

The edge

Vol' 02

quarterly



Thriving vs. Surviving in the new world
of AI and Automation

Thriving with Artificial Intelligence

Top 5 Automation & AI game changers

THRIVING SURVIVING

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THRIVING TOGETHER

We are in the thick of disruption today. The world is constantly changing, and AI & Automation is at the heart of this evolution.

Enterprises today face a multitude of challenges — an exponential increase in customer demand, the pressure of delivering a superior experience, competition arising from disparate sectors, and clearly to have a robust and sustained bottom line. Simultaneously, there are two major waves of technological revolution unfolding that are questioning the way enterprises function and work — specifically AI and RPA. The breakthroughs in these new technologies are occurring at a rapid pace, and the changes will hit us sooner than we can imagine. In a not too distant future, we expect them to converge to become even more powerful.

What can an enterprise do in such a dynamic environment?

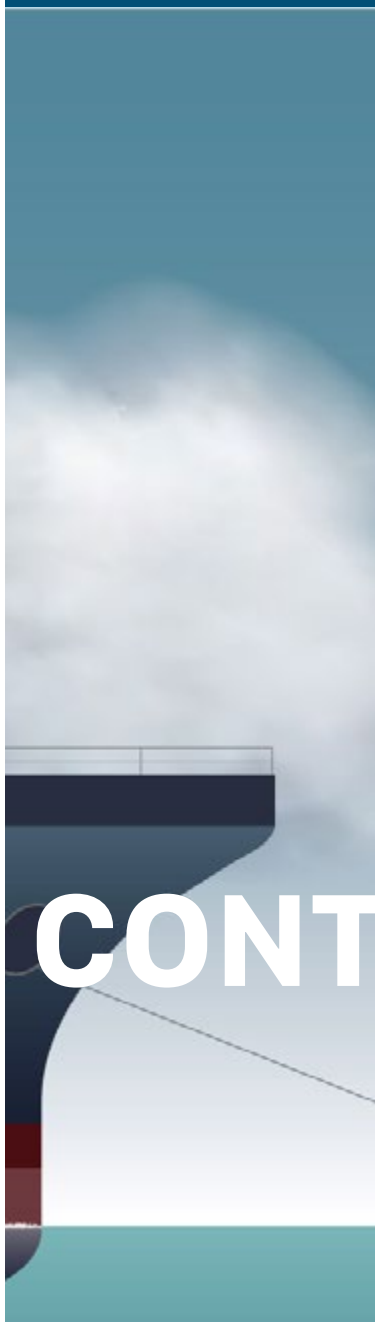
There are two ways in which your enterprise could approach these disruptive times. (1) Watch anxiously and try tentatively to salvage your threatened business. (2) Act decisively, striding ahead with confidence to embrace a new way of doing business.

The Edge Quarterly was conceived to share practical leadership ideas and best practices with enterprise leaders and strike a conversation around rewiring enterprises. We hope that you will like the articles and share ideas, thoughts, and comments. You can also view the online version of the magazine for access to other cutting-edge white papers in addition to blogs on AI and Automation at www.edgeverve.com/the-edge-quarterly

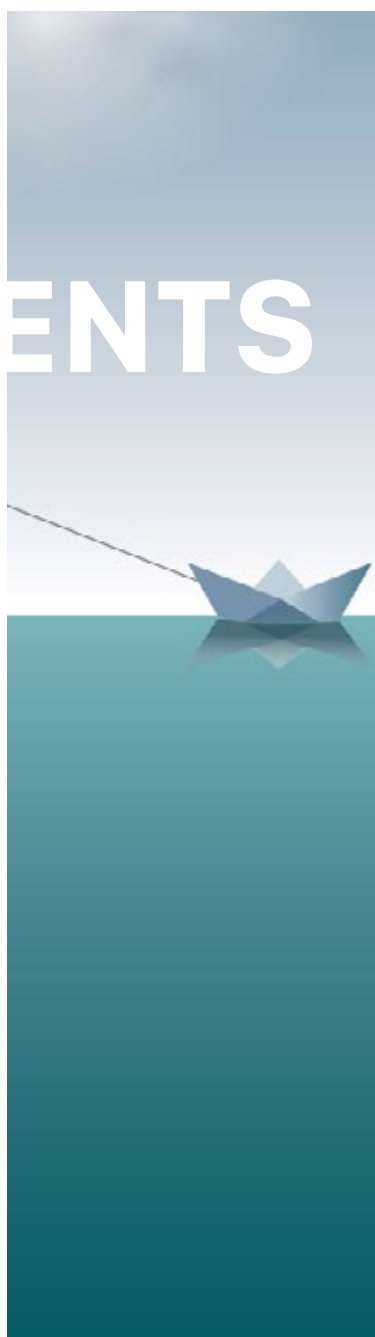
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- Editorial Team





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THRIVING

vs.

SURVIVING

IN THE NEW WORLD OF AI AND AUTOMATION





By Atul Soneja

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Thriving vs. Surviving in The New World of AI and Automation

There are two major waves of technological revolution unfolding that are questioning the way we function and work — specifically Artificial Intelligence (AI) and Robotic Process Automation (RPA). The pace of change in both these fields is unprecedented, with rapid breakthroughs happening even before we've had a chance to assimilate prior changes. A leading analyst firm predicts that over \$265 billion will be invested in new intelligence technologies by 2023 and by 2025, AI will be inescapable. Also, analysts have listed Hyper Automation as one of the biggest trends in 2020. Soon, an even more powerful convergence of AI and Automation will be the new normal.

It is incredible to witness our imagination becoming a reality. And AI and Automation are at the center of this reality — transforming every aspect of our personal and professional lives.

Driverless cars, drone deliveries, stores that already know what we want to buy, refrigerators that can stock up automatically; all of this is possible today. In industries, AI & Automation is parsing mountains of data to assist humans and revolutionize the way they work — be it predicting diseases like Alzheimer's in Healthcare or scrutinizing legal documents in Law.

We are in the midst of another industrial revolution — one powered by AI — that has the potential to profoundly affect how people live, work, and play. Technology will continue to evolve in making things smarter and smarter. It is expected that in two to three decades, the intelligence levels of AI will exceed the combined intelligence of humanity. AI will be one of the biggest influences on our generation and society, helping us push the boundaries of 'possible.'

Disruption is everywhere, and so is the fear and excitement that usually comes with change. On the one hand, people are excited about the traffic and safety issues autonomous vehicles will solve, and on the other hand, there are concerns about the possibility that the jobs of truck or cab drivers will disappear. I am a firm believer, that like every other technological change that humanity has gone through, we will find a way to thrive with technology and be able to better apply ourselves to human pursuits.

But I digress. Regarding this change, there are several questions that face us today as leaders of diverse enterprises:

- Do we have the time to get used to the idea of this change?
- Are we fully leveraging the potential of AI and Automation?
- Are organizations thriving in the world of AI and Automation or just surviving and struggling to use these technologies?

It's no more a question of why rather when

The annals of history are studded with examples of companies that have weathered similar disruptions and either thrived to become leaders; or barely managed to survive; or have become obsolete in the new reality. Recognizing the need to change, players in every industry are taking steps towards AI and Automation. From large companies like GE and Toyota leveraging robotics to lead in manufacturing, to the more recent examples with companies such as Amazon and Uber riding the evolution of the Internet-based smartphones and at present, using AI to power their backend, transforming customer experiences.

Most organizations are at different stages of their AI and Automation journey and have realized that only by embracing these technologies can they steer towards their larger goals. Either they take the lead and thrive in this digital economy or take a backseat and try to survive this change. Both, are potent strategies with their own pros and cons.

McKinsey's recent research suggests that companies that apply AI and analytics at scale are three times more likely to see outsized gains in revenue growth and cost savings than peers who linger in "pilot purgatory." In my conversation with a group of CXOs on a similar topic, there was vehement consensus that "If you overestimate the cost of being wrong, you underestimate the cost of being late." AI and Automation are true game-changers that today's organizations cannot afford to ignore.

The paranoia of staying relevant to clients

The former Intel CEO Andy Grove, in his book 'Only the Paranoid Survive', talks about a company's need to adapt to strategic inflection points when changes occur and threaten its existence. The only way to survive and thrive is to stay ahead of these changes. No wonder then that CEOs are paranoid about staying relevant to clients!

We are in the age of being relevant, where consumers compare their banking and retail experience to the one they get from Amazon. And if enterprises are not building themselves to own the customers and their problems - and succeed in solving that problem - they will fast become irrelevant. **AI provides an organization with the ability to perform constant analysis for insights and Automation enables them to take action on those insights.**

With all the conversations happening on AI and Automation, I felt that a grounded perspective on the actual, 'here and now,' trends happening in this space will be beneficial to all of you. These are not just trends, but strategic initiatives that enterprises are adopting, bringing them significant success. There are many ways to make AI and Automation work for an organization, and below are a couple of real success stories that impact the top line and bottom line.

- **Increase competitive advantage:** A global leader in the manufacturing of chocolates and confectionary infused AI to fuel visibility and agility across their supply chain. This helped them understand emerging demand patterns, provided insights on channel visibility and cannibalization to grow product category and plan new product launches better.
- **Improve efficiency and compliance:** A leading financial services organization used Automation to deploy best-in-class security with a role and profile-based access control. This helped them offer tiered access on a need to know basis and stay compliant with stringent regulations.

The opportunity to thrive!

So, we are at the start of 2020, and what does this year hold for AI and Automation?



For each of you and your organizations? We believe it's an opportunity to thrive! **AI and Automation have the power to solve problems for an enterprise and society at large. This capability is what makes these futuristic technologies exciting, along with the potential to enable enterprises to reimagine new possibilities.**

The journey from concept to outcome is a big deal for enterprises. Bringing new ideas from a level that is a prototype to success makes a huge difference. It is a highly complex and significant effort. Today, the biggest risk with AI and Automation is failing to work on it and stalling progress by failing to leverage it. Research indicates that approximately 30% of enterprises have been able to increase market share due to AI and Automation. On the flip side, around 70% of organizations are still at a pilot stage or yet to scale their AI and Automation

AI and Automation have the power to solve problems for an enterprise and society at large. This capability is what makes these futuristic technologies exciting, along with the potential to enable enterprises to reimagine new possibilities.

initiatives.

While the challenges in leveraging AI and Automation exist, we have seen many new ideas and evolution in the deployment of initiatives to overcome these challenges. For example, outcome-based models have become a reality in this space, shifting the focus from implementation problems to scale and success. **Recently, a leading US-based manufacturing enterprise embarked on a true RPA-as-a-Service engagement to automate around 350 processes across 30 countries on a gain share model. Similarly, a leading bank in the US leveraged AI to improve end-to-end customer experience measured through outcome and success.**

It's just the beginning

At EdgeVerve, we spend a considerable time thinking about this evolution and help enterprises, CXOs, business leaders and IT leaders transform their operations and business models. Last year alone, we worked with over 200 enterprises on a varied set of use cases to make their dreams of AI and Automation become a reality. We've made a difference by identifying various organizational dimensions that drive value through AI and Automation solutions rather than just our customers buying these components.

You will find many such examples and practical trends across this volume of The Edge Quarterly, that can be adopted immediately to accelerate the AI and Automation journey within your organization.

A key dimension to thriving in the world of AI and Automation is to realize that most of us are at the starting point of what promises to be a disruptor across industry segments. Similar to the Internet boom and an era when Google, Amazon, or Ubers of the world did not exist. But this evolution will be faster than what we have seen before. And 2020 holds great promise for taking AI and Automation forward. The question is, are you ready to thrive in the world of AI and Automation? ■

¹<https://www.mckinsey.com/about-us/new-at-mckinsey-blog/davos-2020-four-big-themes>

In conversation with




John Gikopoulos

Partner | Global Head AI & Automation,
Infosys Consulting

As AI makes waves across industries, we got John Gikopoulos to talk about the hottest discussion topic in the boardrooms today. In an enlightening interview, John gives us a way forward towards an intelligent future.

THRIVING WITH ARTIFICIAL INTELLIGENCE

A small, grey paper boat is shown floating on a blue surface that represents water. The boat is positioned to the right of the word 'WITH' in the main title.



Q: 2019 was when Artificial Intelligence (AI) started living up to its hype. Do you think 2020 is the year when AI will seep deep into the enterprise DNA?

John Gikopoulos (JG): When a new technology is still at the hype stage, everyone is so awed by its potential that no one talks about its problems. At the peak of these inflated expectations, the technology is hailed as something almost miraculous. The discussion around adoption obstacles or the challenges that the new technology will bring is almost non-existent.

Last year this was the case with AI. The hallowed initials AI were appended to every conceivable offering, much like it happened with IoT and Cloud in past years. However, people are now beginning to think much more critically about AI and are recognizing and talking about the challenges.

So, in my view, **2020 will focus on debating and solving the critical challenges that the widespread adoption of AI has revealed. This is the time when Artificial Intelligence needs to move beyond being a trend, a hype, and needs to become a reality and start delivering value.**

Process-heavy, data-intensive sectors such as financial services, healthcare, and manufacturing will likely see the most impact from AI. There is enormous scope for automating manual processes such as algorithmic trading; delivering insights for areas such as drug discovery; and identifying efficiencies from the shop floor to the supply chain.

Q: What are some of the key developments you envision for the year ahead? How can enterprises cut through the clutter and apply AI for impact?

JG: I believe the most important developments in the field of AI in the year ahead will be the following:

AI-as-a-Service

When everything is available as-a-Service, AI had to follow the trend. The as-a-Service model enables even the smallest company to benefit from enterprise-grade tech - revolutionizing the way that organizations procure technology. This approach can reduce upfront investments by more than 50% and ensure time-to-market occurs in weeks rather

than months. In 2020, at least 2 in 5 of AI-related deployments will be of the 'packaged' variety.

The exciting things about AI-as-a-service are one, the vast economies of scale that will make the technology available to every organization that wants to use it. And two, it will also help us create real and sustainable value by harnessing infrastructure, platforms, and knowledge. By packaging AI as part of a service, identifying and delivering on valuable new use cases will be much easier.

Solutions will gain prominence

Instead of looking at products and vendors to accelerate value; AI will bring solutions center stage. AI-based solutions will provide holistic approaches to resolving critical business questions rather than today's piecemeal approach.

This year, businesses will attempt to answer the key questions facing their organizations using best-of-breed, more cost-efficient, or even open source methodologies focusing on four categories:

- a. ML for the masses.** Data augmentation and data-healing techniques to enable the creation of test sets, which will enable more insightful outcomes upon choosing the right algorithm. In 2020, we will be able to move from an (unstructured, weak) data set to ML-created insight in less than 2 weeks.
- b. Customer-centric analytics.** AI will be able to 'translate' data-rich journey touchpoints into humanly digestible experiences in an easy, UX friendly way.
- c. Smart X / Smart Everything.** Leveraging IoT technologies to enhance real experiences, utilizing ML as an accelerator of adoption.
- d. Higher degree Automation.** RPA and machine-to-machine Automation that does not just solve one part of a (sub)process but instead identifies and prioritizes holistic reactive and proactive value creation across entire value chains. Moving from the bot and the bot farm to an Intelligent Automation-enabled Center of Excellence.

Greenfield AI

As the interest and belief in new technologies is growing, we are going to start seeing more

newfound enterprises begin life based on AI principles. AI will not only be thought of as the solution to incrementally lower cost, increase revenue, and adjust the customer experience, it will be used as the basis for the definition of the enterprise's business model. Just think of the differentiated way a transportation company changed the way it set up its operations during the transition from horse and carriage to mechanized means of transport. Enterprise requirements, KPIs, culture, business plans are all going to be based on the enhanced capabilities that AI enablement can bring.

Of course, this is only the tip of the iceberg. AI could evolve a lot more in the coming twelve months—moving past the hype into an incredibly rewarding a world where AI powers everything.

Birth of the 'AI Ethicist'

As AI-powered applications become indispensable to our work and personal lives, the ethics of AI is becoming an increasingly important consideration. This year will witness the birth of the AI Ethicist. Companies will start employing people or even teams of people whose primary role will be to formulate the ethics of our new AI-powered world. The main task of these AI Ethicists will be to define the field of play and the rules and conditions that govern it. In 2020, 2 out of every 4 AI-enabled organizations will announce the appointment of an Ethicist.

Q: We have quite often seen enterprises getting stuck in AI PoCs. How can enterprises move ahead and do things differently to nail and scale AI?

JG: There are two key issues companies face when it comes to using AI:

- 1. Considering it as a technology and not as something that requires organizational change**
- 2. Lack of know-how to scale the usage of AI to an enterprise-wide service.**

These pitfalls can be avoided by the ongoing collaboration across teams and by considering the broader cultural and organizational changes necessary to become a mature AI business. The following four-step approach should be employed:

1. Define your AI specific vision and aspiration.

When defining your vision, think cross functionally and across the organization, think holistically and have the end game in sight. Do not follow trends or hype and do not accept the limitations and directives of competition and vendors.

2. Calculate the value creation potential and identify the right enablers. Spend time upfront doing the math, identifying obvious and hidden costs, talk to organizations that have undergone similar journeys and comprehend what impeded progress.

3. Choose the right use cases by prioritizing. Identifying the starting point can make the difference between failure and success. Being able to tackle big and high worth projects is important, but implementation obstacles and challenges need to be surmountable. Being able to deliver value to your organization within a 3-6-month window will build trust capital that you can cash in later on to overcome soft hurdles (organizational mindsets and change management).

4. Set yourself up for success. Create a joint IT-Business Team that seamlessly coexists to translate business to IT requirements and obstacles back and forth. Ensure senior sponsorship to resolve bottlenecks at the highest level.

Across organizational change and AI implementation, organizations should also consider AI governance. The governance layer needs to suit the firm's level of AI maturity and the level of new risk introduced. At the same time, it must be built to be rapidly scalable as needed. Building a solid foundation for AI governance will help organizations manage programs and spend effectively and deliver high-quality services to customers.

And finally, organizations must have a roadmap in place for AI-related skills. Skilled and experienced AI resources are still scarce so expanding awareness of AI at both business and technical levels is vital to taking AI from experiment to broad scale production usage. AI skills and expertise should not just be in the domain of technology teams; instead, the opportunities, implications, and responsibilities

should be shared across an organization.

The question that any business must ask about their AI deployment is whether the technology is helping us make better-informed decisions. That, ultimately, is what AI means for business. The process Automation, the ability to learn, the data crunching-these are all the functions rather than the goal of AI.

Q: While AI offers a host of benefits, how can enterprises deter the unintended consequences and risks, such as privacy, data safety, information leakage?

JG: It is essential to understand that cybersecurity concerns are not, and cannot, only be limited within the realm of AI solutions and enablement. Cybersecurity is about guarding as well as proactively preparing for malicious attempts to cross the physical-digital barrier. As such, AI enabled processes, solutions, and tools need to be as safeguarded as any other interface within the enterprise boundaries.

In terms of user behaviors, the mental shift towards understanding that any information shared is no longer shared with a close circle of trusted recipients, but rather the world wide web of malignant and benign users is of the utmost importance. Again, along this barrier, AI can enable information exchange but rarely allow or expedite it unless the user requires it to do so.

In summary, the most crucial shift in an AI-enabled organization culture needs to come from AI users. As long as the enterprise has defined a robust and well-architected cybersecurity strategy, risks can be managed and mitigated.

