

# Forum

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**Agility and Simplification**  
Getting Ready for Digital



# Foreword



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Welcome to the seventh edition of Forum, the TCS Retail Thought Leadership journal.

The emergence of digital business models is disrupting the retail industry, giving rise to new business complexities and uncertainties. While businesses are on a mandate to accelerate change and gear up for rapid growth, IT organizations often fall short of this expectation.

To embrace and lead the change, some organizations are adopting DevOps, Agile practices, building tightly integrated teams, and looking at IT organizational design changes. But many, unlike their new age digital competitors, are still functioning with age-old IT practices and loosely coupled teams, inflexible to changes due to the baggage of legacy systems.

In such scenarios, the need for business success mandates the reinvention of the IT organization. In this edition of Forum, I am happy to share an article from our Global Head of Technology, Retail & CPG on the top five best practices for a holistic approach to IT simplification. The retail industry is in a constant state of flux, making it essential for C-level executives to respond quickly with the right strategic moves. We share a 'BizDevOps' framework which can bring in speed and certainty in strategic decision making, leaving less room for business failure.

With the right decisions in place, execution becomes critical. In the article, 'An Effective Approach Agile IT Delivery,' we bust some myths about the Agile approach and share our experiences in achieving excellence in Agile delivery. In the reinvention journey, to reap the real benefits of Agile, it is important for organizations to achieve scale. Only automation can deliver on this count. In the last article, 'How Intelligent Automation Can Be a Game Changer,' we share an industry first approach to automation that is intelligent, resilient, and mimics the human brain.

To compete in the digital age, organizations need to anticipate change drivers, respond to business needs quickly with new tools, and strive for organizational agility and simplicity. The time ahead of us looks uncertain and challenging yet exciting, for it opens new horizons of opportunities that will serve as the foundation for the digital future.

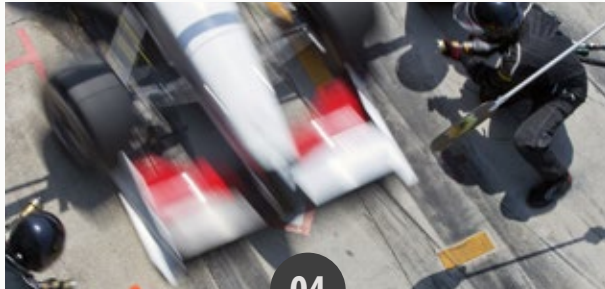
I sincerely hope you enjoy reading this issue of Forum. I would like to invite you to contribute to Forum and share your ideas and thoughts with the broader retail community. I welcome your suggestions and feedback. Write to me at [pratik.pal@tcs.com](mailto:pratik.pal@tcs.com)

**Wishing you a happy and healthy 2016!**

Warm regards,

**Pratik Pal**

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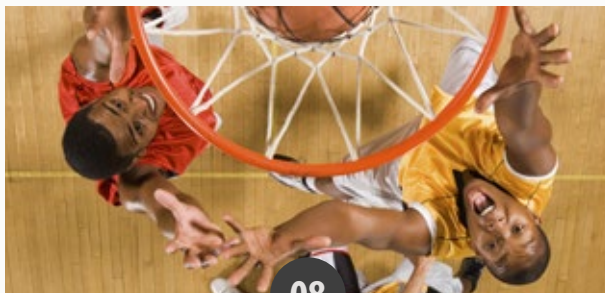
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# Simplify IT to Accelerate Digital

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Simplification of the  
IT landscape is key  
to becoming nimble,  
regardless of size  
”

Consumers' shopping expectations have changed dramatically due to the digital revolution. They are tech-savvy, have instant access to information to make their purchase decisions, and expect to be served at a time and place of their convenience. The arrival of Generation Z consumers, the first completely mobile generation in the market place, is further accelerating this trend. With this continuous evolution in consumer expectations, the retail industry is expected to change much more over the next five years than it has in the last 50 years.<sup>1</sup>

The importance of an omni-channel setup has never been greater. Retailers will need to cater to the growing number of millennials and Generation Z consumers and thus serving an omni-channel customer. They are therefore under tremendous pressure to reinvent their business models continuously through technology and innovation. Simplification of the IT landscape is key to becoming nimble regardless of size and competing with newer online competitors who are not shackled by a legacy IT environment. IT simplification will help retailers benefit from agile develop-

ment and delivery systems, digital operations, and lower operating costs, allowing them to respond quickly to shifts in the market place.

