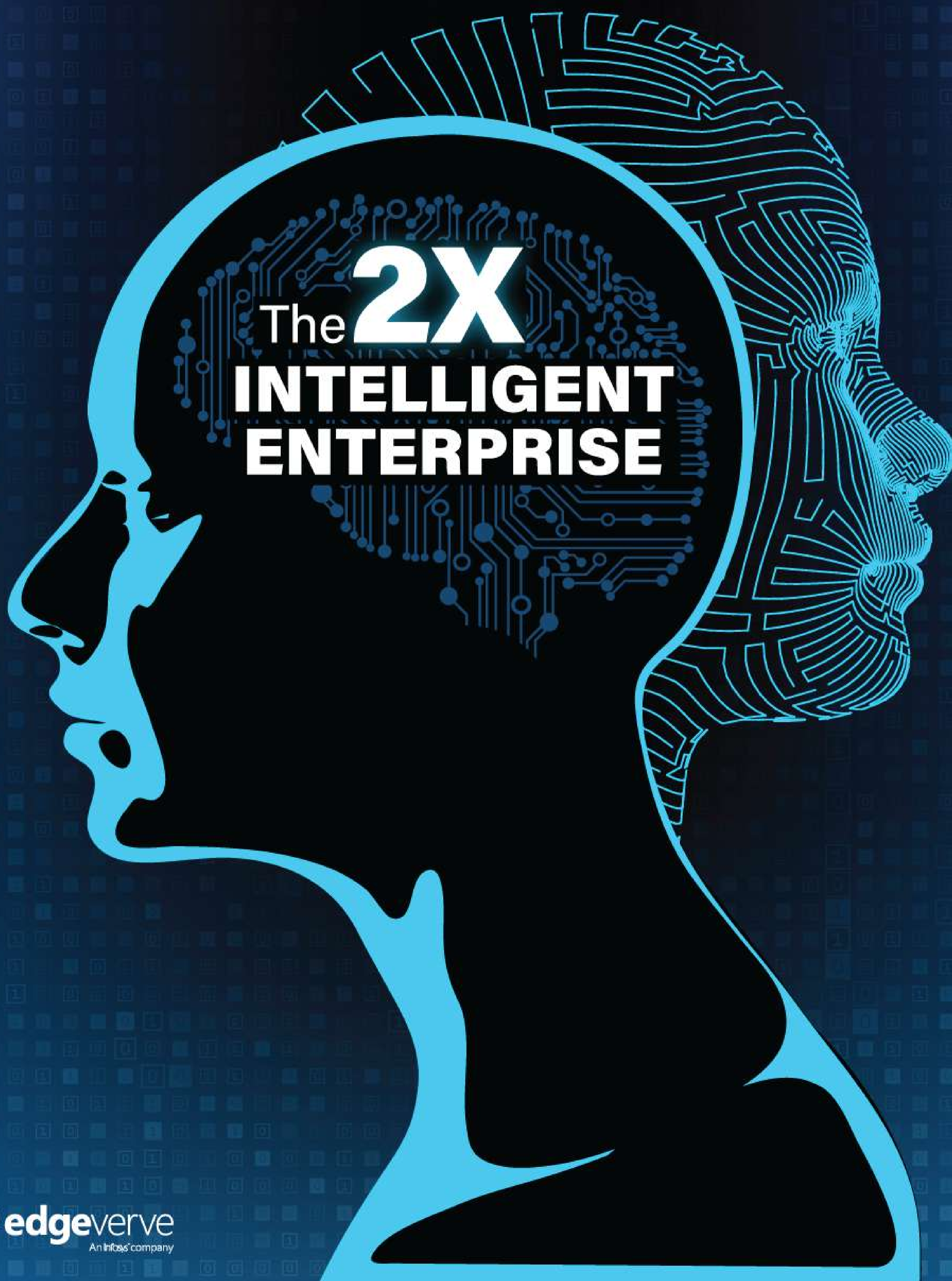


the edge

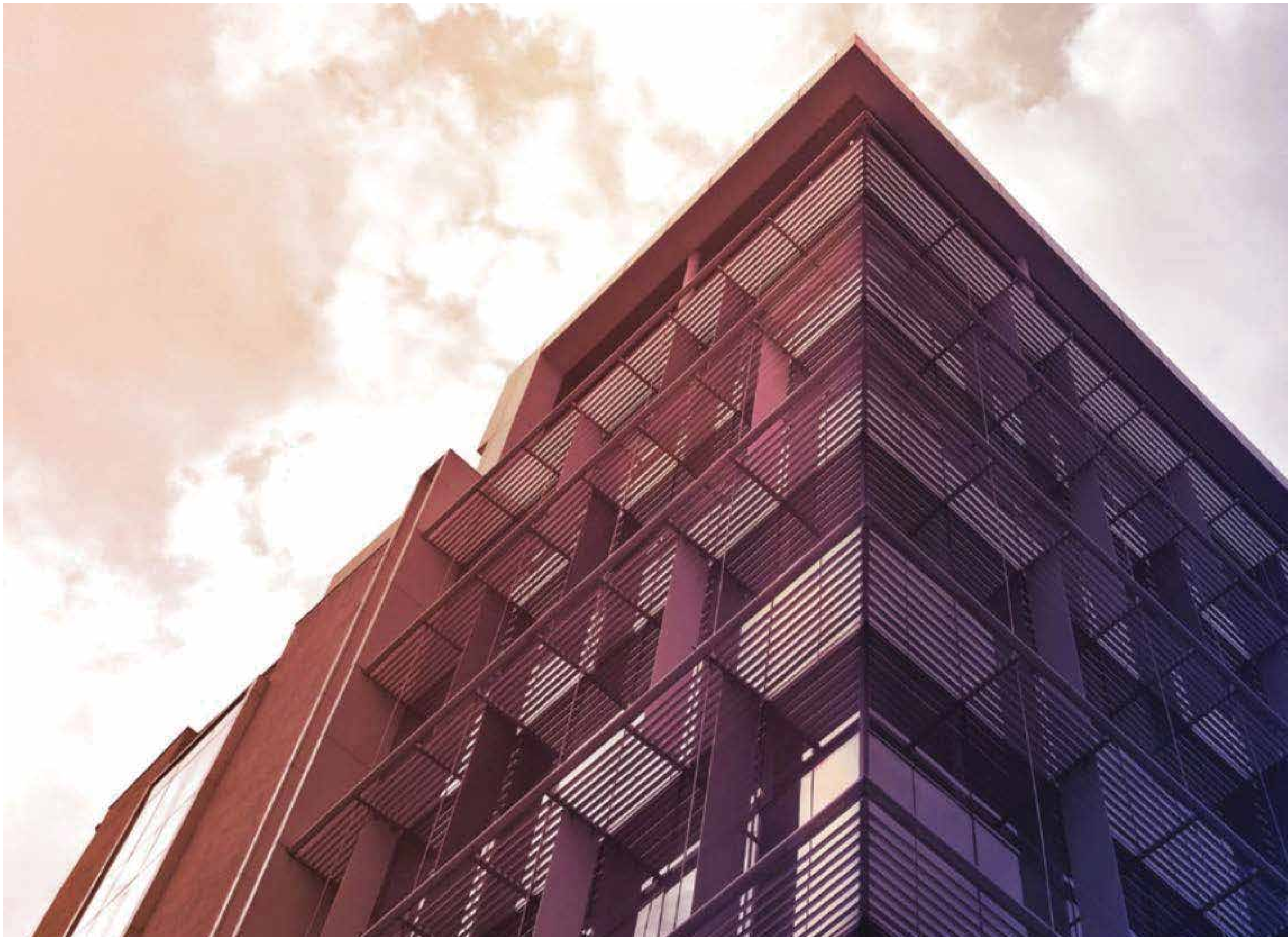
Vol'07

quarterly

PRACTICAL THOUGHT LEADERSHIP ON AI AND AUTOMATION



The **2X**
INTELLIGENT
ENTERPRISE



EdgeVerve Headquarters, Bengaluru, India

About EdgeVerve

EdgeVerve Systems Limited, a wholly owned subsidiary of Infosys, is a global leader in AI and Automation, assisting clients thrive in their digital transformation journey. Our mission is to create a world where our technology augments human intelligence and creates possibilities for enterprises to thrive. Our comprehensive product portfolio across AI (Infosys Nia), Automation (AssistEdge) and Supply Chain (TradeEdge) helps businesses develop deeper connections with stakeholders, power continuous innovation and accelerate growth in the digital world. Today EdgeVerve's products are used by global corporations across financial services, insurance, retail, consumer & packaged goods, life sciences, manufacturing telecom and utilities.

Visit us to know how enterprises across the world are thriving with the help of our technology.

www.edgeverve.com

The 2X Intelligent Enterprise

Volume 7, Sep 2021

Enterprises today are powered by intelligence — and that's a no-brainer. Intelligence explosion is taking the world by storm, positioning companies for new growth that demand human-focused experiences bolstered by digital tech innovations. Besides, AI is no longer science fiction. Business opportunities in this day and age revolve around leveraging AI & Automation technologies to create a whole new Intelligent Enterprise.

It's time to add speed to your digital transformation programs and bring them closer to each other, inter-connect them to leverage their full potential. The Intelligent Enterprise of the future can save the day for organizations across sectors, no matter large or small. Enterprises that are willing to take a gamble and move into uncharted waters will go a step further, creating exceptional end-to-end experiences — a win-win for both the enterprise and its customers.

Presenting **The Edge Quarterly Volume 7 — The 2X Intelligent Enterprise.**

In this issue, we take stock of the role of AI & Automation in the rise of the 2x Intelligent Enterprise. Discover the latest trends, insights, and how industry-leading customers are redefining the future.

The Edge Quarterly was conceived to share practical leadership ideas and best practices with enterprise leaders.

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 edgeverve.com/the-edge-quarterly. To feature your enterprise story or transformation journey in our next edition, please write to us at contact@edgeverve.com

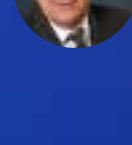
The Editorial Team

Contents

Value Networks Enabling Autonomous Supply Chain	5
Strategising RPA to form a Centre of Excellence A Practitioners Guide	6
Self-Drive Connected Automation An Empirical, Data-Driven Automation Framework Powering Transformative Value for Enterprises	7
The Total Economic Impact™ of EdgeVerve AssistEdge RPA Platform	8
Scaling in CPG and Retail How Cloud-based Solutions Can Drive Agility and Flexibility	9
Automation Trends for 2022 Productivity Disruption	10
Microservices Architecture for Retail and E-commerce The Backbone for Achieving Speed and Scale	11
Commerce through Connectedness How Networks Are Set to Redefine Enterprise Supply Chains	12
Driving Transformation through Intelligent Automation The 3 Step Guide for Large Enterprises	13
Understanding Sentiments with AI A Technical Paper on Capturing Complex Human Emotions	14

Value Networks

Enabling Autonomous Supply Chain



George Lawrie

Vice President, Principal Analyst - Forrester



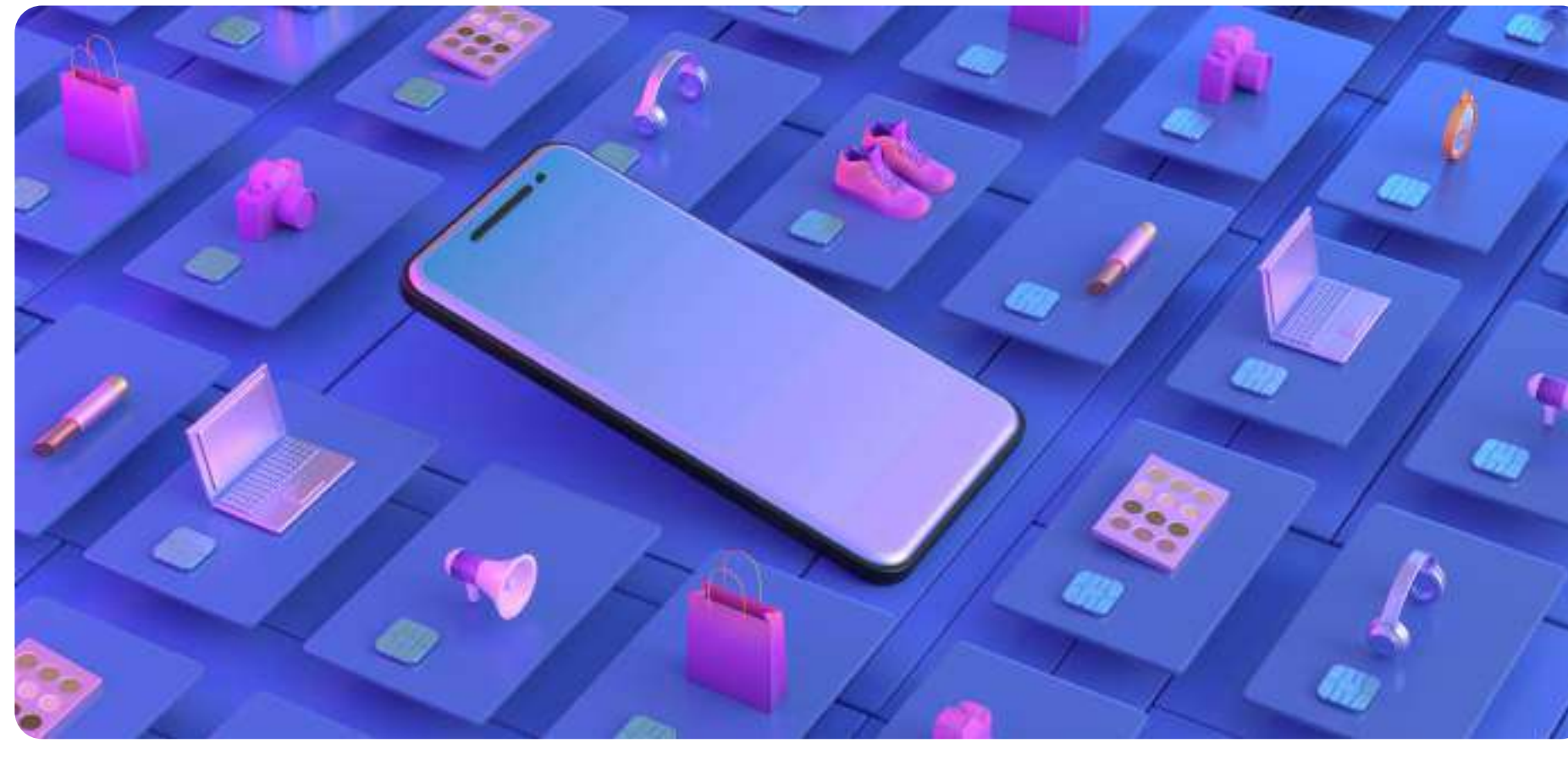
Summary

Is your supply chain suffering from linear dependencies created by Traditional Value chains? Value network allows enterprises to break these dependencies. They allow for Intelligent Demand Sensing and near real-time Channel visibility. In this discussion with George, we uncover how enterprises can unlock Supply Chain potential by leveraging Multi-enterprise Value Network

With recent disruption, how is supply chain, as a function evolving, and what should be the key focus areas to adapt to unpredictable business scenarios?