Q: The debate around ethical AI has garnered a lot of eyeballs. What are your views on this topic?

JG: One of the most important ethical questions is about intention – for example, where, when, and how AI interacts with the analogue reality that we have all been accustomed to living in? Who is going to decide what is the right playing field and what constitutes acceptable or unacceptable uses of AI? Regulators and legislators are trying to define and control the degrees of freedom, but they are

working at analog speeds. We need faster answers to questions that we're already facing today.

Q: What is your advice for companies who are struggling with their AI Initiatives?

JG: There are four things enterprises will need to do to ensure that their organization can take advantage of all that AI has to offer in the future:

1. Acknowledge that AI will be an end-to-end journey

Many firms are trying to implement AI and Automation solutions in chunks, which makes sense as there is a tremendous amount of risk involved for most companies. The problem is that these chunks tend to be built in layers, meaning they replace one part of a process instead of end-to-end, resulting in limited value. For instance, customer service ChatBots in most companies today can only offer very rudimentary, FAQ-type support. When the customer actually speaks to a human agent, they need to repeat their question, and this leads to frustration and makes the customer experience worse. Organizations need to ensure they implement AI in vertical chunks rather than horizontal chunks-covering one process end-to-end.

2. Work with HR to reskill employees

Companies are seeking developers, data scientists, and solution architects to build in AI processes. However, demand for these professionals far outpaces supply. There's only so many people that you can get straight out of university and into these heavy-duty processes to manage end-to-end customer journeys. Hence, retraining and repurposing individuals working in IT and the business side to become data scientists and solutions architects is important in the near term. The next generation of data scientists and solution architects are going to be 40-year-olds, tenured people who are retrained and repurposed to carry out this type of activity.

3. Spearhead smart technology investments

Messaging about the path forward toward AI and Automation in any organization needs to come from the CIO. Technology is at a level right now that it can support and realize Artificial Intelligence

and Automation solutions. The need of the hour is to choose the right process and the right tools to deliver on this potential.

4. Lead the ethical discussion

There is a lot of talk about how humans can ensure that machines, systems, and algorithms do not expose or take advantage of the information they are supplied with. We're looking at this the wrong way. **We're trying to manage the aftermath that the bullet might cause once it has left the gun. Organizations need to be extremely careful about what they plan to do with AI before they begin using it,** which means taking into account potential issues with cybersecurity and biased algorithms.

Q: Could you please share some real-life use-cases of companies who are thriving with their AI Adoption and what would your advice be as they go through their journeys? (Things they did right that other companies can benchmark against).

JG: Two shining examples of AI at work are a British educational institution employing AI to predict and proactively manage student attrition and a global cosmetics manufacturer who has deployed a B2B2C assistant avatar that learns as it assists the company's retail partners.

The educational institution, one of the world's first remote schooling establishments, was facing substantial student attrition to online learning. By looking at the challenge holistically, the institution managed to tap into all its different data sources. Consistent cohort analysis helped them predict the chances of a student failing or dropping out of a course pretty much at the moment of sign up. By adopting different communication channels to convey the message as well as offer alternatives, the institution has managed to drop attrition rates by at least 30%, thus allowing it to re-establish a viable business model in the way it delivers remote learning.

For the cosmetics manufacturer, the focus was on deploying an advanced chatbot solution that not only interfaced with / reacted toward retailers but also had a real ability to learn and adapt. After a short gestation period, a human-like avatar has

been deployed as the main interfacing channel with the company's affiliated retailers. The avatar acts as a (product – services) knowledge management as well as a sales assistant / advisor interface. The affiliated network received the avatar so enthusiastically that it is now used as the internal 'face' for company events and communications.

In both these cases, and despite early successes, senior management commitment has remained very high, and business impact expectations have, actually, heightened. My advice to both organizations has consistently been to create wide-reaching but straightforward internal communication campaigns to ensure that AI successes help shape their respective culture and DNA, thus making identification and implementation of future use cases much quicker and effective.

Q: What are your views on the convergence expected to happen between AI and Automation in translating insights to action and creating an exponential impact?

JG: The most critical challenge in the transition between Automation and AI-focused initiatives is the level of understanding, the tangible impact if you like, between the results achieved with solutions within the two domains. In most companies, users, SMEs, product owners, and also senior executives are much more accustomed to the outcomes of an RPA or even I (intelligent) PA focused enablement vs. what can be expected from the advent of AI-related solutions.

Going forward, organizations will start realizing that the boundaries between Automation and AI are blurring, just because outcomes from AI enablement initiatives will start becoming more tangible on a day-to-day level.

The likes of IoT enabled ML solutions, advanced Digital Twin types of modeling, self-cleansing / self-healing databases will end up becoming the expectation rather than the surprise outcome or exotic demo that they tend to be today.

The key to mastering this transition will have to be the faith in AI enablement outcomes with the notion of "Safe being Risky" becoming part of the advanced enterprise culture.

Q: How can companies manage change, so that AI sticks?

JG: Change management has traditionally been the art of effective human resources management during a change of (mainly cultural and/or business model) course within an enterprise. **In the world of AI enablement, change management needs to become the art of teaching human resources ways to interface and seemingly cooperate with machines.** Even writing these lines evokes the emotional reflex of fear. Successful change management will be all about mastering and understanding the roots of this fear and gradually alleviating its effect with the certainty that humans cannot and will not lose control over their destiny but can and should prioritize the type of tasks they are willing to relinquish.

A useful tip and accelerator to this change is including AI development and deployment in the future performance management scheme, not in the form of timely delivery of AI projects or achievement of tertiary KPIs, but rather in the same way an existing employee – an old hand – is expected to spend time, provide opportunities and mentor newer employees while they are being handed over their new tasks. **AI needs to be thought of as a future colleague, not just a future technology. ■**





GAME CHANGERS

that will set the course for

Enterprise Growth

in 2020



By Praveen Kombial

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If you look at any prediction articles for 2020, specifically with regards to enterprise tech, you probably hear a lot about data, Artificial Intelligence (AI), and cloud. AI, for instance, has permeated the consumer ecosystem with every smartphone manufacturer set to have AI-enabled chips, apps supporting object recognition, NLP, API data exchanges from IoT devices, and also data prediction. In the enterprise space, the exponential spike in cloud adoption, the growing appreciation for data as a source of growth, and enhanced data computing capabilities are likely to drive a 25-35% increase in data-driven technologies. Much is written about these tech developments, but I think about them from a specific lens. How do they impact the growth of an enterprise? So, that's what I have decided to explore in this piece. Let's get started.

50% of Consumer Product companies will gain D-2 visibility on their supply chain and inventory requirements

As retailers start to expand into new categories and markets, they take on an incredible level of complexity, from both an operations and management standpoint. An intricate and extensive network of distributors tends to service the rest of the consumer-facing ecosystem, with each level having its operations and data management system, if any. Often, distributors and retailers don't have the technology to collect or transfer on-ground data, blindsiding head offices through inadequate visibility into their secondary sales and inventory status. Demand-driven planning hence continues to be a challenge.

Success in retail today is built on the smallest of margins, and enterprises cannot afford information leakages at this level. In organized retail, there continues to be some complexity in how big chain retailers share their data with primary principals, and this is exacerbated by the fact that they have various requirements. Data consolidators like Nielsen and IR also offer sampling services, but the time relevance of insights remains an underlying problem.

Visibility, in this regard, is crucial. **Companies cannot continue to rely on organic growth or hope that market trends shift in their favor and must use the benefit of foresight made available by AI & ML-driven technologies.** The advantage is compelling, and we have seen reactions firsthand.

For instance, the team managing trade promotions at a top-ten CPG firm was amazed to hear that the ability to see total sell-through sales at SKU level within a day was not just plausible but easily accessible.

The advancement and proliferation of cloud-based platforms provide a solution. Globally scalable, customizable to individual markets, and amenable to usage-based pricing, these solutions are now transforming supply chain visibility from a challenge to a prerequisite to earning a competitive advantage. The way I see it, **powered by intelligent cloud-based platforms, almost half of all CPG organizations will have D-2 visibility into their supply chain and inventory, with the resulting foresight allowing them to make smarter decisions faster.**

10% of top 100 CPG organizations will build a digital twin of their physical supply chain

A recent analyst report on supply chain trends stated that "by 2023, at least 50% of large global companies will be using AI, advanced analytics, and IoT in supply chain operations." I see this being a significant development in the year ahead. A source of dissonance in this segment has been the fact that enterprise players don't enjoy enterprise-level decision making.

Assuming this planning rigor is in place, 10% of all CPG organizations will begin to build a digital twin of their physical supply chain. A dynamic, real-time, end-to-end model that will allow for a wide variety of analyses could have a revolutionary impact on planning and forecasting. Enterprises will now be able to build a nuanced picture with granular views of not just present but future scenarios, allowing for smarter trade-off analysis and decision-making.

Organizations have been occupied with creating a unified and consumable view of the data, in itself a mammoth task, but often consume a time-bound static view. It is here that the visual digital twin of the physical supply chain comes into its own, helping enterprises navigate the complexities of managing, supporting, and governing their supply chain.

By sitting on top of existing enterprise systems, the digital twin will allow leaders to make designs based on interconnected factors that are a common feature in supply chain operations.

Further, enterprises can think beyond their existing models using this newfound ability to trial different performing scenarios. I am bullish about both adoption and success in this case and see at least 10% of CPG organizations commencing efforts to build a digital twin of their supply chain.

One-third of all Global 2000 organizations will normalize their spend cube and hierarchy to a Level-4 category and pivot to a highly mature spend analysis and forecast paradigm

Traditionally laggards from a digital investment standpoint, procurement teams are now undergoing substantial changes thanks to the rise of enterprise-grade intelligent platforms on the cloud. **AI-based applications are accelerating the progress of procurement's contribution as a value center, capable of making strategic contributions to enterprise growth.** Data from disparate sources, multiple systems of record, and the absence of efficient analysis methods have meant that enterprises have typically been preoccupied with data consolidation over the last five years.

Today, 60-70% of enterprises have taken their data organization efforts to an advanced stage of maturity. However, organized as the data may now be, enterprises are yet to mine insights from it. With the support of intelligent platforms capable of delivering comprehensive data management, powerful spend analytics, and opportunity identification, organizations can now normalize their spend cubes to a Level-4 category, deriving insights at the commodity level. **Better data hierarchy normalization also has a knock-on effect on the entire procurement department, enabling more efficient, and effective decision-making, while improving supplier relationships, and improving visibility at the leadership level.**

The opportunity is far too good to pass up and, quite frankly, a necessity, not a choice. I further expect a subset of these organizations will have the ability to bring together external market and supplier risk data along with contract insights and spend cubes to inform Procurement as a strategic lever.

Consumer-facing micro-lending businesses will see a 2-3% rise in risk provisions

We live in the golden era of consumption. The increase in consumer purchase appetite has expectedly affected the number of choices, and also on the ways to purchase. Consumer-facing lending organizations keen to expand their borrower base continues to develop increasingly attractive offerings, increasing their risk exposure in the bargain. Combine that with the uncertainty of the market, and it's easy to see where the risk lies. The IMF says there will be a rebound, others say there will be a crash, and this standard deviation means that people are unsure of where it's going.

There is no such ambiguity about online purchase volume, only likely to go up. Small ticket online-offline buying is increasingly impulse-driven, and financing options on online platforms are not backed up by the rigor of traditional organizations. A lot of online buying is not supported by the platform, but by its financing organizations. Amazon, Baidu, and other retailers, for instance, are not risk-taking organizations in a financial sense, and consequently will have a learning curve on how they monitor and manage risk. That makes it even more crucial for financing organizations to strike a balance between borrower acquisition and debt consolidation, which I don't believe is currently the case. **Organizations are yet to internalize contextual intelligence and customer insights, driven by analyzing a combination of internal and external data into their strategic thinking.** This relentless focus on growth and, unfathomably ignored, increased risk exposure without the required checks and balances are why I see at least a 2-3% rise in delinquency provisions across small-ticket financing operations.

One third of top 200 global banks will experience near real-time visualization of their customer relationships and sales channels

Following on from the previous point, large finance companies with assets more than \$100bn, have understood the problem and are taking steps to stay ahead. They are harnessing the power of enterprise-

grade intelligence to generate previously unimaginable detail of their customer relationships and sales channels. Several have used this intelligence to create standalone businesses, online-only offerings powered by an entirely new stack of best-in-class tech, built to thrive in a digital-first ecosystem. These organizations are leading the charge, and I see that trend becoming more popular. Most new players are not there yet but will need to be if they are looking to survive.

From SLA and SOP-driven customer engagements and sales pipelines, firms are now moving to personalization at scale, internally and externally.

From a customer experience perspective, a granular view of consumer behavior is allowing enterprises to provide highly personalized and intuitive services, ensuring better conversion and retention across the funnel.

For sales teams, the insight is something of a superpower. Previously bound by targets and gagged by the absence of intelligence, sales leaders are enjoying unprecedented clarity into the state of their pipeline, allowing enterprises to unlock a wide variety of opportunities. Consider a situation where leaders don't just understand their sales progress but have deep insight into the individual components driving performance, like a specific sales channel or a particular region. From customized training for salespeople to outreach methods targeting individual consumers and near real-time visualization of the entire funnel, the addition of intelligence will see companies with assets over \$100bn make critical strides towards widening the gap with their competitors.

For all the changes the industry can expect this year, one feature remains constant - the agile will thrive, and the others won't. Agility is a function of

leveraging every competitive advantage instead of sticking with the status quo.

Our work with the world's leading companies



informs the design of our AI-and-Automation-based suite of Business Applications. We are solving for the challenges and opportunities reflected in the above predictions. To learn more about EdgeVerve's domain-specific products and their ability to transform your business, visit www.edgeverve.com/business-applications. ■





By Sateesh Seetharamiah

VP, Global Product Head, AssistEdge,
EdgeVerve Systems Ltd. (An Infosys Company)

5 GAME CHANGERS That Will Define ENTERPRISE Automation IN 2020

Last year was a time for Automation experimentation. Small PoCs and pilots formed the bulk of enterprise implementations, and although some outliers, several in our client portfolio, achieved significant scale, a majority of Automation initiatives were trials. That will change. **As enterprises progress on their journey towards a transformation plan aligned with their goals, it will be imperative to establish, execute, and scale a comprehensive Automation strategy.** Make no mistake. A mad scramble to jump on the Automation bandwagon is destined to fail even if initial results offer some promise. Due diligence, planning, and a shift in mindset are all equally crucial in ensuring the success of any Automation implementation, but success at scale needs more. It requires foresight, perspective, measurability, and longevity.

Our experience of delivering some of the largest-scale enterprise-grade Automation implementations on the planet, automating over 10,000 processes combined with domain-specific consulting expertise, leaves us well placed to identify and address the Automation needs of today's industry. Spearheading product strategy at the only company with the unique distinction of being a leader in both enterprise Automation products and Automation services offers me a unique vantage point, and I am excited to take a shot at predicting how 2020 will unfold. So, without any further ado, let's take a look at my five Automation predictions for 2020.

1. PROCESS DISCOVERY WILL BECOME CENTRAL TO ANY AUTOMATION IMPLEMENTATION

As pioneers of process discovery in RPA, we have found that knowing what to automate is as important as to how you implement Automation. In a classic case of putting the cart before the horse, several enterprises dive headfirst into RPA, automating arbitrary processes and finding themselves bewildered at the disappointing results. In an environment that demands scale and effectiveness, process discovery is the force that drives Automation.

A set of machine learning-based tools that record possible process variations, making decisions based on empirical data, process discovery helps organizations identify the right actions for Automation. The resulting intelligence delineates the processes that can be automated and also influences the design of Automation workflows, allowing organizations to create process maps aligned with business objectives. Based on data gathered from actual process execution, the technique dramatically reduces the manual effort of mapping variations and exceptions, eliminates human bias, and lowers cost by harnessing the potential of AI in process design. Continuous improvement, essential to sustained Automation success, can only happen if enterprises have the mechanisms and tools to discover and rediscover processes.

Further, as the low conversion ratio of pilots to large-scale production demonstrates, showcasing ROI is critical to embed Automation into enterprise operations.

Process discovery enables enterprises to accurately forecast the results of their projects and make a case for sustained investment.

It is also vital to foster learnability in Automation platforms, one of my other predictions for 2020. If an enterprise does not understand and implement process discovery, it will miss the boat as the competition races ahead. It is that simple.

2. RELIABILITY IS SET TO BECOME A KEY DIFFERENTIATOR

The success of a workforce-human, digital, or blended-depends on its ability to perform tasks to the required expectation reliably. Reliability is a function of performance and consistent outcome. This year, the enterprises that set themselves up to drive reliability through the support of platforms and partners capable of delivering large-scale Automation implementations will be in pole position to enjoy success.

Enterprises today are using Automation not just to lower costs and improve efficiency but also to transition the competencies of their human workforce, training, and allocating resources to areas of the highest value. Automation has matured to a point where the question is no longer **'does it work?'**. That said, another pressing issue remains and could hamper adoption - **'can I trust it?'**. For any chance of scale, Automation platforms need to be extremely reliable, i.e., the bots and Automation scripts that are written and implemented need to do what they're supposed to do.

While the primary benefits of Automation are undeniable, value is limited if there is no dependability. For enterprises to pursue the journey towards "Automation Singularity", Automation platforms must be reliable.

After all, until the Automation results are reliable, any value is purely notional, and no organization will stick its neck out to reroute employees, scale worldwide, or make a massive investment.

Solution partners will need to understand that reliability is hygiene, and clients need it to achieve their Automation objectives, taking on larger, mission-critical processes and scaling their platform worldwide. If the value is proving elusive, reliability has a lot to do with it.

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4 VALUE REALIZATION
AND SCALE WILL
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CORNERSTONE
OF AUTOMATION
IMPLEMENTATION

5 OUTCOME-BASED
ENGAGEMENT

3. LEARNABILITY TAKES CENTER-STAGE AS CONTINUOUS IMPROVEMENT BECOMES AN INTEGRAL PART OF AUTOMATION STRATEGY

As expectations of Automation continue to rise, platforms must incorporate learnability into the architecture to ensure that the system evolves with the enterprise's journey. Delivering a return on this investment demands an Automation platform that can adapt and increase Automation coverage.

That's why we believe that Automation's most significant impact is closing the loop between human and digital, moving towards the confluence of the future workforce. Learnability has to become the core as enterprises embark on the journey towards 'Automation Singularity.'

Learnability also plays a substantial role in adoption and is vital to make Automation ubiquitous in the enterprise. The best platforms today offer natural language processing capabilities that, when combined with learnability, can adapt to working with the use of different words, structures, and styles, delivering a more nuanced service than rudimentary Automation tools focused on deterministic processes.

This ease of use should also make it easier for enterprise clients to introduce Automation-led workflows, enabling human users to discover the joy and flexibility of working in tandem with a digital worker.

4. VALUE REALIZATION AND SCALE WILL BECOME THE CORNERSTONE OF AUTOMATION IMPLEMENTATION

Two things will happen in 2020 concerning scale and value. First, more clients will prepare themselves and their Automation initiatives for enterprise-wide scale. Second, it will become imperative for enterprises to strengthen the value proposition of their Automation projects.

For meaningful differentiation, Automation must be executed at scale, delivering sustainable value. 2020 will be the year where we will start seeing breakaway implementations - implementations where the Automation-led value will go beyond cost levers to influencing customer journeys.

