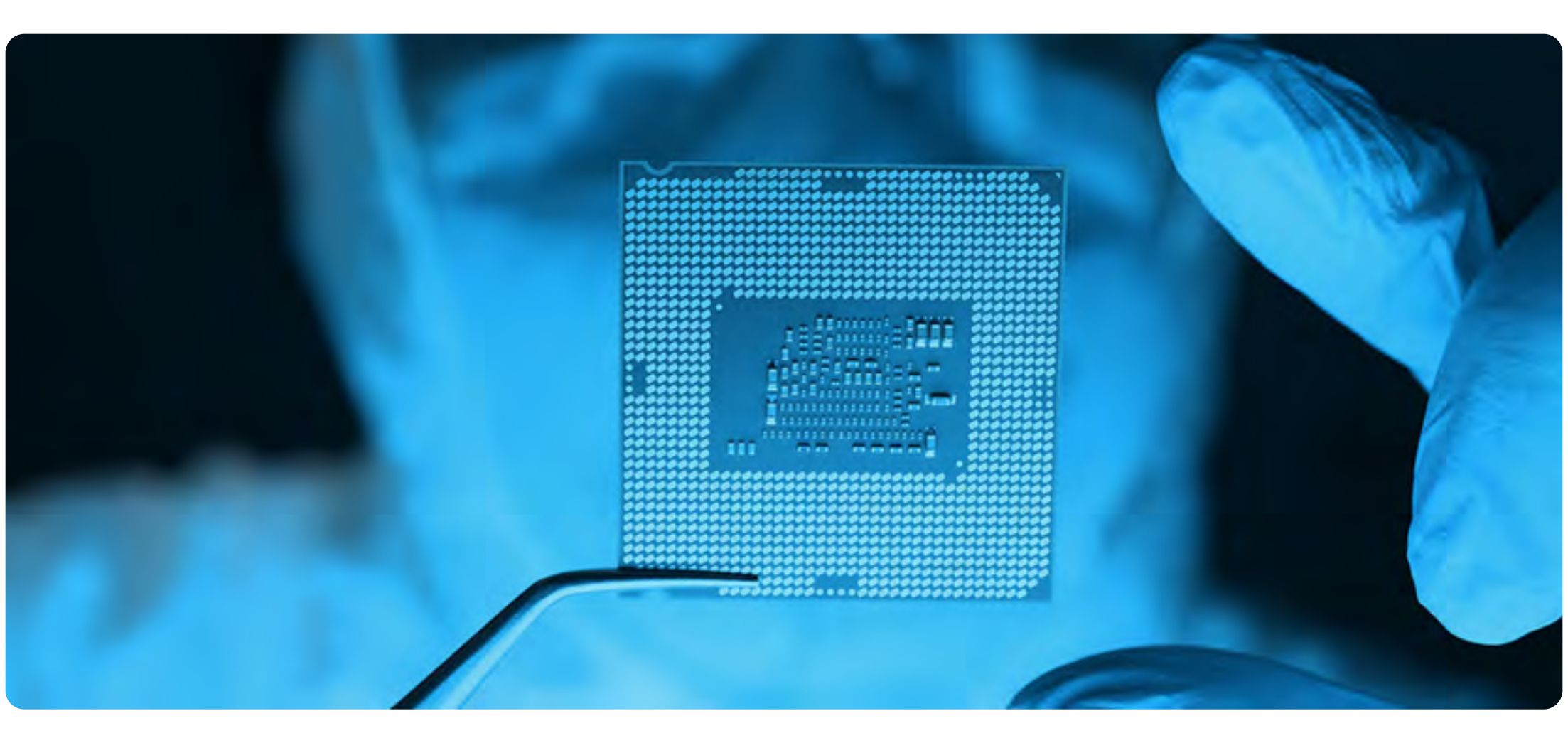
- **Long timelines for setup** - A five-year timeline[7] for setting up the semiconductor fab is quite long and needs to be optimized.
- **A two-fold talent shortage** – According to McKinsey, the industry faces a shortage of skilled labourers[8] to build the massive semiconductors fabs and a lack of trained personnel[9] to operate them once built.
- **Complex, legacy processes** - A typical chip-making process has hundreds of steps[10], and the time frame from design to mass production can be months. One of the reasons for this is the tremendous amount of human intervention involved in this process.

One might wonder why companies that plan to spend billions of dollars building semiconductor fabs still use a legacy approach toward chip manufacturing. The answer lies in human psychology. Key decision-makers ask themselves, "Why to fix a process that has worked for more than four decades?"

The existing semiconductor fabs have been around, unchanged or with very few minor tweaks, for decades because no one wants to risk a breakdown, which is a fair point. However, now that there is a new opportunity and billions of dollars are being invested in new factories, semiconductor players need to ask themselves some hard questions:

- Are the new semiconductor fabs being built right? How should we design these factories to be relevant in the coming decades?
- How do we ensure that legacy challenges and decades of inefficiencies are not inherited?
- What new capabilities can we deploy **to improve ROI, yield, operational efficiency index (OEI), and other KPIs?**
- How do we get the chips to market faster and with better capabilities?
- How do we use technology to shorten production cycles, optimize costs and resources, and increase innovation velocity?

Finding the correct answers to these hard questions will certainly lead to billions in cost savings and process improvements. Hence it is worth asking and answering these questions correctly. One of the potential answers to these questions could be our ability to leverage artificial intelligence, especially generative AI, and how it can drive cognitive operations and amplify the human potential for exceptional gains.



Understanding Generative AI

We did an exciting experiment with ChatGPT 4 and asked the model to explain generative AI. After several prompts and deeper probes, it came up with this

> "Generative AI is a subfield of artificial intelligence that focuses on creating new data, content, or designs based on existing data and patterns. These AI models can generate new text, images, audio, and even designs by learning from large datasets and capturing the underlying structure and relationships present in the data".

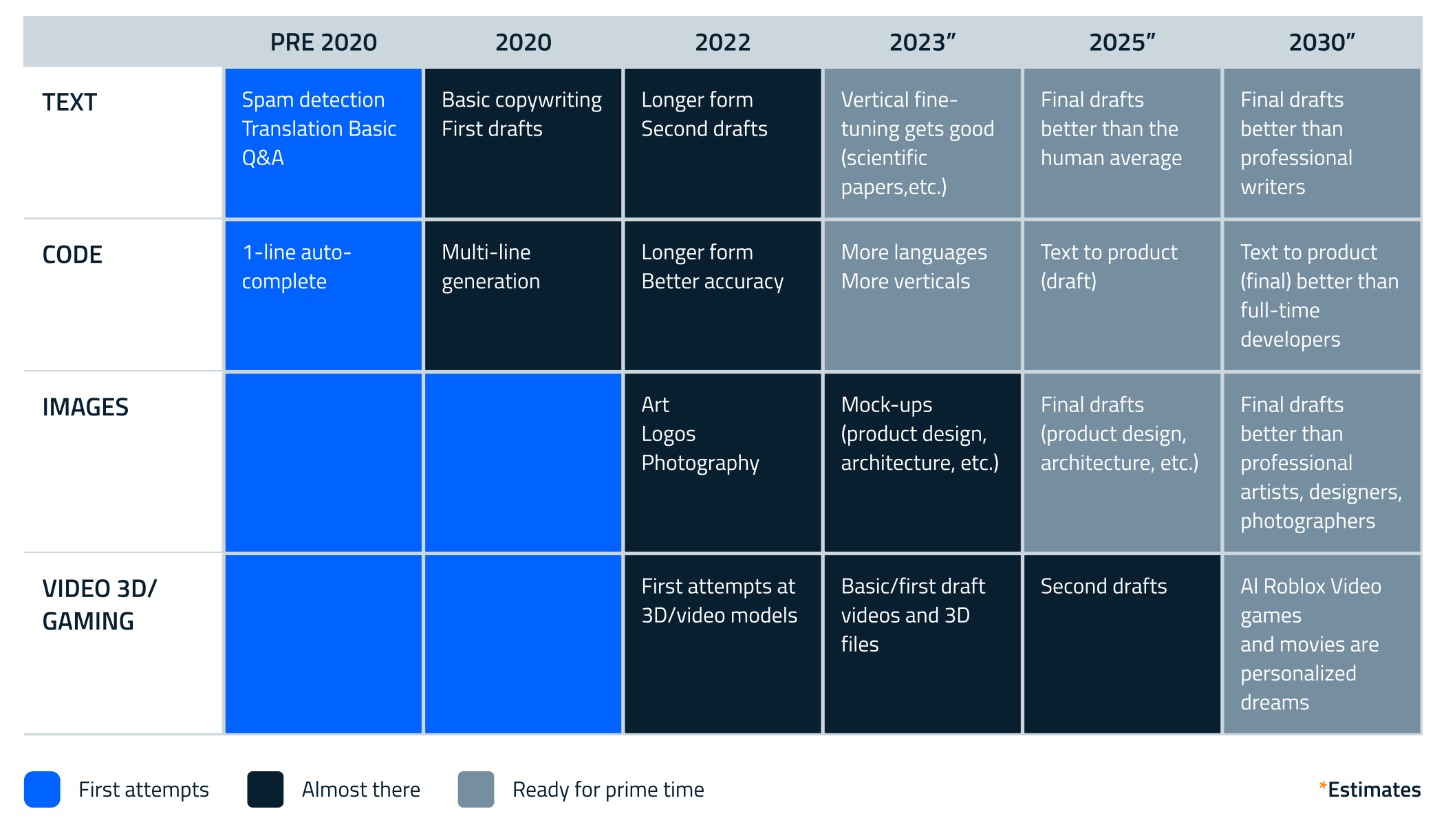
Large Language Models (LLMs) are a type of generative AI model specifically designed for natural language processing (NLP) tasks. They are trained on vast amounts of text data, enabling them to understand and generate human-like text based on the context provided. LLMs can be used for various purposes, such as text completion, translation, summarization, and content generation.