George: Supply chains lack transparency and resilience and have proved brittle in the face of COVID-19 disruption. Supply chain as a function is evolving from a command to a collaboration orientation. Supply chain as a discipline previously oriented around scouring the world for lowest unit cost suppliers. Now it is much more focused on agility, resilience, and sustainability. Forrester has seen enterprises.

- > Invest to federate data and distribute trust to collaborate with customers and suppliers in multi-enterprise supply networks.
- > Invest in capabilities to anticipate, sense, and respond, complementing time series or historic sales data with predictive variables, forecast interest rates, take-home wages, even social data and search engine arguments can help with “anticipatory shipping” to place inventory in the distribution network, ahead of demand.
- > Build event pipelines, for example, monitoring supplier and customer creditworthiness or natural disasters disrupting production or transportation. Analyze the feeds in an event or “war” room, assigning responsibility for resolutions, such as expediting material by air freight or switching to alternate suppliers or alternate bills of material.
- > Identify and monitor potential bottlenecks and protect them with strategic inventory stockpiles or options for alternate sourcing or production.
- > Identify vendors and platforms to help continuously replan supply networks, inventory, and assets. Triennial, annual, or even quarterly planning of supply networks, assets, and inventory risks a flat-footed response to sudden changes in supply and demand. Enterprises must continuously replan distribution networks to anticipate changing patterns in demand and supply.



How can multi-enterprise value networks help in transforming supply chain to deliver more value?

George: Multi-enterprise value networks can play a critical role in meeting ESG goals. Networks can help validate suppliers and consignments to meet regulators' and consumers' demand for sustainable supply chain practices with sourcing and transport to minimize carbon footprint slave labor and use of harmful material. They can also pool knowledge to power models that track, simulate, and predict real-world behavior inside a virtual environment, informed and updated by sensor readings from the physical asset. In supply chain the assets are inventory, storage facilities, and transportation equipment. Through the digital twin supply chain, leaders can:

- > Monitor real-world behavior – for example, changing patterns of demand
- > Predict future bottlenecks – for example, warehouse capacity constraints and soaring shipping costs signaling the need to replan sourcing, production, and the distribution network
- > Simulate the impact of alternate sourcing and production or a reconfigured route to market on the cost to serve and on lead time and customer service

How can enterprises boost collective visibility, considering their varying levels of technology maturity?

George: OEMs would like to know about Available-To-Promise and Capable-To-Promise further down the supply chain and of course, those at lower levels want more timely accurate granular demand signals.

Lack of visibility contributes to the famous bullwhip effect and a ton of waste and lost sales. My advice is to build trust by progressively sharing insight. Perhaps, start with a Demand Signal Repository, and progress to selective ATP and CTP, and finally build a community digital twin supply chain to model scenarios. Forrester² report described the network advantage of collective sensing and responding to peaks and troughs in demand, and periodic constraints or gluts of raw materials or intermediate products. The network can provide a hub for exchanging and normalizing data from network members at different levels, offering perhaps portals or CSV uploads for the less sophisticated and full API interoperability for the more sophisticated.



Demand planning problems vary by the industry (e.g., CPG, Fashion & Pharma); what are your thoughts on this?

George: Where you have long lead time and inelastic supply, think semiconductors and seasonal fashion, you need to use all the data you can to make the best bet you can. Of course, you can use postponement, options, in-season expediting, two speed supply chains to mitigate the worst impact of demand uncertainty. Surprisingly though, even in, say, CPG or pharmaceutical, you can't really rely on time series or historical forecasting because the fast rate of change and the huge impact of promotions means that supply chains must anticipate uplift from new product introduction, line extension and promotional variants.

Consumers are shifting online to shop; however, brands sites and distribution systems are not e-commerce ready to fulfill individual consumer demands. Do you see a paradigm shift where brands move to D2C models?

Brands must now own the customer relationship. Not all brands will sell directly to consumers, but all should develop direct customer relationships and connect consumers to brand product availability. In this research we described how to craft a direct-to-consumer strategy based on digital maturity and brand product type. There are four branded product types based on exclusivity and purchase frequency.

What challenges do you see in the buy-side of the value chain with respect to supplier collaboration? What is your advice to Supply Chain professionals to address these?

On the buy-side, there are, of course, challenges about mutual trust and transparency. Networks can help by providing community authentication of network members and their reputation as well as pooling inspection and testing efforts. But in my view the main challenge will be to incentivize supply chain professionals to balance supply chain risk against the global cost to serve. For example, they might need to source and procure smaller lots from more local suppliers, but the reduction in risk and improvement in supply chain risk will be well worth the extra cost.

About George Lawrie

George serves Application Development & Delivery Professionals. He brings to Forrester more than two decades of experience deploying global enterprise resource planning (ERP) applications in complex multinationals. During his five years with Forrester, George has led research into topics such as SAP deployment best practices, ERP consolidation, IT investment prioritization, global data synchronization, and trade promotion management.

George has been quoted in general business media such as the Financial Times and specialist publications such as Retail Week. He is a popular speaker and has appeared on the BBC and Sky. He has led sessions at user conferences for vendors such as IRI and Progress Software and well-received sessions at Forrester events.

References:

1. <https://www.forrester.com/report/Greener+Consumers+Demand+Sustainable+Brands/RES162635?objectid=RES162635>
2. <https://www.forrester.com/report/Digitally+Remaster+Your+Supply+Chain/RES162556?objectid=RES162556>
3. <https://www.forrester.com/report/Now+Tech+Trade+Promotion+Management+Q3+2019/RES153536?objectid=RES153536>
4. <https://www.forrester.com/report/Branded+Manufacturers+Master+Your+Own+Digital+Destiny/RES157516?objectid=RES157516>

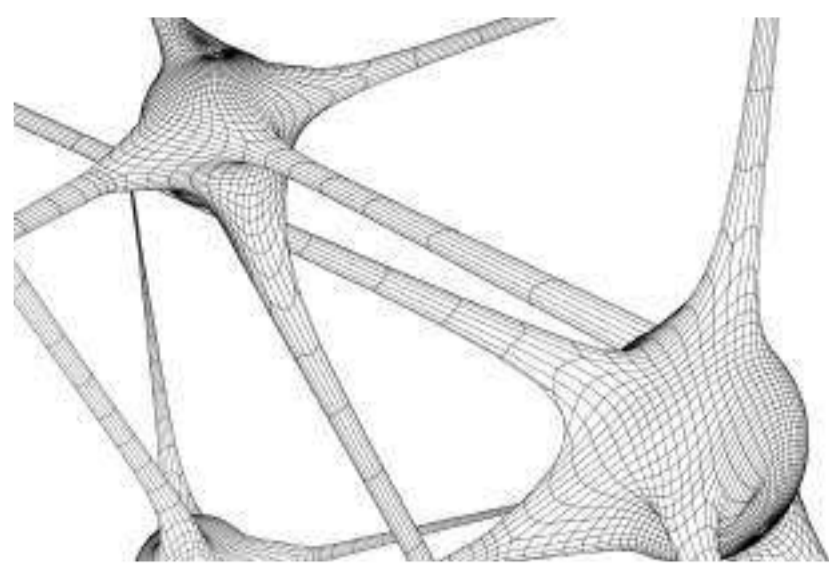
Strategising RPA to form a Centre of Excellence

A Practitioners Guide



Liam Spence

Disruptive Technology Manager, Openreach



Summary

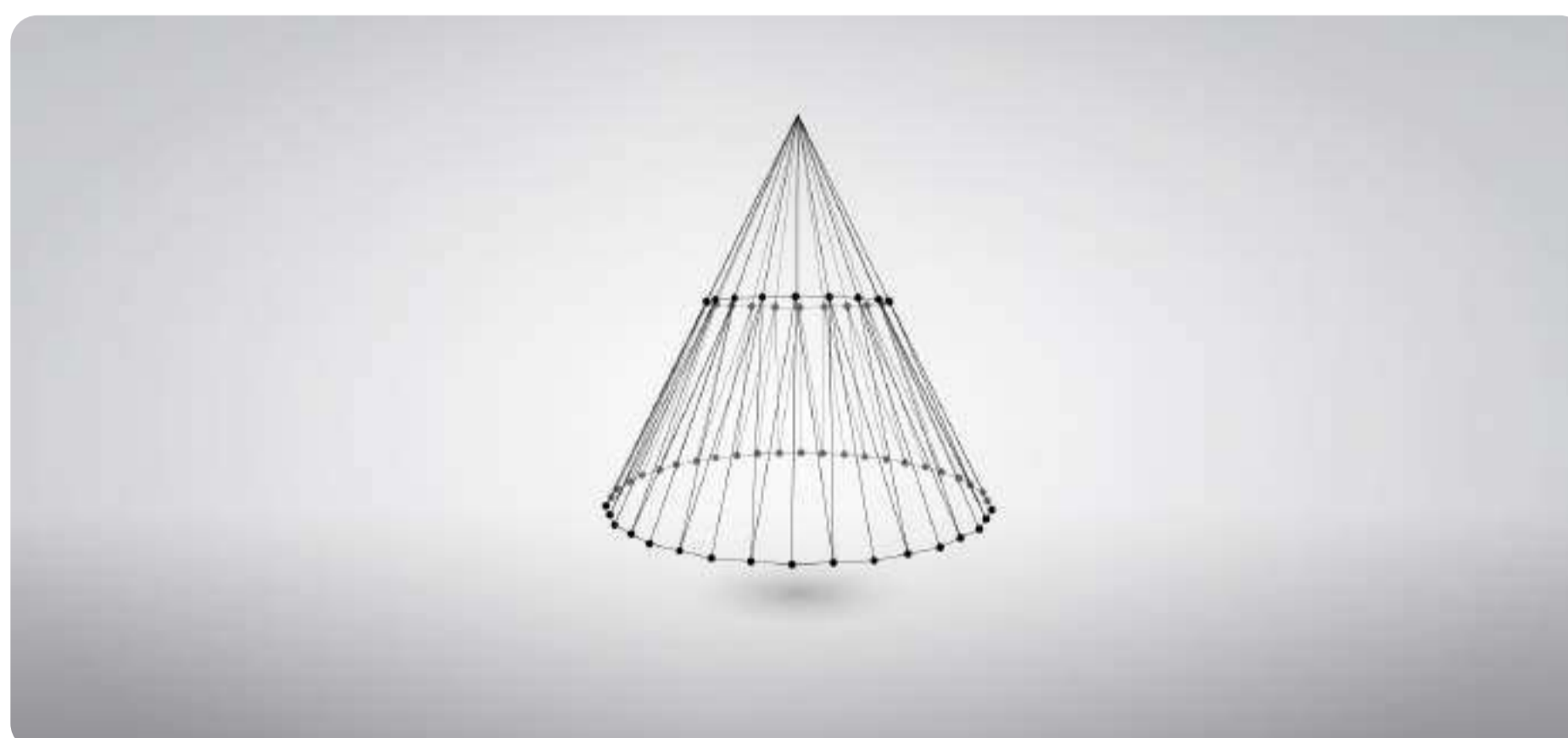
Most organisations successfully leverage automation to drive digital transformation but fail to infinitely scale the business. Establishing an RPA CoE can add those accelerators to any RPA program, delivering incremental value and improving the overall customer experience.

Read on to know how an RPA Centre of Excellence helped Openreach Limited reap the potential benefits of automation.

When organisations look at automation as an accelerator to drive their digital transformation journeys, the first step is choosing the right technology platform. This usually delivers quick wins, and RPA is considered a success. However, two years down the line, it often happens that the benefits of automation haven't been replicated across the enterprise. The positive win in one part of the business should be easily transferrable to other business units so that the benefits stack up exponentially.

As Mona Dash, EdgeVerve's AI and Automation lead for Telcos in Europe, points out, the months of effort to choose a technology partner, the commercial investments, and the time spent in automating use cases seem to be huge impediments that enterprises have to scale. But there's often doubt about the landing. Is this a perfect landing? What comes next? How does one scale to the next step? In fact, the question being asked should be, "What is the next step?" The following story is from one of our strategic customers; within a three-year period, they've not only started the RPA journey and been on an ascent path but have also successfully maintained the upwards trajectory.

This article describes how setting up a CoE can add those accelerators to any RPA program. There's a lot to learn from the simple five-step framework developed by Liam Spence and the team at Openreach Limited.



How Openreach has centralised strategic RPA to form the RPA Centre of Excellence

Openreach Limited is one of the world's biggest communication companies and connects millions of people across the UK – from homes and businesses to schools, hospitals, and broadcasters. As a wholly-owned subsidiary of BT Group, Openreach builds, maintains, and manages the UK telecommunications network. Supporting over 650 communications providers who sell phone, broadband, and Ethernet services to homes and businesses – both large and small. Openreach Limited runs the UK's digital network.

The start of our RPA journey

It was three years ago when I became involved with the strategic implementation of AssistEdge RPA in Openreach. The initial two-year programme focused on automating desk-based activities within the Service Delivery division, enabling our desk agents to focus on complicated engineering solutions that help our customers stay connected.

Over the course of the programme, we pushed RPA beyond the limits of 'traditional automation' by innovating with the support of AssistEdge. We have created SMS-based self-serve solutions for Openreach engineers and have even deployed cognitive RPA. In our case, this means combining a Natural Language Processor (NLP), which reads free-form notes before predicting what should happen next with a customer order, and an RPA, which executes those transactional next steps.