Enterprises will soon move from just automating processes to designing programs with long-term value. To this end, they must establish dedicated Centers of Excellence (CoEs) with strike teams to lead and monitor their Automation progress. With intelligent Automation now at a stage of maturity where leadership will want tangible benefits moving away from experimentation, we don't expect to see any more piecemeal Automation consumption. Partners who offer enterprise-grade solutions that combine RPA, AI, and analytics while providing exceptional consulting services will be gold dust as companies look for strategic partners over mere vendors and maintenance contracts. Scale or fail-those are the two simple choices to make, and it's easy to see what the popular option will be.

5. OUTCOME-BASED ENGAGEMENT

Amid all the talk of technology, innovation, and intelligence, business results remain paramount to the success of any enterprise transformation initiative. Enterprises now understand that RPA needs to be a part of the larger Automation story. It's not a function of just buying bots. RPA, is not a silver bullet for all Automation opportunities. It is most effective when leveraged in conjunction with AI and machine learning capabilities. At this stage of maturity,

Automation technologies will be held accountable for their ability to influence enterprise growth, making it pertinent for delivery models to be reimaged.

Solution providers confident of their offering must be able to offer enterprises a range of pricing and delivery models customized to suit their individual needs. Expect to see new frameworks that incorporate performance-based or milestone-based payments aligned with business KPIs.

There you have it-my five predictions for the developments that will set the tone for enterprise Automation in 2020. As organizations mature on their transformation journey, intelligent Automation will play an increasingly important role in their development, preparing them to take on the challenges of what is set to be an intensely competitive market. The clarity with which enterprises approach the idea and their choice of solution partners will be vital in their bid for growth and longevity. ■

140
Processes
Automated

400,000
Person Hours
Saved



Download the case study to learn more

www.edgeverve.com/assistedge/global-healthcare-technology

Our client, a European multinational, is one of the world's leaders in health technology. The organization has a presence in nearly 100 countries delivering cutting-edge solutions to consumers and businesses. With a strong focus on innovation, the company is accelerating its next phase of growth by harnessing the power of digital transformation.

Our client was looking at digitally transforming and automating their finance strategy and processes to achieve higher productivity, accuracy and increased performance.

Multiple manual and complex processes being managed on disparate systems posed challenges for the organization. The inordinate amount of time required to conduct process changes for supporting new products and solutions was creating roadblocks.

In addition to the above, large volumes of these complex manual processes led to an error-prone system with a long lead time, affecting business performance and stakeholder experience. The constantly expanded workload required an increase in staffing and a reduced focus on value-added services, an organization-wide concern.


Read how the client leveraged RPA as one of the critical levers of efficiency and identified two areas in their global business services to optimize operations.



Creating a Magical Cinema Experience

Even in the era of streaming, going to the movies remains an experience of choice — be it for the premium seating, the surround sound, the best screens and vision, hot gourmet popcorn, or unique cinematic experiences like 4DX.

EVENT C I N E M A S



Aylene Baldwin
General Manager Business Transformation
EVENT HOSPITALITY AND ENTERTAINMENT

Mark Pinder
RPA Centre of Excellence Manager
EVENT HOSPITALITY AND ENTERTAINMENT

Cinemas invite the world to escape from it all and immerse themselves in a world of movies. Watching a movie at home can never match up to the excitement of the cinema theatre, and so, despite other entertainment options, the cinema industry continues to thrive.

The cinema industry in Australia is currently progressing through a significant phase of disruption, innovation, and growth. Last year, the industry spend was forecast to exceed AUD 1.8bn while growth is expected to continue at an average of 1.4% over the next five years.

Once thought of as a mature industry facing decline, the entertainment and film industry today is adapting and continually evolving to offer something for everyone. The industry is staying ahead of the curve and reinvesting in better experiences for consumers; experiences that are memorable, that leave a mark, and make an impact. Service providers in the industry are also continuously seeking ways to operate more efficiently.

Despite increased competition from other sources of entertainment such as online subscription streaming services, the exhibition industry is thriving, forging ahead with innovative ways to provide the ultimate movie-going experience, be it luxury seating, new cinema concepts, and the use of emerging technologies.

At the same time, industry data suggests food and beverage (F&B) to be a lucrative investment area. F&B expenses average around 20-30% of the total costs, and the introduction of hot food and better-quality food products could boost the efforts to deliver competitive advantage.

Event Cinemas realized that the food and beverage value chain for the company's 80+ cinemas across Australia and New Zealand was an opportunity for business transformation through the use of Intelligent Automation.

Through engagement with suppliers, cinema operations teams, and food and beverage departments, the RPA Center of Excellence Team was tasked to review and reengineer its processes completely. This exercise resulted in three key projects being identified:

Introduction of a virtual Kanban system to reduce wastage and improve cash flow

Introduction of advanced predictive analytics to assess product demand and catalog insights to recommend the right order requirement, and

Automation of a centralized order process for all suppliers

Introduction of a virtual Kanban system to reduce wastage and improve cash flow

Many external factors can impact demand for food and beverage requirements; seasonal considerations such as public holidays, fluctuations in ticket admit demand in line with blockbusters and the film line up, promotional food offering and bundles, and supplier product changes.



Event Cinemas identified an opportunity to improve order cycle management by reducing sellouts and excessive ordering. With EdgeVerve, Event Cinemas was able to simulate a virtual just-in-time supply ordering system, across all products replicating a traditional Kanban card system.

The result has been the ability to maximize asset productivity through more efficient use of storage space, improved cash flow operations, and reduced stock wastage.

Using advanced predictive analytics to assess product demand and catalog insights to recommend the right order requirement

Once the algorithms for ordering supply were defined, EdgeVerve was engaged to help develop a robust, accurate, and timely predictive analytics process to identify the best-recommended order for each product.

With the use of EdgeVerve's RPA technology, the team was able to define a process whereby every product was assessed by demand and usage history, right down to the amount of salt allocated to popcorn.

Robotic Process Automation (RPA) helped Event Cinemas assess thousands of product cataloged items even before the ordering process started. This was achieved by calculating the activity over the previous 52 weeks, for each product, by each Event Cinemas in Australia and New Zealand. The result; Event Cinemas now understands supply and demand trends — right across the network — and uses these insights to propose the recommended order requirements based on RPA data for each product.

This recommended order quantity feature also considers future demand variables and provides a rolling 12-week order forecast for cinema operation and planning purposes. The recommended order and prediction are also delivered to the cinemas, using automated communications, by 7 am weekly.

Automation of a centralized order process for all suppliers

Each Cinema Management and the Entertainment Food & Beverage Team reviews the recommended

order, allowing for flexibility and the capacity to consider local or national programing changes and upcoming events. Once the order process has been checked, RPA is used to re-cut all finalized cinema order requirements and data by supplier type for order preparation.

This new process means each supplier now receives only one order on behalf of all cinemas, with additional product and distribution information communicated using Automation. Suppliers also receive a 12-week rolling forecast to support forward manufacturing estimates.

The entire process is human-led, assisted by stakeholders across the supply chain order process, and is completed on the same day.

Other benefits

Process improvement using Intelligent Automation has also resulted in greater efficiency to the overall ordering process, including:

- Standardized order processes with greater transparency in centralized operations
- Improved cinema cash flow and operating margin
- Increased order governance and controls
- Improved revenue from the reduction in sellouts
- Improved supplier performance and management
- Thousands of hours in productivity savings through cost reductions or reallocation of resources to more valuable tasks
- Improved customer satisfaction

Partnership for success through EdgeVerve

To support the delivery of these projects, in conjunction with the EdgeVerve Team, Event Hospitality and Entertainment developed its own methodology and operations plan to manage the RPA / AI program. Led by Mark Pinder, this methodology combines best practices from the waterfall and agile approaches. An 8-stage waterfall project approach retains sufficient governance while deliverable activities within each stage take an agile approach to project delivery.

Perhaps the key success driver has also been incorporating the ProSci Change Management



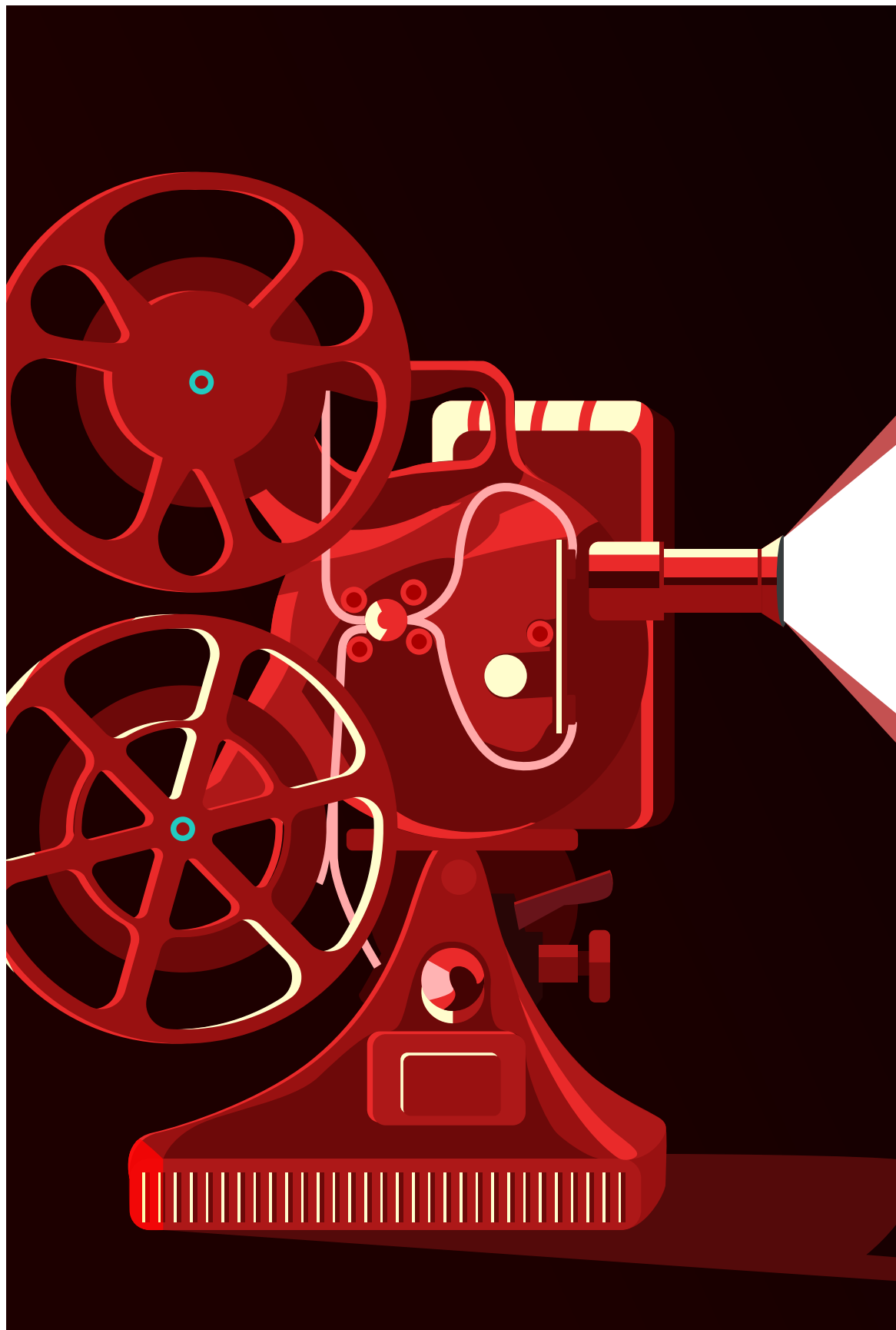
ABOUT EVENT HOSPITALITY & ENTERTAINMENT LIMITED

Event Hospitality & Entertainment Limited (EVENT) is a leading entertainment, hospitality and leisure company. Founded in 1910 and headquartered in Sydney, EVENT is at the forefront of the experience economy and delivers over 40 million customer experiences annually. From movies and adventure to travel and dining, EVENT believes that in an increasingly busy world, an outstanding experience can make the day better and create lasting memories.

EVENT owns the largest cinema circuits in Australia, New Zealand, and Germany under the brands Event Cinemas, Birch Carroll and Coyle, Cinestar, Greater Union, and Moonlight Cinema. EVENT also owns and operates more than 60 hotels, including Rydges Hotels and Resorts, QT Hotels and Resorts, and Atura Hotels. In the leisure space, EVENT operates Australia's much-loved ski resort, Thredbo Alpine Resort, and one of Australia's oldest theatres, the State Theatre. The company also owns a substantial property portfolio.

With over 9,000 employees, the Group shares a passion for creating truly exceptional customer experiences, world-class hospitality, and continuous innovation. EVENT is committed to protecting and giving back to the communities in which it exists through a focus on sustainability, fundraising, and diversity.

EVENT listed on the Australian Securities Exchange (ASX) in 1962 and trades under the ASX code of EVT. It has a market capitalization of \$2 billion.



methodology across the operations plan. Mark suggests this approach is a good fit and ensures change management is considered throughout the entire lifecycle of the project.

Event Hospitality and Entertainment utilizes onsite EdgeVerve resources and offshore resources in India. However, the team is seen as one combined team internally, with EdgeVerve staff embedded in the company's culture. The combined team also shares the same key drivers for the RPA / AI program, which are revenue recognition, cost reduction, productivity gain, and experience.

Conclusion

Designing the entire process with human-assisted intelligent Automation capabilities in mind has ensured the successful adoption of the new process across all stakeholder groups. These cinema projects are proving to deliver a favorable result across all metrics.

Staff resources have been freed, enabling greater focus to be given to tasks that are meaningful to cinema staff and that have a positive impact on the organization, ultimately increasing customer engagement and the overall customer experience.

From ideation to deployment, the full project took just under six months. Event Hospitality and Entertainment is now seeking to leverage this capability for re-use into other areas of the business and will continuously explore ways to advance the process further by increasing the use of cognitive automated solutions.

So, the next time you visit Event Cinemas to experience the thrilling 4DX concept, the latest Boutique Cinema experience, the luxurious Gold Class menu, or you simply can't wait to grab a popcorn and drink combo, spare a thought for how technology and Automation have helped deliver the best experience possible! ■



UNSURE ABOUT AI? 20 GAME 20 CHANGERS



By Jasdeep Singh Kaler

AVP, Global Product Head, Infosys Nia,
EdgeVerve Systems Ltd. (An Infosys Company)

2019 was a year where the potential of AI entered the mainstream. According to recent analyst report, worldwide spending on AI reached \$35.8 billion in 2019 with a 44.0% growth over the spend in 2018. Marked by innovation, experiments, and pilots, enterprises demonstrated the intent and mindset to harness the power of AI for business growth.

However, adoption was not without its challenges. As we move forward, it is evident that there is a need to refine, focus, and streamline the approach to AI adoption.

Enterprises have to think of the potential of AI in solving everyday challenges like being able to predict system failures, speeding up issue resolution or extracting and making use of information that remains locked away in datastores.

To fully realize the business benefits of infusing AI, a comprehensive AI vision and strategy is a starting point. Without purpose-built tools, organization-wide processes that are stitched together and are aligned to the vision, AI projects might not progress beyond the pilot stage.

As with any other disruptive technological innovation, the enterprise AI journey will depend on the industry and the appetite for technology adoption. The early adopters will focus their effort and investment to move out of the experimental stages and research into engineering and production. In contrast, the late adopters will watch for the benefits gained by the early adopters and begin pilots for their AI Journey and increase their investment in data preparation. Laggards, on the other hand, may continue to be on the fence through 2020 or may begin some pilot projects.

From all our conversations with experts, analysts, clients, and prospects, we can see some trends emerging in AI lifecycle and AI adoption in 2020, across industries. These trends can be classified according to the stages of the AI pipeline, starting from data ingestion and preparation, to model building, model ops, and deployment in production.

I see it prudent to define these from a broad industry standpoint as they signify developments in mindset and operationalization, not just technological progress. Let's get straight to it:

1. Enterprises will focus more on ease of access and use of enterprise-wide data in business decision making

A significant hurdle to enterprise AI adoption at scale is the inability of companies to integrate knowledge across sources into the decision-making process. **A large number of data sources, disparate systems, and a combination of structured and unstructured data does not translate into effective use of enterprise data assets.** Manual efforts to digitize data have been proven to be as error-prone and inconsistent as they are inefficient.

As enterprises start to use and develop expertise in ML-driven harmonization tools, successful use cases inspire further trials. Document intelligence will be a significant area of disruption in 2020 with AI and computer vision techniques leading the charge in reinvigorating the useful but limited traditional OCR.

With integrations for external data, a central gateway will allow teams across the organization to mine data for answers, make existing apps intelligent, and enable decision-making based on a more comprehensive market view and reveal actionable business insights.

2. Explainability of AI solutions will become the cornerstone for enterprise AI adoption

Having outgrown its 'emerging technology' status, AI can no longer absolve itself of the liability for accountability, and transparency. Over the past few years, there have been discussions around ethics of AI, and the AI methodologies have acquired a "black-box" tag because of the apparent lack of transparency and explanation of results.

In the model building phase, the most significant change will be the increased focus on explainable and interpretable results. Apart from showing improvements in processes and operations, results

produced by AI model deployments will have to be understood by human experts and make sense to users. Explainable and interpretable results and what-if scenarios will go a long way in improving the acceptance of machine-generated decisions.

3. Standardized processes for ModelOps will become integral to consumption of AI in the enterprise

2020 will see further industrialization and the consumption of AI in the enterprise. One of the key vectors that'll garner attention will be the lifecycle management of models in an enterprise. ML Ops, as the industry calls it, will define the entire process of implementation from data preparation to model training to the governance of models in production and integration with the CICD workflows.

AI platforms will start to bring together the requirements of the entire lifecycle into focus and some will provide mechanisms not only to train ML jobs, set hyper-parameters, and auto-tune models, but also to oversee models deployment, monitor metrics and versioning. Defined processes governed by a dedicated CoE, perhaps supported by IT departments, will begin to take shape as organizations develop scalable operational models backed by a robust framework. Consistency and reliability will be crucial to moving AI from an experimental workbench technology to a mainstream component of enterprise operations.

4. Standardized processes will evolve for testing AI models leading to increased reliability of AI workloads

Since AI models are different from traditional IT deterministic systems, that are deterministic, the testing and quality assurance requirements of AI systems are fundamentally different. Along with increased AI adoption, there is a growing need to standardize the testing processes as well. Enterprises will look to create systems for unit and end-to-end testing while ensuring checks

1 ENTERPRISES WILL FOCUS MORE ON EASE OF ACCESS AND USE OF ENTERPRISE-WIDE DATA IN BUSINESS DECISION MAKING

2 EXPLAINABILITY OF AI SOLUTIONS WILL BECOME THE CORNERSTONE FOR ENTERPRISE AI ADOPTION

3 STANDARDIZED PROCESSES FOR MODELOPS WILL BECOME INTEGRAL TO CONSUMPTION OF AI IN THE ENTERPRISE

4 STANDARDIZED PROCESSES WILL EVOLVE FOR TESTING AI MODELS LEADING TO INCREASED RELIABILITY OF AI WORKLOADS

5 2020 WILL SEE A DEFINITE SHIFT TOWARDS OUTCOME-BASED AI SPENDS

and balances for real-time monitoring as well. Third-party audits could become mandatory for compliance, regulation, and integrity, as cursory checks on AI output fall short of the diligence needed for consistency.