OpenAI has developed a series of LLMs called Generative Pre-Trained Transformers (GPT), while Google has built two LLMs for NLP: LaMDA (Language Model for Dialog Applications) and PaLM (Pathways Language Model). These models can be fine-tuned for specific tasks, making them highly versatile and suitable for various applications. For example, ChatGPT and Bard are chatbots based on GPT 4 and LaMDA, respectively.

> Generative AI, Large Language Models, and GPT models offer powerful tools for businesses to automate tasks, generate new content, and support decision-making processes. They can help enterprises to improve efficiency, reduce costs, and foster innovation, making these technologies a valuable investment for companies looking to stay competitive in the digital age. Let's look at how this technology can revolutionize semiconductor manufacturing.

GENERATIVE AI SYSTEMS TIMELINE

Sources: Global X ETFs with information derived from: Huang, S., Grady, P., & GPT-3. (2022, September 19). A powerful new class of large language models is making it possible for machines to write, code, draw and create with credible and sometimes superhuman results. Sequoia.



	PRE 2020	2020	2022	2023"	2025"	2030"
TEXT	Spam detection Translation Basic Q&A	Basic copywriting First drafts	Longer form Second drafts	Vertical fine-tuning gets good (scientific papers,etc.)	Final drafts better than the human average	Final drafts better than professional writers
CODE	1-line auto-complete	Multi-line generation	Longer form Better accuracy	More languages More verticals	Text to product (draft)	Text to product (final) better than full-time developers
IMAGES			Art Logos Photography	Mock-ups (product design, architecture, etc.)	Final drafts (product design, architecture, etc.)	Final drafts better than professional artists, designers, photographers
VIDEO 3D/ GAMING			First attempts at 3D/video models	Basic/first draft videos and 3D files	Second drafts	AI Roblox Video games and movies are personalized dreams

🟦 First attempts ⬛ Almost there ▨ Ready for prime time *Estimates

Generative AI As The Agent For Change

Artificial Intelligence is not new in production. Audi, for instance, has been using AI[11] to automate quality testing, detecting flaws in components and the quality of spot welds, etc. More recently, they have also deployed a generative AI model called felGAN[12] to inspire new rim design ideas for wheels.

The recent interest in generative AI models like ChatGPT has brought the immense potential of Large Language Models into the limelight. Generative AI can be the knight in shining armour that can help semiconductor companies break free from the shackles of tradition and outdated approaches toward manufacturing. It can help optimize the manufacturing process itself and, along the way, help augment the capabilities and performance of the humans in the process. Some potential use cases of how it can help set the foundation of a new era of semiconductor fabs include:

1. **Improve human decision-making in setting up new machinery:** One way to address long fab setup times is to help people make better decisions. People involved in setting up the new factories may need to learn all the challenges or best practices that affect yield, quality, etc. Generative AI models can ingest past data to answer queries or generate a set of instructions to double-check everything. Even small changes can have a significant impact on an industry like semiconductors. For instance, minimizing the number of setups needed in the new factory or minimizing human error can save millions of dollars. Building a fab on a specific set of quality standards only to realize that the standards were different is a costly error that can take tens of millions of dollars to correct. Similarly, it can; for example, help choose the best design for an amplifier or a microcontroller from multiple options based on several parameters.

2. **Optimize chip design for manufacturing:** Today, Infosys experts estimate that nearly 30-40% of the time in chip design is wasted due to process inefficiencies. Does the design to tapeout process need hundreds of steps? With Generative AI, it's possible to cut out unnecessary steps and automate the design process[13]. Generative design can minimize human input and overcome the limitations of a traditional Electronics design to better align with Process Design Kits (PDKs). Semiconductor players can also use reinforcement learning to optimize the component placement, reducing product-development life cycle time[14] from weeks to hours. Fewer steps with automated decisions also translate to higher yields at a much lower cost while addressing the talent gap.

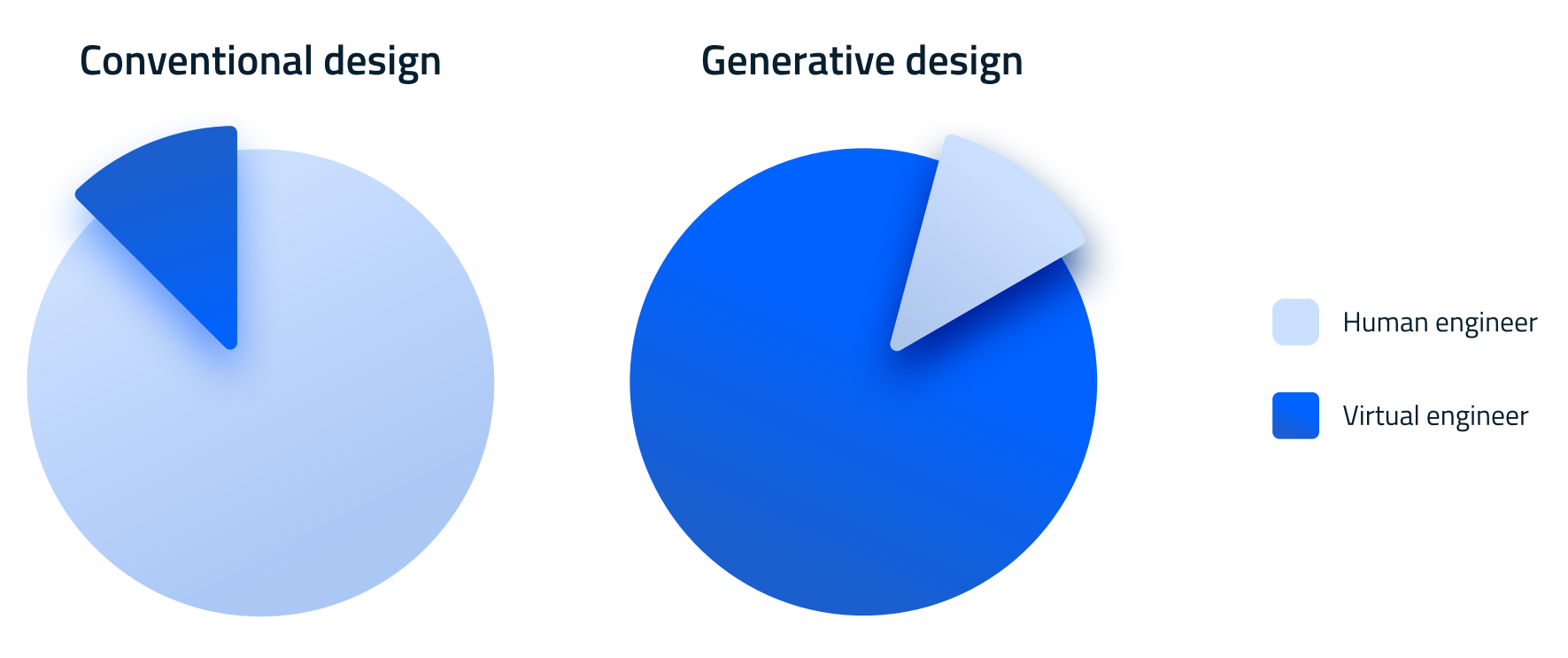


Figure 7. Comparison between the involvement of a human engineer and virtual engineer in conventional and generative design (Courtesy Diabatix)

3. **Optimize scheduling and resource planning**: Most work done on-site in semiconductor plants is still dependent on manual decision-making, which is often time-consuming, limited in scope, and prone to errors. Generative scheduling[15] can help create multiple scheduling and resource allocation scenarios and compare them in real-time to improve critical decisions regarding labour, equipment, installation rates, access, start-up sequence, etc. This end-to-end optimized plan can help minimize cost and schedule overruns.

4. **Improve metrology and defect detection**: Shrinking device sizes with billions of components working together in tight specifications at an atomic level[16] have made metrology an essential process in chip manufacturing. Even the smallest of changes can render a chip unusable. While the quality specifications get more complex, the inspections remain manual – a scenario not viable for the new foundries. Generative AI can leverage unsupervised learning to detect defects, generating realistic images of defective chips to empower visual inspection and improve anomaly detection.

5. **Enable straight-through processing with intelligent transactions**: Business process transformation has mostly been around functionality. While that is needed, the ultimate process efficiency gains come from straight-through processing (STP). To enable STP, the systems must be able to process and consume both structured and unstructured data. AI can help manage all structured and unstructured data in the semiconductor fab, bringing information from various sources, unifying it, and delivering a single source of truth, to connecting operational areas such as orders, inventory, logistics, supply chain, and more. This facilitates Straight Through Processing to speed up transaction processing times, improve compliance, manage risks, and amplify user experience.

6. **Reduce the cost and impact of indirect labour**: Two of the core metrics of a fab – capacity and time to volume – depend not only on the manufacturing process but also on indirect work such as building the factory, plumbing, contracting, etc. According to McKinsey, indirect labour accounts for ~18-20%[17] of annual manufacturing expenses. Given the talent shortage and the associated costs, the industry must look at digital solutions. Automating processes, extracting document data, generating insights, etc., can significantly impact contract management and negotiations, risk management, safety and quality, preventive maintenance, etc. Companies can augment human decision-making and accelerate value by enabling NLP queries with generative AI.

Towards A Smarter Future

Generative AI is just the first chapter in the book of semiconductor chip manufacturing. The time isn't far when we will see truly smart semiconductor fabs where the manufacturing processes work in pitch-perfect synergy to improve yields and optimize costs. At the same time, with every manufacturing component sharing information, water usage, emissions, and power consumption can be tracked in real time. This will enable ESG(Environment, Society, Governance)-centric decision-making to help the semiconductor industry meet the standards of the most demanding regulatory frameworks.