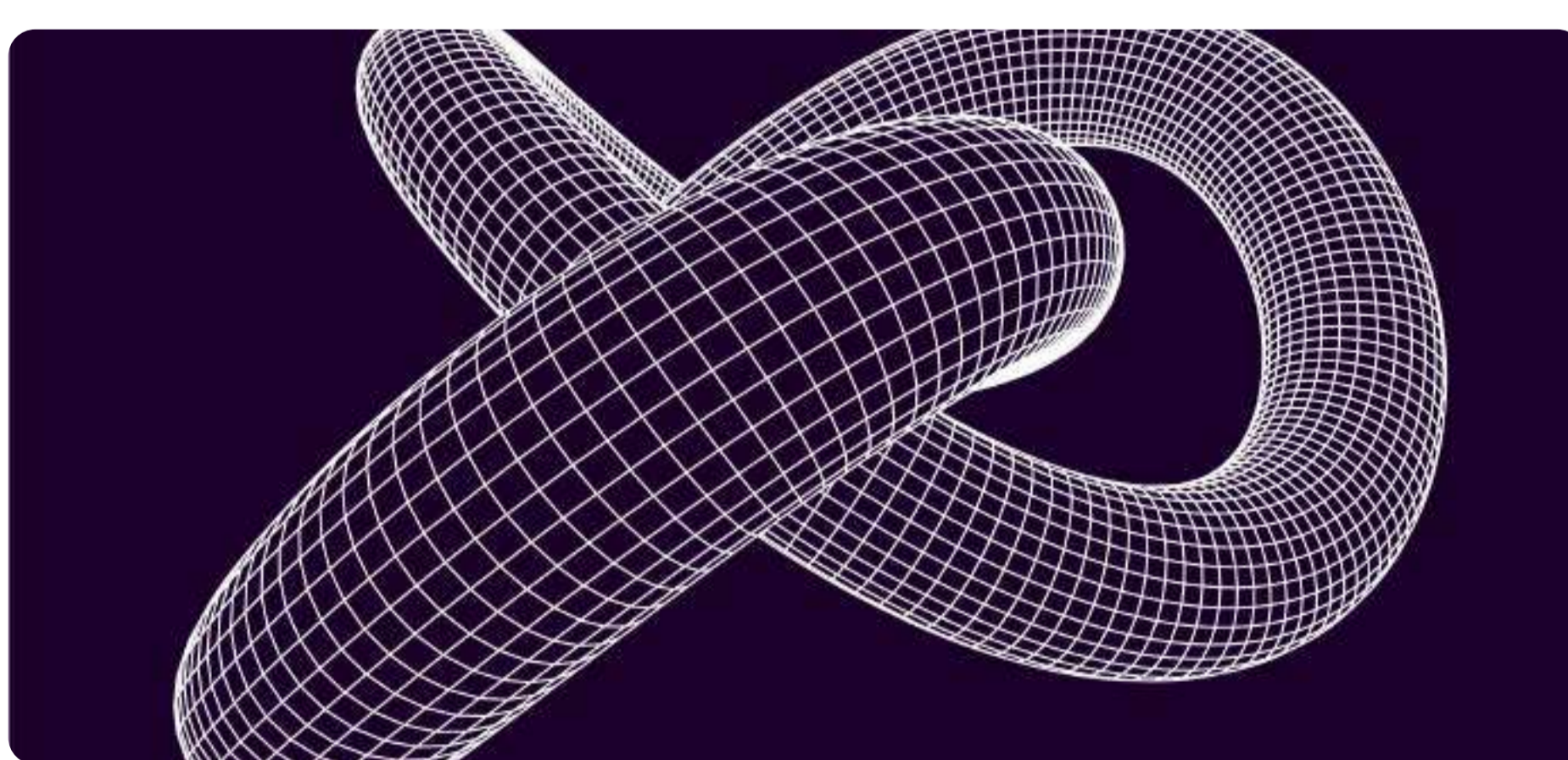
This journey provided us with the experience of determining what makes a good automation idea, along with how to develop and successfully deploy automation into an operational environment. The success of the programme allowed us to transition into the next part of our journey - making RPA infinitely scalable and accessible to the rest of the business, ensuring all at Openreach could reap the potential benefits of RPA.

The reason we set up the RPA CoE

Our RPA Centre of Excellence was established in response to parts of the business-facing automation roadblocks. There was an apparent demand from various teams to introduce automation within their space, but a variety of factors blocked them from going further with their ideas.

One of the biggest roadblocks was a lack of a centrally governed body that assists in coordinating how an automation idea converts into reality. Teams within Openreach were unaware of how to set up and manage a development team to turn their idea into a strategically implemented robot.

By forming the RPA CoE, we were able to remove the roadblocks and produce high-quality development of good automation ideas. The five-step framework that we have set up outlines what's needed to progress onto the next step. Roles and responsibilities have been clearly defined, so all involved understand what's expected of them.

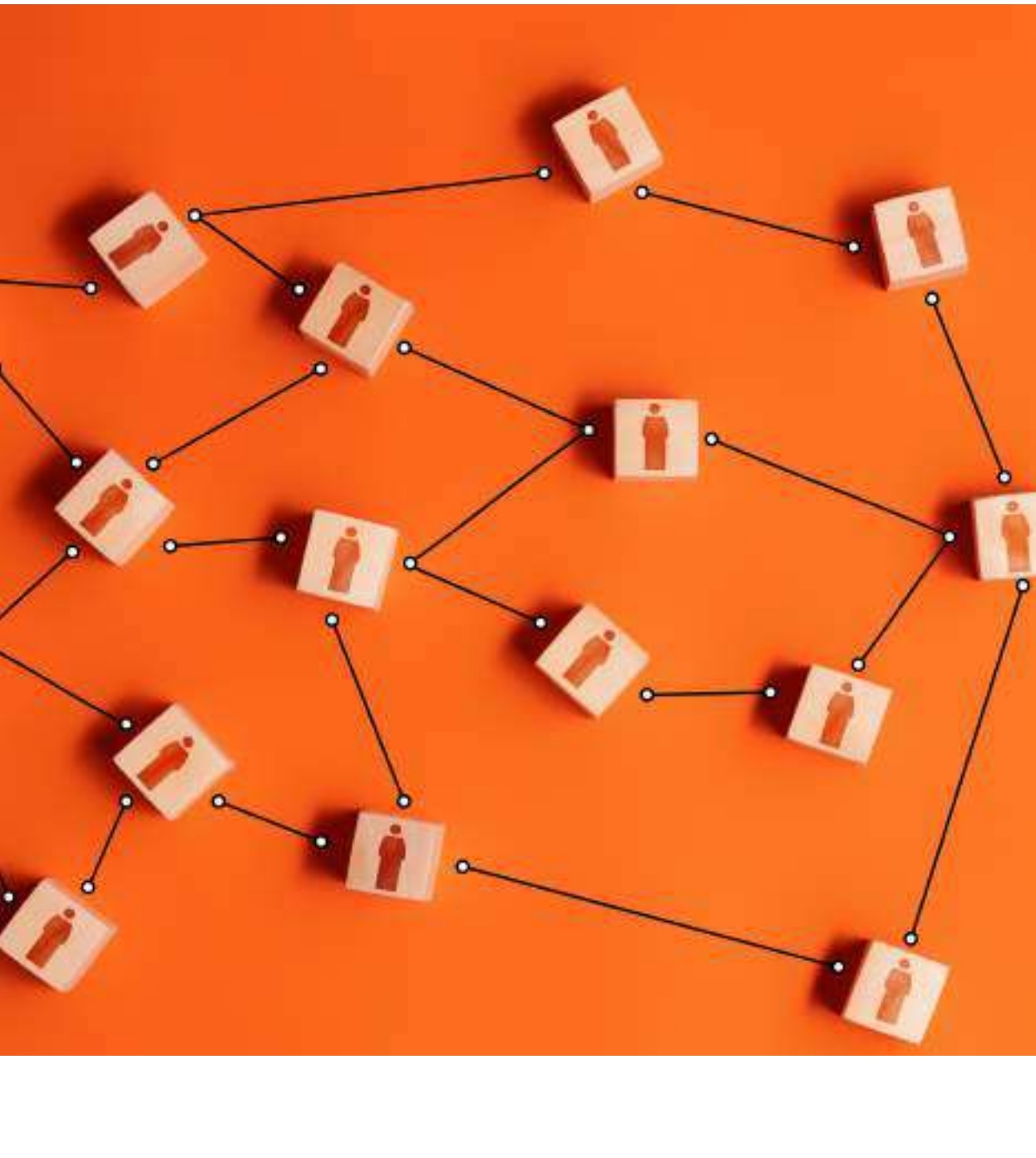


Our five-step framework

The five-step framework is as follows:

- > **Define:** The person within a business with the expertise becomes the product owner, who's responsible for the development delivery
- > **Decide:** The product owner takes the defined idea to their chief technology innovation office (CTIO) lead, who decides if the idea is suitable for RPA
- > **Estimate:** Our AssistEdge assessment team will review the requirements and provide a cost back to the product owner along with the development timescale
- > **Fund:** The product owner will take their business case to their finance lead for sign-off
- > **Develop:** A team of AssistEdge developers and a space on JIRA is provided to the product, along with a run-through of agile principles to support them on their automation journey
- > There must be an understanding of business processes before there's an RPA implementation. If you rush to build RPA without a clearly defined end-to-end process, then you could end up doubling your timescale on the build
- > Having executive buy-in from the senior leadership team from the beginning ideally, align with your company's vision for digital transformation
- > A strong framework that you implement and stick to. The framework you set up has been set up for a reason; if you deviate and skip steps, it could do more harm than good

Hopefully, this provides some insight if you're either kick-starting your RPA journey or have already begun and are considering setting up an RPA CoE.



Self-Drive Connected Automation

An Empirical, Data-Driven Automation Framework Powering Transformative Value for Enterprises



Shrikant Deo
Associate Director and Lead – Product Management,
EdgeVerve System Ltd (An Infosys Company)



Summary

Even though more and more enterprises are adopting robotic process automation, a large percentage of projects don't deliver on the expectations. The reasons for failure range from lack of focus to visibility. In this article, I will take you through 10 ways you can guarantee Automation success.

As a critical business imperative, RPA continues to be a crucial driver of enterprise digital transformation. Gartner predicts¹ a market cap of \$1.89 billion for RPA software revenue in 2021, up 19.5% from last year, and forecasts such double-digit growth for the next three years. The impact of COVID-19 exacerbated an already critical need for digital transformation, and automation is essential to power this process, offering increased efficiencies, accuracy, cost reduction, and adding resilience. That's why it is no surprise that the report also suggests 90% of large enterprises across the world will adopt RPA in some capacity by next year and triple their RPA portfolio capacity in the next three years.

A substantial improvement in enterprise productivity and quality is the most significant benefit of the adoption of Intelligent Automation. Enterprises today realize that efficiency and accuracy at scale are prerequisites to thrive in a competitive environment marked by uncertainty and volatility. They also understand the need to invest in technologies capable of driving fundamental long-term impact with few incremental investments. For these reasons, RPA is a business necessity, and enterprises are looking to implement automation at scale. However, while these benefits present a robust case for automation implementation, there are also challenges.



How Human Bias Hinders Automation Performance

Enterprises building their RPA ecosystem complete the following steps usually:

- > Mine ideas for automation from employees
- > Validate these ideas before listing potential automation candidates
- > Prioritize automation opportunities
- > Develop and automate
- > Measure ROI

During development, developers create requirements and design automation in consultation with SMEs before using RPA studios to configure the final automation. In theory, the process works well and has enough checks and balances to drive improvements over the status quo.

Why then, as EY suggests based on its experience, do almost 30-50% of early RPA projects fail²? The EY report details a range of reasons, including:

- > Seeing RPA as IT-led instead of business-led
- > Delaying planning until after pilots
- > Automating the wrong processes
- > Viewing RPA as a one-off automation exercise instead of a comprehensive transformation program

Over the past few years, new and existing tools and frameworks such as process mining and process discovery have injected empirical validation into every step of the enterprise automation journey. However, while implementations today benefit from data-validated decision-making, planning doesn't. Virtually every step in the planning process - ideation, prioritization, and briefing - happens manually and without empirical data. When you combine this problem with frequently shallow inputs based on anecdotal evidence and the manual interviews that influence the ultimate design, it is easy to see that the current RPA implementation process is fraught with manual bias from the collection of ideas through to automation.

The result?

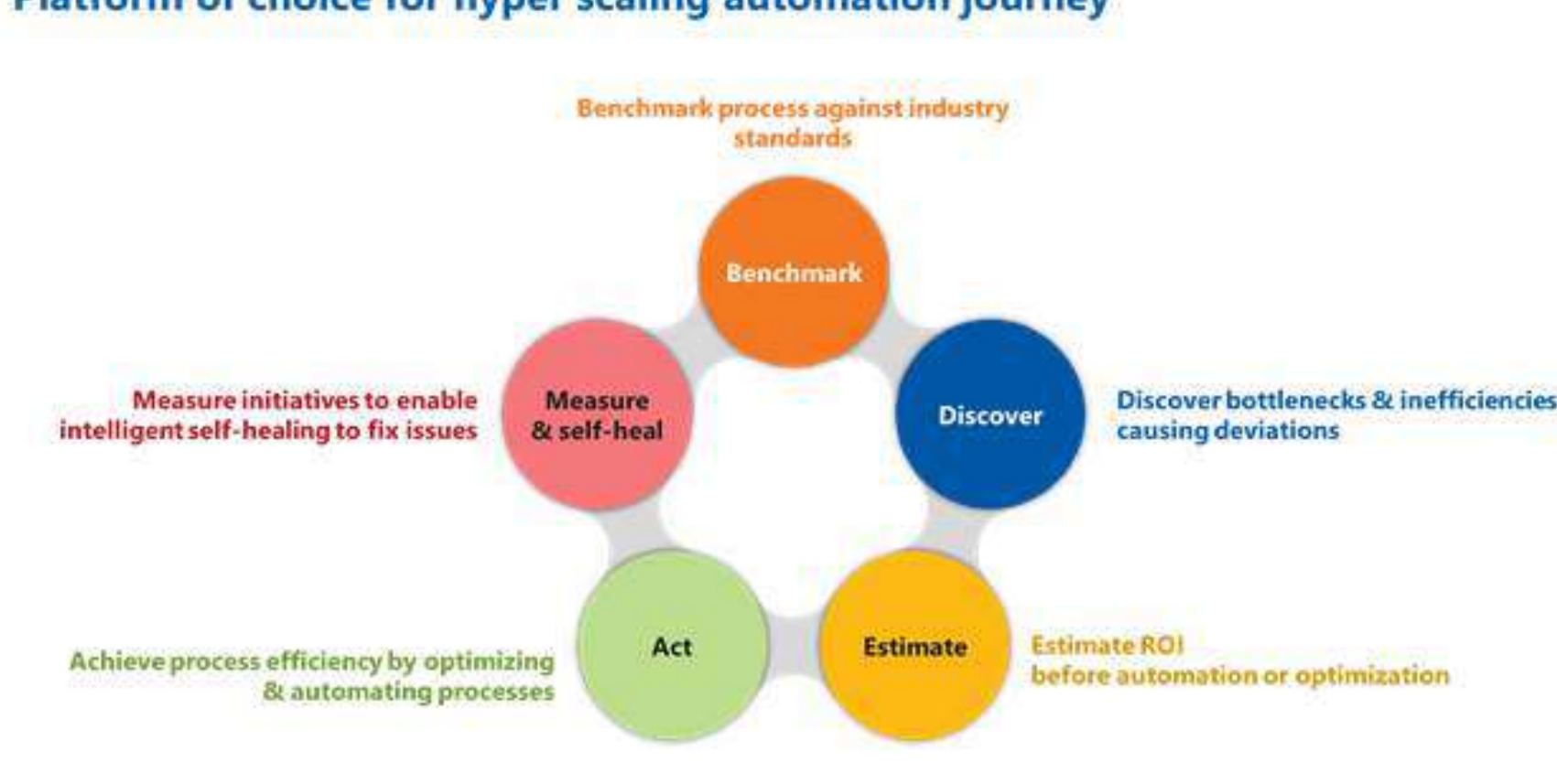
- > Reduced business trust in automation projects
- > A lack of a scientific approach that can forecast, validate, and assure automation success
- > An inability to measure and validate ROI, further limiting both spends and planning effort
- > The absence of clarity and objectivity in a decision-making process riddled with human bias
- > Shallow inputs that limit the specificity of implementation and affect the output
- > No empirical way to prioritize automation use cases

Our experience has shown that RPA is at its most successful when adopted as an enterprise-wide transformation program. This adoption needs trust, and it requires clarity, which is precisely what a more empirical, data-driven approach offers. Granular empirical data combined with intelligence and analytics increased the effectiveness of RPA implementations exponentially, and an RPA-driven approach from the outset could do the same for planning. RPA could drive better RPA.