5. 2020 will see a definite shift towards Outcome-based AI Spends

In all our client interactions and industry conversations, we have seen a clear trend emerge towards a preference to measure AI performance based on well-defined and explainable outcomes aligned with business goals. While AI itself could function as a layer of ambient intelligence, its performance should be assessed by the results it generates. On the one hand, the challenge for solution providers will be to create easily consumable AI that can offer customized views based on user personas and their KPIs. On the other hand, enterprises must delineate their business goals for every AI implementation, ensuring alignment with the core growth strategy.

These predictions offer an industry-agnostic overview of what is likely to be a year of refinement and consolidation for enterprise AI. It is important to note, however, that the AI adoption lifecycle is also heavily reliant on the industry vertical. High-tech, finance, and Insurance, for instance, lead

the AI adoption wave. Others, like retail, have seen deployments only in specific areas like marketing and sales. That said, there is immense potential for disruption at every stage of the value chain in areas such as store space optimization, merchandising, demand forecasting, and pricing.

A combination of an increasingly challenging market landscape, demanding customers, and the exponential rise of data complexity means that enterprises cannot adopt just any piecemeal AI intervention. To be connected with strategic imperatives, deliver business outcomes, and unlock intelligence at scale, organizations need to rely on AI offered by enterprise-grade platforms.

Enterprise-grade AI platforms deliver exponential benefits over time with continuous learning capabilities. Enterprises that are diligent about their choice of platform and factor scalability into their decision can expect to accelerate time-to-value while setting the foundation for intelligence-driven growth substantially.

One way to reduce the uncertainty of returns on AI investment will be to partner with providers who offer product, domain, and consulting expertise, ensuring a well-rounded business initiative instead of a mere platform acquisition or licensing exercise. Most importantly, enterprises should have clearly defined metrics for AI success complemented by a forward-looking AI roadmap. ■



Procurement: Intelligence-driven Excellence



By Prabhu Eswara

Director, Product Management, Business Applications – ProcureEdge,
EdgeVerve Systems Ltd. (An Infosys Company)

Right off the bat, I would like to clear up the confusion, if any. Procurement does not need to become a value center. It is already a value center. In addition to optimizing cost, exceptional procurement teams deliver innovation, enhance supplier performance, moderate risk, and ensure the highest standards of compliance. And to do this, they need the necessary tools in their arsenal that

enable them to meet growing expectations.

In a highly competitive market, an efficient and well-oiled procurement function, and its ability to contribute towards business strategy, is essential to enterprise success. In a dynamic environment, however, the ecosystem needed to cope with these rising expectations is becoming increasingly complex.



The Times Are Changing. Procurement Isn't.

Procurement organizations must navigate both operational and strategic hurdles in playing a value center role. These include, but not limited to:

- **Stagnant Ecosystem** : Expectations continue to rise while team size, technology stack, and company philosophy remain the same. Organizations focus their transformation initiatives on customer experience, operations, and marketing while leaving procurement transformation to piecemeal improvements without a clear objective.
- **Multiple Systems of Record** : The presence of various ERPs or numerous instances of the same ERP system across business units can make it difficult to clean, harmonize, classify, and normalize data.
- **Skewed Insights** : Even if analytics systems are in place, they are often relying on disparate data sources, multiple systems of record, disconnected data elements - basically the absence of a single source of truth.

- **Limited Visibility** : The lack of spend visibility across categories does not offer a clear picture and also hampers the creation of category-specific strategy. Generic approaches may be sound in principle but do not translate into impactful outcomes.
- **Manual Effort** : Opportunity identification is based on narrow insights and remains a manual effort, increasing inefficiency, cost, and the possibility of inaccuracy.
- **Information over Intelligence** : Category managers need to deal with immense complexity without access to high-quality data-driven insights. This limitation places significant pressure to drive business results without the benefit of a complete understanding, much less foresight.
- **One-size-fits-all Approach to Analytics** : With vertical-specific strategies starting to be the norm, procurement roles are becoming more specialized. The KPIs of various functions — CPO, category manager, analyst, and others — are connected, but vastly different in practice. At the same time, data and insights provided by existing systems tend to be the same.
- **Missed Opportunities** : Existing tools may offer some insights but not enough substance to take advantage of opportunities like negotiating discounts for higher volume contracts or consolidating supplier relationships to increase an enterprise's spend under management.

Data – Insights – Opportunities – Actions: So close, but so far

In light of the above challenges, organizations must take a step-by-step approach, starting with effective data management, generating actionable insights from this data, identifying improvement opportunities, finally leading towards moves that put these opportunities into action.

Clean, consistent, consumable, and enriched data is crucial in this regard. Intelligence engines will do the heavy lifting, but what you get is only as good as what you put in.

Irrespective of the make of car you drive, ignore the fuel at your peril. So, what should enterprises do then?

- First, there is a need to build and operationalize a single source of truth. Unify information across systems, make it consumable, and then make it accessible.
- Enrich existing intelligence systems with external data to provide category managers with actionable insights on supplier performance, category performance, and market dynamics.
- Draw on all available intelligence to generate opportunities complete with a comprehensive cost-benefit analysis for faster decision-making.
- Add analytical capabilities like what-if scenarios and forecasting, essential to move procurement from a reactive support function to a proactive growth engine.

There are products in the market that demonstrate some promise in this regard. That said, several solutions attempting to tackle the procurement challenge fall agonizingly short of expectations. They:

- Address only a part of the problem, like in the case of analytics or reports that provide information but do not suggest any actions to address their findings.
- Do not draw on interconnected factors such as internal data and external factors such as supplier risk profiling, market information, macroeconomic trends, or even the news.
- Use analytics to deliver findings but not insights, intelligence, opportunities, and actions.

The evolution of intelligent solutions powered by AI and ML is offering enterprises an answer to some of these problems.

AI-powered platforms will drive the future, but existing iterations are not user-friendly. These tools need to be molded according to the needs of the enterprise and KPIs of individual users, ensuring that adoption is not a chore, but the key to sustained success. Further, the solution should sit seamlessly on top of their existing systems and offer stability, even if there are changes to the underlying platforms. They should deliver value beyond the barebones requirement.

Tools shouldn't just monitor performance, but also detect and solve performance issues while

providing ways to improve. This value addition can be the difference between a failed pilot and a successful implementation that directly augments savings, visibility, and decision-making speed. Recommendations made by the platform need to inspire trust, which is substantiated by a high degree of explainability and interpretability.

The fact that a solution is useful in one scenario doesn't mean that it works for every organization. Enterprises must implement a platform that scales with their business and their changing needs.

Look Before You Implement

Before commencing the process of selecting a platform, it is prudent to assess the organization's readiness and set a clear agenda for procurement transformation. Those questions could include the following:

- Do you have a platform that enables procurement teams to draw on near real-time actionable insights?
- Is the platform suitable for users with no technical expertise?
- Are the insights generated by your existing systems easily consumable?
- Does the platform identify opportunities in contracting, payment terms, or supplier relations?
- Is the platform capable of offering ML-driven data management, integrating, cleansing, validating, and harmonizing data?
- Are insights derived from a combination of internal and external data? Can these insights be customized to individual users?
- Would it be possible to implement a new platform without overhauling the existing architecture?

Once these questions are answered, enterprises can make an informed decision about the process of selecting a solution and a partner, but that's just the first step. **The second and even more**

significant challenge is ensuring adoption at scale, instead of an investment in an exciting but redundant and rarely used technology, an all too frequent occurrence in enterprise transformation projects.

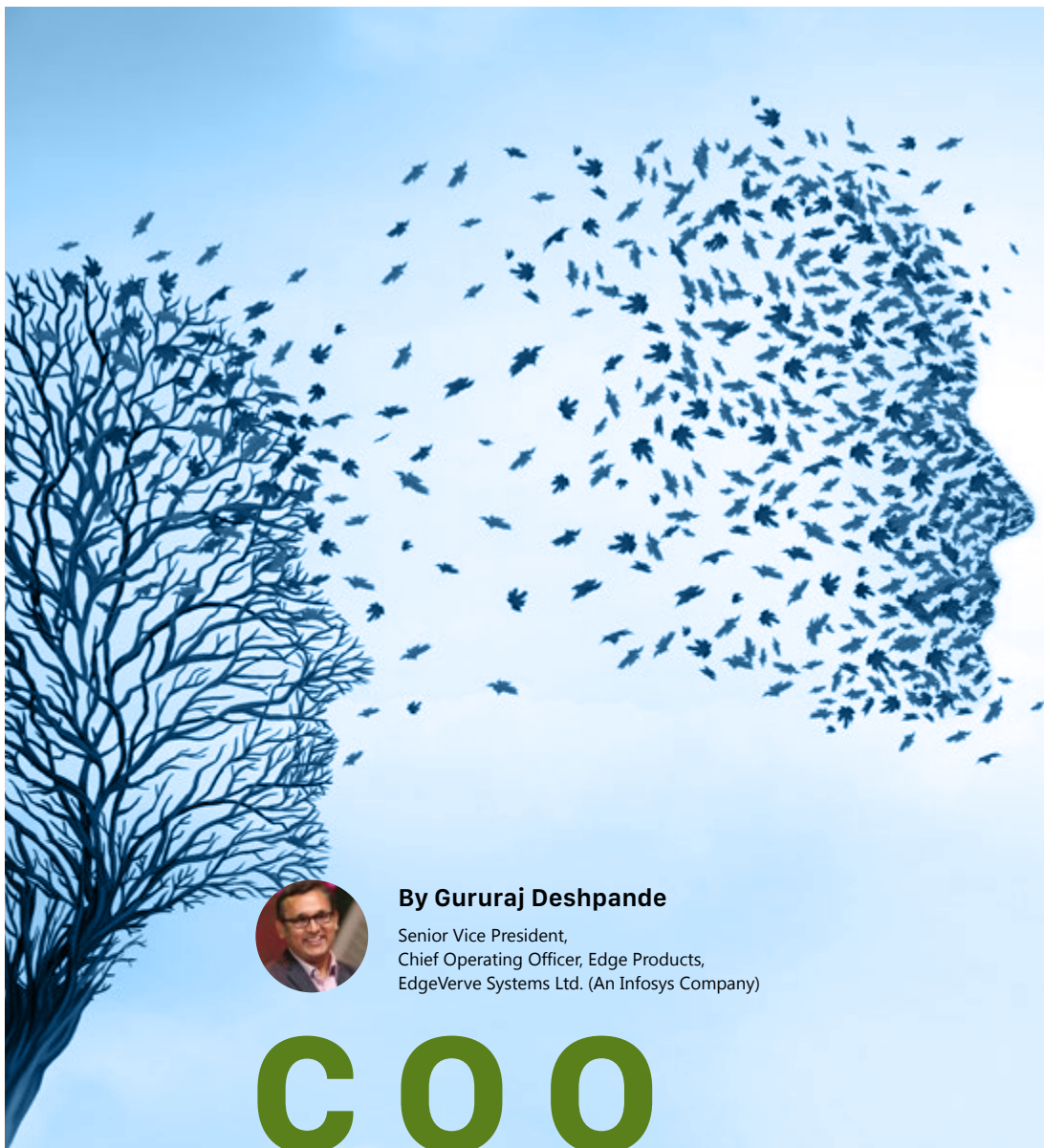
How can EdgeVerve help?

EdgeVerve has created a built-for-purpose, enterprise-grade, AI-powered intelligence system — **ProcureEdge**, designed to augment the performance of procurement teams. The system sits on top of existing systems of record, eliminating the need for any rip-and-replace. It generates value for procurement leaders through deep insights and execution support and opportunity identification across spend data, market data, category data, supplier data, and contract data.

The future of procurement and enterprise growth will be driven by real-time, contextual, and on-demand intelligence. It is this intelligence and the ability to harness it that will be the defining factor in enterprise success, demarcating the difference between those who thrive and those who survive. ■

Before commencing the process of selecting a platform, it is prudent to assess the organization's readiness and set a clear agenda for procurement transformation





By Gururaj Deshpande

Senior Vice President,
Chief Operating Officer, Edge Products,
EdgeVerve Systems Ltd. (An Infosys Company)

COO

The New Custodian of an AI-Enabled Enterprise

The onset of new digital capabilities, including Automation and AI, has led to a rapid redefinition of traditional organizational process, as well as traditional roles. In the midst of such change, can the COO role be left behind?

Without a doubt, every company out there is going “digital” to meet the ever-growing demands of superior customer experience and operational efficiencies. And for this, companies need digital processes and operations at the core to support their offerings at speed and scale.

There was a time when once the company strategy was defined (the “where”) and the vision charted, success boiled down to the nitty-gritties of execution – the “how.” In the era of assembly lines, the “how” was tried and tested. And the COO’s role, typically, was to manage the “how.” But it was largely the company strategy – the “where” – that determined success. However, in the digital world, the “how” is beginning to determine the “where.”

How do we ensure better customer experience? How do we remove several steps in a process or even make it touch-free? How do we ensure faster vendor onboarding? How do we launch products faster? How do we hit the bull’s eye on campaigns? How do we stay compliant and cost-efficient? These are concerns that are becoming critical to a business’ success. For instance, in its quest for being the world’s most customer-centric company, and creating the surrounding processes to enable the same, Amazon became the world’s biggest retailer. Similarly, in its quest to bring in software at the heart of a car’s operation, Tesla became the world’s most loved automobile.

As operations become more integral to business success, the role of the COO becomes more critical in driving competitive advantage and thriving in the new world order.

Reincarnating the Modern Chief Operating Officer

Traditionally, CEOs set the company’s vision and COOs executed it with great efficiency. Today, the COO must co-create the company strategy with the CEO and ensure its day-to-day recalibration and adaptation for execution. The operations

themselves must become more innovative and technology led. COOs need to change the traditional, brick-and mortar outlook and infuse digital DNA in their systems irrespective of industry.

As compared to their traditional counterparts, the modern COO deals with more disruption, moving their focus from being ‘problem solvers’ to ‘problem finders’ – anticipating and addressing issues proactively in line with rapid market cycles. This requires them to shift their view – from a primarily inward focus to a one attuned to both external and internal factors. This means that COOs must stand on a unique intersection of understanding what the market and the clients need and determining how the organization can most efficiently deliver on these needs. Their friend in this endeavor is data. Earlier operational data was a by-product, today it is the fuel that powers efficiency and accuracy via continuous insights on improvement opportunities.

This shift also requires the COOs to change their mindset. Instead of looking at processes as sacrosanct, they need to look at them in a new light and reimagine them completely – simplifying, streamlining, and removing redundancies. In this role, COOs also become the champions of organizational change. Their initiatives towards inculcating enabling technologies such as AI and Automation amplify human capability, while making the system more efficient. They are able to drive culture change where people, free to do more meaningful work, rethink and create success stories on the ‘art of the possible.’ And finally, they contribute to building a sentient and live enterprise where people upgrade skills, keep learning continuously, and transform and adapt to into new roles as processes and market dynamics change.

Bringing in a New Era of Operations with AI and Automation

As companies adopt disruptive technologies to cater to customer demands, the way they work is also undergoing a change. In fact, the definition of ‘work’ itself is changing. Millennials have brought democratization of technology and anytime-anywhere working to the workplace – blurring personal and professional boundaries. Expectations have moved from blindly ‘doing’ to ‘smart supervising or orchestrating,’ using a combination of amplified humans and digital workers.

The role of the COO is changing from 'keep the engine running efficiently every day' to 'upgrading and adapting the engine each day while it runs' — thus enabling the company's human resource to be efficient and effective at any time and any place. As much as next-gen technology is part of the company's offerings, it must become the mainstay of the process and operations. The availability of data and the onset of AI, ML means that the COO has this never-before opportunity to reinvent the organization, starting with digitizing the core.

Here's an example of just how that's attainable. A Fortune 500 conglomerate has hundreds of thousands of contracts going on at any point in time. Imagine the effort — and the chances of error — if this volume of contracts has to be manually created, reviewed, and analyzed for risk. One of our client's procurement team was unfortunately doing just that, creating a bottleneck for the businesses' ability to scale. They opted for Nia Contracts Analysis to leverage AI and build contract summaries quicker, perform risk analysis in a

touch-free fashion, and get alternate clauses / legal wordings at scale. With automated risk scoring and suggestions for alternate clauses, Nia directly reduced our client's risk profile, made contracts stronger, and their negotiation posture better. Before Nia Contracts Analysis, each employee was spending about 150 minutes in reviewing one contract and now this has reduced drastically — to less than 15 minutes!

And procurement contracts is just one area where AI and Automation can make a difference. The possibilities for operations excellence in every organizational area are limitless. For instance, AI-assisted contact centers can help customer service agents do their job better — reducing customer churn and retention. Cognitive onboarding experiences can make joining experience simpler and personalized for new hires. AI and Automation in IT help desks could reduce ticket resolution time, improve productivity, and employee satisfaction. And operational efficiency is only the beginning. AI and Automation strategies can also be effectively utilized to find new revenue streams and also discover missed opportunities.



Here are some more operational aspects across organizational functions that can be reinvented with the COOs guidance:



Legal

AI-based, touch-free contract interpretation and revenue recognition



Procurement

AI-based smart procurement assistants to identify saving opportunities, smart category management



HR

Cognitive Automation for onboarding process, employee query resolution via Chatbots, attrition prediction, and fitment prediction



IT infrastructure

Ticket Automation, AI Ops, healing, Self-service chatbots, automated customer service, tribal knowledge management



Customer service

Automate customer touchpoints and learn from customer behavior



P&L

Predicting CapEx and OpEx spend based on demand patterns and business cycles



Transport fleet

Vehicle dispatch, coordination and monitoring



Quality control processes

Automated quality prediction



Marketing

Leads conversion and promotions effectiveness



Contact center operations

Reduce human intervention and aid agent performance, sentient contact operations



Finance & Accounting

Automated salary processing and invoice dispatch, Smart collections



Learning & Development

Training reminders, tracking learning paths

Thriving in the Age of Intelligence

In a digital world, competitive boundaries are blurring, and the COO has the onus to ensure business readiness for the digital future – keeping an eye out for new disruptions and cross-sector competition. The COO has this unique opportunity to move from Chief Operating Officer to the Change Over Officer who can ensure a transition from time-tested practices to time defying rapid innovations while also thriving

in a resource-constrained scenario. To do this, they must be able to envision the marriage of technology to the possibilities in the process. **The way forward is to adopt an Automation and AI-first approach and shift from a “why digital” to “only digital” strategy while envisaging the new workforce as human-led but significantly augmented and enriched by digital workers and capabilities.** ■

Building Next-Generation IT for Banking Industry

Key challenges and way forward



By Ashok Hegde

Head – Domain Consulting Services Group,
Financial Services,
Infosys Ltd



As we all know, the bank of the future is going to be much different from the bank of today. Changes in technology, client needs, regulatory pressures, and the emergence of new players are impacting the way banks service their clients, operate, govern, and invest in adapting to regulatory and client needs. With AI & Automation at the heart of this evolution, there is a clear distinction between how the banks of today operate and respond to business imperatives and how the banks of the future will adapt and respond to the challenges they encounter.

Today's Bank

Even today, largely the function of banks and wholesale banking has been aligned with the business structure of the organizations. From a perspective of service rendered to the business, this has served the organizations well in the past. However, emerging trends suggest a deeper thinking in of organizing the business applications, which drives competitive advantages in building the shared services utility model within the banking IT space.