> AI will also deliver on a critical missing piece, connecting the design and manufacturing components so that companies can combine a historical track record and advanced predictive analytics and further improve their fabs and performance.

Descriptive, prescriptive, and predictive AI-driven technologies will help build future-proofed semiconductor fabs that can mine gold from the goldmine of the opportunity presented to them. To learn more about how you can build future-proof AI-enable factories, write to us at **edge@edgeverve.com**

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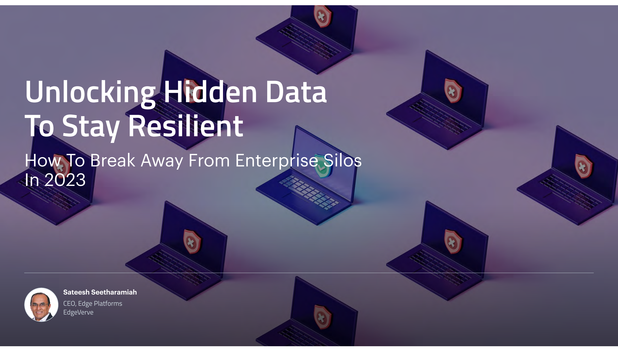

Unlocking Hidden Data To Stay Resilient

How To Break Away From Enterprise Silos In 2023

Sateesh Seetharamiah
CEO, Edge Platforms
EdgeVerve

Summary

Sateesh discusses how businesses can build long-term resilience by connecting their operations in new ways. Despite spending billions on digital transformation, many companies still suffer from silos, disjointed processes, and data visibility issues. As AI and ML evolve, intelligent automation will look different, and every industry's work will change radically. Businesses can create a connected enterprise that mitigates data silos by orchestrating AI, automation, and humanity. Read on to know what shapes the future of a Connected Enterprise.

The human body is one of the most complex systems known to us. And yet, it runs its core processes flawlessly, efficiently, and autonomously without any conscious human effort. Billions of cells; collaborating, deeply connected, and exchanging information – keeping us alive and at peak performance.

This impressive feat is possible because we have mechanisms to sense and synthesize vast volumes of data in the environment and respond, adapt to, and thwart any risk.

> Enterprises, like humans, need this awareness and synchrony to build resilience. They have yet to consider connecting your business in ways you haven't considered. Misreading the signals or failing to identify information gaps can threaten survival and longevity.

A connected enterprise is core to building a resilient business that drives shareholder value in the long run.

Disconnected Processes Are Eroding Business Resilience.

Covid was an eye-opener in many ways and showed us that enterprises are still disconnected and siloed despite spending billions of dollars on digital transformation. Amidst lockdowns, enterprises struggled with visibility and execution challenges, inventories piled up, customer connections broke down, supply chains were disrupted, and employees struggled to stay connected remotely.

And if you thought that was disruption, think again. What we will witness as AI and ML come of age will be far more disruptive.

> Just look at what it's done for drug discovery. We all know drug discovery is a multi-step process that costs billions of dollars and can take decades to show outcomes, right? Well, recently, there was a breakthrough in one of the steps. While traditionally, folding proteins into three-dimensional structures took years, in 2022, AI did it in seconds.

From years to seconds! What a radical shift in the timeframe.

And soon, we'll see this disruption everywhere as the fast evolution of general-purpose artificial intelligence pushes more boundaries. We are already seeing it with the meteoric rise of ChatGPT. Intelligent automation will look very different in the coming years, and how work gets done in every single enterprise will change radically in every industry.

The Question Is, Are We Ready For It?

A study by BCG showed that almost 80% of companies are reactive with operations that are not structured for long-term resilience[1]. While the digital enterprise has undoubtedly come a long way, it's still bogged down by silos, disjointed processes, and data visibility issues. For example, around 35% of supply chain leaders can see only as far as their first-tier suppliers[2]. And for most organizations, only 20% of digital contacts are unassisted, with only 12% having highly integrated digital contact centre platforms[3].

This inability to override data silos erodes competitive advantage and longevity in the face of new, digital-native businesses. We all know how long it takes for an insurance claim to get paid out – days, weeks, months, even. Today digital native companies are paying claims in a matter of minutes. Banks are opening accounts without any paperwork. Companies are driving tremendous personalization.

At the root of such success stories are digital, data-backed, connected platforms that allow them to understand and deliver on customer experience needs.

> It's not that large organizations don't have access to this data. They do! But it's dark data, hidden in innumerable processes or siloed in systems that don't talk to each other. The problem is compounded by analytic skill gaps and a poor understanding of how data is collected, stored, and processed within different departments.

Intelligent Automation Can Shatter Silos And Unlock Hidden Data

Imagine a CPG company where marketing, sales, and supply chain functions are connected. Marketing teams have access to state-of-the-art platforms to analyze customer data; sales teams have the most up-to-date data on customer priorities in their CRM; and supply chain teams know what is getting sold where. Together this data can generate more comprehensive insights and drive better business outcomes with near real-time decisions. But lack of operational foresight and poor technology integration prevents enterprises from reaping these benefits.

> While no enterprise is immune to data silos— orchestrating a Connected Enterprise[4] where humanity, AI, and automation work together can help mitigate them. If companies can connect these systems, unearth contextual data, and generate actionable insights, they will see immediate returns.

For instance, during the pandemic, supply chains were disrupted, most shelves were lying bare, and companies didn't know how to restock them. One of our clients leveraged a connected platform to identify and mobilize inventory and reduced their out-of-stock to less than two days.

Similarly, a leading commercial insurer transformed underwriting by improving information flow from the submission stage and connecting 3rd party data sources. By extracting, validating, and enriching information, they unlocked a 5% improvement in the 'Submission-to-Quote' ratio and ~15-20% improvement in 'Quote-to-Bind.'

This success is only possible if we transform how enterprise data is collected, curated, and consumed across end-to-end business processes. Here's what you can start with:

1. Build a data framework and architecture
2. Establish guidelines for data governance and compliance
3. Foster a data-driven culture with executive support

Building A Connected Enterprise Is Key To Long Term Resilience

The problem with most organizations is the tendency to see business outcomes in siloes - customer experience, productivity, efficiency, resilience, or anything. When the truth is that to get these outcomes, organizations need end-to-end connectivity – within the enterprise and with their value partners.

Shaping the future for every enterprise will depend less and less on historical data and more on understanding changing customer preferences, innovating faster, and orchestrating the entire value chain to execute in short order. To survive and thrive in the digital age, we need a system where processes, people, and data work towards a common purpose - enabling pre-emptive action against threats or capitalizing on opportunities.

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Navigating The Future OF AI

The Evolution And Emerging Applications Of AI

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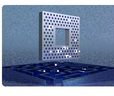


Summary

Prasad emphasizes the evolution of AI technology and how it is transforming various industries today. AI-enabled technologies like Computer Vision and NLP help improve customer experience by identifying valuable information about customers, partners, and markets. He also discusses concerns about copyright ownership of content created by generative AI platforms and shifts focus to the importance of data privacy and security in the digital age. Read on to how AI has and will progress to define how we live harmoniously.

The web series "Person of Interest", aired a few years ago, showed an AI-driven platform called "The Machine", which combined face recognition with data pulled from multiple sources, including social media, phone calls, messages, emails and emails from other agencies to predict future crimes. The Machine's nemesis, "Samaritan", went a step ahead and was even able to manipulate outcomes.

Sounds futuristic, something that belongs to the world of fiction? The truth is we are nearer to that end state than we think. Artificial Intelligence, or AI, is evolving by the day, from the early purpose-built AI, which was primarily rule-driven, to intelligent platforms today, which apply knowledge and skills that it has gained to different contexts, similar to how human intelligence applies to various situations.

ChatGPT, DALL-E and a host of other conversational and generative AI platforms are bringing AI to the common people, who use it as a creative aid for personal and professional activities. With new masterpieces like The Next Rembrandt[1] and generated voice and music[2] being created by generative AI platforms[3], a question arises of copyright[4] and who owns the created content.

> Artificial Intelligence (AI) has been a buzzword in the technology industry for many years and has come a long way since its inception. Its significance has grown exponentially in recent years – from a concept in science fiction novels and movies to now becoming an integral part of our lives. While chatbots, virtual assistants, self-driving cars and smart homes are becoming more prevalent, the most significant impact of AI can be seen in the corporate world, where it has transformed how companies operate and compete.

The AI Evolution: From Rule-Based Expert Systems To Deep Learning And Beyond

Computer scientist John McCarthy first used the term Artificial Intelligence during a Dartmouth Conference in the 1950s, where computer scientists and researchers from various disciplines discussed the potential of AI and the possibility of building machines that could think and act like humans.

> Largely theoretical at that time, researchers were focused on developing algorithms that mimicked human intelligence, which led to the development of early AI applications like rule-based and expert systems. These expert systems were used to make decisions based on specific inputs but struggled when they needed to handle complex tasks or adapt to different situations.

The last decades of the 20th century saw a resurgence in AI with the development of machine learning (ML) algorithms. ML-enabled systems learnt to process and analyze data, leading to the development of predictive models and decision-making systems, marking the beginning of Big Data management.

With machine learning evolving thanks to the advances in computing power and data storage and management capabilities, more sophisticated AI systems were created which could process vast amounts of data using neural networks that mimicked the human brain.

> The next stage of development in AI was deep learning algorithms which could analyze vast amounts of data and identify patterns. This enabled breakthroughs in areas such as image recognition, natural language processing, and speech recognition, used in various applications, including virtual assistants and autonomous vehicles.

The past decades have seen AI integrate with other emerging technologies like cloud computing, automation, IoT and Blockchain, to name a few. To cite a few use cases, AI is used to automate processes, enhance decision-making, and improve customer experiences through optimized supply chain management, automated customer service, and enhanced fraud detection[5]

Unleashing The Potential Of AI Today For Enhanced Business Performance

Today's organizations generate vast volumes of structured and unstructured data, including valuable information about your customers, partners, and markets. AI-enabled technologies like Computer Vision and NLP can identify, extract, and process these data into meaningful insights.