Connected Automation - The Future of Automation Programs

There is an obvious case to consider a new data-driven view of automation planning and implementation. What if, right from the start of the planning process, we could combine the efficiency of automation with the instinct of human intuition to create an empirically sound automation plan? The impact of data would eliminate bias, increase accuracy, and offer the measurability and insights to drive leadership support and success at scale. In addition, it will lead to a mechanism of continuous learning and validation of decisions at each stage of the implementation

Platform of choice for hyper scaling automation journey



Understanding the Insight-driven Automation Journey

Each of the five stages in the framework above comprises specific steps for substantiation and validating, driving greater confidence, accountability, accuracy, measurement, and troubleshooting. Let's look at this insight-driven automation journey:

- > Benchmark your tasks and processes against standards

Before making an automation decision, it's important for businesses to make an on-ground assessment of where their tasks and processes stand. Benchmarking your tasks/processes against industry and functional standards is the right first step in this direction. That's why the first step is to benchmark tasks and processes to industry standards and function standards. Next, enterprises can compare their task and process performance with either their industry or function (Procurement, HR, Finance, etc.) by using detailed process maps. This benchmarking exercise allows business leaders to assess the need for RPA and outline base objectives to gauge what they need to achieve from their implementation.

- > Collaboration Hub for automation ideas

Another essential step in the planning process is the aggregation of ideas. Great ideas can come from anywhere, but the best ones come validated. A structured, automated, and intelligent centralized repository will gather ideas from across the organization. It will then validate them using benchmarking data, driving a scientific process to measure idea quality, a far cry from the usual method of picking contenders from unwieldy email threads. Once the benchmarking is complete and ideas shortlisted, enterprises can move to the next stage, where they discover process automation candidates and build their automation blueprint.

- > Process discovery through on-ground task maps

Even though ideas are validated superficially, the detailed discovery of these ideas is crucial. In line with current best practices, enterprises should take on a comprehensive process discovery exercise based on empirical data gathered from user keystrokes to identify automation candidates. Then, using on-ground task maps built with primary data, process leaders can make informed decisions, driving better implementation success and increased business resilience through awareness of exceptions from the outset.

- > Granular step-level insights and automation opportunities

This step highlights specific areas within the identified task where opportunities to improve and automate are present. With granular step-level insights, specific parts or variations of the tasks that can be automated are identified

- > Prioritization of automation opportunities (Automation Blueprint)

The current prioritization process is completely manual, depending on anecdotal data on the human effort and potential of savings. Today, however, leading discovery tools can use empirical data and advanced algorithms to create simple 2X2 matrices to prioritize automation use cases. This unprecedented clarity ensures greater confidence in execution planning and offers a clear direction for RPA implementation.

- > Estimate ROI to build a data-driven business case

Any technology intervention must improve top-line and bottom-line revenues, which makes it surprising that current business cases for RPA remain focused on experimentation or expectations based on industry standards. Since this framework uses both primary data from the enterprise and secondary data featuring industry benchmarks, it is now possible to estimate the ROI of RPA implementation and build a robust data-driven business case, eliminating subjectivity and increasing leadership confidence in the exercise.

- > Shortened requirements gathering process and one-click task map export to RPA studio

A manual briefing process has significant issues. On the one hand, it needs SMEs to spend hours explaining the process to developers, and, on the other, it frequently misses exceptions, focusing on the aspects that work instead. The outcome is a time-consuming exercise resulting in significant failures as the bots are not configured to handle exceptions. In the insight-driven automation journey, however, SMEs have access to task maps to see all process variations and make a conscious decision about the aspects to automate. They can then choose the suitable variation to automate and export it to an RPA studio with a single click.

For developers, this tool automatically creates a detailed requirements document complete with a pre-configured task map. In addition, the conversation with an SME is more focused, designed to solve queries instead of providing a thorough understanding. The briefing process is now free from human bias in this framework, ensuring higher clarity, greater efficiency, lesser subjectivity, and substantially better performance.

- > RPA execution in action

Automation configuration, the final execution step, is much simpler through this framework. Previously, developers would need to build automations from scratch with a plan based on incomplete and often inaccurate information. Since developers already have a partially configured process map, detailed and validated, they only need to make minor corrections and additions to complete the configuration.

- > RPA ROI Analytics and Insights

Once the implementation is complete, it is helpful for enterprises to match estimated ROI to actual ROI to assess the success of the execution. Here, automation analytics focused on ROI can be invaluable. With comprehensive automation analytics, business leaders can compare estimated ROI to actual ROI and compare automation ROI to the pre-automation numbers on customized analytics screens. In addition, if they find that the actual ROI is lower than expected, they can also drill down further by understanding possible reasons, including bot failure rate, exception management issues, or any other performance concerns.

- > Continuous Monitoring and Improvement (Self-heal)

The next level in this journey is to figure out issues automatically and enable a thorough analysis before identifying and implementing fixes automatically. Automatic troubleshooting, analysis, and fixing create a self-healing system capable of continuous improvement, significantly reducing both costs and effort over time. Once the system stabilizes, the process returns to the benchmarking step and begins all over again.

Driving the Future of Enterprise with Insight-Centric Automation

This fundamental change in RPA planning, driven by Self-Drive Automation, will enable enterprises to create a culture of continuous improvement, intelligence, and efficiency designed to provide resilience and improved performance. Integrating simplicity, efficiency, validation, and detailed analytics into every step of the process also transfers control of RPA-driven transformation from IT and developers to business, which is where it should always have been. Efficiency gains notwithstanding, the proposed framework also creates the critical resilience that businesses today need by establishing a collective awareness of exceptions from the outset.

Today, we can consider the possibility for automation at scale with the infusion of clarity, specificity, efficiency, and measurability. Instinct has its place, but it cannot be the fulcrum of execution. As we move into a new age for enterprise growth, powered by resilience and endurance as much as dynamism and innovation, insight-centric automation will be the bedrock of enterprise transformation.

References:

1. <https://www.gartner.com/en/newsroom/press-releases/2020-09-21-gartner-says-worldwide-robotic-process-automation-software-revenue-to-reach-nearly-2-billion-in-2021>
2. <https://eyfinancialservicesthoughtgallery.ie/wp-content/uploads/2016/11/ey-get-ready-for-robots.pdf>



The Total Economic Impact™ of EdgeVerve AssistEdge RPA Platform



N Shashidhar
Global Product Head, AssistEdge,
EdgeVerve Systems Ltd (An Infosys Company)

Summary

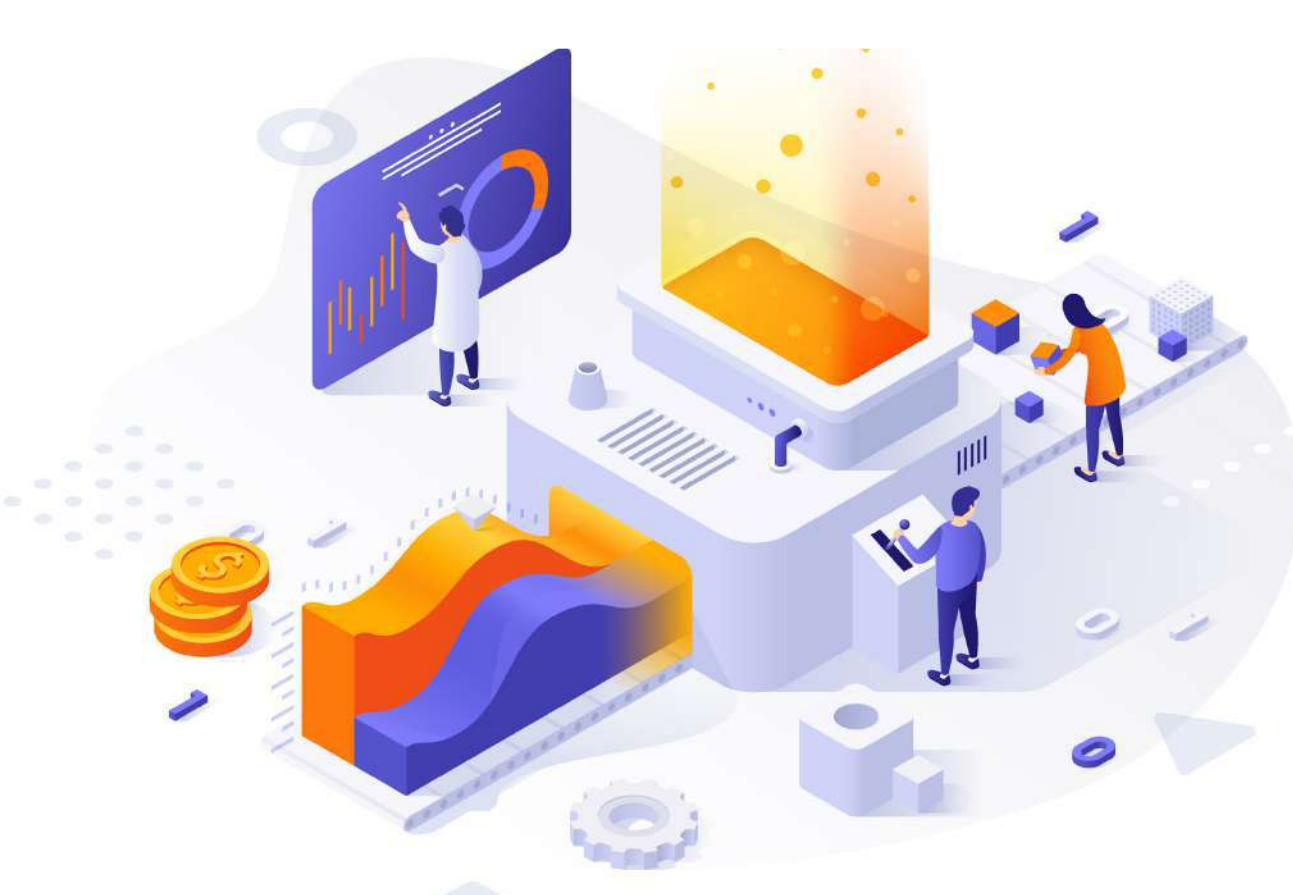
The Automation Implementation at Philips with AssistEdge RPA is one of the most complex and largest finance transformation programs in the world. Collaborative efforts led by Philips Finance leadership, powered by the technology capability of AssistEdge RPA and delivery expertise of Infosys BPM, delivered significant cost savings and business benefits over the last three years. With an ROI of 159%, this program exemplifies the power of Automation when applied as a core business strategy, in a well-structured and planned manner.



EdgeVerve commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying the EdgeVerve AssistEdge RPA platform. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of the AssistEdge RPA platform on their organizations. To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed one EdgeVerve AssistEdge customer, Royal Philips, and used this experience to project a three-year financial analysis.

Forrester interviewed Royal Philips with the following characteristics in mind:

- > Large multinational conglomerate, headquartered in Europe, focusing on electronics and health technology
- > Manages finance operations through Infosys BPM, employing 1,200 Infosys employees across finance processes



Key Objectives of Automation Implementation

Royal Philips finance BPM operations, managed by Infosys, saw a significant impact on time efficiency in finance tasks and cost savings on automated FTE hours with RPA implementation. Given the level of manual operations in the conventional finance task functions, Philips had adopted a Hoshin strategy to eliminate, simplify, standardize, and automate finance operations processes. Their main objective of using RPA was to provide:

- > Automation of 1 million work hours in finance operations over three years of deployment
- > Efficient, improved, and consistent performance across finance operations
- > Centralized BPM operations and enabled end-to-end automation across the finance operations domain

Setting foot on a Successful Automation journey

As Philips looked to expand its automation capabilities, it worked with EdgeVerve and Infosys BPM to define strategic use cases for RPA implementation within the existing Infosys BPM functions. Based on design principles, and change management, standard processes for RPA were defined and implemented from 2018 for the customer.

After investing in the EdgeVerve AssistEdge platform, Philips has been able to automate tasks across 220 use cases in finance BPM operations, including automation, elimination, and standardization. The automated FTE hours and productivity gains from this implementation enabled cost savings for Philips.

Reaping the Benefits

After investing in the EdgeVerve AssistEdge platform, Philips has been able to automate almost 31% of their BPM finance workforce. Some key benefits are as listed below:

- > Quantified Benefits:

Risk-adjusted present value (PV) quantified benefits include:

Average handling time of payroll posting reduced by 72%

RPA implementation saw BPM staff eliminate a total of 49,348 hours across three years in payroll posting processes. Cumulatively, this productivity gain saw a net present value of \$993,137 over a three-year period.

Faster and more effective cash collections saw 30% reduction in time spend on this task

Automated dunning process with RPA especially from the second year of the RPA program, saw a total of 21,320 hours eliminated in the cash collections processes.

An average of 11 FTEs automated across three years from account reconciliation activities

Standardizing and automating reconciliation processes saw an average of 65% of time saved on this task for the customer's accounting teams, incurring a net present value of \$1,386,959 over a three-year period.

Over a three-year period, the customer saw a 31% automation rate with its BPM operations

The organization enable automation across a total of 220 use cases, including the four called out separately in this report. Across its remaining 216 use cases, this customer saw a net present value of \$9,639,525 from FTE hours automated.

- > Unquantified Benefits:

Benefits that are not quantified for this study include:

Standardization of processes

Philips leveraged RPA implementation to standardize processes across finance operations. Due to RPA, running compliance or changes over process requires a less time and effort, and builds better structure. Through the RPA implementation, 59% of use cases involved complete standardization, while a further 25% saw partial standardization.

Boost in employee morale

Due to the elimination of FTEs involved in repeatable tasks, BPM staff were able to move towards more value-added tasks, boosting morale and skills.

Change management processes to optimize RPA solutions

The customer also established a broader ESRA (eliminate standardize, right-source, and automate) strategy in its organization to identify the processes that RPA would most be suited for. This included identifying processes that can be eliminated, simplifying existing processes, standardizing across regions, and looking at what can be automated. That can be eliminated, simplifying the existing processes, standardize across regions and then looking at what can be automated. Within the automation phase RPA was one of the enablers that the customer used.

Ongoing operations and maintenance support

Dedicated staff across Infosys BPM and EdgeVerve teams were needed for operations, product support. This also required consistent effort from a core group of the customer's IT managers for project management, bringing in an additional cost of \$3,627,352.

- > Costs:

Risk-adjusted PV costs include:

Infrastructure, licensing, and maintenance support

Infrastructure and maintenance, as well as licensing across a majority of attended bots and remaining unattended bot implementation, saw a net present value cost of \$4,295,849.

Ongoing operations and maintenance support

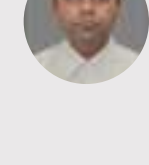
Dedicated staff across Infosys BPM and EdgeVerve teams were needed for operations, product support. This also required consistent effort from a core group of the customer's IT managers for project management, bringing in an additional cost of \$3,627,352.



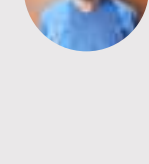
[Read the complete study by Forrester on this link](#)

Scaling in CPG and Retail

How Cloud-based Solutions Can Drive Agility and Flexibility



Ashok Kumar Ratnagiri
Director and Head - Systems Engineering,
EdgeVerve Systems Ltd (An Infosys Company)



Basavaraj Umarani
Computer Scientist - Systems Engineering,
EdgeVerve Systems Ltd (An Infosys Company)



Summary

The last two years have brought about tremendous growth in CPG and Retail. This growth can partly be attributed to the rise of e-commerce and partly to COVID. While that is good news for businesses, they must prepare themselves to scale at unprecedented speed. This article covers various aspects of the right cloud and SAAS-based supply chain solution, through the lens of systems engineering.