Within the Banking industry, the exclusivity of services has been considered a logical extension of the business model based on the foundation of relationship and trust. Besides, there is always an overbearing consideration for customer-centric confidentiality of the information held by the organization. Therefore, the cost associated with the service organization for the business is considered as the cost for doing business and hence warranted little or no attention.

The cost associated with the services has been, to a large extent, covered through the various forms of service fees and retention considerations from the end customer. Customers did not take offense at the same since most of these fees are well covered from the return banks have historically generated in addition to the other value-adding services. Reflecting these views as a principle of doing business, banking organizations paid little attention to mandate their IT organization structure to look into cost drivers and ask for optimizing the same. Service availability and support requirements have historically been considered important IT drivers than cost optimization through process improvement and reorganizations.

The changing paradigm

Broadly, when we look at the key areas that are dynamic in the banking system and which we believe should be the focus areas for the Bank of the future, a few significant items come into view.



1. **Technology** : Changing technology is leading to emergence of new challenges and an opportunity to service clients with differentiated offerings. This is possible today with deep customer segmentation using advanced analytics capabilities of AI. AI & Automation offerings accelerate digital transformation and amplify business possibilities. Automation particularly helps rewire traditional enterprises by connecting siloed systems and automating manual tasks without a complete rehaul of existing systems, eventually making them more agile and competitive. Automation platforms helps enterprises reduce operational costs while improving the overall process efficiency and elevating the customer experience.
2. **Products** : Financial Products are evolving to cater to the changing demographics and regulatory/technology changes. In housing finance, for example, lenders can no longer base their decisions on traditional credit scoring and are making way for alternative credit scoring mechanisms to cater to the gig economy. In trade management, order routing to multiple execution venues can be machine-controlled based on the current market conditions and pre-determined rules.
3. **Channels** : Emergence of new channels has necessitated banks to look at accelerated digitization and integration of multiple channels to provide a single view to their clients.
4. **Operational** : Banks have re-jigged their internal systems, processes and governance model to be nimble and adapt to changing market dynamics.

Bank of the future

In the new normal economy, the scene is different. In the era of heightened competition and due to the need for continuous improvement in the execution of service cost to the larger clients, Banking organizations have increasingly taken outsourcing and off-shoring route to ensure lower cost of ownership of IT assets. Leading industry research firms such as Gartner and Tower Group in their various research outputs have placed the number anywhere between 30-50 percent of outsourcing of IT functions. With these initiatives, over a decade, Banking organizations have taken the significant

portion of their fixed cost out of their systems. By increasing the variable component in their overall cost structure, they can address significant demand for business agility in this volatile environment.

However, the thinking in the past two years has changed the landscape of IT organization within the financial services industry. In an interconnected world, the exclusivity of information does not last long enough to be advantageous. What it means from the perspective of banking is that they are increasingly redefining their market segments to respond to emerging competitions from non-core banking businesses such as Telecom and Retail. The emergence of Google and Amazon in the FS industry can only be countered by creating a social graph (using social media) and building an in-depth knowledge about the customer.

In addition, there is the key lesson learned in the past decade, which initiated the first wave of cost rationalization. Banks, to a large extent have moved away from individual-based programming and supporting applications to a more matured service level agreement-based development and support functions. They have increasingly out-sourced non-core functions of the business to external service providers globally. This route was considered low risk once to achieve target saving in the IT support functions. Considering that this move was primarily to exploit the labor arbitrage, cost-saving has significantly influenced the thinking.

Destination IT

However, business changes are shaping new thinking in the IT organizations of these enterprises. Changing dynamics of the market as well as predictable nature of IT application to solve the business needs are creating defined shared service utilities across functions. Potentially these concepts can enable building leaner and efficient IT organizations, that can meet the dual objective of further cost rationalizations and building superior IT support structure to support business. Though some of these concepts are in an early stage of thinking, it appears that the factors are driving the change once again, within the world of financial service. We believe Banks have an opportunity to reshape the IT organization to lead these industry changes by answering below leading questions.

Is it realistically possible to build shared service organisation across business units?

Shared services within certain functions of single LOBs are somewhat proven concepts in the industry, though organizations have faced some difficulties when it came to the point of cross border trade and business due to varying degrees of regulations. However, building cross LOBs supporting services is yet to be understood in detail. One significant challenge organizations are facing in the decision-making process is rooted in fear of disturbing process which is working well. A radical approach to take IT organization into the next wave requires a few examples of first movers for the industry to feel comfortable. Fear of the unknown, as well as awareness of the risk involved, deters trying to change the course. The question for many organizations is to be or not to be.



A significant challenge in mindshare among diverse team across LOBs

Consolidation of services on the utility concept requires a broader consensus among a diverse set of business users and participants. Consolidation also means a leaner organization structure. It may force decision-makers to make multiple hard decisions that may not be liked by all. Unless a consensus is built, embarking on major initiatives can disrupt the organisations.

Difficulty in analyzing cost benefit of these initiatives

Rebuilding legacy platforms supporting various business processes, consolidating databases,

migrating applications and reorganizing message flows and changing downstream application interfaces are difficult to conceptualize and analyse from the perspective of cost benefits. This is further complicated by the choices available today. Considering the vastness of the changes which is required to build a newer way of IT supports, decision-makers are facing significant challenges to build a future case based on current realities. Since some of the decisions are forward-looking, quantifying the value of outcome is proving to be difficult. In this context, certain decisions may have to be taken on the principle a leap of faith so as to build an uncharted path of cross LOB IT support.

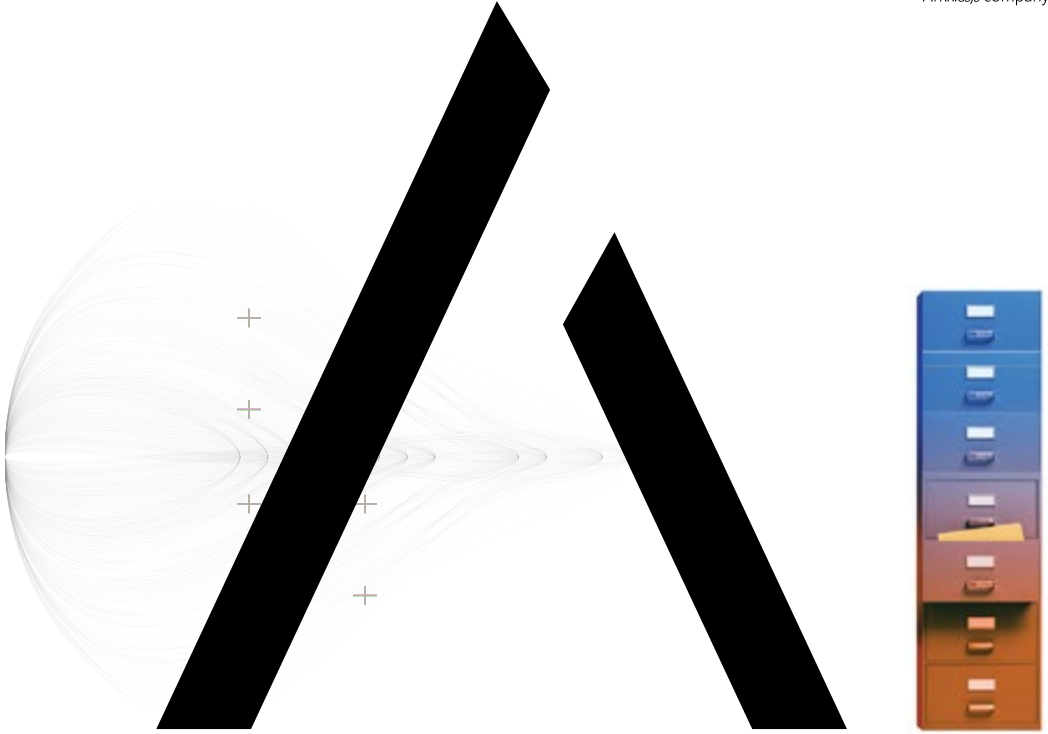
In conclusion

We believe, while we look at simplifying application architecture at banks along with infrastructure supporting the same, it is pertinent to address the vital issue of mapping raw data from source systems into an appropriate canonical representation that downstream applications will consume as they are provisioned. Hence, for a successful bank-wide IT services model, it is pertinent to address the key issue of mapping raw data from source systems into an appropriate canonical representation that downstream applications will consume as they are provisioned. With the advent of Service-Oriented Architecture and Batch Integration mechanisms, today's technology is far entrenched in addressing these challenges.

- Lowering the cost of transactions & increased operational efficiencies – through enhanced standardization of services (infrastructure, application /maintenance and operations) and harmonization of life cycle managed across processes.
- Leveraged data management through proper life-cycle management– enabled through enhanced dashboards, minimized faults through proper checks & balances and visibility into all aspects of the banking relations with customers and suppliers – effectively managing larger eco system of the banking industry.
- Enhanced risk management services – through proper alignment of risk servicing infrastructure to enable a consolidated view of Liquidity, Market, Product and Credit Risk across different entities, accounts & geographies.
- Adaptation of "Single Customer View" – through the adoption of creating a complete and accurate customer warehouse. Provisioning of an organization-wide standard of customer data for representation, access, control, and governance leads to significant cost savings and increases operational efficiencies.
- New business models – through the application of advanced analytics and technologies like AI, Automation, Blockchain, Cloud that can enable a new way of working in which the organization

does not need to own the IT or Operations infrastructure (as-a-service) to give a superlative service to its clients.

We believe while we look at simplifying application architecture at banks along with infrastructure supporting the same, it is pertinent to address the vital issue of mapping raw data from source systems into an appropriate canonical representation that downstream applications will consume as they are provisioned. With the advent of Service-Oriented Architecture and Batch Integration mechanisms, today's technology is far entrenched in addressing these challenges. ■



Digitize and harvest intelligence

NIA CAN

Documents come in different forms and formats, and converting this disparate data into actionable insights takes expertise and experience-- that NIA has. NIA CAN.

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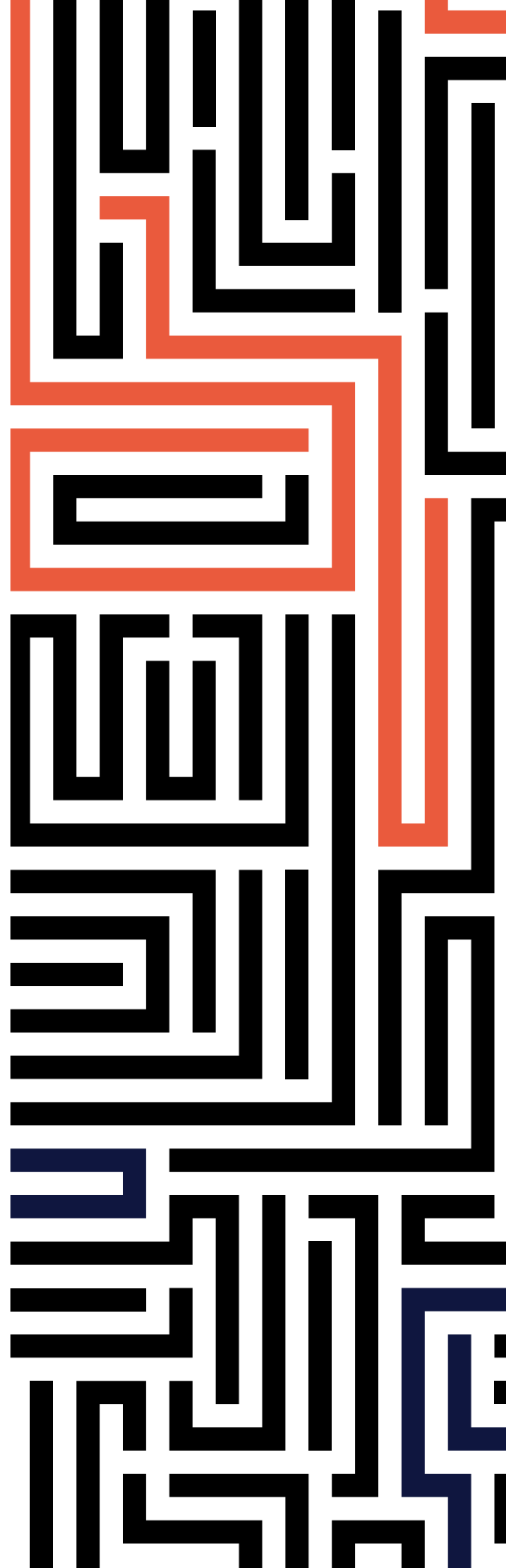
Why Process Discovery is Key to Digital Transformation

In the previous edition of The Edge Quarterly, we talked about the idea of Automation Singularity, a highly customer-centric and agility-oriented approach to Intelligent Automation. Driven by the human-digital twin, a seamless combination of digital and human workers, Automation Singularity serves as a beacon for enterprises to conceive, design, structure, and deliver products and services. In an environment driven by intense competition and increasingly demanding consumers, it will unlock unprecedented creativity and efficiency in the enterprise. However, with the desire for greater effectiveness comes the requirement for absolute clarity. Enter **Process Discovery**.

Although the benefits of RPA are beyond doubt, the implementation models across enterprises aren't. **All too often, initiatives fail not because enterprises lack intent, but because it's misplaced.** On the one hand, the identification of process candidates for Automation is rife with challenges and, on the other, enterprise-wide deployment and scale is often a stumbling block. Process Discovery provides a transformative solution by using empirical data to visualize manual effort and inefficiency in every process, offering a data-backed recommendation complete with opportunities for improvements.

Let there be light

The undeniable impact of RPA does not mean that advocacy is without its challenges. In an enterprise scenario, credible scenarios and use cases must drive any proposal for platform adoption. However, the old school of IT doesn't quite rhyme with the bleeding edge. Managing processes, albeit complex and critical, remains a disproportionately





Process Discovery enables the absolute transparency of actual processes and creates a robust foundation for operational performance improvement.

manual role. **Inevitably, process managers tend to have biases about the workflow and process construct that can contaminate the decision-making process. Add to that the lack of transparency in process evaluation, and it becomes easy to see why the approach needs an overhaul.** Process Discovery identifies the processes best suited for Automation and, when used in conjunction with RPA, big data, and data analytics, can be a catalyst for agility.

Understanding Process Discovery

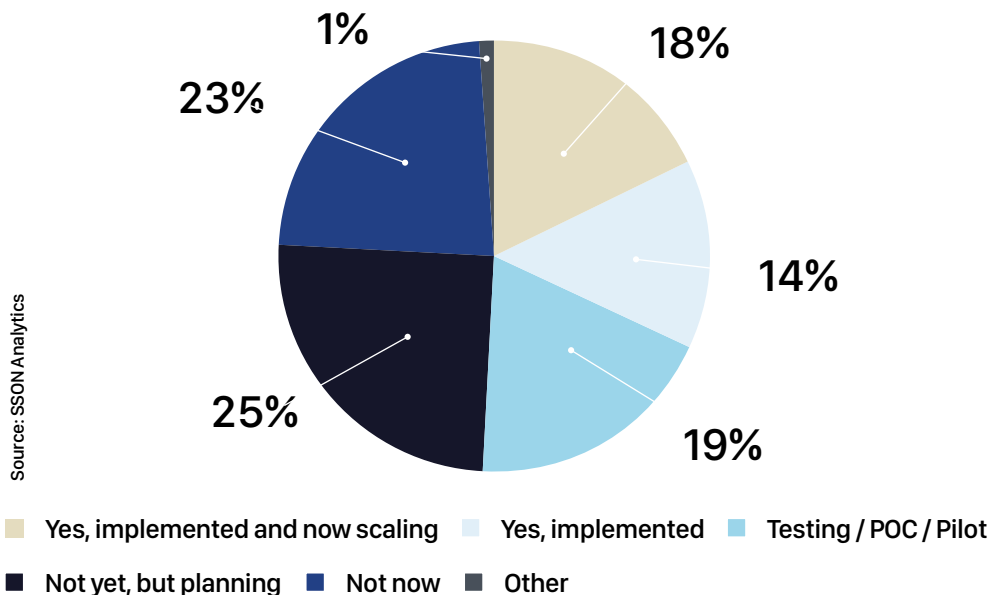
As an investigative tool, Process Discovery combines the best of business process management and data mining. It analyzes data from user keystrokes in enterprise systems to identify, improve, and monitor actual processes. It employs empirical data for analysis to eliminate bias in enterprise Automation strategy and tactics, offering a better understanding of the right process candidates for digital transformation. More importantly, Process Discovery is a shot in the arm for teams looking to build a business case for Intelligent Automation. Enterprises can now review comprehensive Automation proposals empowered by process information across activities and users, gathered non-intrusively from actual execution data.

Calibrating for Impact

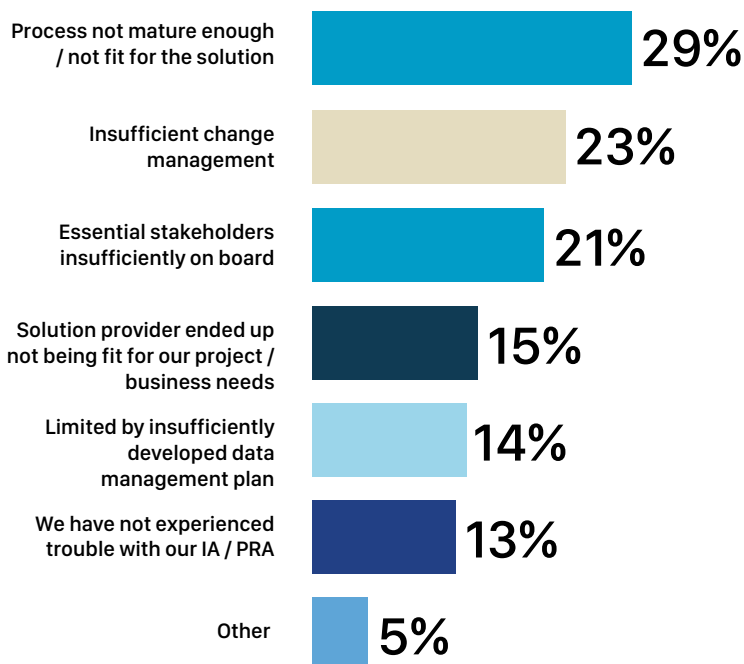
In the absence of up-to-date process documentation and knowledge which is a common occurrence across a majority of enterprises, it is practically impossible to have the required transparency around exceptions and variations. Working blind does not offer an environment conducive to the success of most initiatives; much less one focused on enterprise transformation at scale. The situation is exacerbated by the fact that consultants and process specialists traditionally rely on subject matter experts for recommendations, integrating bias into the Automation roadmap. Often, the resulting approach either fails to prevent, and often intensifies, the impact of process inefficiencies that cost businesses by way of increased expenses, delays, missed business opportunities, and a loss of revenue.

Data Insights on Intelligent Automation Implementations and Process Mining

Is Intelligent Automation (e.g. RPA) part of your operations?