Predictive analytics enabled by powerful ML algorithms are used to analyze these insights to identify patterns and predict future trends and events. NLP also allows computers to understand and respond to human inputs like gestures and speech, offering personalized support and service. These technologies enable companies to make informed decisions, improve performance, and provide customized customer service and support.

> From regular business functions to industry-specific applications, AI is being used to improve efficiency and productivity. With chatbots handling customer inquiries, predictive analytics forecasting sales and optimizing pricing strategies, AI enhances productivity by automating repetitive tasks and providing personalized training.

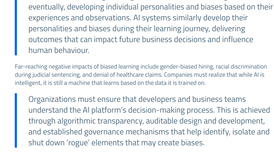
Unlocking The Future Potential Of AI-Enabled Automation, Robotics, And Personalization

A PwC Global Artificial Intelligence Study[6] predicts a potential US$15.7tr contribution to the global economy by 2030 from AI. AI is expected to drive greater product variety, with increased personalization, attractiveness and affordability over time, resulting in product enhancements and stimulating consumer demand.

Productivity gains across industry sectors, including healthcare, automotive, financial services, retail, technology, communications, entertainment, manufacturing, energy and logistics, will be realized from the increasing use of AI to automate processes, including the use of robots and autonomous vehicles, augmenting existing resources and improving consumer demand through personalized AI-enhanced products and services.

The field of robotics is seeing significant advancements, with robots becoming more sophisticated, learning from their environment, and adapting to real-time situations while performing a more comprehensive range of tasks and interacting with humans more naturally. Autonomous vehicles are in various development and deployment stages and will soon be a common sight on the roads and corporate campuses.

> The healthcare industry uses AI to develop personalized treatment plans and early diagnoses of acute diseases. Finance services are using AI-driven predictive models to identify fraud and manage risks. The retail industry creates personalized shopping experiences and optimizes supply chain management using AI platforms. AI-powered robots are improving efficiency in the manufacturing industry by optimizing production and reducing waste.



Building Trust And Mitigating Bias Through Responsible AI

AI is the defining technology of our age, with industries using AI in some form. AI is transforming the marketplace for consumers, businesses, and society. Humans and machines collaborate closely, reducing the cycle time of AI-driven innovations coming into the mainstream.

> AI is evolving from rule-based systems to unsupervised learning platforms that closely mimic human learning. This evolution is like a human baby, born without inhibitions, knowledge and bias, learning from their surroundings through observation and imitating others, and eventually, developing individual personalities and biases based on their experiences and observations. AI systems similarly develop their personalities and biases during their learning journey, delivering outcomes that can impact future business decisions and influence human behaviour.

Far-reaching negative impacts of biased learning include gender-biased hiring, racial discrimination during judicial sentencing, and denial of healthcare claims. Companies must realize that while AI is intelligent, it is still a machine that learns based on the data it is trained on.

> Organizations must ensure that developers and business teams understand the AI platform's decision-making process. This is achieved through algorithmic transparency, auditable design and development, and established governance mechanisms that help identify, isolate and shut down 'rogue' elements that may create biases.

As AI systems scale and evolve, there is a need for a continual feedback loop between business users and developers to ensure the system is functioning as per the evolving expectations and objectives. Development teams need to build inherent controls based on inputs from business users which can identify opportunities for improvement. These controls could be in the form of appropriate baselines that monitor the functioning and accuracy of the algorithms and look for unwanted bias or deviations while learning from new data or situations.

Organizations need to understand the importance of assurance and control of AI systems and develop a responsible AI framework that addresses the constraints, liabilities and potential downsides of AI and applies a defined governance structure that can mitigate and manage the same. This strengthens confidence in how the AI systems make decisions and builds trust in their outputs.

Embracing AI For A Better Future

While AI is redefining how employees do their jobs, it is also automating routine and redundant tasks, possibly resulting in loss of employment. Organizations and employees both need to invest in retraining programs that leverage the use of AI rather than delaying or fighting the adoption of AI at their workplaces.

> AI continues to revolutionize the way companies operate and compete. With AI systems becoming more sophisticated, they can automate complex processes and make more informed decisions, enabling companies to work more efficiently and effectively and giving them a competitive edge in their respective industries.

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Unlock Data Potential To Drive Omnichannel Growth In 2023

To Drive Omnichannel Growth In 2023

This article is an excerpt from a webinar that included

Suresh Bharadwaj
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Summary

As digital-savvy consumers' expectations and buying habits evolve, consumer-packaged goods (CPG) companies must prioritize omnichannel growth to remain competitive. This means managing inventory, increasing investments in omnichannel, and streamlining supply chain operations to deliver an unmatched customer experience. Real-time data flow and visibility are crucial to success, and businesses must effectively manage inventory across all channels. However, failing to manage consistency across channels could lead to lost customers and added complexity to the CPG industry's supply chain operations. This article will delve deeper into the importance of an efficient omnichannel strategy for CPG companies and explore ways to achieve success in this space.

As we move further into 2023, consumer-packaged goods (CPG) companies are challenged to meet growth objectives while concurrently addressing rising input costs. E-commerce continues to be a big growth driver even as sales in some categories are seen coming back to pre-pandemic levels albeit settling at a slightly higher level. With evolving expectations and buying habits of today's digital-savvy consumers, the time available to supply chain functions for analysis and action is also shrinking ever-so rapidly. Given the cost considerations, unlike in the past, organizations no longer have the luxury of planning each channel in a silo.

So, what's driving the agenda for supply chain leaders in 2023?

Cost containment:
First and foremost, recessionary trends have made taking out costs, particularly around inventory and transportation, critical. Note that inventory and transportation costs always move in opposite directions.

Omni-channel investments:
Second, past investments in omni-channel commerce were primarily on the front end: on the digital, on websites and e-commerce enablement. To maximize benefits from those investments, it is imperative that any consumer demand so generated be completely fulfilled.

Challenges To A Profitable Growth Agenda:

Network re-structuring is costly and time consuming:
Since the late eighties, low-cost manufacturing hubs in Asia-Pacific, that the fashion and apparel industry has relied on, not only offset shipping costs but also higher inventory costs typically associated with long lead times. Post-pandemic, companies are mitigating supply risks by moving select manufacturing near-shore. While this counter-intuitive move certainly increases manufacturing costs, to what extent it will be compensated by lower transportation and inventory holding costs is yet to be seen especially given the volatile nature of consumer demand.

Lack of visibility:
Enterprises have long recognized the importance of end-to-end visibility across their supply chain ecosystems. Often, different functions within an enterprise have their own source of such information resulting in there being no single version of the truth. Add to this, data latency and you have a perfect recipe for each function coming to a different conclusion on what to produce, how much and when. The fact that an omni-channel consumer could expect to be serviced virtually anywhere (and whose location remains unknown until order placement) only makes it worse for determining where to position inventory.

Building Blocks To Address The New Paradigm:

Near-real time Sales Visibility:

To address shifts in consumer behavior, traditional demand planning that has long served to predict sales over a medium-to-long term needs to be augmented by short-term demand sensing capabilities to fulfill demand here and now. This would also necessarily mean getting visibility to market action in near real time. Getting to know yesterday's sales today is no longer a nice-to-have capability, but a business imperative.

> Brick-and-mortar retailers who have long sold their point-of-sale (POS) data to syndicated providers are seeing the benefits of direct collaboration with their suppliers. Consequent complexities for suppliers around managing data from different sources in different formats in different granularities and received at different frequencies including data harmonization have long been solved by platform-based services like TradeEdge.

Real-time inventory visibility:

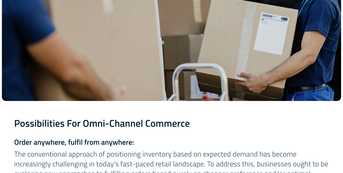
This is yet another driver for success. As much as it is important to know the rate of sales, a brand's ability to meet such demand is critically dependent on knowing how much inventory exists across its entire network. In real time! By virtue of being inherently associated with a specific location, real time inventory visibility is no longer limited for use in the planning realm rather for executing against individual consumer orders.

Unified Repository:

Recognizing that omni-channel blurs the boundaries between physical and online, bringing together sales and inventory data in real or near-real time from across channels is a key step in breaking those channel silos. Consequently, one's ability to fulfill orders without looking at the 'color' of the inventory gets maximized. Unified data repositories can only be bested by making such information available across your entire network.

Business networks:

By now it must be evident that no two businesses, especially those that are part of the same value chain, can be successful independent of the other. It goes without saying that such success is dependent not only on collaboration between the maker and the seller, but includes a larger ecosystem of logistics and financial enablers, each of who needs access to the same information that brand manufacturers and retailers are operating from. The result is the creation of a business network whose limits are only determined by the participants of such network.



Possibilities For Omni-Channel Commerce

Order anywhere, fulfil from anywhere:
The conventional approach of positioning inventory based on expected demand has become increasingly challenging in today's fast-paced retail landscape. To address this, businesses ought to be exploring new approaches to fulfilling orders based purely on shopper preference and/or optimal fulfilment costs. This requires that businesses in the network fulfill a customer order regardless of inventory ownership and reconcile later necessarily implying collaboration across the network.

> Further, when supported by a platform such as TradeEdge Network with its common data model anchoring the participants' underlying systems of record, a pre-requisite to reducing latency of interactions between parties and eliminating point-to-point integrations, inter-operability across parties becomes a new reality.

Reverse Logistics:
Omni-channel commerce is as much about driving consumer buying experience as it is about when he/she decides to return a product. The same principle that was used to execute a fulfilment from the most optimal location would now be used in the other direction. i.e., enhance shopper convenience by allowing her to return goods at any store nearby whether owned by you or a partner.