### Simplifying IT to build a future-ready enterprise

Increasing mergers and acquisitions, the presence of disparate systems and standards, and the need to support fast paced change have increased the level of complexity in the retailers' IT landscape. In addition, most established retailers have their core business systems running on monolithic legacy environments that are inflexible and expensive. As a result, they are now struggling with a highly heterogeneous and complex IT environment comprising different technologies, platforms, and infrastructure. This complexity is, in turn, adversely impacting their ability to scale up and become future-ready. With the digital five forces revolutionizing business models and creating new opportunities, enterprises with legacy environments are seeing gap in their ability to deliver on business needs. This delivery gap will only worsen in proportion to the change retail industry is expected to undergo unless the legacy architectures, infrastructure, processes, and UI/UX are modernized.

To keep pace with consumer expectations as well as meet business demands, retailers need to undertake simplification programs to help manage their IT complexity and ensure scalability and agility through:

- Consolidation and rationalization of applications, systems, and data-centers
- Legacy modernization
- Unification of the operating environment
- Cloud and Open Source adoption
- Automation
- Tools rationalization

In the following sections, we look at the key components of a simplification program that can lay the foundation for a robust digital enterprise.

### Architectural and a holistic approach to simplification

When faced with the limitations in their legacy systems, retailers typically devise workarounds and patches that create incompatibilities among discrete layers of the technology stack as well as applications within a layer. Furthermore, in a legacy environment, these layers are tightly integrated. Complexity in current IT environment therefore lies within

the entire technology stack and its processes. This makes it imperative for retailers to approach simplification holistically and architecturally to redesign the technology landscape and its processes.

Figure 1 provides an integrated view of the holistic approach to simplification.

### Rationalizing the application portfolio

A large U.S. retailer benefited from this approach and successfully shrunk their mainframe footprint to modernize core business systems, including those in merchandising and the supply chain. The modernized architecture included a responsive front-end, RESTful service layer, and reusable APIs for web, mobile, and service providers. A systematic assessment was carried out to rationalize their applications, map their functionalities against business processes to recommend the ideal modernization strategy, and develop a roadmap. The implementation was accelerated by tools and complemented with the adoption of cloud and open source. As a result, the retailer was able to integrate omni-channel seamlessly, while providing a rich user experience (UX). This approach reduced the

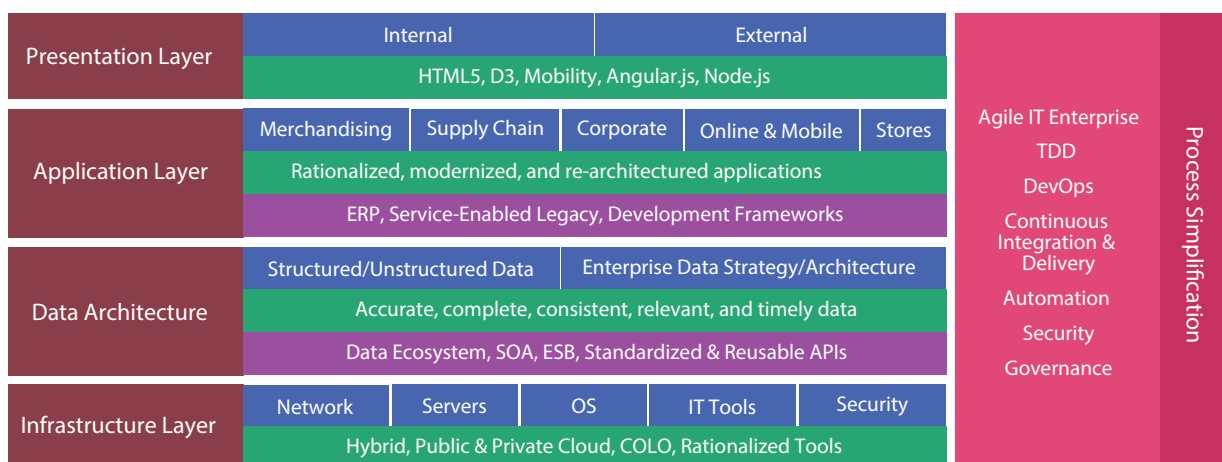


Figure 1: Reference architecture for holistic simplification

application portfolio by 30%, enabled 20% shift of in-store associates towards high value customer-facing activities, and reduced costs by around 15%.