If necessity is the mother of invention, the recent pandemic has helped spark an explosion of innovation. With COVID-19 causing significant disruption to the CPG industry, enterprises in this segment must focus on agility, innovation, and improved performance while strengthening security. On the one hand, enterprises are looking to build resilience. On the other, buoyed by a change in consumer behavior and the evolution of cutting-edge technologies, they are creating new engagement channels and customer segments. Also, the democratization of technology, even enterprise technology, has leveled the playing field and allowed new entrants to compete with established players. Combine that with Gen-Y and Gen-Z consumers ramping up the demand for innovation and better experiences, and it is easy to see the challenges for companies in this sector.



A Spotlight on Scalability

While rapid change is routine for the retail and CPG industry, the last two years have dramatically increased the need for agile innovation. The rise of startups, supported by trends like healthy foods, organic produce, and a preference for environment-friendly products, has compounded the need for corporations to transform their operations. With sales channels diversifying from mom-and-pop stores and supermarkets to online marketplaces even for the basic items, enterprises must assimilate, unify, and analyze an explosion of data from disparate channels. The exponential complexity and sheer volume of data are matched only by the growth in another equally crucial factor - competition.

In an already competitive space, CPG and retail companies are under substantial pressure to transform their operations or risk being upended by any of the many agile startups at their heels. The ease of expansion to new markets is an example of this digital-driven opportunity, but, on the flip side, it has also removed the barriers to entry and opened up the space for new players. These entrants have the advantage of starting digital-first, sidestepping the many years of evolution that more established players are yet to build upon. These disruptions are forcing large corporations to look at rapid scaling, upwards or sideways. Agility is now a prerequisite to survive and thrive.

Constrained by the Traditional

The inherent limitations of conventional systems inhibit the performance of a variety of critical enterprise functions, especially responsiveness and flexibility. Functions constrained by these traditional systems include distributor onboarding and data processing, especially with multi-format data from disparate organizations. The status quo still sees manual and semi-automated processing of the order and invoicing data. If allowed to continue, this state of affairs can increase order fulfillment time, consequently inflating the time to market and time to reach the customer, both of which can cause a loss of market share.

Business managers need to quickly onboard more distributors and partners, which conventional and non-digital solutions do not support. Also, with the visibility essential to supply chain integrity, CIOs and data engineers must have a single source of truth for sales data across distribution channels. Additionally, to drive enterprise-wide cloud adoption at scale, CTOs need to provide business users agility that powers scale and ease in order and invoice processing operations. Each of these needs requires a scalable, cloud-based solution. Despite the urgency of this need, enterprise leaders remain indecisive for various reasons.

A Question of Confidence

Considering all the signs point to a more digital CPG enterprise, why do some leaders remain reluctant to implement this approach? In our experience, factors include:

- > **A lack of confidence in claims made by solutions**
- > **The absence of awareness of solutions that offer enterprise-grade technology in SAAS offerings**
- > **Concerns that a solution's scalability may not match their rate of data ingestion and processing needs**

By digitizing all information that flows in and out of the enterprise, transitioning to a digital-driven ecosystem also opens up many opportunities by extracting insights from data gathered. Consider the case of processing distributor orders and invoices from distributors. An appropriate automation platform could create more streamlined processes while lowering costs. It can also gather, integrate, and analyze data to develop agility in decision-making, quicken product launches, and improve the speed of responding to market changes. Choosing the right platform and implementation partner is integral to realizing these benefits. Let's look at the attributes of the ideal solution.

Doing it Right

The most important enabler of a reliable business solution is the proper tooling powered by scalable technology, combined with the right processes. Besides features capable of addressing every aspect of the value chain, the correct solution must also handle spikes in workload and volumes without compromising service levels. It is essential to consider several factors such as the agility of the solution, its track record of driving measurable results, scalability, modernity, with the least possible overheads of maintenance. We can categorize the salient features of the ideal solution under the following segments:



> Cloud and SaaS

The best solutions must leverage everything that the latest technology offers. They are available through a SaaS model, hosted on the cloud, and make the best of its elasticity and other native services. A cloud-based solution offers flexibility, agility, and scalability. It also minimizes time to value, cutting down installation time and reducing IT procurement and maintenance overheads, yielding significant savings over the medium-long term. Also, by offering rapid expansion, these solutions can handle the periodic spikes typical of the retail and CPG industry, for example, the year-end holiday season, etc.

> Product Performance

The architecture of the product, keeping in mind its ability to leverage the best of the cloud and its ability to drive scale and performance, ultimately determines whether it can handle consistently high workloads while maintaining service levels. Products must be multi-tiered, with each tier capable of scaling as required. Providers must tune them to perform under specific workloads typical of CPG and retail. These can include multi-file format transformations to more common formats, ingestion of large files, and quick record processing while providing the flexibility to generate customized output. Also, housekeeping activities such as logging, and audit tracing should not affect the performance of business processing. With traditional database servers compromising the flexibility to scale, increasing maintenance and administration overheads, cloud-native services such as DBaaS could help lower costs and offer agility. Just as a product requires sound design, these features need the suitable configuration to deliver at their best, which brings us to our final parameter.

> Optimum Configuration

The underlying infrastructure and the design of cloud-native services are essential to the performance of the product. Critical configuration parameters include database pool settings, maximum connections, file descriptors, and maximum TCP connections. As workloads keep changing, these parameters require tuning. A cloud-based SaaS solution, relieves the CPG company of such nuances while assuring similar service levels, scalability, agility, and speed that are alluded to throughout this piece.

What Makes a Solution Scalable?

The design principles of highly scalable applications include identifying and segregating models based on whether they are supporting services or process-heavy services. These principles enable a horizontal scale-out of the compute and data-intensive modules.

TradeEdge innovatively adopts the principles of micro-services architecture into a batch processing framework. Services such as format validations and file identification are separate and treated differently from data processing modules, enabling horizontal scaling for intense services. These services are multi-threaded and multi-process, ensuring that input files are processed efficiently and in parallel once split into blocks.

The ideal solution processing approach will allow applications to work consistently across multiple smaller files or even large standalone files.

Another critical aspect of a super scalable solutions is a workflow manager, an orchestrator that ensures services work in tandem with each other, asynchronously, eliminating bottlenecks. All instances of a given service and different services are then tied together through queuing systems, and each service, in turn, is a combination of a reader, processor, and writer, allowing each service to read from the queue, process data, and write the output back into the queue independent of other services. Since the architecture is staged and event-driven, it presents the flexibility to scale a particular processing engineer horizontally as required, depending on the workload increase or decrease. These application features facilitate a highly scalable structure integral to the rapidly changing workloads typical of a CPG company. With this framework in place, companies can adapt to spikes and dips in demand swiftly and also have the option to automate the spikes.

A scalable solution like TradeEdge can process a million records in about 16 seconds, all on the cloud. So, suppose a CPG company's daily business volume is 100 million records and invoices, a scalable solution such as TradeEdge would process the data in about half an hour before making it available for further downstream insights and analysis in a matter of minutes. In the lab, TradeEdge has processed workloads up to 2.38 billion records in 10 hours without any failures, demonstrating its resilience and accuracy at the same time. Here, data processing also includes the homogenization of input data and storage in a structured format for downstream analytics and not just the business logic.

Scalable solutions sidestep the pitfalls of traditional systems by consuming on-cloud native services such as DBaaS to leverage the elasticity of the cloud. In stark contrast with old generation on-premise systems, solutions on the cloud also provide more options such as the choice of the right kind of file storage infrastructure fit for file transfers and the optimal processing power, allowed by the flexibility of cloud infrastructure. Additionally, given the variations in data volumes and formats, enterprises should look for a cloud solution that can efficiently process data while scaling horizontally and vertically based on present and future needs.

Our client a global leader in the CPG space generates 25 GB of data per month, translating to 2.5 million records per month, which TradeEdge processes efficiently. This data includes sales orders, invoices, and a host of data points in multiple formats. That translates to about 80,000 to 100,000 records per day which a scalable and well-performant solution such as TradeEdge would process in matter of seconds. Such a solution can serve effortlessly the needs of many medium-sized companies simultaneously.

Enterprise looking to pivot to a cloud-based solution must ensure that their choice ticks the right boxes. For instance, CTOs must evaluate whether the solution has been tested through various benchmarks and scalability tests on popular cloud platforms such as Microsoft Azure or Google Cloud Platform. The solution provider should also have documented data sheets to aid the optimum configuration for pool sizes, operating system parameters, and network/TCP parameters to support high-speed processing and enterprise scalability. As a result of this due diligence in choosing the right solution, achieve clients can get the best of both worlds - a highly scalable software solution and the flexibility of the cloud while eliminating the overheads of management and administration of the environment.

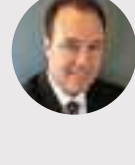
Building a Digital CPG Organization

If chosen correctly, technology is not an expense but a force and growth multiplier for businesses. CPG and retail enterprises are sitting on a wealth of data that can be leveraged to draw insights for greater agility, better inventory management, promotions planning, product launches, and even for seasonal demand. The industry must start looking at order fulfillment and supply chain optimization with a laser focus on agility and scalability supported by data-driven insights. Over time, organizations quick to adopt this approach can develop an intuition for consumer trends and behavior, earning a massive competitive advantage.



Automation Trends for 2022

Productivity Disruption



Glenn VanLandingham
VP - Head - Solution Consulting,
EdgeVerve Systems Ltd (An Infosys Company)



Summary

Productivity improvements in humans have forever been a key catalyst for the growth in our global economy, but we've never seen anything like this. The ability for humans to perform their jobs more efficiently has been boosted by mechanization, institutional education systems, electronics, and computers. But the impact on productivity we are seeing today from AI-driven automation is unprecedented and will only accelerate in the short and long term. This article covers four trends for 2022.

Automation is changing the nature of work that goes beyond productivity improvements and is better described as a period of productivity disruption. Human jobs are being permanently converted to digital automation. Jobs are being transformed into dual activities between humans and technology. New jobs for humans are emerging with the free time they have. Jobs are being converted from office to remote. Massive re-skilling is required and underway. At the heart of much of this are Intelligent Automation technologies, which free humans from tasks now performed mostly by digital robots.

The pace of this productivity disruption is documented in countless studies, but maybe best captured by this prediction from "The Future of Jobs Report 2020" (World Economic Forum¹)

By 2025, the time spent on current tasks at work by humans and machines will be equal.

By now, your company, department, or organization has probably already started its automation journey, but below are some short-term Intelligent Automation trends that will continue to supercharge productivity :

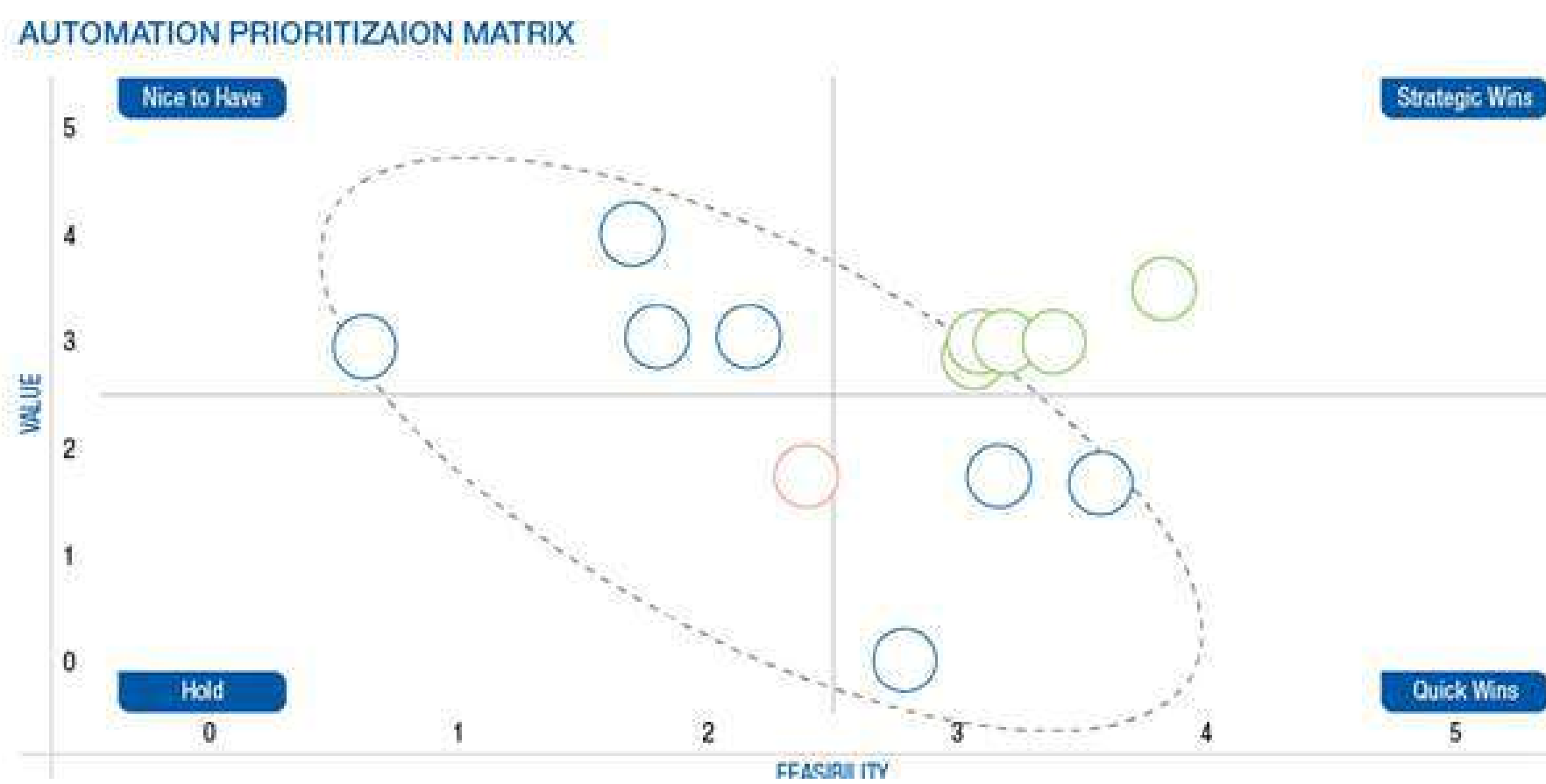
> Automating the "Long-Tail" of Processes

Automation initiatives have logically started where the productivity gains were obvious. High-value, low to medium complexity processes are where most automation initiatives start and often end.

But significant technological advances and implementation methodologies today allow companies to automate so much more. The 'long tail' and 'nice to have' of lower-value (or indirect value) processes are increasingly on the company's automation roadmaps.

Some of the technology advancements enabling this include process discovery tools, which provide objective analytics and allow automation teams to build longer, more logical, and comprehensive automation roadmaps. Some processes that were originally considered 'too complex' or 'too low in value' may look different with objective data, allowing teams to reprioritize the 'long tail.'