Product Traceability:
For food and beverage companies who are constantly faced with the possibility of product recalls, the ability to track products at a pallet/batch/lot level in real time becomes a key differentiator for those minimizing recall costs and staying compliant with local statutory requirements and those that don't. Depending on the size of a recall, it could mean tens or even hundreds of millions dollars that would otherwise impact a company's financials.

Conclusion:

The traditional value chain paradigm is shifting towards value networks or multi-enterprise collaboration networks which emphasizes many-to-many connectivity. Being part of such a network can help brands uberize delivery of products and services and enable a superior shopper experience. A brand becomes the fulcrum bringing together various players such as retail stores, logistics players, suppliers and customers.

> This new paradigm becomes even more powerful when non-competing brands come together as a consortium to collectively drive inefficiencies out of the eco-system compared to doing it alone (which has traditionally resulted in just shifting costs from one player to the other or from one function to the other in the name of optimization). The shift to value networks is not a matter of if but when!

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Data and AI for retailers

That's what keeps them trendy

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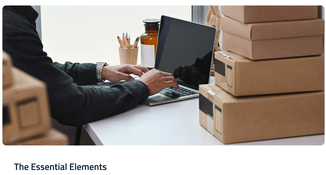
Summary

The article discusses how retailers are using data and AI to stay trendy in the digital age. Leveraging data analytics, machine learning, and AI to understand customer behavior, retailers are developing personalized recommendations, optimizing pricing strategies, and streamlining supply chain operations. Examples of companies such as Walmart, Sephora, and Amazon show how data and AI can enhance customer experiences and drive business growth. The article also highlights the challenges and opportunities retailers face in implementing data and AI strategies and concludes with key takeaways for retailers looking to leverage data and AI to stay ahead in the competitive retail industry.

It is a bizarre time for consumers. The pandemic may have eased off, but the possibility of inflation and recession keeps economic uncertainty around. Repercussions on consumer behaviour remain to be seen.

> According to Forrester's Predictions 2023[1] guide, consumer spending will increase despite economic headwinds. The savings made during the pandemic, and an estimated increase of over 6% in household cash flow in the latter half of 2023, will keep consumer spending intact. This puts the onus on retailers to retain and attract customers by providing them with the best experience.

Activewear company Solfire is one example[2] that places the utmost importance on customer experience. It aims to build a community comprising customers and maintain lasting relationships. Its stores have smoothie bars and dedicated areas where fitness clubs can socialize and work out. During checkout, it asks customers to fill out their information in an iPad point of sale (POS) system. According to Solfire, most customers do it willingly to stay updated on community events.



The Essential Elements

Delivering memorable customer experiences is a failsafe path to improved customer satisfaction and loyalty, which drives repeat rates and sales. Analysis[3] by Harvard Business Review shows that customers with the best experiences spend 140% more than those with the poorest backgrounds.

Memorable customer experiences improve customer satisfaction and loyalty, driving repeat rates and sales.

Retailers can take customer relationship management strategies to new heights by leveraging the right mix of technologies. This includes:

- Intelligent technologies for autonomous retail
- Online marketplaces and predictive analytics
- Data-driven and automated supply chains
- Automated stock management

Let's explore each of these in detail.

Smart technologies for autonomous retail

Consider the convenience of a cashier-less store with a self-checkout option. A surreal space where there is no interaction yet an interconnectedness between the shoppers, suppliers, and partners. This happens through person detection, object recognition, activity analysis, and pose detection, among other aspects. This concept took off through Amazon Go stores, where customers must download the Amazon Go mobile app to enjoy the convenience of skipping the checkout process[4] entirely. Retailers like Aldi, Carrefour, Sainsbury's and 7-Eleven also experiment[4] with this technology. AI-driven video analytics solutions – that allow real-time monitoring of transactions – help retailers reduce inventory loss caused by theft in a self-checkout environment that lacks staff supervision. In other scenarios, streaming video feed analysis in real time provides retailers visibility on customer traffic congestion areas and lets them redirect staff to packed areas.

The Infosys Extended Store Solution[5] is an end-customer mobile application that enables customers to scan an item in the store, build a cart, and make contactless payments. This lightweight, noninvasive system provides scan and pays & go capabilities for a contactless checkout experience on consumer smartphones.

> Augmented and virtual reality technologies can also provide immersive and memorable digital experiences. Nike partnered with Roblox to create Nikeland, a metaverse where users can dress their avatars in Nike-branded virtual outfits. Louis Vuitton made headlines when it launched Louis: The Game to celebrate its founder's 200th birthday. The phone app lets users follow the protagonist 'Vivienne' through six different worlds in search of collectable non-fungible token (NFT) candles. When it comes to AR and VR, no brand wants to stay behind, be it sporty, high-street, or luxe.

Online marketplaces and predictive analytics

Analysis[7] by financial services advisory firm IBe shows that online marketplaces could be worth as much as $7 trillion in sales by 2024. Online marketplaces are ideal platforms for retailers to connect third-party sellers with customers and reap profits. Vendors, especially small businesses, get visibility for their products without setting up an e-commerce platform alone or incurring heavy expenses.

> Automating processes eliminates the need for legacy systems and related inefficiencies for all parties involved. Predictive analytics helps businesses assess their customers' profiles and behaviour and understand their needs. Customers, too, benefit from online marketplaces, having access to great deals from various vendors.

For example, a leading sports fashion retailer uses a connected eco-system of suppliers, contract manufacturers, wholesalers, distributors and retailers to improve performance across the supply chain. This holds benefits for all parties involved, enhances customer service and boosts loyalty to the brand. Linking multiple roles across a cloud-based platform leads each partner to do its work better.

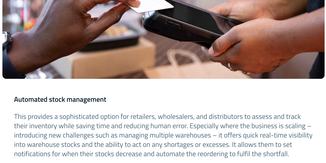
Some retailers have created a 'one inventory' model. The capability to fulfil demand from anywhere reduces inventory holding and enables fast response to changes in demand. Promotions can now precisely target micro-markets and zip codes.

Data-driven and automated supply chains

Climate and geopolitical factors have disturbed supply chain operations globally. The issues caused include a need for more visibility regarding demand prediction, product availability, pricing strategy, transportation costs, delivery tracking, last mile optimization, asset visibility and utilization, and carbon footprint.

> Organizations can leverage advancements in Data Science, AI, and IoT to solve issues related to the supply chain. Access to the right data can help supply chains be agile, resilient, and responsive. It can help detect a problem early or even preempt it and take the necessary measures.

Automating tedious tasks in a supply chain saves time and effort, reduces errors, and resolves labour shortage issues. According to the Lucas Systems Voice of the Warehouse Worker Insights[8], technology drives[8] employee attraction and retention. Of the respondents surveyed, 90% believe that investment in new technology will attract and retain workers instead of creating a fear of being replaced. Automation is sometimes the bad guy, and perception is changing in its favour.



Automated stock management

This provides a sophisticated option for retailers, wholesalers, and distributors to assess and track their inventory while saving time and reducing human error. Especially where the business is scaling – introducing new challenges such as managing multiple warehouses – it offers quick real-time visibility into warehouse stocks and the ability to act on any shortages or excesses. It allows them to set notifications for when their stocks decrease and automate the reordering to fulfil the shortfall.

> Automating mundane supply chain tasks saves time and effort, reduces errors, and resolves labour shortage issues.

> It also offers insights into sales made and what inventory is to be expected without any manual effort to create or analyze inventory reports.

This streamlines the entire process – from receipt to order fulfilment – and manages customer order deliveries flawlessly.

Infosys Simplified Supply Planning™ is an advanced supply chain inventory planning solution that offers time-phased replenishment with warehouse and store-level order smoothening. The answer is designed to provide multiple replenishment methods for producing a flexible buy plan for the entire chain.

Clearly, technology trends combined with data and AI can reinvigorate retail. However, this involves challenges that businesses must understand and know to tackle.

To read the challenges associated with Data and AI and how to overcome them, head to **How Data and AI are Helping Retailers Get Trendy | Infosys Knowledge Institute**

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Driving Automation Success in Banking

with Process Discovery

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Summary

Traditional banks are struggling to keep up with new-age financial services businesses that are gaining advantages from data-driven technologies. However, revitalizing legacy systems with new data-driven technologies, processes, and products can enable scale, driving better customer experiences. Automation in the banking industry can save between 30% to 70%, and various areas can benefit, such as customer service, accounts payable, and HR services. Read on to know how AI-driven process discovery helps identify repetitive and mundane processes, ultimately leading to cost savings and efficiency improvements

Traditionally, the banking industry was at the forefront of tech-driven transformation. However, the once innovative and cutting-edge technologies have turned into legacy systems. Traditional banks need help to keep up with new-age banking and financial services businesses gaining advantages from new data-driven technologies.

Traditional banking organizations must revitalize their legacy systems by introducing new data-driven technologies, processes, and products. When combined with legacy infrastructure, these new-age systems have the advantage of scale, enabled by vast volumes of historical data that drive better customer experiences.

Discovering Opportunities For Automation In The Banking Industry

In the banking industry, there are many areas where manual work can be replaced with automation tools to free up efforts for more effective use elsewhere. Effective banking drives growth and provides hassle-free banking experiences to customers.

> The savings from automation can range from 30% to 70%, depending on the automated process. Some crucial areas that can benefit from automation include customer service, compliance, accounts payable, KYC, report automation, account management, managing deposits and loans, fraud detection, credit card processing, and HR services. By automating these processes, banks can offer better services to customers and utilize their workforce more productively.