If your RPA project has run into trouble, what do you attribute this to? (up to 3 options chosen)



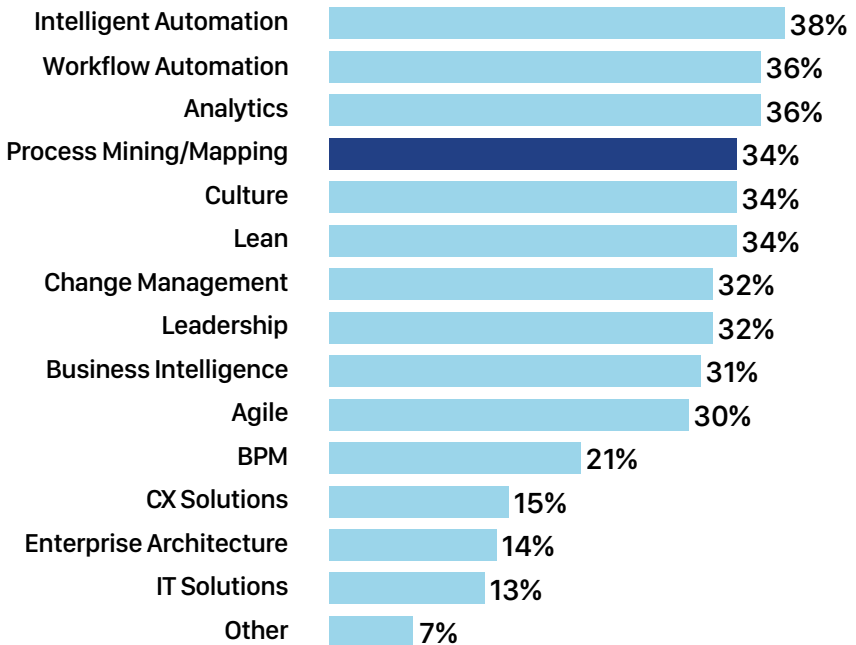
Do you use Process Mining?



Are you going to be using Process Mining in the next 6-18 months?



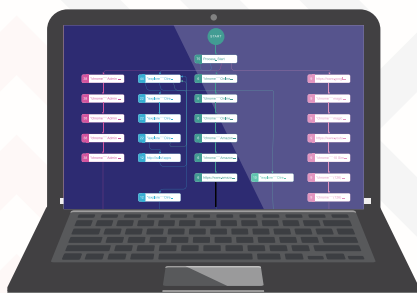
Which of the following areas are your biggest anticipated investment priorities or interest?





Process Discovery leverages user keystrokes and sophisticated neural network algorithms to capture task-level data

The data and information captured is represented with the help of an insightful business map



Using business maps, insights and recommendations from Process Discovery, automation and process improvement opportunities are identified



Process Discovery enables the absolute transparency of actual processes and creates a robust foundation for operational performance improvement.

Despite the apparent advantages, the market leaves much to desire by way of maturity. Under a third of respondents in a recent Process Excellence Network survey were found to be using Process Discovery. An additional 30 percent, however, planned to employ Process Discovery within 6-18 months. This appetite is a function of process improvement targets as much as it is of the desire for harnessing Automation. Driven by the need to offer hyper-personalization to consumers while reacting to market changes at speed, operational leaders to understand how to identify and act on opportunities to deliver greater agility. Near real-time responsiveness is proving vital for enterprises to retain their competitive advantage. Still, when underlying processes fail to keep up with front-end digital changes, the mismatch can prove to be a substantial obstacle.

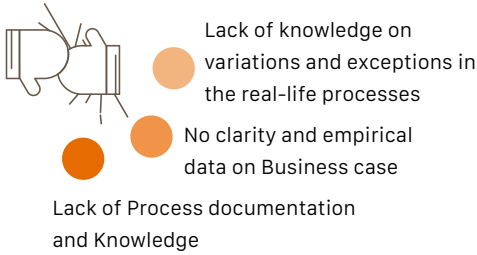
The Case for Process Mapping

The staggering opportunity cost of wrong process selection makes the most persuasive case for Process Discovery. The results of a 2019 industry survey conducted by the Shared Services and Outsourcing Network (SSON) drive this point home, that **identifying the wrong process selection topped the list of causes for RPA performance failure. With experts stating that up to 50% of RPA projects either stagnate or fail, enterprises must find ways to address the hurdles in the implementation process.** Enterprises face several challenges when choosing the right process candidates for Automation, from basing their decision on SME knowledge and manual documentation to low-quality data capture and delays in understanding process exceptions. It is here that Process Discovery comes into its own.

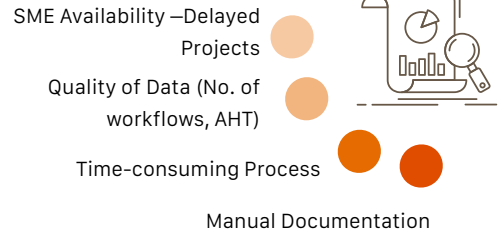
It gains credence by combining a holistic understanding of process nuances through workshops with process owners and subject matter experts before creating a high-level process flow of key activities. This approach also details whether a bot or a human executes the process. In addition to identifying automatable activities, delineating the

Enterprise challenges in the Automation journey

Challenges



Consultants Traditional Approach



various ways in which business and regions manage the same process, Process Discovery computes crucial business case metrics such as return on investment and payback period. This combination of clarity, coherence, and capability ensures that Process Discovery helps enterprises drive sustained results from Automation at scale as opposed to the unpredictable, and almost always unsatisfactory, outcomes of piecemeal interventions.

Why do we need to Automate Process Mapping?

Advantages

- An alternative to the current manual, time consuming unrealizable approach
- Process Discovery tool can be deployed across all user workstations at once
- It can collate data irrespective of variations in SLAs or process steps
- It captures process gaps and scope of optimization
- Results are accurate as the input is taken from actual data across users

Catalyzing Growth at Scale

By drilling data down to an unprecedented level of granularity, breaking every process down to its bits and bytes, Process Discovery gives organizations powerful insights. In combination with machine learning and data mining, this information can be

an incredible driver for digital transformation. A deeper understanding of processes sets the stage for cognitive capabilities, easily the most innovative tools for accelerated digital transformation through their ability to influence customer journeys and accelerate time to value. Once active, cognitive capacity can redesign operating models from the ground up, also rewiring processes, and injecting agility into the enterprise bid to meet the changing demands of the market and customers. It is evident that the most significant avenues for enterprise growth lie in acceleration and amplification, both of which require the elimination of inefficiencies, and process discovery is integral in this regard.

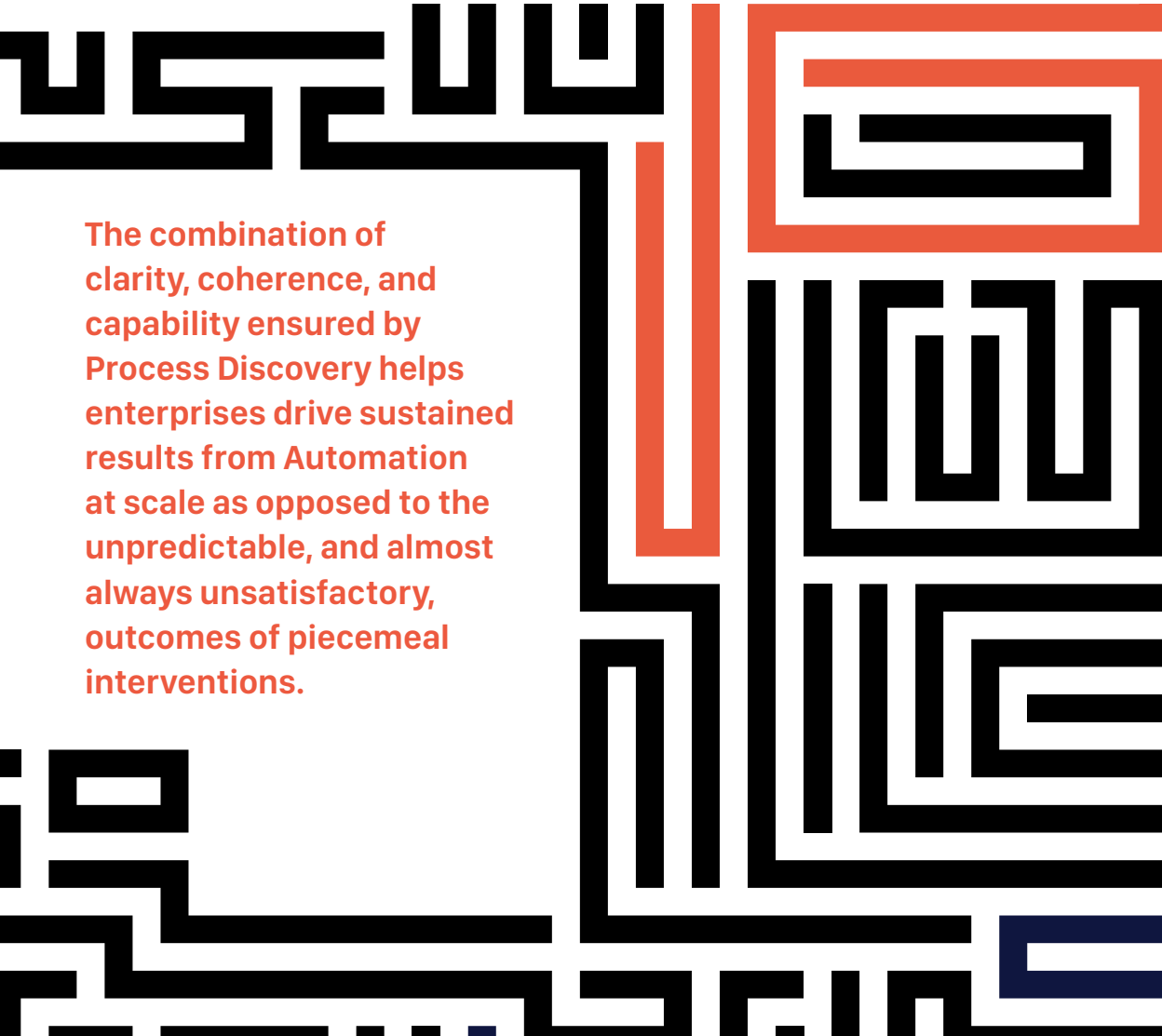
Enterprises looking to implement a process discovery solution must ensure certain key capabilities to drive sustained results.

Key capabilities to look out for in a Process Discovery product

- Prioritize tasks with Automation Blueprint
- Identify process nuances and variations
- Automatic data capture
- Highest level of granularity of data capture
- Understand process nuances
- Identify key process insights
- Easy-to-use process maps
- Data privacy compliance

Effectiveness Driven by Clarity and Focus

Process Discovery is at its most transformative when the insights it generates are followed by action. Once enterprises analyze the performance of a process against its original objective, specifically from a business standpoint, they can determine the key areas of focus. Armed with the clarity generated by Process Discovery, enterprises can start to generate sustained results from intelligent Automation at scale, furthering their progress towards harnessing the best of human and digital capabilities for growth, towards the holy grail of Automation Singularity. ■



The combination of clarity, coherence, and capability ensured by Process Discovery helps enterprises drive sustained results from Automation at scale as opposed to the unpredictable, and almost always unsatisfactory, outcomes of piecemeal interventions.

 assistedge | RPA

Automation Singularity Led by Humans

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At EdgeVerve, we envision a world where the two forces – the human worker and digital worker converge to co-create the future worker, enabling a synergy of people, process, and technology.

As Automation gains momentum, businesses need to look at building a solid foundation to embark on the Automation Singularity journey - an end state of the future workforce.

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The EdgeVerve logo, featuring a stylized 'e' icon followed by the text 'edgeverve' and 'An Infosys company' below it.

Automation at Scale

Thriving in the digitally enabled enterprise of tomorrow



By Shrikant Deo

Associate Director, Product Management,
AssistEdge,
EdgeVerve Systems Ltd. (An Infosys Company)

With RPA growing at the speed of light, scaling your virtual workforce is arguably at the top of most business leaders' agendas. Today, organizations are seamlessly integrating technology solutions, leveraging cloud, and shifting the human workforce to more value-adding work to transition to a digitally-enabled enterprise.

What does a smart digital workforce mean? Are scalability and Automation two sides of the same coin? How can enterprises deploy the digital workforce at scale?

The Edge Quarterly team caught up with **Shrikant Deo, Associate Director, Product Management, EdgeVerve**, to discuss one of the most debated topics, Automation scalability and the role of bot scalability in digital transformation.



The vibe in his office is calm — tech books dominate the bookshelf, colorful bean bags to flop into for a quick brainstorming session, and the sunny windows give you a view of the lush Pune campus.

Shrikant is deeply invested in several Automation projects — has authored many whitepapers and reports, has been a part of global discussions and events on Automation, providing his insights on one of the most disruptive technologies.





Here's the complete transcript of our conversation.

Editor: What's the best advice for scaling the digital workforce?

Shrikant Deo: The key difference between the current enterprise and the future, digitally-enabled enterprise lies in the integration of technologies and capabilities. Today, many Automation tools are still stacked together and, therefore, not fully optimized. The complexity of integration

can overshadow the benefits of value. But the customer wants a simplified experience, so the big challenge – and opportunity – lies in providers offering an integrated solution that supports scaling and makes it easy. However, the scalability of solutions depend on the infrastructure and on the groundwork that is laid. Strong governance and strategic oversight are needed to ensure control, and IT involvement is critical – but on its own is not enough.

We have developed a concept of 'Automation Singularity' that combines a human-digital workforce with intelligent Automation solutions that are constantly becoming smarter. This means that enterprises start with the right basis, a framework, and gain the benefits of smarter Automation as this capability develops.

The market is still at the early stage, but it's definitely on the way to a collaborative workforce operating in perfect synchronization.

Editor: What's the best practice for implementing and developing the digital workforce?

Shrikant Deo: The implementation roadmap must clearly account for each of the three phases: discovery, implementation, and orchestration. Service providers can play a strong partnership role here. Enterprises want a low-complexity experience and needs guidance across all three areas – selecting the right processes, building the Automation, and planning how to apply it – what we call orchestration, and of course scaling Automation out.

There are so many aspects that support optimized application: There's the employee engagement piece, the reskilling piece, the workforce restructuring piece, and the organizational structure itself that needs to adapt.

There is significant work involved in layering new Automation capabilities on top of the underlying operational landscape. Too often, we see insufficient change management support limiting results.

Editor: What's a common reason for Automation failing to scale?

Shrikant Deo: As I said, change management is a critical part of the digital journey. Often, the failure to hit targets is down to plain negligence in planning and execution. Adopting a digital mindset

around a digital workforce requires enormous transformation. It doesn't happen in a vacuum. It only evolves through true partnership across the enterprise as well as with the solution providers and service integrators.

Important prerequisites are to define expectations around Automation and scaling in support of business objectives. The purpose of digitization is to enable a more intelligent enterprise, so you need to keep your eye on the end-objectives.

You also need to understand and agree on how you define scale – what are you trying to achieve?

Beyond that, it's about engagement, IT support, and cultural change as much as it is around process definition and optimization.

Editor: What does a smarter digital workforce mean for the enterprise?

Shrikant Deo: This developing intelligence of the digital workforce is a key enabler for tomorrow's enterprise. Future digital workers will learn from the knowledge base that is currently being built in the enterprise. The digital workers of the future will learn from their human partners to the extent that eventually they will no longer need to be told what to do – they will learn what to do. That means that growth – or expansion – of scope will be self-generating. Automation will fuel Automation.

To understand this better, we need to take a step back. While today most solutions still work more or less in isolation – RPA & AI – in future, these capabilities will merge to create a new state of technology defined by intelligent Automation – Automation Singularity. These technologies will also become more 'natural' and 'stable' in the enterprise. That is not yet the case. Today, most enterprises are not yet at the stage where they can smoothly integrate and scale such technologies. That requires maturity.

Things are changing quickly, however. As organizations mature in their understanding of Automation's capacity, they will also prepare their employees to use these technologies – without

friction. This capability will depend on a common platform, however, that connects Automation with AI and machine learning.

Today, RPA and AI are seen more as incremental initiatives layered over the enterprise IT landscape. In tomorrow's digitally-enabled enterprise, these capabilities will form the core of the landscape.

Employees too will have developed Automation and AI as core skills and be able to problem-solve business solutions based on them.

Finally, the management and governance of the digital workforce will be a key factor. As the digital workforce swell in the ranks of an enterprise, we can expect more conflict to arise between human and digital workers. Resolving these conflicts requires collaboration. This methodology must be enshrined in rules around governance and how to distribute and orchestrate work.

Editor: How will the digital workforce become 'smarter'?

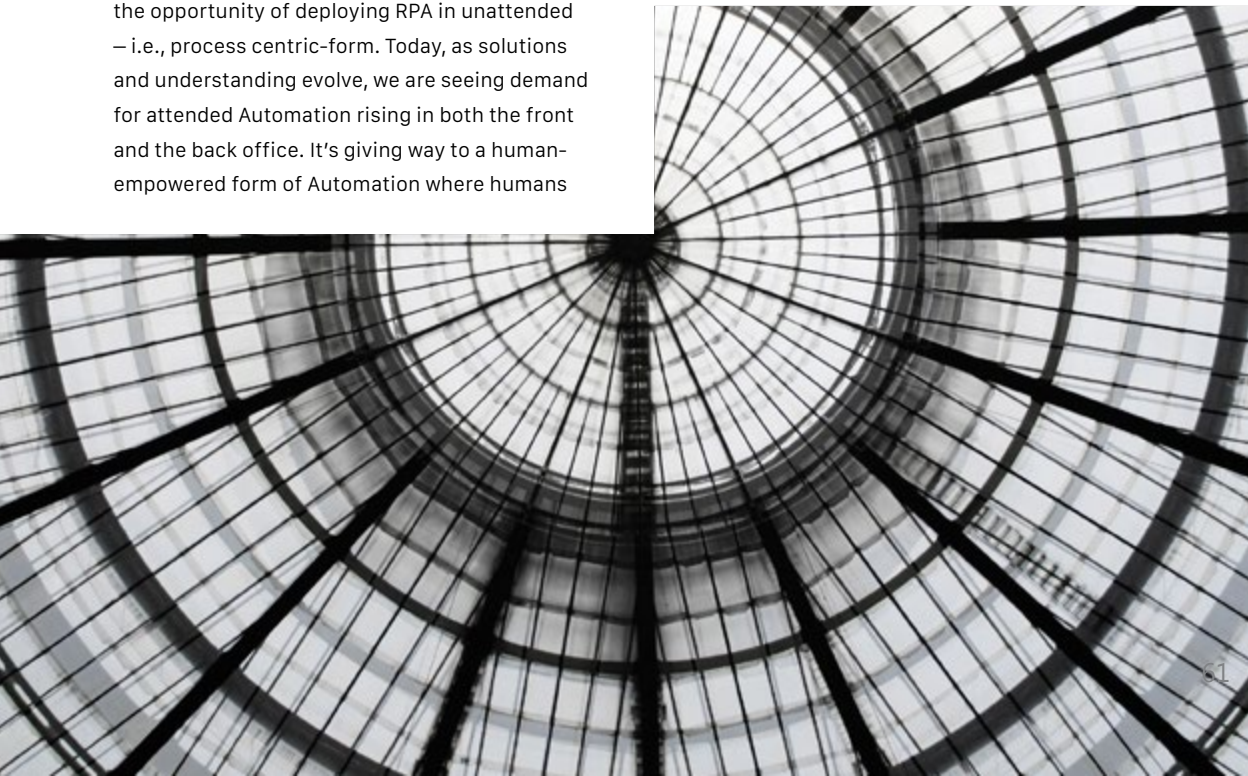
Shrikant Deo: For the past decade, operational Automation – we did not call it RPA back then – took the form of attended Automation, by supporting work initially in contact centers and customer-facing activities. Then, the back office recognized the opportunity of deploying RPA in unattended – i.e., process centric-form. Today, as solutions and understanding evolve, we are seeing demand for attended Automation rising in both the front and the back office. It's giving way to a human-empowered form of Automation where humans

trigger Automation and AI, but also enable the digital workforce to become smarter.