### Migrating infrastructure to the cloud

Infrastructure efficacy should be evaluated alongside applications in terms of cost, utilization, performance, availability, and alignment. Performance improvements and significant cost savings can be achieved by adopting virtualization and grid computing, optimizing storage, and migrating to hybrid cloud models. An elastic architecture can also enable organizations to try out on-demand experimentation at lower costs, thereby fueling enterprise IT agility. By migrating their infrastructure to the cloud, a large European company improved time to market, agility, service scalability, and end-user experience. They were also able to ensure disaster recovery and reduce TCO by 30%.

### Creating a unified data architecture

Retailers with foresight make data-driven business decisions to stay ahead of their competition. That involves capturing structured and semi-structured data from various sources to arrive at real-time decisions. They can no longer afford to have ETL nightmares and multiple versions of truth. Developing an enterprise (big) data strategy is crucial to simplification efforts and should focus on a Unified Data Architecture for simpler and more futuristic Enterprise Information Management.

### Simplifying processes

The simplified technology architecture needs to be supported by IT processes and practices that enable agility. Evaluating IT processes helps identify opportunities for agile engineering practices such as continuous integration or delivery, prototyping, reusable components or APIs, and DevOps, amongst others such as adoption of automation-as-a-culture and innovation-as-a-culture that can

significantly accelerate IT delivery capabilities.

Figure 2 shows how the four pillars –engineering practices, agile infrastructure, automation, and people practices–can propel IT from playing the role of an enabler to that of a business partner. That is exactly what a U.S. retailer did. They transformed their legacy IT landscape that was overpowered by mainframes into a multi-tiered architecture supported by agile practices such as continuous integration, a reusable components library, and agile development frameworks. The retailer was able to improve time to market by 15 times while achieving better customer satisfaction scores.

### Top five best practices for a successful simplification program

Simplification programs need to be structured and executed through a systematic approach to ensure success. This starts with conducting a detailed assessment and arriving

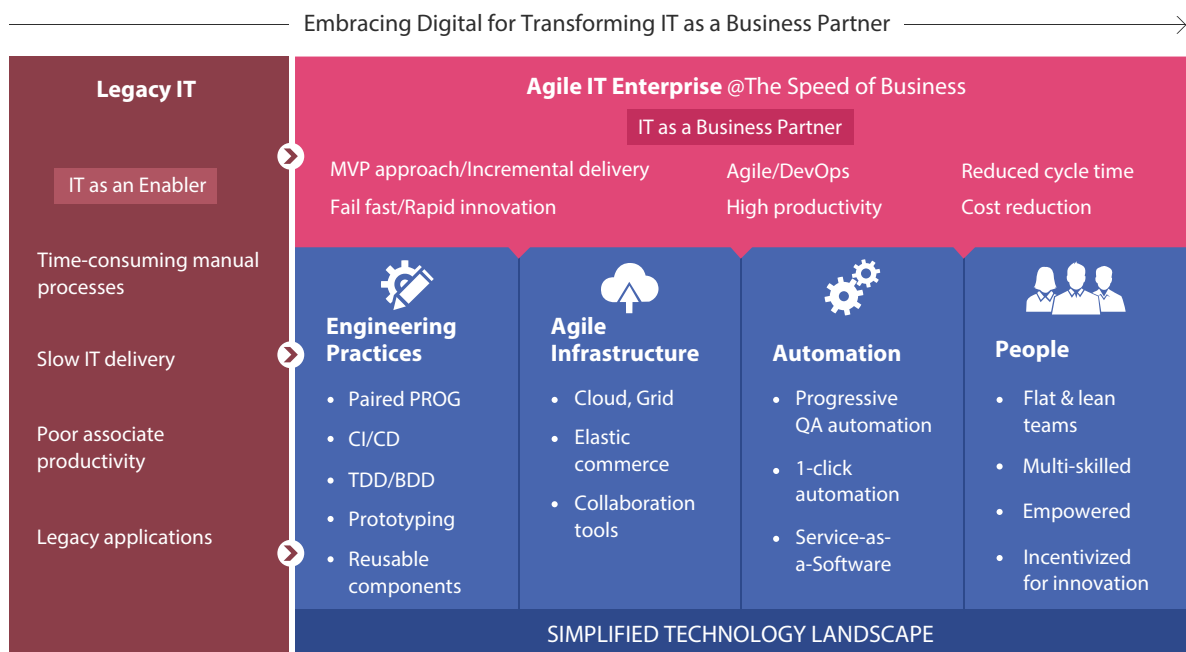


Figure 2: Transforming into an agile IT enterprise



at immediate and long-term recommendations. Establish a pragmatic and tangible implementation roadmap, and apply program management guidelines for execution. To successfully drive simplification programs, execution excellence is essential. In addition, strong governance and change management processes should be followed while focusing on automation to mitigate risks and reduce cost of implementation.