Challenges Of Process Discovery In The Banking Industry

As mentioned earlier, the banking industry faces the challenge of ageing, legacy applications, and an intricate web of processes. Further, the nature of banking operations is strictly regulated, and there is no easy access to applications and processes. The data stored includes customers' personal and confidential data, which Data Privacy and Protection Acts regulate.

A 2020 PwC[1] report states that a staggering 81% of banking executives are overwhelmed by the speed of technological change that calls for constant refinement and restructuring of business processes.

Despite being one of the most data-driven sectors, the banking industry must catch up in digital transformation due to core legacy systems developed in the 1970s. The scope of this problem is enormous, with Reuters reporting that almost 43% of US banks use COBOL[2], a programming language from the 1950s. These legacy tech stacks are incompatible with digital technologies, making legacy system replacement projects massive, expensive, and, most importantly, risky.

> Banking organizations adopting automation must first identify, map and discover process variations and opportunities for automation. However, owing to the strict IT and data security policies, process discovery can become a tedious process with the potential to miss out on many vital tasks and points of interaction.

One of the largest Fortune 500 financial services companies in the US, with a wide range of services across retail, commercial banking, investments, insurance, wealth management, asset management, corporate banking, capital markets & specialized lending, was facing a high volume of complex manual processes leading to increased processing time & errors. Employees were spending manual efforts in high volume, low dollar chargebacks leading to potential revenue loss, accounting processes requiring manual checks & validation across several applications, and a high frequency of ATM audits, fraud reporting, credit card loan verification, teller cash reconciliation and financial insights leading to increased error rates in processing.

Ensuring Data And Process Security During Process Discovery

AI-driven process discovery helps deliver business process insights by accumulating process and task-level data from user devices across the bank, analyzing the collected data, providing insights using visually rich process maps, and creating a blueprint for automating the right processes. During this process, care is taken to ensure compliance with data security and privacy policies.

> Mature process discovery platforms include advanced security features that ensure data encryption and minimization for GDPR compliance, role-based access control, transparency, purpose limitation, masking, and screenshot redaction. The whole process of discovery is executed either on-premise or in the private clouds where the banking systems are hosted, ensuring that there is no exposure of process or data to external parties.

Advantages Of AI-Driven Process Discovery For The Banking Industry

AI-driven process discovery in banks consciously discovers processes that need to be automated and validate them based on the frequency of execution, efforts involved, and business expectations. This helps banks derive cost and effort savings for automated processes, have a session with businesses, and finalize the processes based on the above points.

> Instead of automating all processes at once, banks can automate one process, share the value with businesses, and get their acceptance before moving on to automating other processes.

The US financial services company adopted AI-driven discovery to streamline its manual processes. They identified over 45 techniques and 35 applications that could benefit from automation and used continuous integration and deployment to create over 230 bots in production. The results have been impressive, with an estimated annual savings of US$184k and a 5% increase in customer satisfaction.[1]

Process Discovery Delivers Cost Savings And Efficiency Improvement For Banking

Automation is becoming increasingly important in the financial sector, especially in banking. As more and more banks are shifting towards online and mobile applications for managing customer accounts, it's becoming harder to retain customers and stay competitive. But, banks can differentiate themselves by effectively utilizing their workforce and getting the best out of them. And that's where AI-driven process discovery comes in! Process discovery can save businesses time and effort by effectively identifying repetitive and mundane processes, ultimately leading to cost savings.

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AI for Financial Services

Bridging the Gap Between Risk & Compliance vs Innovation

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Summary

Are you curious about how artificial intelligence (AI) is transforming the banking industry? According to a recent survey, banking executives believe new technologies like AI, automation, and blockchain will continue to drive the global banking sphere for the next five years. But what about regulatory concerns around these technologies? While risk management has never been about risk avoidance, banks must re-evaluate their risk culture to win in the digital age. In this article, we explore how AI is crucial in accomplishing risk and innovation goals and delve into some exciting AI use cases in the client onboarding and AML/KYC space. But how can disruptive AI be successful in banks? Read on to find out.

The pace of digital innovation in financial services has been stupendous in the last few years. From products and services like digital banking, digital wallets, robo-advisory, and crypto trading, to the adoption of infrastructure driving open banking, cloud banking, and real-time payments, as well as serving high-risk growth businesses like the cannabis industry, online gaming, etc. – the landscape is rapidly changing.

Findings of an Economist Intelligence Unit survey[1] report say that 66% of banking executives believe that new technologies like AI, Automation and Blockchain will continue to drive the global banking sphere for the next five years while regulatory concerns around these technologies remain top of mind for 42% of banking executives.

While robust risk management has never been about risk-avoidance but rather to manage risk effectively, in this age of tech-driven innovation, banks must relook at their risk culture and reassess the desired risk-reward balance to win in the digital age.

The Risk & Compliance functions continue to become more of a strategic business partner, enabler, and driver – and intelligent automation/ AI can play a significant role in bridging the actual or perceived gap between risk and business innovation.

A Top-Down View Is The Need Of The Hour

Risk management and business innovation might intuitively appear at loggerheads with each other. Taking a strategic view, however, there is a common set of objectives to be driven from both a risk and an innovation perspective. A few examples are listed in the table below.

HOW MIGHT WE...	RISK PERSPECTIVE	INNOVATION PERSPECTIVE
... become truly customer-centric	Get an accurate client-centric 360 view of risk across the client lifecycle.	Offer hyper-personalized solutions throughout the customers' financial lives.
... enhance user experience	Frictionless risk journeys for first and second line employees	Simple, digital journeys for clients
... rapidly respond to the evolving industry landscape	Respond to regulatory changes quickly and effectively	Build competitive advantages out of the changing regulatory and business landscape
... dramatically improve operational efficiency	Streamlining and automation of processes to reduce risk	Reimagine analyst productivity and skillsets
... leverage data insights	Strengthen risk oversight	Insightful and predictive offerings

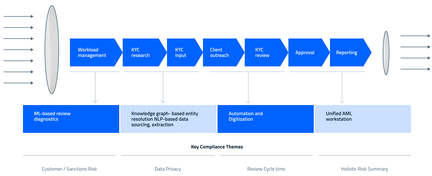
AI can play a key role in accomplishing the risk and innovation goals in each of these broad themes. So, if Financial Services firms take a top-down view, they can drive AI programs strategically to achieve enterprise-wide objectives rather than implementing use cases in silos.

A Deeper Dive Into Some AI Use Cases

Let us take the example of client onboarding and KYC reviews to demonstrate the applicability of AI across the value chain, both for reimagining and innovating the process, and for improving risk management as part of digitalization.

KYC Review Value Chain

KYC Review Value Chain: AI-led Innovation and Key Compliance considerations



Some use cases for applying next-gen technology in this space include:

- **Knowledge Graphs**: Entity resolution and network analysis can help evaluate risk in the context of associations and connected data. The insights generated from the connected data across client relationships can help spearhead innovations, from minimizing client burden during onboarding (staying one step ahead in data gathering) to providing a one-bank model for customers.
- **Process mining**: Control gaps, operational violations or inefficiencies can easily be detected, and automated risk & controls can be implemented to address these. The process intelligence provided can drive multiple innovations to streamline and simplify the onboarding journeys and omnichannel onboarding experience.
- **Advanced Analytics**: In the AML/KYC space, insights, predictions, and outlier detection can help risk managers better manage emerging risks. Similarly, these insights can help with new customer acquisition at exponential volumes and provide hyper-personalization of offerings cutting across business/ product silos.
- **Natural Language Processing / Generation**: Drive risk insights from unstructured data while improving the productivity of Risk & Compliance managers. At the same time, it can be game-changing in simplifying the complex account opening requirements for clients and streamlining requirements across business/ product lines and jurisdictions.
- **Generative AI**: Of course, one cannot fail to mention the latest technologies, which can quickly transition from hype to actual use cases like conversational advice to clients and risk summarization for compliance managers.

We have helped implement several of these use cases at both mid-sized and large FS firms, not just at the Proof-of-Concept level but also at production scale. In our experience, a critical success factor at these firms has been an active buy-in and involvement from Risk and Compliance executives; in fact, many of these initiatives have been led by and piloted for the second line of defence even before being used by the first line of defence.

How Can Disruptive AI Be Successful In Banks?

Disruptive technologies can be a significant enabler of innovation and digital risk management, but we must acknowledge that they can also bring newer manifestations of operational, financial, and reputational risk.

- Top management and Boards need to gain a deeper understanding of disruptive technologies and their associated risks.
- As banks focus on technology-led innovation, they must include Compliance and Risk as partners, enablers, and advisors from the start of their transformation journey.
- A culture of Digital Risk by Design needs to be established while also digitizing core risk processes themselves.
- Compliance, Risk and Legal teams need to restructure and reskill to have a seat at the digital innovation table.

It is but a myth that Risk and Innovation – the twain shall never meet. Thoughtfully applied next-gen technologies can play an instrumental role in bridging the gap for financial institutions.

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Personal Data Protection

Data Privacy and Protection is important as ever

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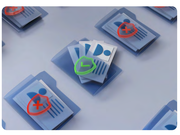


Summary

Data is the new oil fueling the digital economy, but its flow is threatened by data privacy regulations and AI-driven platforms. How can businesses protect personal data throughout its lifecycle and include data privacy and security in their digital transformation efforts? Find out why a centralized privacy policy is crucial and how identifying vulnerabilities and building data privacy into workflows can unlock the true potential of your enterprise in the digital age.

While oil was one of the most critical resources of the industrial age, data is now powering the engines that the digital economy is progressing on. The internet, the backbone of the digital economy, is seen as the new oilfields with IOT, automation, AI/ML and other emerging technologies providing the refining process to transform raw data into valuable insights that power decisions.

For the past decade, digital transformation has been a critical item on every CXOs agenda. The digital transformation initiatives generate data about products, services, and customers, helping organizations predict trends and take decisive actions to improve customer experience and increase customer satisfaction.