Here is what this means.

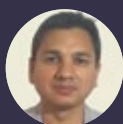
Within the scope of many attended automated transactions, humans step in to make the right decisions where the robots, for whatever reason, cannot. However, because this is happening within the scope of automated transactions, the robot - the software - is learning. In our product, this is called the Digital Workbench. Automation is learning from every decision made by humans. So, as humans step in to fill in the gaps, and at the same time, they are training robots to be smarter.

Robots are watching and learning from humans, which develops their own 'intelligence.' This trend will gain momentum to where the digital workforce will move from what we are currently still calling digital assistants, to highly capable and intelligent, digitally-empowered independent workers. ■



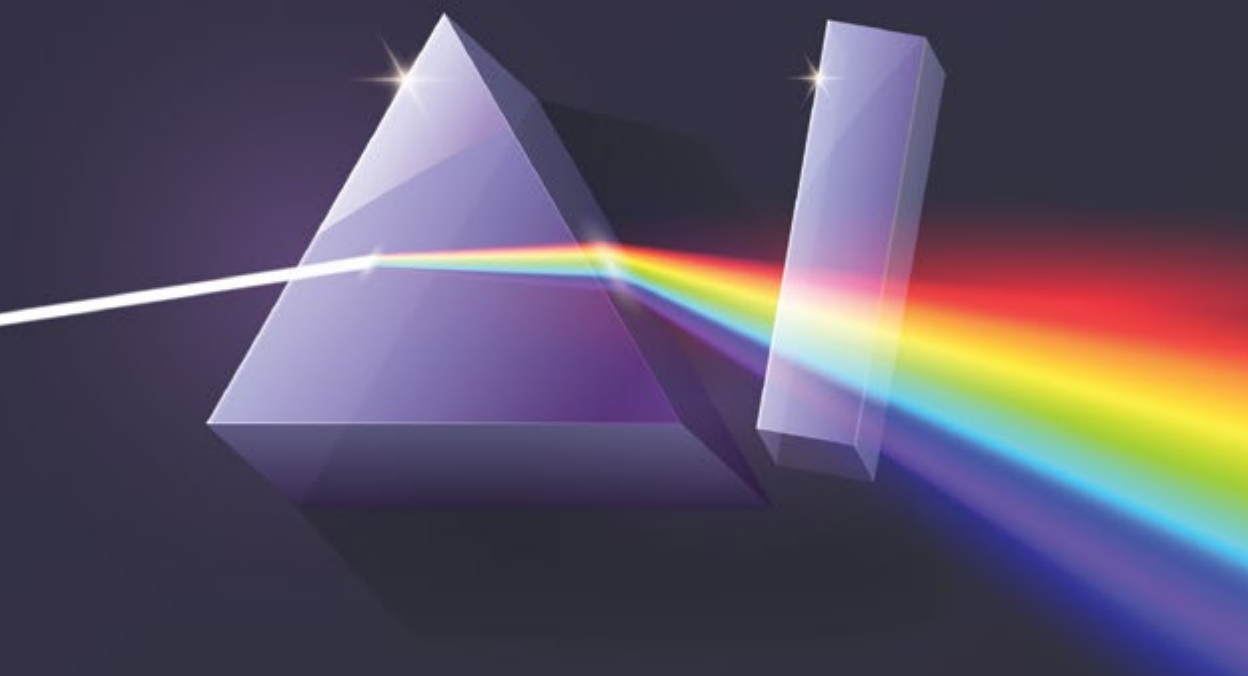
BIAS IN AI

Taking Off the Blinkers



By Ashish Khandelwal

Director - Product Management,
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EdgeVerve Systems Ltd. (An Infosys Company)



Lawmakers across the globe aim to protect protection against discrimination in lending decisions through a number of local and federal regulations. In the US, for instance, the Equal Credit Opportunity Act (ECOA) makes it unlawful for credit applicants to be discriminated based on factors such as race, color, religion, national origin, sex, marital status, age, or assistance from any public programs - traditional practices, and standard operating procedures prevalent today.

There is no working definition of bias under the act, only an explanation of its provisions, which can often fall short of ensuring fairness. Lately, however, the evolution of technology has offered hopes of change. AI, specifically, with its ability to learn, evolve, and compute rapidly, is capable of eliminating bias that may be attributed to subjectivity in the (manual) decision-making process. It turns out that AI can also get biased. This calls for thorough due diligence, comprehensive checks and balances to make AI systems fair.

Bias in Intelligence

Over the last few years, we have seen the promise of ubiquitous AI. The technology, in its various forms, is starting to enter mainstream dialogue, no longer confined to enterprise boardrooms or sci-fi constructs. AI is supposed to make us more efficient, more intelligent, and more objective. If popular accounts are anything to go by, it could be what drives our species forward. What do you do, then, when AI is found to be biased?

Consider the following examples:

¹Google, widely regarded as a leader in commercial AI, experienced an issue with its AI in 2015, when the image recognition algorithms in Google Photos classified an image of black people as 'gorillas.' The company then promised a fix and then just erased the 'gorilla' label from its image classifier after two years.

Fast forward to 2019. Enter Apple. The company's ²Apple Card, built in partnership with Goldman Sachs, was in the headlines when it gave an American tech entrepreneur a credit limit 20 times higher than his wife's, despite her higher credit score and the fact that the couple jointly filed tax returns. Although allegations of a 'sexist algorithm' made for better media traction, the reality was far from this narrative. Goldman Sachs publicly stated that gender was not a factor in its assessment of creditworthiness. Gender, in fact, didn't even feature as an input.

In this piece, I want to address the nature of bias in AI and why it should be a concern for enterprises everywhere.

Why Companies Should Care?

Bias in data, algorithm and AI designer can lead to unfair discrimination that disadvantages individuals either intentionally or unintentionally. AI applications can create unexpected and inexplicable outputs. Often interpreted, inaccurately, as algorithmic bias, previous actions driven by human-driven choices influence the decision. ML is not causing discriminatory bias, but the historical data created by our society,

influenced by its biases, can often contaminate the computing process.

That said, organizations must understand that they are responsible and liable for all AI application output in production, even in instances where AI is designed externally or given full autonomy. For the finance industry, in particular, organizations face a significantly higher risk of legal action if their lending decisions are found to be discriminatory. In addition to the intent and desire for fairness, companies should proactively manage all forms of bias to ensure that individuals are not intentionally disadvantaged or mistreated.

Unfortunately, bias is not easy to detect and eliminate. Consider the following scenario:

A bank grants a mortgage for USD 350,000 to applicant A while rejecting the same loan for another applicant B. It turns out that A is a male applicant, and B is a female applicant. Is this a case of sexist bias? What if it is discovered that the credit score of A is 900 and that of B is 650?

The answers to such questions are not usually straightforward and may require expertise on what constitutes a bias under local laws. First, we would need a systematic way of measuring bias to be able to make an objective judgment on this topic.

What Causes Bias?

AI is not born with biases. We teach it how to discriminate. AI is based on mathematical models that try to mimic the behavior learned from a dump of historical data to make predictions about unseen data. Humans learn by observing what's happening around them. AI algorithms learn from the patterns in the data. At the risk of oversimplifying things, there is a tempting analogy to describe the two processes:

A human child exposed continuously to discriminatory behavior may not know any better. An AI algorithm will learn the biases that exist in the training data. The algorithms are fundamentally free from any prejudices, as is widely feared and believed. The point I am making here is that the problem lies in the dataset we provide to the AI algorithm and, hence, the solution lies in fixing the bias in the dataset rather than fixing the algorithm.

I believe it's safe to say that all modern banks and lenders are fully aware of the risks involved

and are taking measures to curb bias at different levels. **The first step in solving for bias is the recognition that it's not a trivial problem to solve. If it were, we wouldn't be talking about it. It requires a systematic framework that detects and eliminates bias while providing incremental improvements. It is worth noting that some of the following measures are commonly adopted to prevent bias, but there continues to be no comprehensive approach in place. These methods include:**

- **Restriction on the use of protected variables (unawareness):** An excellent place to completely do away with the prohibited attributes when training the AI model. This approach becomes the first level of defense and is commonly prescribed by most anti-discriminatory frameworks.

AI exhibits certain advantages in this regard, whereas with human decision-makers, it is impossible to prove to auditors that any decision was utterly unaffected by the protected factors easily observed during any social interaction. It is possible to systematically and deterministically show the exclusion of the protected variable in the creation of the AI-based lending approval model.

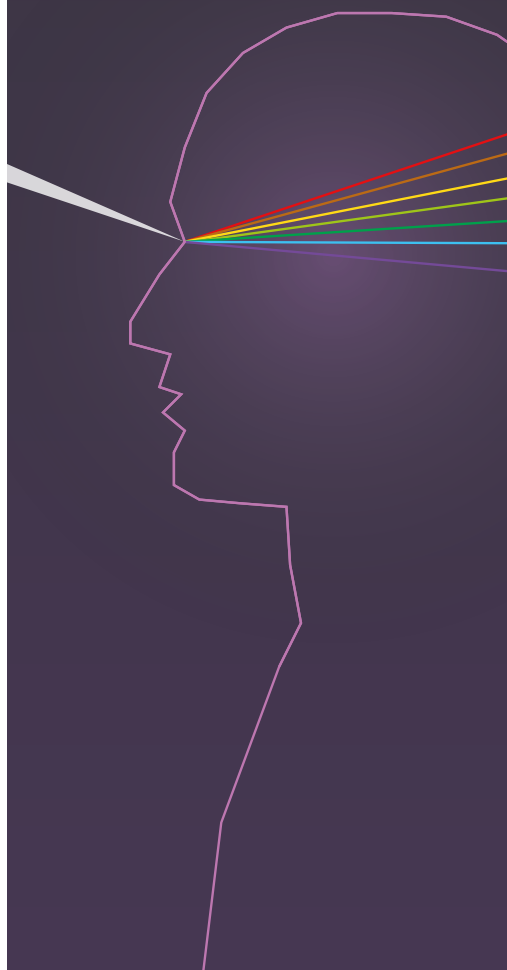
While the legal and model validation teams in your organization may be satisfied with this simple exclusion, since it is consistent with the notion of disparate treatment as defined in ECOA, 1964, real-life results may not be as simple.³

- **Removing variables highly correlated with the protected variables:**

Data is an accurate representation of the nature of our society. The discrimination, and resulting fallout, in our history, has been extensively discussed and documented. Every country, subculture, and individual, however, tends to have its version of discrimination and attributes personal to their judgment. By extension, there may be variables other than the protected variables in the data with encoded information about the protected variables.

For example, a part of the city inhabited by a minority class with a disproportionate number of refused loan applications will influence AI model predictions.

AI is not born with biases. We teach it how to discriminate. A human child exposed continuously to discriminatory behavior may not know any better. An AI algorithm will learn the biases that exist in the training data. The algorithms are fundamentally free from any prejudices, as is widely feared and believed.



The indirect influencers of the above kind are also easy to detect by a simple statistical correlation measure. The idea is to identify the variables that may have a high correlation value with any of the protected variables and diligently remove them from the list of approved elements for AI model training.

A correlation matrix, as shown below, will help to identify seemingly unrelated attributes causing indirect bias quickly. This matrix is just a tabular arrangement of correlation measures between the prohibited variables (columns) and the other variables in the rows. E.g., the high correlation value of 0.9 between 'Race' and 'City/Region' indicates that certain cities/regions are inhabited predominantly by people belonging to a specific community/race. Hence, the usage of the 'ZIP Code' will bring in the inherent bias and cause the model to discriminate against one particular race.

	Race			Age		
	0	0	0	.1	0	0
City Region/ Zip	0	.9	0	...	0	0
	0	.1	0	...	0	0
				...		
	0	0	0	0	0	0
	0	.1	0	...	0	0
Make of Phone	0	.1	0	0	.8	0

Protected Attributes

A correlation matrix will help identify seemingly unrelated attributes causing indirect bias. Variables highlighted in the dark grey rows exhibit high correlation with the prohibited variable and should be omitted from the training model.

Fig 1 shows how a correlation matrix can help identify and eliminate sources of indirect biases from the data:

Quantifying the Bias

So, most legal teams are satisfied with the first technique, and we have offered an additional step as well. At this point, we may hope against all the odds to have eliminated entire biases in the AI model created. To ascertain that the bias is within a certain permissible threshold, we would need a formal metric. The threshold 'α' will have to be selected with extreme care such that any



discrepancy beyond 'α' may be safe to consider noise. One such parameter could be expressed as below (for a model that approves or rejects a loan application; protected class = attribute protected under anti-discriminatory laws).

$$\frac{E(\text{Loan Approved} | Z = \text{protected class})}{E(\text{Loan Approved} | Z = \text{non protected classes})} > \alpha \text{ (where } \alpha < 1)$$

In other words, we would mainly like to keep the ratio of expectations of loan approval through the model under test, for a protected attribute/ minority class concerning that of the majority class/ unprotected above a certain threshold to eliminate the likelihood of bias in the model. The generally adopted guideline comes from the four-fifth rule or 80% rule, which sees a selection rate for any particular group less than four-fifths of that with the highest selection rate as evidence of adverse impact.

At this point, after diligently executing step 1 and 2, and carefully selecting 'α', we should be convinced to have removed all possible bias. This delusion is probably the biggest stumbling block in this exercise. The following point will conclusively illustrate why it is still possible to detect bias in the 'under test' model.

In a contrived example, the dataset shown below, the data fields X, Y, Z, K, L, M are seemingly unrelated variables denoted alongside a protected variable. The protected variable is, in fact, a non-linear function of all of these variables. Any modern machine learning model is sufficiently capable of recreating protected variables purely from X, Y, Z, K, L, and M with satisfactory accuracy.

X	Y	Z	K	L	M	Protected Variable
3	7	1	7	9	7	791
1	10	7	2	3	2	95
10	4	5	7	9	3	584
8	10	2	2	1	1	98
4	8	3	10	10	8	1653
10	6	9	6	5	3	461
5	9	5	3	4	2	119
2	3	10	2	4	3	161
9	9	8	2	1	5	297
5	4	3	1	4	10	1059
1	6	1	7	3	10	1366
6	7	2	8	2	5	695

	X	Y	Z	K	L	M
Protected Variable	0.039	0.125	0.125	0.693	0.093	0.591

Fig 2a: A sample dataset with X, Y, Z, K, L, M as variables with no correlation to the protected variable

This example clearly illustrates that while individually, variables may not be correlated with the protected variable. The combination could be used to extract information about the protected variable easily. In that case, the following combination will exactly reproduce the protected variable.

$$\text{Protected Variable} = X^2 + 2*Y + Z^2 + K^3 + L^2 + M^3$$

And hence even if all, directly and indirectly, correlated fields are removed from the training dataset it is still possible to have a bias in the AI model.

The idea here is that even if a specific variable shows a low correlation with the protected variable, a combination of them might not. As you can see, even the correlation matrix is not enough. Microsegments clearly show more significant bias patterns.

To put this in perspective, a bank might provide multiple variables to the AI modelers. For simplicity's sake, let's consider only two of such variables. Area of residence and brand of phone (let's call the phone Swift - X). We know that male to female ratio in the world population is 101 to

100 (about 50-50). Now while Swift - X might have an equal ratio of male and female buyers globally, in a particular country, the ratio might be skewed towards men (and this maybe due to factors such as social structure, design, price, etc.) in that country. AI can use a combination of these two variables to

learn the gender of the applicant and corrupt the decision with gender bias. This makes the entire model biased because the model knows that if you have Swift - X and you live in a particular country; you are more likely to be a male.

Hopefully, this provides a good flavor of why detecting bias is not as trivial as it seems on the face of it. The laws need to change, and people should start moving to new methods. Hence it becomes imperative to think outside the box and apply non-conventional techniques to remove bias. We will quickly touch upon a few of those techniques, currently useful in labs but sure to enter the mainstream, in this section of the article.

1. Reweighing - A Contrarian View

It can be easily shown that including protected factors rather than excluding them in building the machine learning algorithms may lead to less discriminatory outcomes. Including these variables in the training dataset present an opportunity to adjust weights on these fields to negate the effect of the bias inducing factors, instead of blindsiding them to the supposed causes of bias entirely.

Although eliminating race, gender, or other characteristics from the model doesn't produce a quick fix, algorithmic decision-making does offer a different kind of opportunity to reduce discrimination. **Instead of trying to untangle how an algorithm makes decisions, regulators can focus on whether it leads to fair outcomes and find more effective ways of dealing with data instead of rudimentary fixes.**

2. Mixing is good!

It's important to understand that there may not be a universal solution to the problem of bias. The complex nature of the problem makes it imperative for the data scientist to cautiously pick one or mix from the buffet of available techniques. Adding a penalty is a popular technique to curb learning from the noise in data (overfitting). Extending the idea and optimizing the cost function over an additional 'discrimination aware penalty term' could help regularize bias. In another technique, the predictions from the AI model could be appropriately recalibrated to normalize the bias detected in the final output

predictions. The calibration could nudge the output in a measured step to slightly favor the unprivileged group so that the final output is within the permissible skewness range.

3. Finally, keeping it Transparent (Explainable Models)

The route to ubiquitous, trustworthy, and accountable AI implementation is complex and challenging, but it also presents a marvelous opportunity. Once solved, AI would not just incrementally improve but exponentially augment the quality of thinking across several areas. In addition to testing ways to eradicate bias, organizations must consider ways to integrate transparency and accountability into their AI platforms. Explainable and interpretable AI, where every parameter behind a decision can be viewed, evaluated, and assessed, will be integral to furthering trust both within and outside an organization. Once they have a way to understand AI output, companies can course-correct their approach, iteratively arriving at the best AI deployment for their business and customer needs.

Addressing AI bias is no straightforward challenge, but there are steps organizations can take towards making fairer and more explainable decisions. With EdgeVerve's **FinXEdge suite** of cognitive connected business applications, enterprises can generate clear audit trails for every recommendation, including factors determining outcomes, while also improving results through weighted bias decision-making.