Getting automations designed, developed, and deployed is also faster than ever, and with low code platforms, some processes that were once deemed too complex or 'not worth the effort'



are back on the roadmap. This has allowed companies to reach deeper into the 'Nice to Have' automation priorities as the time to value shrinks.

Surveys vary, but automation consulting firms generally state that deployment timelines for design, development, and installation of process automations have reduced by 50% in the last five years.

> Goal Setting and Performance Measurement for Robots

For decades, we've known that a critical element to maximizing human productivity is setting goals and measuring performance. While digital robots aren't affected by many human factors such as fatigue, emotions, motivation, and attitude, there is still lots of benefit to measuring the performance of your automated processes.

There are plenty of metrics companies can track to maximize the ROI of their automation efforts. Automated processes are still subject to accuracy, exceptions, and volumetric trends, which should be monitored and managed. Best practice for maximizing ROI in automation initiatives also calls for setting goals regarding how many processes will be automated, the transactions and human hours eliminated each will generate, and the resulting savings. Measuring performance against these goals can maximize the ROI for a company's automation initiatives.

In fact, many Intelligent Automation platforms are following the lead of other major enterprise platforms and embedding Productivity Management tools and dashboards for robots, in much the same way they've done for humans.



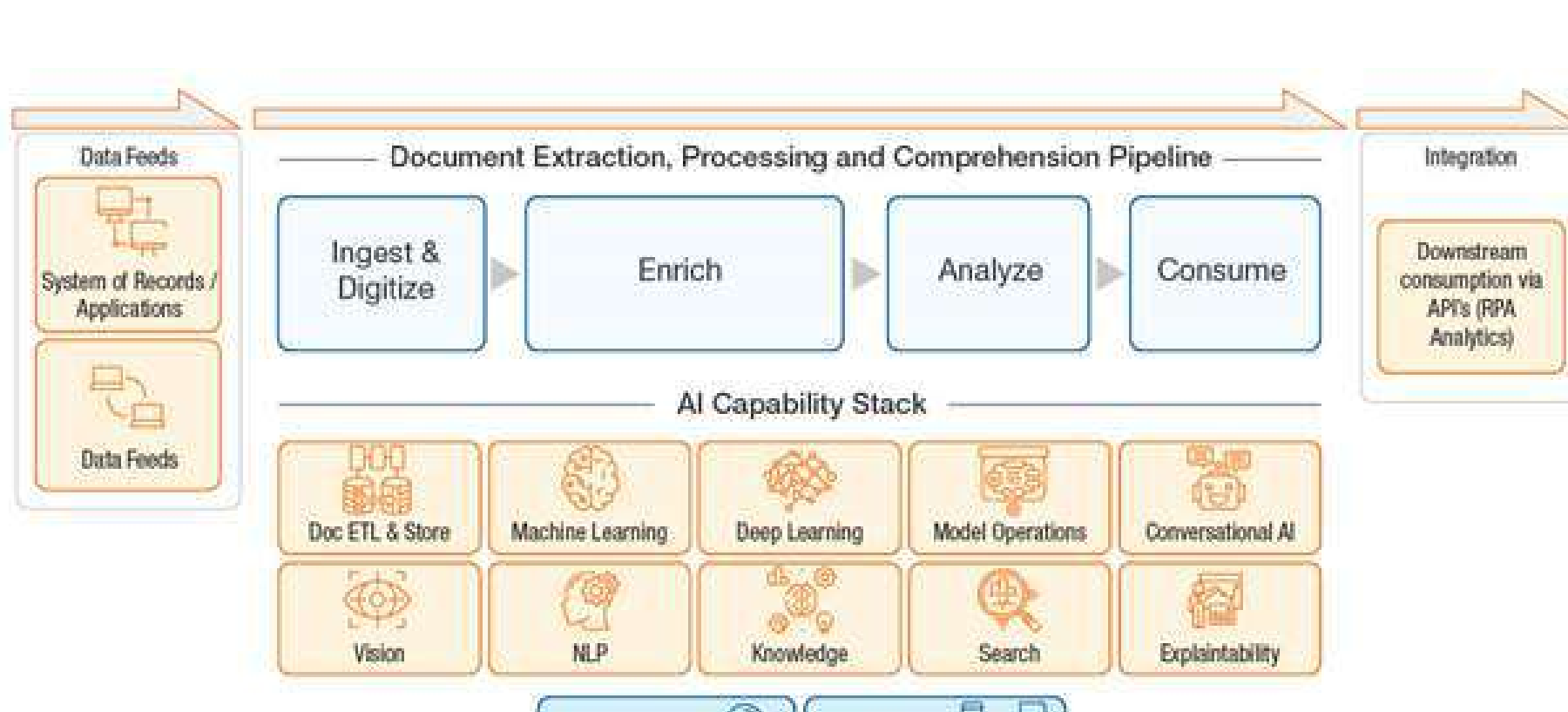
> Focus on Intelligent Document Automation

Of the many reasons why automation has disrupted productivity is the breadth of its applicability in use cases. Automations of all types have been deployed in virtually every industry and every job function. This has been especially true as robots have become 'smart,' thus moving beyond just deterministic use cases.

But the global productivity disruption is fueled by several incremental subset disruptions focused on a common set of use cases with certain features. Without a doubt, the ability of Intelligent Automation platforms to digitize documents and use AI to process unstructured data in documents is a clear example of one of these subset disruptions.

So many business processes involve processing documents. Sometimes these are simple and (mostly) structured documents like purchase orders, invoices, reports, or forms. But many also involve complex documents like contracts and legal documents that contain unstructured data and require extensive human processing time.

Huge advancements in Intelligent Document Automation are enabling companies to accelerate automation of the plethora of use cases involving documents. Core processes like purchasing and invoicing can have staggering volumes, resulting in massive automation value. Automation use cases associated with complex documents like legal documents often replace expensive human hours (think paralegals), skyrocketing ROI.

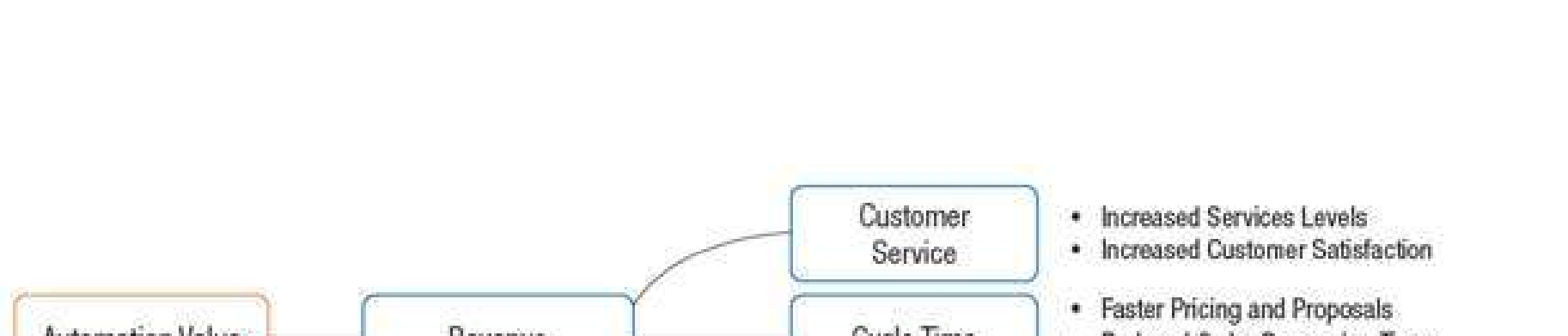


Combining Document AI with RPA is not the only combination of automation solutions that is likely to supercharge productivity. The combination of other technologies such as AI, Process Mining, Business Process Management, Chatbots to create a comprehensive automation solution will continue to be the norm. This convergence of solutions is now mostly referred to as Hyperautomation and will further supercharge productivity in business.

> The Automation of Making Customers Happy

Like previous productivity improvement eras, much of the emphasis on automation has been on costs. Making humans more productive or using technology to replace human work reduces the associated costs burdens. Much of early Intelligent Automation initiatives have been focused on the same.

However, the 'value map' for initiatives that skews significantly towards top-line benefits, and one of the main ways is by helping companies improve customer service. This is achieved in multiple ways, sometimes directly as automation in the form of chatbots or technology that assists customer service agents. Both can make helping customers inherently faster and more satisfying.



Companies are also finding that by automating many of their processes, they not only reduce costs but speed up their sales and cash collection cycles. Companies that can use automation to increase the speed or decrease the errors associated with pricing, order fulfillment, invoicing, or dispute reconciliation will get revenue into their finance cycle more quickly.

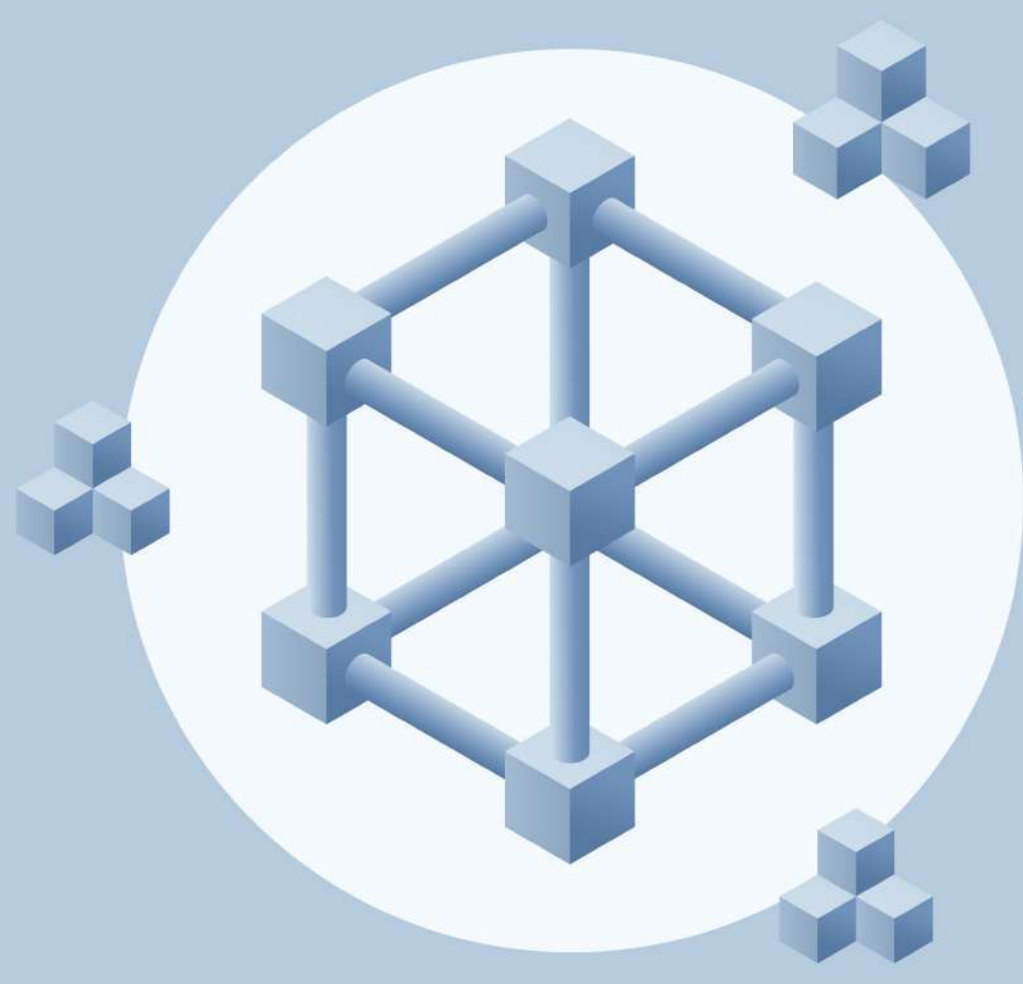
Maybe the biggest impact automation has on driving revenue is by freeing up humans to focus on what matters most: customers. Going deep into a company's automation roadmap frees up lots of human capital; these and these hours can be invested in many customer-facing functions that only humans can do.

The Future of Productivity Disruption

Automation will ultimately impact virtually every aspect of the business. The impact on productivity will be beyond what all legacy technologies have done in the past. Companies will deal with massive consequences of this automation, but the benefits from the productivity disruption will be at a scale rarely if ever seen before.

References:

1. <https://www.weforum.org/reports/the-future-of-jobs-report-2020>



Microservices Architecture for Retail and E-commerce

The Backbone for Achieving Speed and Scale



Suman Mukhopadhyay
AVP - Senior Director and Head - Technology Management, EdgeVerve Systems Ltd (An Infosys Company)



Summary

Retail therapy is the therapy Gen X, Y, and Z swear by, and with the rise in e-commerce, this therapy is now available to everyone in their palm. However, for the whole experience to be truly worthwhile, retail and e-commerce brands now must shoulder the responsibility of providing variety as quickly as possible. And that means faster scalable applications. This article takes you through the various pitfalls of a traditional architecture used by retail and e-commerce enterprises and the way forward.

As I am writing this article, it's the festive season in India, which means every e-commerce website has a sale going on. I was buying a gift for someone and as I reached the payment page, the app got stuck. I waited for a few seconds and finally decided not to buy the product at all.

Even in the 5G era, with the internet running at GBPS and not MBPS, websites and apps getting stuck are common occurrences. That almost always results in the customer opting out of buying the product and sometimes never visiting the app/site at all. While sometimes, the blame lies on internet speed, most of the time, it is the traditional monolithic architecture of the application.

End of the Monolithic Era

In the traditional monolithic architecture, the entire application is a single, self-contained, tightly coupled entity. It is responsible for a particular task and can finish it end-to-end. The components of monolithic applications are built on top of one another and all code exists in a single codebase. It was great for ease of development, but the compromise was speed, scale, and flexibility.

A monolithic application, built on the three-tier architecture, is slow. For every request, the entire application – the presentation layer (UI layer), Business Layer (Logic code layer), and data layer (Layer which connects to database - is deployed at the same time. If one component falls short or fails, everything comes crashing down. Also, each copy of an application instance gets access to all the data. This makes caching less effective, along with large memory consumption. Added to this is the sheer amount of input-output traffic.