> At the same time, with businesses utilizing and exchanging sensitive data, there is an increased risk of data breaches and leaks. The year 2022 alone saw various business titans, including Apple, Meta, Twitter, and Samsung, disclosing security breaches involving sensitive customer personal information with rising frequency.

The Need for a Centralize Privacy Policy Amidst Increasing Data Privacy Regulations

Governments and regulatory authorities focusing on data privacy and personal information protection mandate privacy regulations and strict control. These drive large organizations with data-driven operations to start their privacy program efforts.

A Gartner prediction[1] states that 75% of the global population will have personal data covered under privacy regulations, with large organizations' average annual budget for privacy exceeding $2.5 million by 2024.

> Managing data privacy through a centralized user experience is becoming critical for organizations today. Recent GDPR updates in the United Kingdom give consumers greater control over their data, leading to heightened expectations for transparency regarding its usage. A centralized privacy policy is necessary to manage data effectively. This can include integrating web privacy components such as notifications, cookies, consent management, and subject rights requests (SRR) processing into a single self-service portal, simplifying things for critical stakeholders, consumers, and workers, and saving time and money.

How AI-Driven Platforms And Social Media Are Impacting Data Privacy

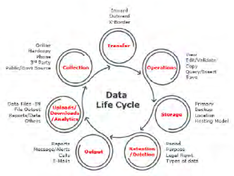
Businesses and consumers interact through social media platforms that collect large amounts of personal data. Further, with the help of AI-driven platforms, data is being processed to create new engines that serve as filters and controls for privacy-enhancing technologies. While these technologies are increasing the rate of innovation and adoption of new ways of existence, they pose a significant risk to data privacy.

Individuals are asking for more control over the information collected about them and how it is used, who can access it, and how the organizations collecting the information protect their personal information. Organizations must build trust in individuals about their data privacy measures and how their data is handled within the system.

Identifying vulnerabilities in the data Lifecycle to ensure data privacy

Data is a valuable company asset, and protecting it by identifying vulnerable points throughout the lifecycle is crucial. Data privacy risk is defined as the potential harm that the violation of personal data can cause. Data is most susceptible at five key stages - collection, storage, sharing, analysis, and deletion – and a data breach at any stage can prove quite costly.

The points of vulnerability are determined by where personal data can be found - transit/transfer, rest, UI display, weblogs, system logs including access and delete, real-time databases, backup and archival data, storage, sharing, channels, interim storage, 3rd party access to the database, in hardcopy and print medium, report uploads and data downloads from apps/sources. By understanding where the data is located within the system, technical and process controls can be implemented at different layers to protect its security and privacy. These controls include UI level, application, database layer, API layer/ESB/3rd party integration, infrastructure, log management, audit trail, NFRs, business domain, and analytics.



Understanding The Role Of Data Privacy And Security In Protecting Personal Data

Let's understand what the difference between data privacy and security is. They vary primarily in whom or what they are protecting personal data from.

Data Privacy prioritizes the individual's rights in deciding how their personal information is handled, processed, stored, and used. Data Privacy ensures that the way personal data is processed, stored, or transmitted by any business complies with regulations and has consent from the owner of that sensitive data.

> Survey findings[2] Prosper Insights & Analytics reports that 62.3% of consumers don't like it when social media sites, search engines, mobile apps, etc., are tracking their online and mobile location data, allowing advertisers to use it to send them targeted advertising.

Individuals and end-users demand more privacy, including clarity, choice, and authority over how businesses collect and use their data, resulting in the digital ecosystem including multiple data privacy tools. Data Privacy tools include browser extensions and add-ons, password managers, and other services that help block websites, internet browsers, cable companies, and internet service providers from tracking personal information and history. This forces businesses to rely on data gathered directly from customers for further processing.

Data Security focuses on securing and protecting personal and sensitive data from unauthorized access or exploitation by third parties. Data security is a prerequisite to data privacy, setting the policies, methods, controls and means necessary to secure personal data. Data Security[3] controls[4] include identity and access management, data loss prevention, anti-malware, anti-virus, event management and data masking software that helps protect data from compromise by malicious actions of both internal and external parties.

With the increasing risk of data privacy, organizations need to include the building blocks of data privacy and security as part of business innovation and digital transformation to protect personal data at every stage of the data life cycle. Enterprise IT teams must implement technical and process controls at different system layers to ensure that personal and sensitive data is secure, and privacy is respected.

The Increasing Role Of Data Privacy And Protection And Privacy Due To The Impact Of Globalization

As enterprises are expanding globally, data is being shared across borders. Global organizations are implementing privacy-enhancing technologies (PETs) to protect and secure sensitive data. Government regulators are also promoting the use of PETs and are developing frameworks that assess the impact of these technologies on data access and availability. However, it is eventually the responsibility of the enterprises to ensure that their technology platforms comply with data privacy regulations and privacy policies that are in force in the specific geography and industry.

There is a continuous evolution in how businesses collect, process and use data with corresponding advancements in data security, privacy, access processes and regulations. As data volumes and sources continue to grow, rules will become more stringent to ensure the safety and protection of personal data.

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Rethinking Insurance with AI

By Exploring the Synergy of ChatGPT and RPA

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Summary

Have you heard about OpenAI's ChatGPT technology and how it could revolutionize the insurance industry? A McKinsey report suggests that between 10% to 55% of insurance functions could be automated by 2030 by integrating ChatGPT and robotic process automation. This could lead to streamlined insurance claims processing, faster risk assessment, and reduced insurer costs. Intelligent chatbots could also enhance customer service and reduce the workload of customer service representatives. However, implementing these technologies at scale could pose challenges such as data privacy, security, and change management. Read on to learn more about the potential of AI in the insurance industry.

With its current capabilities, McKinsey reports, OpenAI's ChatGPT can automate 10% to 55% of major insurance functions by 2030. (Please note that when we mention ChatGPT in the article, we are referring to the latest version, i.e. ChatGPT4)

Does this sound like great news for business? Certainly. But does it sound like good news for business leaders? Likely not.

> Google boss, Sundar Pichai calls AI more fundamental than fire or electricity. However, not everything's good because of this fundamental element. Millions have lost jobs to AI and automation, as we currently observe dwindling economic conditions. On the other hand, most industry leaders are still searching for answers to what AI is capable of yet. So, let's dissect one such industry that is on the cusp of rapid transformation - the insurance industry.

B.C. 2023 (Or, As We Call It Before ChatGPT, 2023)

To begin with, let's consider some real-world examples and the current usage of A.I. in the insurance industry. A.I. has already automated functions such as claim processing, accelerated claims adjudication, and rapid documentation digitalization, among other industry functionalities.

However, that's not the end of it. Reports suggest numerous other functions can be automated. This includes customer services and underwriting as well. Let's look at how this tech is redefining the insurance industry.

Streamlining the Claims Process

Going by industry standards, claim processing can be time-consuming and complicated, at the very least. The process is infamously known to **eat away 50% to 80% of insurance premium revenue,** making it one of the most in-demand tasks that need to be automated from a business perspective.

> With the integration of ChatGPT and RPA, the entire process could be automated and **reduce time by as much as 70%.** Consider this, RPA bots can extract information from customer-submitted forms, while ChatGPT can validate and verify the accuracy of the information provided by the customers. This results in a low likelihood of errors and improves the speed and efficiency of the claims process.

Underwriting

Underwriting, the process of evaluating and assessing risk, can overwhelmingly take a few days to weeks to say the final 'yes' or 'no'. This generally depends upon the applicant's quality and may get delayed further due to missing information. And this is where RPA and ChatGPT come into play. Using RPA, insurers can identify missing information and extract relevant information from the submission, reducing the time and effort required by underwriters.

> Next, ChatGPT can then be used to provide a comprehensive view of the submission and aid in quick decision-making. This helps insurers make informed decisions, reduce processing times, and improve customer service.

According to a McKinsey report, using RPA in underwriting can save as much as 60% of previously observed turnaround time, leading to a significant reduction in costs for insurers and the mutual interests of both parties.

Improving Customer Service

Undoubtedly, customer service is one of the critical functions of every industry, whether insurance or not. However, a large part of it is repetitive and needs lesser manual intervention, making room for automation.

> As per the experts, the intelligent chatbot can replace traditional bots, making it to interact with customers and brokers, thereby allowing insurers to improve their customer service and reduce the workload of their customer service representatives.

RPA can then automate tasks such as data entry or routing customer inquiries to the appropriate department, allowing customer service representatives to focus on more complex tasks and improving overall efficiency. A report by Gartner found that using chatbots in customer service can reduce customer service costs by up to 30% and improve[1] customer satisfaction by up to 25%.

Ensuring Data Privacy

For insurers, storage, security, and adherence to data compliance can be challenging, at the very least. In such times, a threat to millions of records can bring the company's reputation at stake and hence cannot be ignored at all costs.

> In such times, ChatGPT and RPA can help insurers ensure data privacy by automating data entry and processing tasks, reducing the need for human intervention, and minimizing the risk of data breaches.

In addition, insurers need to consider using secure cloud-based systems to safely store and process customer data. As insurance companies strive to become more efficient and customer-centric, ChatGPT and RPA evolve as powerful tools for automation and digital transformation. By leveraging these technologies' strengths, insurers can significantly improve their operations, including faster turnaround times, lower costs, and better customer experiences.

A Few Key Points To Keep In Mind Before Using ChatGPT And RPA Across The Enterprise

Despite knowing the benefits, companies haven't utilized these technologies at scale for numerous reasons. Most insurers claim to be aware of the challenges and considerations associated with A.I. Here are some critical challenges.

Data Privacy and Security

Insurance companies collect customer data massively. These records include access to personal, medical, and even financial information. Protecting these data from unauthorized access and breaches or being used for unauthorized activities is essential. ChatGPT and RPA put an end to this risk by automating processing tasks but haven't been successful in making any significant disruption yet.