The conversation about bias is laying out the path for the future where enterprises will need to become more efficient, more agile, and more impactful, and they will have to do all of this while meeting a rigorous standard of fairness and transparency. ■

¹<https://www.wired.com/story/when-it-comes-to-gorillas-google-photos-remains-blind/>

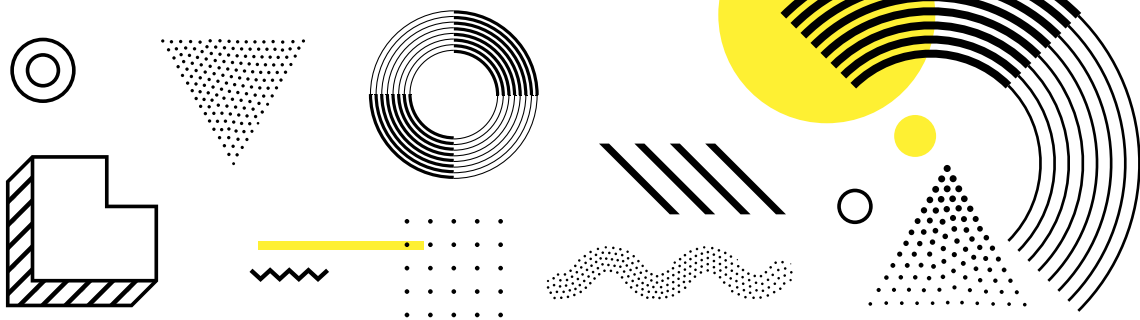
²<https://www.bloomberg.com/news/articles/2019-11-09/viral-tweet-about-apple-card-leads-to-probe-into-goldman-sachs>

³<https://towardsdatascience.com/a-tutorial-on-fairness-in-machine-learning-3ff8ba1040cb>



Vision: Moving the Needle from Sight to Insight

Creating Insights from Complex Heterogeneous Documents



By Kajari Ghoshdastidar

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The evolution of AI can simplify and make existing enterprise operation models efficient. But its real value lies in allowing them to tackle greater complexity with confidence. Computer Vision, which deals with automating tasks usually performed by the human visual system, is one of the most exciting areas in this regard. Today, the intersection of several technological advances ranging from

the rise in computing power even on the edge devices, to advancements in Machine Learning algorithms, are making Computer Vision a reality beyond hypothetical use cases, its capacity even exceeding human visual computing power. This article seeks to understand how computer vision algorithms can help us mimic human capabilities in using visual cues to find insights in visually rich complex documents.

Enterprises across industries and verticals process a staggering amount of information. The different content and context of this data can make processing and classification a significant challenge. Categories can include operational documents such as contracts or invoices to more complex materials such as infographics.

Visually Rich Documents

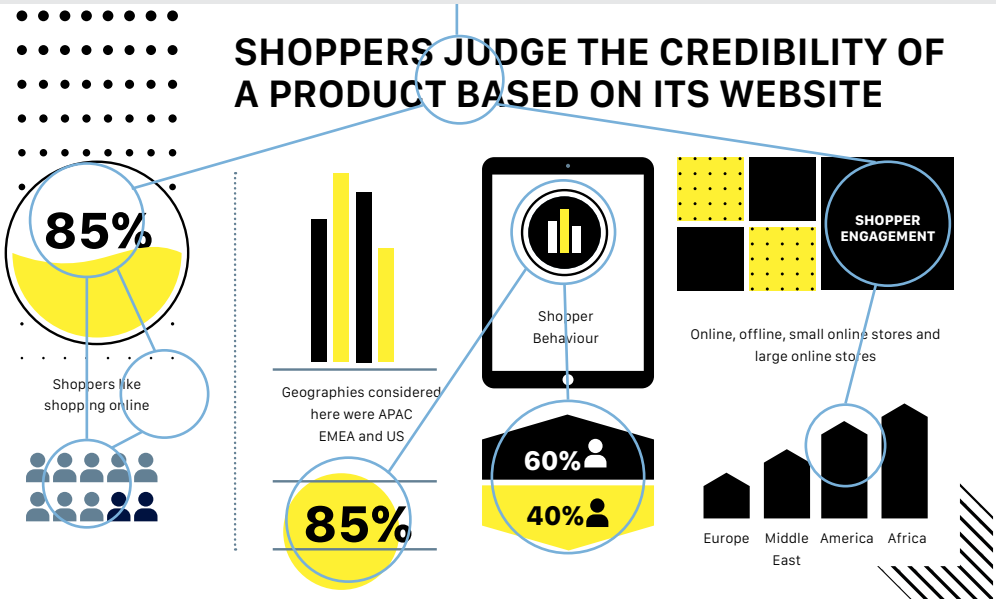
Documents can be broadly segmented into

four categories:

- Continuous textual flow like books
- Form-based textual documents such as forms, receipts, and invoices
- Visually-rich documents like posters, banners, and infographics
- Images such as pictures, screenshots, and video frames

Anatomy of a Visually Rich Document

Sparingly placed text and visual segments logically connected using visual cues to create a coherent story.



Artifacts and Formatting Cues

Images	Logos	Word Art	Symbols
Chart	Bar	Text	Caption
Font style	Color	Background	Whitespace
Positioning	Size	Orientation	Symmetry

Visually rich documents, as you can see, are inherently heterogeneous. The complexity arises not from being abstract but from the fact that humans typically, and instinctually, interpret a combination of seemingly disconnected visual elements and limited text to generate a perfectly coherent message (refer to Fig 1: Anatomy of a Visually Rich Document).

Traditional Optical Character Recognition (OCR) continues to be used at large for the first two categories, but it falls short for the remaining ones. OCR for character or word recognition relies on layout analysis or 'zoning' of a document to establish a baseline for various document elements like character shape, size, orientation, text background, among other factors.

Therefore, consistency of format and the presence of a clear pattern in font styles and backgrounds are critical in ensuring OCR accuracy. The reality for the visually rich documents in the enterprise context, however, is anything but homogenous and consistent.

Areas of Impact

Unlike structured textual documents that rely on templates and NLP-based analytics for information extraction, the semantic structure of visually rich documents is observed primarily by visual cues interpreted by the human brain. In this context, the ability to automate and augment document recognition for intelligence at scale can deliver a powerful impact.

Consider the following use cases:

1. **Ad Tech Companies** - These organizations are likely to analyze a wide range of materials such as posters, pamphlets, catalogs, digital ads, and other content assets. The results could be used to inform their conversion strategy, devise promotions, and focus their content creation approach.
2. **Marketing** - Teams need to analyze marketing assets, competition communication, and even industry research materials to develop cogent approaches for marketing and sales.
3. **Research** - Large research organizations frequently have to sift through thousands of pages of information in different formats, creating inefficiency, and also running the risk of bias and inaccuracy from human processing.
4. **Retail** - To extract information from product labels.

With traditional OCR just not equipped to handle this level of complexity, each of these areas can require a substantial effort of time and investment. It is here that, **with accuracy in object identification and image classification doubling over the past decade to 99 percent**, the progress in the field of computer vision is proving transformative. So, how does it work?

Seeing and Understanding: Multimodal Extraction Approach

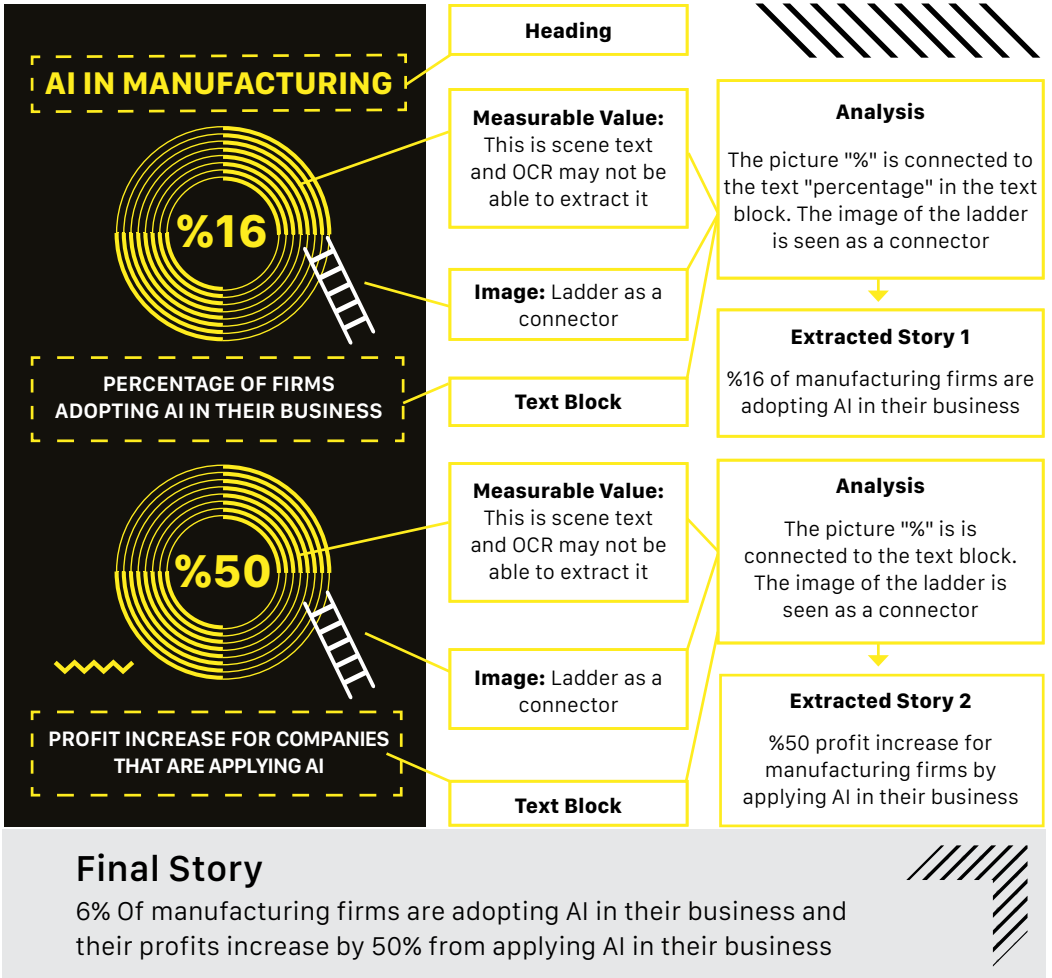
A cursory output that offers some detail, often incomplete, would still require manual interpretation to make progress, defeating the purpose of the exercise. **The actual benefit of computer vision lies in identifying meaning, not mere object recognition and classification.** Multimodal image extraction is the technique that refers to the collective analysis of multiple information types in the same document to create a coherent understanding of its content. In this method, the visual cues from the image are used to tie different document segments (or entities) into a cohesive message.

Computer vision augmented with text analytics can extract the semantic structure and content from such documents. **To paint a picture, a visually rich document can be represented as a graph, with each node of the graph containing specific information and the edges of the graph connecting the information logically. Computer Vision and OCR are used in conjunction to extract data from each node while the graph's neighborhood knowledge ties up all the information together to build a consumable narrative.** We can understand this better with an example.



Computer vision and OCR are used in conjunction to extract data from each node while the graph's neighborhood knowledge ties up all the information together to build a consumable narrative.





The infographic above has been selected as an example of digitized content with a range of elements that may throw off traditional OCR. It includes text and scene text alongside images in the forms of logos, scene text, and vector illustrations. Now, the heterogeneous structure and combination of element formats in this asset will confuse OCR even from a recognition and classification standpoint, much less the more complex challenge of assimilation and comprehension. Here is how a typical multimodal approach can help:

- The algorithm detects that the marked blocks are connected. The other blocks, if any, are separate and will not be considered integral to the main story output. This ability is achievable using neighborhood information through graph embedding.
- Computer Vision then uses the hierarchy of information to understand that 'AI in

Manufacturing' is the heading, before making the inference that all mentions of 'firm' in the text boxes refer to a manufacturing firm.

- When you look at the numbers highlighted in the graph — 16% and 50% — you can see that they represent scene text, much like the text on a stop sign in a photograph of a busy road. OCR cannot process these text formats, but Computer Vision can understand the difference intelligently and apply separate scene text processing techniques for interpretation.
- All text blocks will be identified accordingly and directed to the OCR module.
- The 'ladder' in the image is identified as a connector. The fact that there is a second connector in the image tells the system that the story is incomplete at the first connector, and there is more information to look for.

- It then extracts the information in the first half of the asset, creating a story for that segment before repeating the same process for the second half.
- Once extracted, the technology pieces together all the information to generate a consumable and analyzable output.

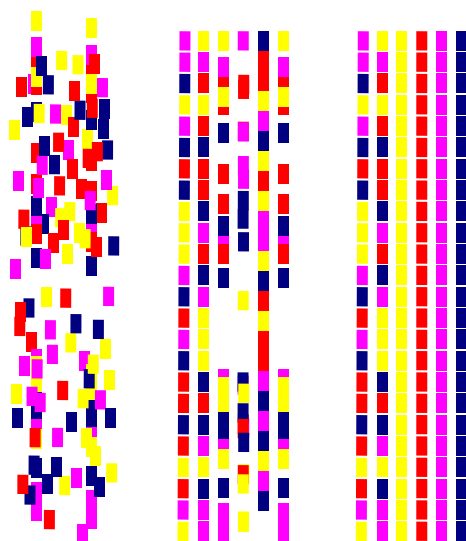
As you can see, the value of the output in this scenario lies in the analysis just as much as the identification. **Unlike OCR, Computer Vision can comprehend information and context, much like the human brain and often faster, significantly improving document analysis speed and quality.**

While the final choice of tech stack may vary, enterprises must look to augment their image recognition needs with intelligence. The approach is fast becoming a growth driver in fields ranging from healthcare where AI has been found to detect illness from scans faster than physicians and automotive where the decision-making ability of autonomous cars is almost singlehandedly driven by advanced Computer Vision.

Navigating the Challenges

As with any emerging technology that promises disruption at scale, Computer Vision faces a few challenges. To be able to interpret content-rich data, it is vital to construct deeper and broader vision models that cover a more extensive range of data features and classes. Creating these supervised models require access to massive labeled training datasets, which can be nearly impossible in real-world applications. Furthermore, even if this data is available, it requires a substantial investment of manual effort, resulting in processing delays and chances of inaccuracy. This is why training of models with less training dataset is a popular active research area. Approaches like active learning, semi-supervised learning, unsupervised learning with data reconstruction, noise injection, and N-shot learning are some of the training techniques being explored to create accurate models with less training data set.

Training data set is not the only constraint we have. Computation time and cost for training and inference for such deep learning models are significant. Most of our customers are looking at quick onboarding (fast training), real-time prediction support and frequent retraining of the models with little to no downtime. We can leverage



recent advancements in both hardware and software-based approaches such as decentralized training infrastructure, adaptive incremental learning to help standardize and optimize resource usage.

For adoption, enterprises must look to work with platform and product partners already equipped with such advanced techniques to address these challenges to improve business values, while ensuring business continuity and optimal resource usage.

Built on the Infosys Nia platform, Nia DocAI offers enterprises the ability to identify information from images and scanned documents using object detectors, OCR, handwriting recognition, and signature tagging. DocAI combines advanced Machine Learning, Computer Vision, and natural language processing to offer a robust layer of intelligence, delivering on-demand services such as intelligent document processing, data enrichment, cognitive search catering to critical business needs like contract analysis. ■

¹<https://arxiv.org/abs/1903.11279>

²<https://dl.acm.org/doi/10.1145/2682571.2797092>

9x improvement in productivity with automated contracts analysis and risk review for a Fortune 500 conglomerate

Our client, headquartered in Tokyo, Japan, is a 100-year old group competing in various industries such as construction, machinery, railway systems, electronics, financial services, and more recently digital technologies. Their \$86B revenue footprint is diversified across their 879 subsidiaries, in over 46 countries.

Challenges:

Loss of productivity: 25% of the procurement staff's time was spent on contracts analysis

Non-standardized risk review: Analysis was subjective and prone to errors

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Read how they automated contracts review, increased capacity, improved contracts management processes and achieved over 90% cost savings.



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BUSINESS APPLICATIONS

AI & Automation based, domain specific plug-and-play applications that help enterprises transform in to data-led businesses



Driving Channel Visibility and Growth

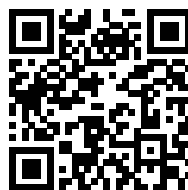


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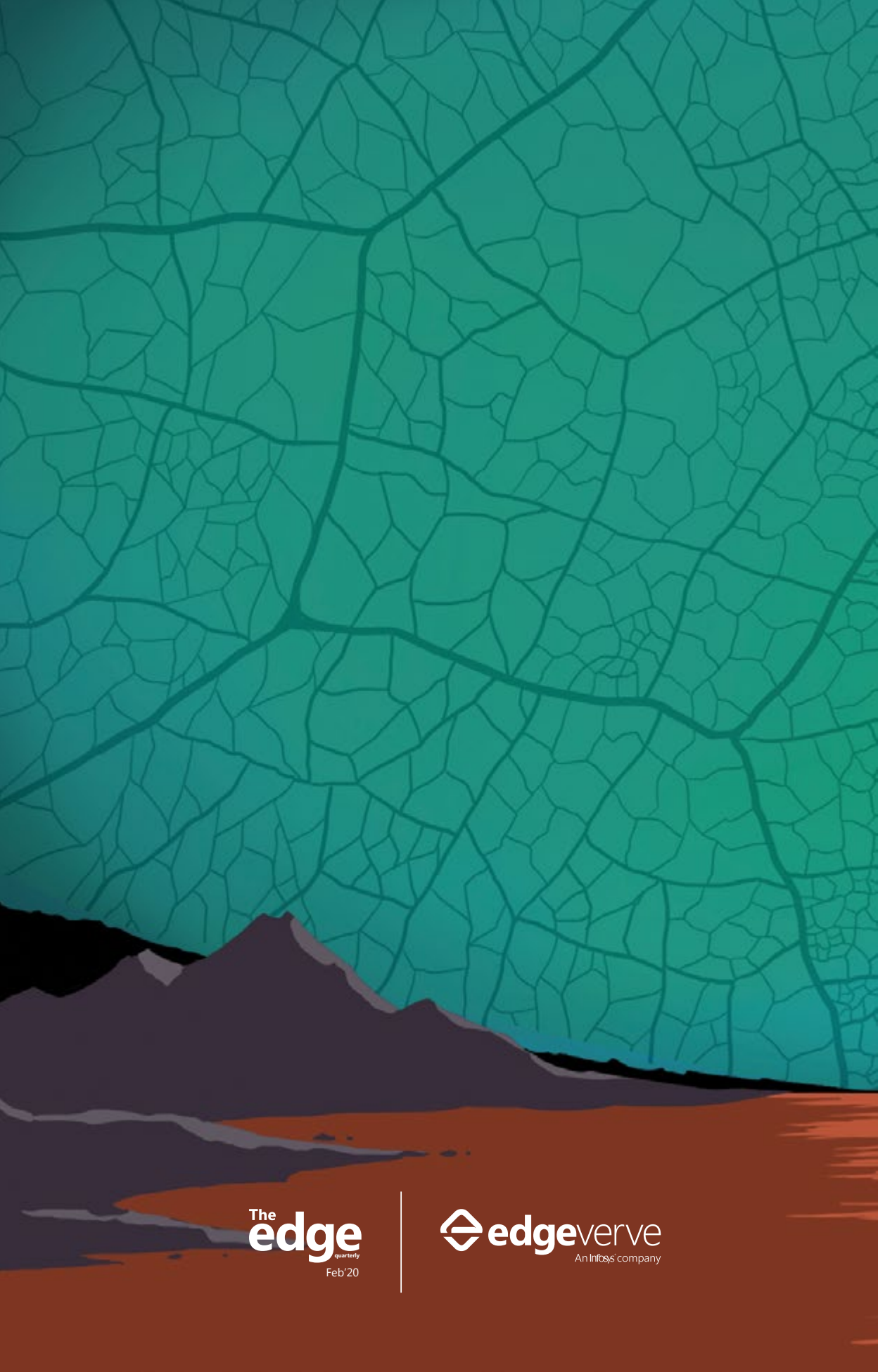
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