Listed below are top five best practices retailers can adopt to ensure the success of their simplification programs:

- **Develop long-term vision:** The target IT architecture must support the retailer's long-term strategy and should be flexible enough to accommodate changes.
- **Provide an executive sponsor:** An executive sponsor should be assigned to champion the IT transformation program while business plays an active leadership role in the company-wide initiative.
- **Apply holistic approach to simplification:** All the key elements such as applications, processes, and infrastructure must be aligned with the simplification objectives and be simplified simultaneously.
- **Drive self-funding with quick wins:** Organizations can focus on areas that provide a quick ROI. These include improvements in user experience and productivity, access to real-time information for faster decision making, and setting up advanced platforms or infrastructure. Savings gained from implementing such low-hanging fruits can be used to fund other simplification initiatives.
- **Ensure timely communication:** It is important to communicate vertically and horizontally across the organization. Creating a reporting dashboard for senior management can help them oversee the IT transformation effectively.

### Benefits of undertaking a simplification journey

Successful simplification programs transform retail organizations making them more agile and adaptable, thereby fueling continuous reinvention through digital and disruptive technologies. They also offer the following benefits:

- Improved time to market for faster delivery of enterprise IT services and deployments.
- Rapid digital innovation and quick exploration of ideas with the adoption of agile development processes and cloud infrastructure.
- Improved customer experience enabled by better omni-channel integration as well as real-time and personalized digital engagement.
- Faster, data-driven business decisions by architecting data for real time consumption and analytics.
- Improved architectural flexibility with timeless design to accommodate disruptive technologies

through event-driven and plug-and-play frameworks.

- Significant cost savings due to legacy modernization and use of Open Source technologies that reduce software and hardware licensing costs.
- Improved IT management and efficient operations as a result of modernized applications, architecture, infrastructure, and processes.

### Simplify today: Prepare for a successful tomorrow

Today's digital era amplifies Charles Darwin's quote on the need for resilience and agility, "It is not the strongest or the most intelligent who will survive but those who are most adaptable to change." Retailers' ability to respond quickly to a shifting market could decide whether they will disrupt the ecosystem or be disrupted. Simplifying IT can help ingrain adaptability into the organizational DNA and create a definitive source of competitive advantage.

### About the Author



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Global Head, Technology for Retail and CPG

#### Previous roles:

- Prior to TCS, has led Application Modernization at Sears Holdings Corporation (NASDAQ: SHLD) as Vice President
- Co-founded MetaScale, a Big Data Start-up company

#### Current responsibilities:

- Drives the Simplification practice at TCS
- Leads all technology efforts and CoEs globally for Retail & CPG units
- Provides thought leadership with focus on innovation and R&D in technology simplification and digital transformation (Cloud, Social, Mobile, Big Data, IoT)
- Advisor to high tech startups and venture capital firms in Silicon Valley and a visiting professor at Indian School of Business for Big Data Analytics

<sup>1</sup>Retail 2020: Retail Will Change More in the Next 5 Years than the last 50 Years, Published on 31st March 2015, Accessed on 27th August 2015, [www.slideshare.net/FITCH\\_design/retail2020-pdf](http://www.slideshare.net/FITCH_design/retail2020-pdf)

# Bringing Certainty and Speed to Decision Making with BizDevOps



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Business decisions  
taken based on  
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Enterprise agility is largely dependent on two factors. The business leaders' ability to respond quickly to market forces with the right decisions as well as the organization's capacity to execute these strategic maneuvers. However, often business decisions are taken based on ad hoc consulting, human intuition, or past experience. This is not a sustainable approach and needs to change. The IT function, which is at an inflection point, can play a crucial role in facilitating agility. Not only can it help you to take well

informed decisions but it also ensures that these decisions percolate to the key departments in the organization for faster realization of benefits.

Mature IT functions use simulation frameworks to create a blueprint of an evolving organization to provide a clearer view of the organization within its business context. This is useful in optimizing decision making and assessing its likely impact. Enterprise modeling is not a new concept and several approaches have been



prescribed since the mid-twentieth century. However, the need of the hour is a dynamic, comprehensive, and machine processable model that can adapt to an evolving enterprise.