A monolithic architecture is also difficult to update and scale as additional nodes are needed for new functionality. If you duct tape new functionality to keep up with your business needs, monolithic architecture can quickly grow into a "big ball of mud"

5 reasons why Monolithic Architecture Cannot Support New Business Needs

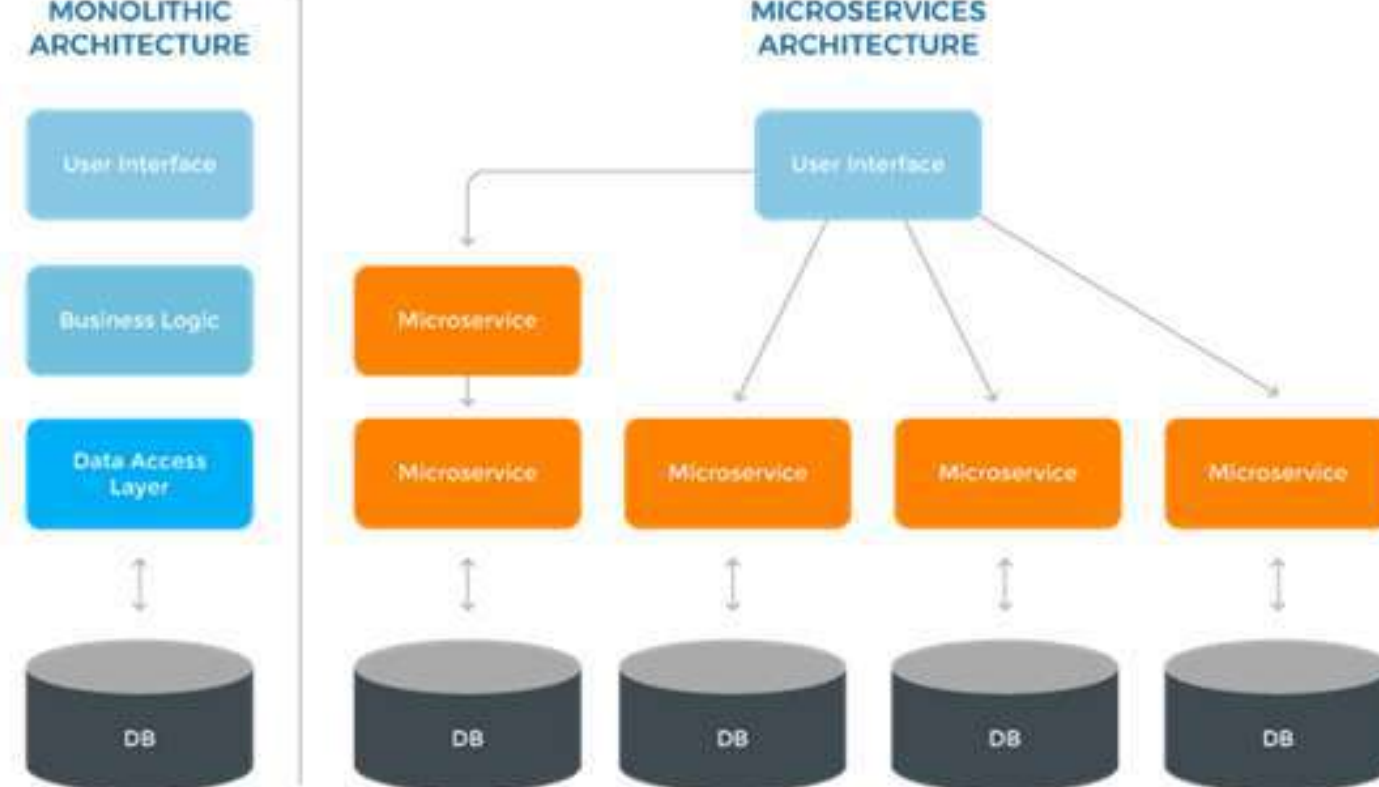
- > Architecture gets more complex, and the quality of code declines over time, making it difficult to understand
- > Technology updates or moves to a new language or framework require redeploying the entire application
- > Every change opens up the application to more risk
- > Overall application performance is affected by an error in a functionality
- > Does not support modularity and scaling will increase the code base affecting performance

where no one knows the interdependencies anymore. Also, any time you make a change to a monolithic application, you have limited options AND you open yourself up to more risk – even a small bug can bring down the entire system!

The slow, sluggish, and change resistant nature of monolithic applications makes them unsuitable for digital business needs – especially when the ask is complex feature sets across a variety of ever-changing devices.

Microservices: Modularity that Supports Agile and Resilient Businesses

Microservices architecture brings in modularity in application development with each feature developed separately and independently. The application is loosely coupled and structured as a collection of small services which are autonomous. These are modeled around a business domain. While the development complexity is higher, applications built on the microservices architecture are high performing, scalable, reliable, and more secure.



Doing it Right

Designed for rapid deployment, Microservices are a great fit for companies working in Cloud environments or with a DevOps approach. In fact, companies like Google, Amazon, and Netflix have been active proponents of this architecture for its ability to provide a consistent user experience across devices and platforms. For companies in Retail, Supply-Chain, WEB/ E-Commerce, Order Fulfillment systems, and FMCG space, moving to a microservice architecture is the need of the hour.

Companies across the board are waking up to the potential of microservices. Recently we helped one of our clients, a global leader in sports retail, deploy a solution based on the microservices architecture to improve logistics between their distributors / warehouses across countries. The new architecture enabled the functionality and scale that was essential for their business needs and could not have been supported by a monolithic application.

Here's why a microservice architecture is a mandate in these times of rapid technology disruption:

> Faster Time to Market

Microservices make it easier to add or modify features faster. Being loosely coupled, makes it possible to change only the specific service and test and deploy it independently. This cuts down time to the market significantly as compared to the monolithic approach.

> Increased system resiliency

With microservices there is minimal impact of modifications to one component on the others, reducing the risk of system failure. Even if several of the services are brought down for maintenance, there will be no noticeable changes in the overall services to your clients.

> Development efficiency

Small teams working on different components in a continuous delivery model work more efficiently. Microservices help leverage reusable code, reduce deployment time, cut down infrastructure costs, while minimizing downtime. In addition, different components do not share code, so they can be written in different languages making the most of new technology skills.

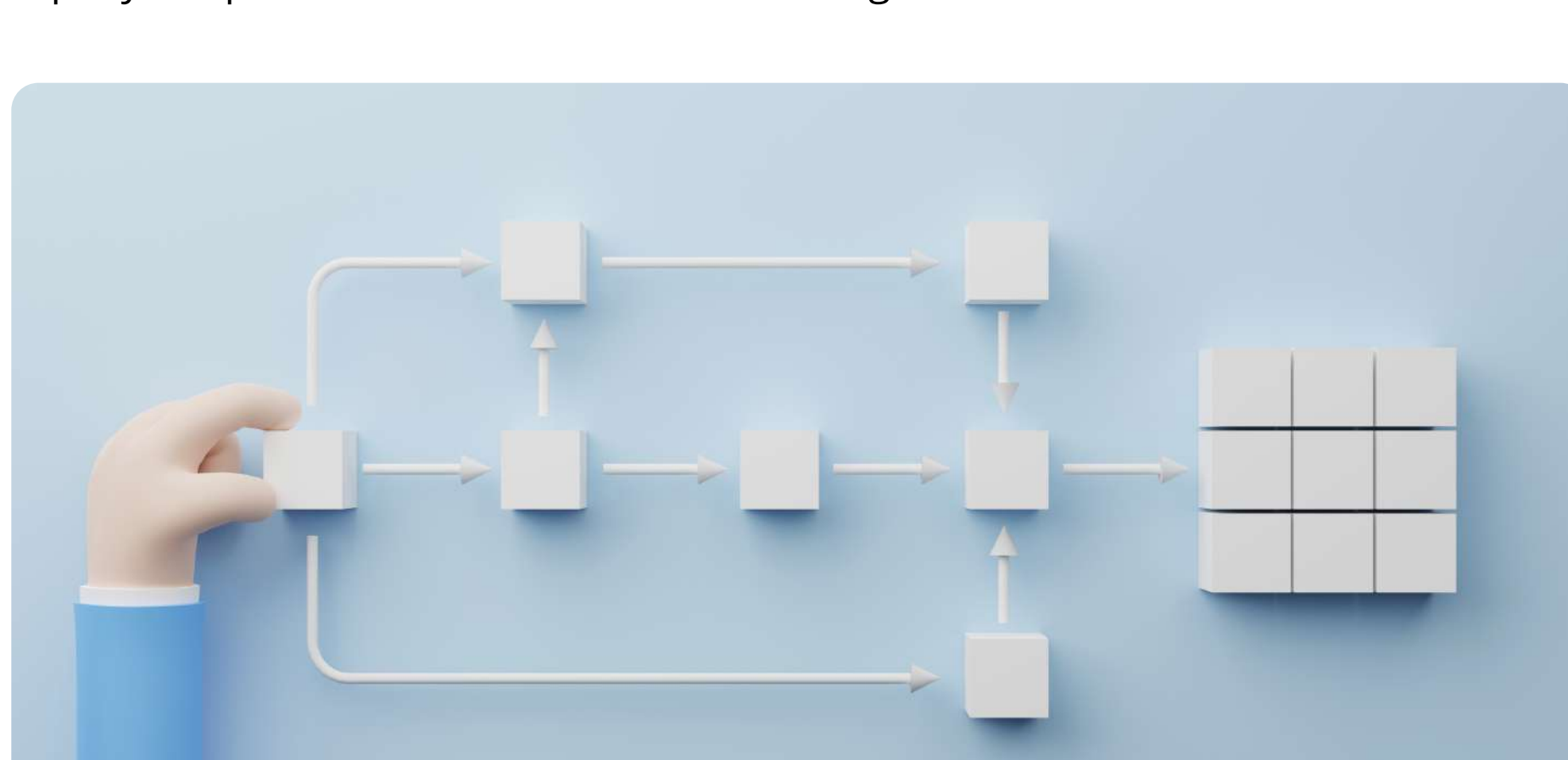
> Scalability

Unlike the monolithic architecture the microservice-based application is well suited for scalability. Instead of the whole application, only the service needing to be scaled up can be updated. In addition, business-critical services can be made available on multiple servers. This improves availability and performance without impacting other areas of the app.

> Performance

In a microservices architecture, components communicate through APIs instead of sharing a database. Each combination of request and response is an independent transaction creating multiple instances of communication and improving the response time. For example, we observed that while a monolithic application on legacy infrastructure could perform X number of Credit Card checkouts per minute, a microservices-based architecture on a Cloud platform could do a similar exercise at 100X per second. That's a massive difference in response time! Imagine the difference it could make to customer experience during a holiday shopping rush.

Recognizing the importance and relevance of this architecture in supporting the products and services of today and tomorrow, we at EdgeVerve have started to rapidly adopt microservices for all our offerings.



Microservices in Action

Think of any e-commerce application. Such an application would have a couple of services. For example, these services could be 'Customer Service', 'Product Service', and 'Cart Service'. With monolithic architecture, all of these various services are deployed to customer as a single service. Their codes are the same, they function all together and if anything goes wrong with one unit, all hell breaks loose.

But, not quite so with microservice architecture. Here, each service functions as a separate component that functions on its own. To the customer, the services are deployed in the same place. But, behind the scenes is a whole other story. Since their codes and data are not the same, they perform services without disturbing the other components. If a program developer were to modify a single service, say, the 'Product Service,' she would be able to do so without touching the other components.

In addition, there may be microservices for channel management that enable various channels (FTP, email, etc.) for file exchange, a distributed cache management service for lookups and transformations, and microservices for row level data processing to perform high-level validation and preparatory tasks.

Important Aspects of Building a Microservices Architecture

The core idea of a microservice architecture is to keep things as straightforward as possible to avoid tight coupling of the components.

The first and foremost common mistake developers make when it comes to microservices is the database. It is quite common to have a single database for all the different capabilities in a monolithic architecture. When a user accesses its order, you'll look directly in the user table to display the customer information, and the same table might be used to populate the invoice managed by the billing system. This seems logical and simple. However, with microservices, you will want the services to be decoupled—so that invoices can still be accessed even if the ordering system is down—and because it allows you to optimize or evolve the invoice table independent of others. This means that each service might end up having its own data store to persist the data that it needs.

Another thing to remember while splitting the monolithic architecture to build a microservices architecture is to keep the communication between services simple with a RESTful API. The communication protocol between services should be as simple as possible.

Let the Future Come Calling

In the coming years, businesses will have to ramp up on innovation and deploy products and services rapidly to meet customer needs – both within and outside the enterprise. Technology will be the backbone of these goals, and ensure your business is operating from a future-ready technology architecture should be on every business leader's agenda today. Are you ready to welcome the future?

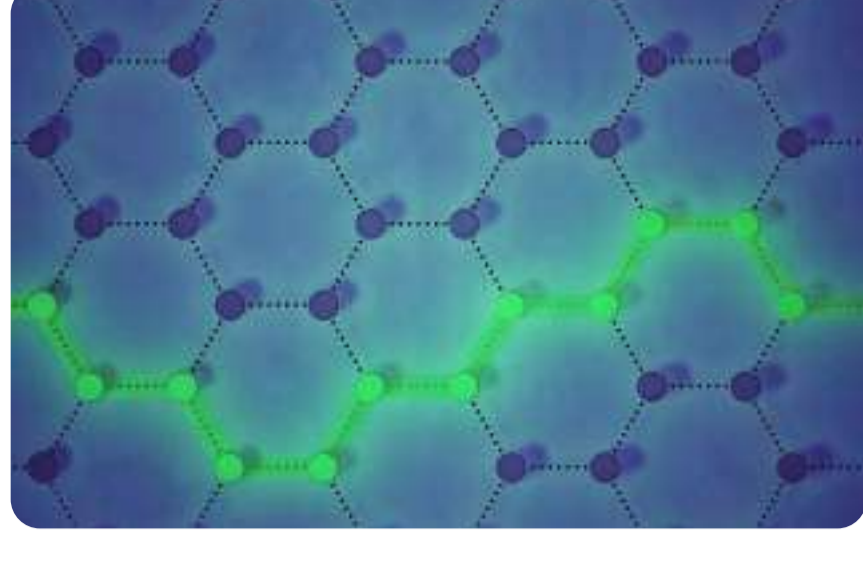


Commerce through Connectedness

How Networks Are Set to Redefine Enterprise Supply Chains



Suresh Bharadwaj
Product Head – TradeEdge,
EdgeVerve Systems Ltd (An Infosys Company)



Summary

The pandemic indicated that supply chain strategies today must include execution, not just planning to drive business resilience. Transitioning from linear value chains to a highly connected value network will emerge as the new norm, a true game-changer. What lies at the heart of today's enterprise is the power of connected intelligence to rethink the global supply chain. Read on.

In the wake of a Black Swan event, it is easy to recommend the virtue of being prescient. Nowhere has this convenience been more evident than in recommendations for supply chain resilience after the disruptions of COVID-19. The industry has said enough about what could have been and used it to inform what we should do now. The reality, however, is that the occurrence of an unexpected event lowers the likelihood of an exact repetition soon. Equally important is the collective belief we all now have in the importance of preparedness and agility. No forecast can predict every potential hindrance or opportunity.

In the supply chain context, demand forecasting based on historical sales data is no different. We can always prepare for something we're expecting, but we can't expect everything that will happen. To drive business resilience and genuine value, supply chain strategy today must extend to include execution, not just planning. How can we do that? Before we talk about the solution, it is essential to delineate the challenges.



Business Challenges, Unprecedented

This past year was different for two reasons. First, usual disruptions involve either a supply shock or a demand shock, and rarely both simultaneously. Second, these interruptions are often limited to a country or a vertical and not spread across the entire global supply chain in varying degrees of intensity. Even with natural disasters, the disruption applies to a warehouse, factory, or a few nodes in the supply chain. The pandemic has substantially expanded the horizons of risk and has shown us that even the best-laid plans can fail for a variety of reasons.