Change Management

Implementing ChatGPT and RPA can require significant changes to an insurer's processes, systems, and culture. Insurers enable this by having a well-defined change management plan. The action plan includes training employees, clearly defined communication protocols, and retaining the concepts of stakeholder buy-in. This proactive approach allows insurers to ensure that their implementation of ChatGPT and RPA is successful and sustainable.

Integrating with Legacy Systems

No matter how far we may have come, most systems used in the industry run on legacy software and hardware. These systems fail to leverage the legacy system's computational aspects that are mostly incompatible with ChatGPT and RPA. To address this challenge, insurers can use middleware platforms to integrate ChatGPT and RPA with their existing systems. Middleware platforms act as a bridge between different software applications, allowing them to communicate with each other and share data.

Ethical Considerations

Let's face it. We are still afraid of the ways it could turn into a fiasco for the entire humanity. Even ChatGPT3 accepts it. Ask the bot, "What are the possible threats to humanity?" The machine gets that A.I. could turn devil. Likewise, ChatGPT can generate biased or discriminatory responses if it is not trained on diverse data sets. It, thus, is essential to ensure that ChatGPT and RPA are designed and used ethically and responsibly.

Regulatory Compliance

The insurance industry is subject to numerous regulatory requirements, including GDPR and CCPA. Insurers must ensure that their use of ChatGPT and RPA complies with these regulations. For example, insurers must obtain consent from customers before collecting and processing their data. A simple yet effective way to achieve this is by being transparent about how ChatGPT and RPA are used.

> An essential feature of the GPT-4 models, the latest version of ChatGPT, is its capability to analyze and process large volumes of documents. This has the potential to enhance document-heavy use cases in the insurance industry significantly. For instance, IDP platforms like XtractEdge can utilize ChatGPT's ability to analyze and summarize insurance policies, enabling underwriters to identify relevant information and make better decisions quickly. The benefits of ChatGPT extend beyond process lifecycle reduction, as it can also analyze customer data and generate personalized policy recommendations based on the customer's unique risk profile.

New Challenges And Opportunities Arising Through Leveraging ChatGPT And RPA In Insurance

ChatGPT and RPA are emerging as powerful tools for automation and digital transformation in the insurance industry. By leveraging these technologies' strengths, insurers can significantly improve their operations, including faster turnaround times, lower costs, and better customer experiences. However, insurers must be aware of the challenges and considerations associated with their use and take a proactive approach to implementation and change management.

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Automating Cybersecurity

For an efficient enterprise

Ashok Kumar Ratnagiri
AVP – Senior Director & Head – Information Technology Edgeverve

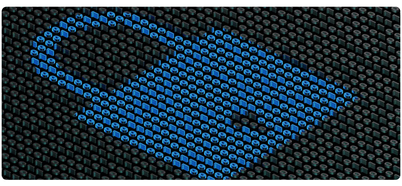
Summary

The global average cost of a data breach increased to USD 4.35 million in 2022, and the cybersecurity skills gap has grown by 26%, resulting in a shortage of cybersecurity professionals. To address this, enterprises are increasingly adopting automation in their cybersecurity operations, allowing skilled professionals to focus on more strategic tasks and improving the speed and accuracy of threat detection and response. However, the difficulty of automating tasks requiring human judgment and decision-making and the potential for hackers to exploit vulnerabilities in automated systems are limitations. How do enterprises take a holistic approach to cybersecurity automation?
Read on to learn more.

In today's rapidly advancing digital landscape, cybersecurity has become a critical concern for businesses of all sizes. With the increasing frequency and complexity of cyber-attacks, companies want to automate their cybersecurity processes to reduce risk, improve efficiency, and bridge the skills gap.

> According to a report by IBM, the global average cost of a data breach increased by USD 0.11 million to USD 4.35 million in 2022, the highest in history. These numbers are staggering and emphasize the importance of a robust cybersecurity strategy. However, many companies need help to keep up with the evolving threat landscape due to a shortage of skilled cybersecurity professionals.

The cybersecurity skills gap is a growing concern in the industry. According to the (IC) 2022 Cybersecurity Workforce Study[1], the global security workforce gap increased by 26 per cent, with 3.4 million additional workers needed to secure businesses effectively. This discrepancy will lead to a nationally significant cyberattack on a major US organization this year. This shortage creates a considerable challenge for companies trying to protect their data and systems from increasingly sophisticated cyber threats.



Automation: The Real Savior?

To bridge this gap, many companies are turning to automation. According to a report by KPMG, 81% of organizations surveyed have already implemented some level of automation in their cybersecurity operations. The trend towards automation is expected to continue, with the global market for cybersecurity automation and orchestration tools projected to reach $1.8 billion by 2024, according to a report by MarketsandMarkets4.

> Automation can help companies reduce reliance on manual processes and allow skilled professionals to focus on more strategic tasks. It can also improve the speed and accuracy of threat detection and response.

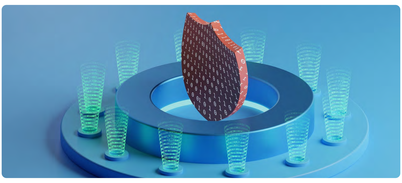
According to the Ponemon Institute, organizations that automate their cybersecurity processes can detect and contain a breach 63% faster than organizations that do not.

But Automation Still Has A Long Way To Go

However, there are limitations to automating cybersecurity processes. One of the primary limitations is the difficulty in automating tasks that require human judgement or decision-making.

> For example, determining the severity of a threat or deciding whether to investigate a particular alert may require human review. Automating these tasks could lead to false positives or negatives, increasing the risk of a data breach.

Another limitation is the potential for hackers to exploit vulnerabilities in automated systems. Hackers can use artificial intelligence (AI) and machine learning (ML) techniques to launch more sophisticated attacks that bypass automated security measures. This is known as adversarial machine learning, a growing concern in the cybersecurity industry.



We Can Overcome The Limitations, However

Companies must take a holistic approach to cybersecurity automation to overcome these limitations.

> This involves identifying the processes that can be automated without compromising security and implementing a robust governance framework to manage automated processes. It also invests in AI and ML technologies to detect and mitigate adversarial attacks.

One area where automation can be particularly effective is threat intelligence. According to a report by the SANS Institute, 49% of organizations surveyed have implemented some form of automated threat intelligence. This can help companies keep up with the increasing volume and complexity of threats by automating the collection, analysis, and dissemination of threat data.

Another area where automation can be effective is incident response. According to a report by McAfee, 51% of organizations surveyed are using automation to speed up incident response times. This can reduce the impact of a breach by allowing companies to respond quickly and effectively.

Automation Is Not A Silver Bullet

It requires careful planning, implementation, and management to be effective. Companies need to identify the right processes to automate, implement a robust governance framework, invest in the right technologies, and foster a cybersecurity-first culture within the organization. One way to ensure the success of cybersecurity automation is to involve all stakeholders in the process. According to a report by McKinsey, applying all stakeholders in the process can increase the likelihood of success by up to 30%. This includes IT and security teams, business leaders, and end-users.

> IT and security teams play a crucial role in identifying the right processes to automate, implementing the automation framework, and ensuring that automated processes are secure and effective. Business leaders must be involved to ensure that automation aligns with business objectives and priorities. End-users need to be trained and educated on how to use automated tools and technologies effectively.

Another critical factor in the success of cybersecurity automation is the ability to measure and monitor its effectiveness. Companies need to establish metrics and KPIs to measure the impact of automation on risk reduction, efficiency, and cost savings. This will help identify areas for improvement and enable continuous optimization of automated processes.

Automation Can Help If You Let It

In conclusion, automation can transform cybersecurity operations by reducing risk, improving efficiency, and bridging the skills gap. However, automation has limitations, and companies must take a holistic approach to ensure its success. This involves identifying the right processes to automate, implementing a robust governance framework, investing in the right technologies, fostering a cybersecurity-first culture, involving all stakeholders, and measuring and monitoring its effectiveness. By doing so, companies can achieve their cybersecurity objectives and protect their data and systems from increasingly sophisticated cyber threats.

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The Editorial team would like to thank all the key stakeholders involved in conceptualizing and creating The Edge Quarterly.

SAFE HARBOR

Certain statements mentioned in this release concerning our future growth prospects are forward-looking statements regarding our future business expectations intended to qualify for the 'safe harbor' under the Private Securities Litigation Reform Act of 1995, which involve a number of risks and uncertainties that could cause actual results to differ materially from those in such forward-looking statements. The risks and uncertainties relating to these statements include, but are not limited to, risks and uncertainties regarding fluctuations in earnings, fluctuations in foreign exchange rates, our ability to manage growth, intense competition in IT services including those factors which may affect our cost advantage, wage increases in India, our ability to attract and retain highly skilled professionals, time and cost overruns on fixedprice, fixed-time frame contracts, client concentration, restrictions on immigration, industry segment concentration, our ability to manage our international operations, reduced demand for technology in our key focus areas, disruptions in telecommunication networks or system failures, our ability to successfully complete and integrate potential acquisitions, liability for damages on our service contracts, the success of the companies in which Infosys has made strategic investments, withdrawal or expiration of governmental fiscal incentives, political instability and regional conflicts, legal restrictions on raising capital or acquiring companies outside India, and unauthorized use of our intellectual property and general economic conditions affecting our industry. Additional risks that could affect our future operating results are more fully described in our United States Securities and Exchange Commission filings including our Annual Report on Form 20-F for the fiscal year ended March 31, 2018. These filings are available at www.sec.gov. Infosys may, from time to time, make additional written and oral forward-looking statements, including statements contained in the company's filings with the Securities and Exchange Commission and our reports to shareholders. The company does not undertake to update any forward-looking statements that may be made from time to time by or on behalf of the company unless it is required by law.

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