### How fast can you anticipate and respond to change?

The retail industry has been at the forefront of leveraging new technologies such as mobile, IoT, and artificial intelligence to cater to customer demand for instant gratification. However, businesses need to be on their toes to accelerate response times in a volatile environment. From optimizing store operations to entering new markets, managing mergers and acquisitions, dealing with unsuccessful products, and reducing the cycle time for new product introductions, retailers have several important decisions to make. Moreover, many large retailers have a global footprint, and need to contend with several autonomous components and hierarchical groups that operate concurrently across the enterprise. Conflicting goals therefore increase the complexity of decision making.

Accurate and speedy response to the constantly evolving market is dependent on three key components—the ability to anticipate the environment (sense), analyze and simulate large amount of data (decide), and enable appropriate processes (respond). However, today, businesses execute the sense-decide-respond cycle with a low level of certainty. Some of the reasons for this are:

- No mechanism to anticipate and predict changing industry dynamics with certainty.
- Lack of analytical methods or models to achieve a trade-off between the exploration and exploitation of strategic components.
- Inability to model changes and simulate expected outcomes to help understand impact a-priori.

Organizations have been using standalone models to make decisions regarding specific business requirements such as M&A. However, we believe an integrated framework that captures a living model of the enterprise and links it to DevOps is more beneficial in providing a dynamic and granular view of your organization.

### The BizDevOps framework for building an intelligent and adaptable organization

The BizDevOps framework integrates business, development, and operations and is instrumental in creating more adaptable organizations. Building an intelligent and adaptable organization starts with understanding the enterprise across the business, process, and systems layers, and from the perspective of every stakeholder in a machine processable manner. This involves creating a kernel language that can reflect every organizational element using operational semantics based on the 'Actor Model of Computation'.<sup>1</sup> This language should involve a minimum set of core concepts that are required for decision making in a socio-technical context.

The BizDevOps framework is based on three principle activities (modeling, analysis, and orchestration) executed in a sequence. It uses knowledge ontologies and scripts, business rules, and domain-specific templates across people, culture, work, and products. The framework also leverages configurable components, a modeling language, algorithms for calculating the value risk and sustainability index, and orchestration rules and workflows.

Backed by data and business rules, the BizDevOps framework enables organizational decision making and orchestration at both strategic and operational levels. At the strategic level, the BizDevOps framework helps

Building an intelligent and adaptable organization starts with understanding the enterprise **across the business, process, and systems layers, and from the perspective of every stakeholder** in a machine processable manner.

you gain a holistic view of the organization including development and operations. At an operational level, it helps you in capturing the business, system, and infrastructure view.

BizDevOps works through a knowledge and workflow system and its software innovation adaptation is similar to the Enhanced Integrated Modeling Framework.<sup>2</sup> As shown in Figure 1, BizDevOps must support five capability areas in an organization with each capability area having its own custom built workflows to execute activities. For example, enterprise modeling and analysis could have a workflow which automates activities such as integrated model creation, knowledge capture, simulation, and result validation.