> Fragmentation of Demand Signals

The number of new products being introduced in the market has gone up exponentially. Most verticals in the consumer goods space might see a new product launched every week - a unique flavor, a new color, or a new style. Many of these new products may not be on the market for very long. They may be seasonal or limited edition or event-driven items. This sheer variety of products makes it difficult to predict or forecast which variant will sell and in what quantities. Compounding the product proliferation is the explosion in online sales, primarily because of the pandemic, causing further fragmentation of demand. Traditional demand clusters like retail stores have suddenly become less important since the end consumer could be anywhere in the world. The result - existing forecasting frameworks found themselves inadequate to address the situation.

> Inventory Deployment

A typical e-commerce transaction can result in one of two options - consumer selecting home delivery or pick up in a store. Consider the pick-up in-store example, which is very common, at least in the Western markets. It is possible in these cases that items may not be available in the store of consumer's choice, but elsewhere in the retailer network. Expecting a consumer to go store-hopping is a sure-shot recipe for disaster. Retailers must orchestrate timely inventory transfer to the store of consumer choice to enhance experience. The same would be true for home-delivery orders where retailers have started repurposing their stores as front-line warehouses. Committing inventories to a store and then having to pull it back for an online order turns out to be expensive, especially in the fashion segment.

> Hierarchical Value Chains

Traditional supply chains are inherently rigid, oftentimes driven by the territorial nature of the business. Value chain partners typically roll up to designated suppliers, thereby limiting flexibility in sourcing their needs.

The early phase of the pandemic saw China closed off to the world, crippling supply chains everywhere. Enterprises now understand that supply-side signals matter just as much as demand signals. Companies are currently looking for intelligence that allows them to see disruptions to the supply partner ecosystem as they occur, ensuring that they can create resilience with alternate sources of supply.

> Systemic Silos

ERP systems, while standardizing processes within an enterprise, track a company's direct customers or vendors and rarely beyond. With every business having its own ERP, data islands have become inevitable, requiring significant integration cost and effort to drive any meaningful collaboration between partners.

> Externality of Data

Nearly three-quarters of critically relevant data required for planning sits outside an enterprise. Mismatching partner master data hierarchies and latency in acquisition make it extremely hard to aggregate information and contextualize it for timely decision making.



A New Paradigm in Business

We see an opportunity for transformation. Supply chain planning is moving from shipment-based forecasting to demand-based forecasting, and manufacturers are now looking for near real-time demand signals. Supporting this trend is the willingness of retailers and channel partners to share point of sale information at granularities and frequency like never before. This ability to sense and respond as events unfold is no longer a pilot or candidate for experimentation but a business imperative. Successful initiatives have resulted in a 15-20% improvement in forecast accuracies.

Our viewpoint is that a similar effort is needed in supply chain execution to bridge the gap left by forecast errors. The current business architecture in most manufacturing value chains is too rigid and driven by territorial considerations. With the advances in cloud, mobile, and network technologies, access to information should no longer be limited by traditional boundaries established during the analog era. While physical goods flow will still experience well-known real-world friction, the ability for value chain players to digitally connect with each other in a non-hierarchical manner becomes a business imperative. We believe the industry will transition from operating in a linear value chain to a highly connected value network going forward. Such networks will trend towards a common goal of matching supply with demand regardless of the size of the participant or the origin of such demand (akin to ride-hailing services in passenger transportation). It wouldn't be surprising to see a billion-dollar corporation digitally connected to a mom-and-pop store either to drive direct marketing messages, receive feedback on new product launches, or even to recruit them to provide last mile delivery services.

What's in it for me?

A multi-enterprise business network makes peers of all value chain players regardless of their size and location. It recognizes the fact that in the business of trading, no entity could be permanently tagged a customer or a vendor; rather, such designation is limited to the context of a transaction. Consequently, for one looking to buy, the network offers a choice of products and vendors like in an online marketplace. For a seller, it is all about the ease of customer discovery. For a marketer, the power of disintermediation had never come this close to reality. And, for a manufacturer, the ability to track and trace products and orders, rebalance inventories across the entire network are examples of benefits that no longer remain a pipe dream.

Technology Considerations

By definition, multi-enterprise business networks are founded on cloud infrastructure and could be public or private in their participation. A key tenet to success lies in the ability of the network to drive inter-operability versus integration. This calls for common data architecture and seamless integration without compromising the privacy of data that participants place on the network. Ensuring the uniqueness of participant, product, and location identification is a lynchpin of a network's success. At the same time, the network must not require participants to give up their systems of record which would be an extremely difficult change management to drive. The networks are logical clusters of businesses that organize themselves using any attribute(s) of participant businesses serving a shared purpose.

Driving the Future of Business

This networked approach to supply chain management is critical to better execution. Through the power of connected intelligence, a network inherently builds resilience in its participants' supply and demand functions. It democratizes access to data and technology, brings consumer-like user experiences in business, and enables them to interoperate in real-time like never before. There will be innumerable use cases that deliver exponentially higher value leveraging data from the entire ecosystem. It has the power to transcend B2C or B2B, Demand or Supply, Product or Services in ways that will make us wonder how we ever lived with such silos for decades!



Driving Transformation through Intelligent Automation

The 3 Step Guide for Large Enterprises



Lakshmanan Ramanathan
Senior Delivery Manager, Infosys BPM



Prashant Vaishnav
AVP - Senior Director – Sales, EdgeVerve Systems Ltd
(An Infosys Company)



Summary

Large organizations often face challenges while rolling out large transformation programs. These challenges range from the technological capability to skill to motivation. How should CXO's navigate this issue? This article takes you through a three-step guide to a successful transformation program.

As the world accepts the new normal, enterprise digital transformation programs are finding more ground among organizations than ever before.

According to a Deloitte survey, 85% of the surveyed CEOs indicated that their organizations had significantly accelerated digital transformation during the pandemic, which also fostered the formation of new partnerships and alliances.

The market is demanding to be more digitally agile and create superior customer experiences. Towards this end, the de-facto standard that the industry has adapted is improved and faster automation.

As Digital helps the world face the new normal, the path to attain transformation is not easy. It is dotted with various challenges, such as skills shortage, lack of a well-defined transformation strategy, employee and CXO digital mindset, and data security to name a few. In our experience in executing large transformation programs for some of the marquee clients, we believe that the following framework should help the CXOs develop and deliver the transformation programs at scale and establish future-ready enterprises.



The right strategy has the potential to transform the enterprise for good:

Automation and transformation go hand in hand. With the pandemic driving the transformation projects in hyperspeed, the CXOs find automation being in the front seat. The priorities while devising an automation strategy are very clear, at the minimum the leaders expect the automation strategy to:

- > Drive value to the customer
- > Bolster the topline and bottom line
- > Enhance employee productivity and experience

According to this Deloitte article, only 38% of the survey respondents who are implementing and scaling have an enterprise-wide intelligent automation strategy. Transformation and automation significantly impacts and improves the KPIs for an enterprise. So what are the processes viable for automation? How would the initial use cases be picked?

In our opinion, it is important to identify and prioritize the process keeping in mind the above-mentioned goals. If not prioritized appropriately, the executives may not realize the all-important 'ROI'.

We suggest, the '3E framework' which could help enterprises develop an efficient automation strategy -

- > **Evaluate the value chain:** Evaluating the processes that have a direct impact on customers, employees, vendors, partners should be step one. Bringing in any form of efficiency or experience improvement almost always leads to better business outcomes.
- > **Eliminate manual intervention:** It is good to examine ways in which manual intervention can be reduced or removed. If people's time can be released to do their core tasks instead of manual system-related tasks, the strategy would reap immense benefits.
- > **Evolve with the technology:** There could be many legacy processes that might need a technology upgrade. It will help if these processes are assessed for evolution keeping in mind the newfangled technologies such as AI, Deep learning, etc.

The right discovery

The rapid digital adoption across the departments of any organization has not only increased the amount of data that is generated but also increased the amount of redundant processes. While evaluating or deploying the automation strategy, making the right discovery is the first step. Process discovery can be defined as a set of tools and techniques that are used to define, map and analyze the processes of an organization.

According to the experts quoted in our research paper, up to 50% of the RPA projects fail due to the following factors:



- > Challenges in identifying the right process for automation
- > Automating the process based on SME knowledge and manual documentation only
- > Low quality of data capture - process fragmentation and inconsistencies
- > Bots do not capture the complexity of processes
- > Understanding of exceptions is obtained at a later stage

There are generally 3 stages of process discovery - Data capture, Process Mining, and Process mapping. The automation process discovery should ideally start small and then scale up, to gain early experience. If your organization has continuous improvement teams then it is advised to leverage them in the process.

So what are the benefits of process discovery? Well, there are many!.



Tools such as 'AssistEdge Discover help enterprise leaders extract business value from rather mundane and boring business processes. The discovery stage plays a robust foundation to build a culture of continuous improvement while creating a hyper-productive enterprise. It acts as a powerful foundation for enterprises seeking cutting-edge technology, to drive intelligent automation and process excellence.

Digital Mindset is critical for transformation

According to this article by Forrester, "In 2021, up to 30% of organizations will ramp up their focus on quality by better planning and testing their automation before deploying it in production or exposing it to employees." It is important that the transformation leaders adopt a bottom-up approach while executing the strategy.

We have been in this industry for over 2 decades and oftentimes we have seen that customers and colleagues relate the term 'automation' to just process automation. However, as demonstrated above it is and must be much more than that. We believe if the following prerequisites are met, the automation strategy could prove to be significantly beneficial.

First, the employees of the organization should feel that automation will not only empower them but will also make their job easy. It is advised that the transformation leaders of the organization hold clear, transparent, and frequent conversations with the employees to empathetically educate them and assure them of the advantages and disadvantages of the transformation program.

Second, leadership buy-in is important and critical for the success of the program. The sheer scale of the program will require the support and collaboration of various departments of the company and consider transformation metrics as part of the unit/leadership scorecard. Therefore, the more the leaders understand the need and benefits, the more chances of the program being a stupendous success.

Finally, aligning the automation program to the overall organizational strategy of digital transformation helps.

Some of our client successes

For a global healthcare technology company based in Europe, we partnered with them on a multi-year transformation and automation program. We first helped them design a framework for transformation similar to the 3E framework mentioned above, and then partnered with them to drive end-to-end global process standardizations that would be automated, as opposed to picking up individual automation in pockets. We also helped them set up a global 4-tiered steering and governance mechanism for identification, prioritization, and execution of the automation use cases, with sponsorship being driven right from the CFO level. EdgeVerve's AssistEdge RPA was used as the automation platform of choice. Our client was able to save over 1 Million Hours of manual effort and realize more than EUR 25 M in savings over 5 years with 110% ROI.

For a US-based global provider of risk management products and services, we helped them quickly and seamlessly move to work-from-home during the initial days of the pandemic, while simultaneously not only maintaining but enhancing their customer service experience. Again, the key ingredients for success here were the right framework for process discovery and prioritization, choosing the right technology solution, and driving change with sponsorship at the right levels. We were able to help the client reduce their average call time by nearly two-thirds and achieve a 15% improvement in the first-call resolution for the customers.

Conclusion:

You can bring the horse to the water, but you cannot make it drink it. Can you? Driving transformation and intelligent automation in large enterprises is all about the right discovery and precise execution to derive the right ROI. You cannot see the results that you need if you do not have the right processes, collaborative partners, and trustworthy employees, and most importantly - willingness to change!

References:

- [1. https://www2.deloitte.com/us/en/insights/industry/technology/focus-areas-to-accelerate-digital-transformation.html](https://www2.deloitte.com/us/en/insights/industry/technology/focus-areas-to-accelerate-digital-transformation.html)
- [2. https://www2.deloitte.com/bg/en/pages/about-deloitte/articles/Intelligent-Automation-Survey-2021.html](https://www2.deloitte.com/bg/en/pages/about-deloitte/articles/Intelligent-Automation-Survey-2021.html)
- [3. https://www.edgeverve.com/wp-content/uploads/2019/03/SSON-EdgeVerve-Report-On-Process-Discovery.pdf](https://www.edgeverve.com/wp-content/uploads/2019/03/SSON-EdgeVerve-Report-On-Process-Discovery.pdf)
- [4. https://go.forrester.com/blogs/predictions-2021-automation-becomes-a-business-imperative/](https://go.forrester.com/blogs/predictions-2021-automation-becomes-a-business-imperative/)

Editorial Team

Soumya Saxena, Abhishek Sharma and Razia Kuvale Zubair.

Design Team

Aprajeeta Anumeh and Arvind PS.

Digital Team

Surbhi Sharma, Vinod P, Zahaida Katun and Pandi Kumar.

Leadership Team

Sateesh Seetharamiah, Kartik Murugan, N Shashidhar, Jasdeep Singh Kaler, Suresh Bharadwaj and Praveen Kombial.

Acknowledgments

Several individuals and teams contributed to the creation of this publication. We would like to highlight a few significant contributors:

Shrikant Deo - Associate Director and Lead – Product Management, EdgeVerve System Ltd (An Infosys Company)

N Shashidhar - Global Product Head, AssistEdge, EdgeVerve Systems Ltd (An Infosys Company)

Glenn VanLandingham - VP - Head - Solution Consulting, EdgeVerve Systems Ltd (An Infosys Company)

Ashok Kumar Ratnagiri - Director and Head - Systems Engineering, EdgeVerve Systems Ltd (An Infosys Company)

Basavaraj Umarani - Computer Scientist - Systems Engineering, EdgeVerve Systems Ltd (An Infosys Company)

Suman Mukhopadhyay - AVP - Senior Director and Head - Technology Management, EdgeVerve Systems Ltd (An Infosys Company)

Suresh Bharadwaj - Product Head – TradeEdge, EdgeVerve Systems Ltd (An Infosys Company)

Lakshmanan Ramanathan - Senior Delivery Manager, Infosys BPM

Prashant Vaishnav - AVP - Senior Director – Sales, EdgeVerve Systems Ltd (An Infosys Company)

Kiran Voderhobli Holla - Group Project Manager, Infosys LTD.

George Lawrie - Vice President, Principal Analyst - Forrester

Liam Spence - Disruptive Technology Manager, Openreach

Product & Marketing Team, EdgeVerve and Infosys CSG Teams and Customer Success Team.

SAFE HARBOR

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

COPYRIGHT INFORMATION:

Copyright ©2021 EdgeVerve Systems Limited, Bangalore, India. All Rights Reserved. This documentation is the sole property of EdgeVerve Systems Limited ("EdgeVerve"). EdgeVerve believes the information in this document or page is accurate as of its publication date; such information is subject to change without notice. EdgeVerve acknowledges the proprietary rights of other companies to the trademarks, product names and such other intellectual property rights mentioned in this document. This document is not for general distribution and is meant for use solely by the person or entity that it has been specifically issued to and can be used for the sole purpose it is intended to be used for as communicated by EdgeVerve in writing. Except as expressly permitted by EdgeVerve in writing, neither this documentation nor any part of it may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, printing, photocopying, recording or otherwise, without the prior written permission of EdgeVerve and/ or any named intellectual property rights holders under this document. For information on reprinting articles and all other correspondence, please e-mail contact@edgeverve.com

For more articles on AI and Automation, please visit our website

Visit our safe harbour

the edge
quarterly