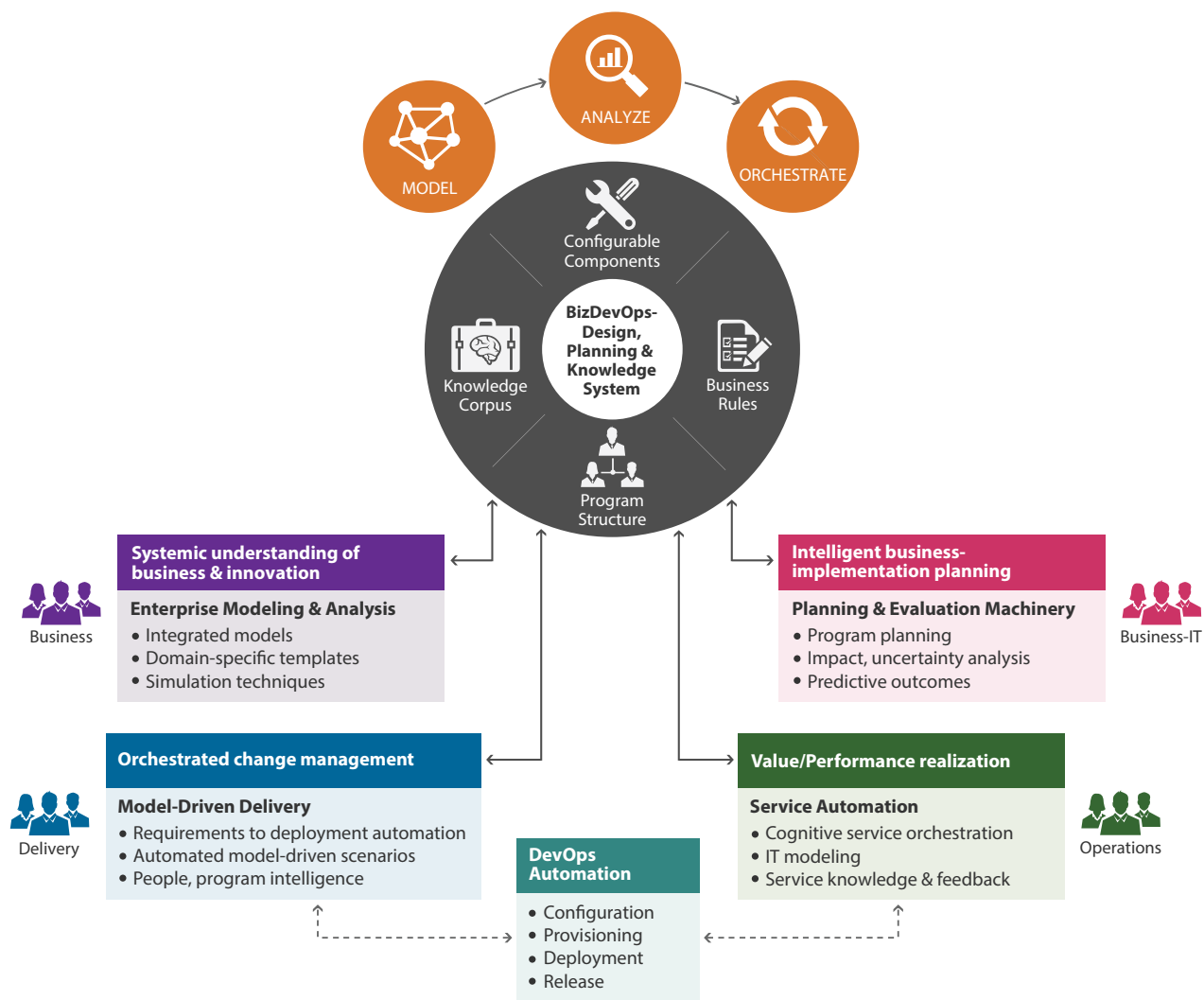


Figure 1: Key capability areas of the BizDevOps framework

As shown in Figure 2, workflows activate the BizDevOps knowledge system to pull specific knowledge related to KPIs, rules, domain templates, and simulation machinery.

The first task is to build an integrated model. This model is dynamic and information is fed through articles and

reports. This integrated model is simulated for various trade-offs and finally a validated model for implementation is prioritized after iterations. Converting the implementation model into an operational model for code execution, test scenario and data generation, as well as code integration, supports the execution lifecycle. The

same implementation models can be used for root cause analysis. The change execution workflow lifecycle pulls appropriate knowledge from the BizDevOps knowledge system to support automated decision making related to people, quality, value generation, and service automation.

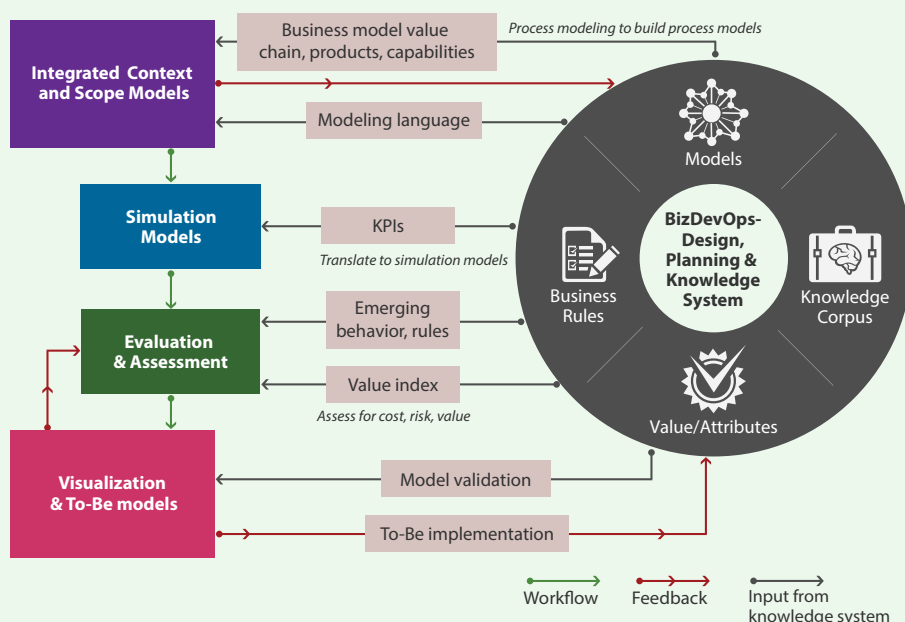


Figure 2: Business decision making using organizational models

## Win the race against time with a dynamic modeling framework

Several enterprise modeling frameworks are available today. While all have their own unique objectives, they share a common trait, i.e., the externalization of the key elements of an enterprise. For instance, the Zachman framework aims to enhance the alignment between an enterprise and its IT systems. It uses English to externalize information about the 'why, what, how, where, who and when' aspects of the organization in a structured manner. The i\* framework is a modeling language that uses a semi-formal notation to specify the 'why' aspect of an enterprise to support qualitative analysis. The iThink framework proposes a systems modeling language and enables decision making through quantitative simulation.

While several modeling tools are available, the enterprise revolves around many dimensions, simultaneously. Due to the paradigmatically diverse nature of modeling languages and non-interoperable nature of tools, the available techniques may not work together in a cohesive manner.

The dynamic BizDevOps framework therefore offers a better alternative, helping you make informed decisions with the following benefits:

- Enables you to understand the changing business environment and bring in agility and certainty in decision making.
- Helps reduce time for strategic decision making such as product launch among others.
- Helps resolve complex problems quickly.

## About the Authors



**Ajay Panse,**  
Innovation Evangelist,  
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### Specialization:

Innovation; Application of newer technologies; Incubating new design and models; Evaluating benefits and outcomes; Thought leadership

### Current responsibilities:

- Involved in the analysis and development of non-traditional models for future software innovation
- Devising strategies for enterprise-wide adoption of innovative models
- Works closely with several TCS clients for the application of the new BizDevOps model by conducting readiness assessments and evaluations



**Vinay Kulkarni,**  
Chief Scientist of Tata Research Development and Design Centre (TRDDC)

### Specialization:

Model-driven software engineering; Self-adaptive systems; Enterprise modeling

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- His work in model-driven software engineering has led to a toolset that has been used to deliver several large business-critical systems. Much of this work has found its way into Object Management Group (OMG) standards.
- Served as the conference and program chairperson for ACM and IEEE international conferences in the area of software engineering
- Has served as a technical program committee member for several international conferences
- Affiliated to Middlesex University London as a Visiting Professor

<sup>1</sup>Actor Model of Computation: Scalable Robust Information Systems, Carl Hewitt, <http://arxiv.org/ftp/arxiv/papers/1008/1008.1459.pdf>

<sup>2</sup>Modelling Framework to support decision making in manufacturing enterprises, Tariq Masood and Richard H Weston, Hindawi article, Advances in decision sciences, volume 2013



# An Effective Approach to Driving Agile Delivery



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To gain a collective value proposition, a judicious combination of Agile and Lean best practices needs to be considered in the context of the culture and the targeted objectives of an enterprise  
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Ensuring faster responses to business demands necessitate sustained Agile excellence; not merely an Agile transition. To sustain excellence, organizations need to foster a culture that encourages an extensible, integrated, and feed-forward adaptation of Agile and Lean best practices.

## Selecting the best fit Lean-Agile combination

Although all Agile-enabling methods have common core values underscored in the Agile manifesto, each method has its own individual characteristics. These methods can be categorized based on the following characteristics:

- Value-spread: Ability to provide broader value focus—engineering, project management, and process centrality—without confining to a specific value element.

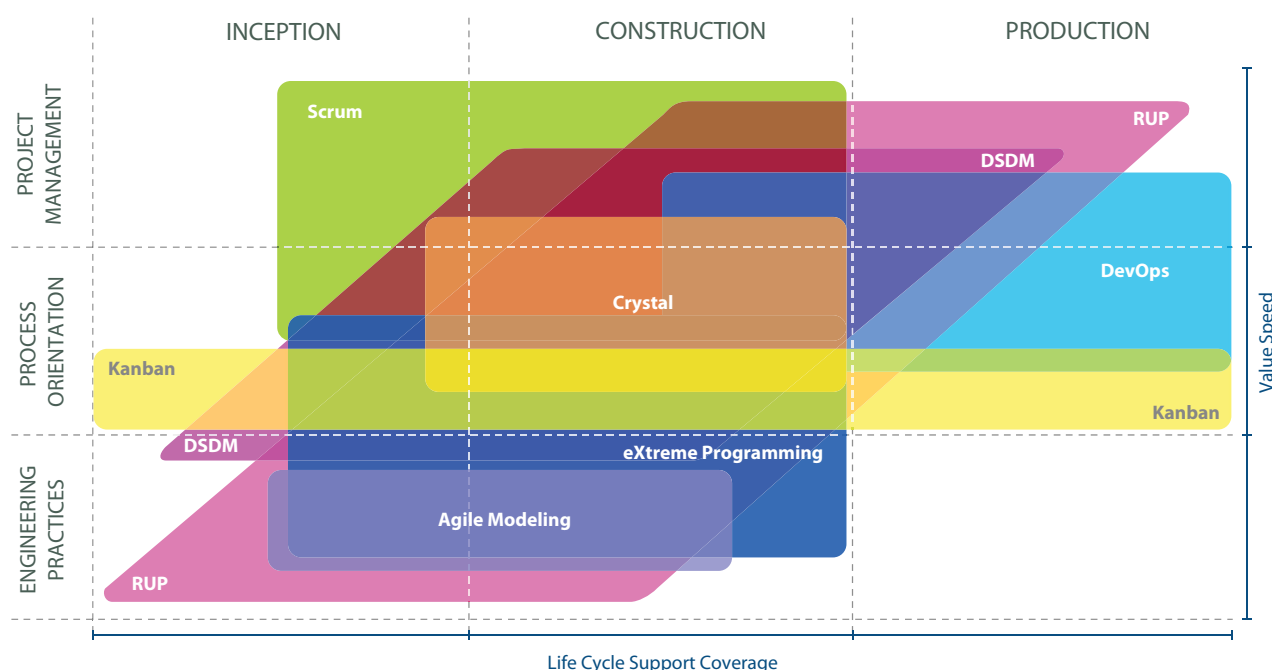


Figure 1: The Agile matrix

- Life-cycle coverage: Extent of support available for inception, construction, transition, and operations
- Support for extension: Ability to support varied distribution, speed, and scale

As demonstrated in Figure 1, most of the popular methods do not cover the end-to-end software lifecycle or offer a balanced value-spread. As the flow-based Lean principles complement time-boxed Agile, combining them together leads to maximum process efficiency. One such emergent combination<sup>1</sup> is the Lean Startup alongside a hybrid Scrum, Kanban, XP, and DevOps method. While Lean Startup helps drive the business ideation cycle of close customer relevance, Lean-Agile-DevOps helps deliver prioritized ideas in the earliest and the most harmonious way possible.

### Establishing an extensible process framework

Having selected a suitable method combination that offers broad functional and lifecycle coverage, the logical next step is to make it work

effectively in varied project contexts. In large enterprises, projects vary significantly from one to another across attributes such as complexity, distribution, speed, and scale. In such environments, establishing an Extensible Process Framework (EPF) becomes essential. Having a customizable common Lean-Agile process definition—with primary and secondary levers of attributes in focus—helps steer the project in accordance with organization priorities. For instance, in the context of speed<sup>2</sup>, teams involved in time-critical releases typically run with the extreme-paced Sprint mode—focusing only on those activities that deliver primary business value. In contrast, for periodic release cycles, switching to a sustained-pace Marathon mode is preferred. Here, activities such as training and talent development that are configured as secondary from the context of speed are accorded importance in meeting long-term organizational objectives.

Dynamic process modeling helps to build such customizable process sets that can be applied to varied project contexts. Applying a tailored

Five best practices for sustained Agile excellence:

- 1 Select the best fit Lean-Agile combination that offers broad functional and lifecycle coverage.
- 2 Establish an Extensible Process Framework (EPF) that supports integrated agile journey.
- 3 Choose dynamic modeling to build customizable process sets that can be applied to varied project contexts.
- 4 Set up Integrated Feed-Forward Execution that facilitates learning through action.
- 5 Deploy appropriate governance to focus on value generation and also to keep the adaptive culture alive.



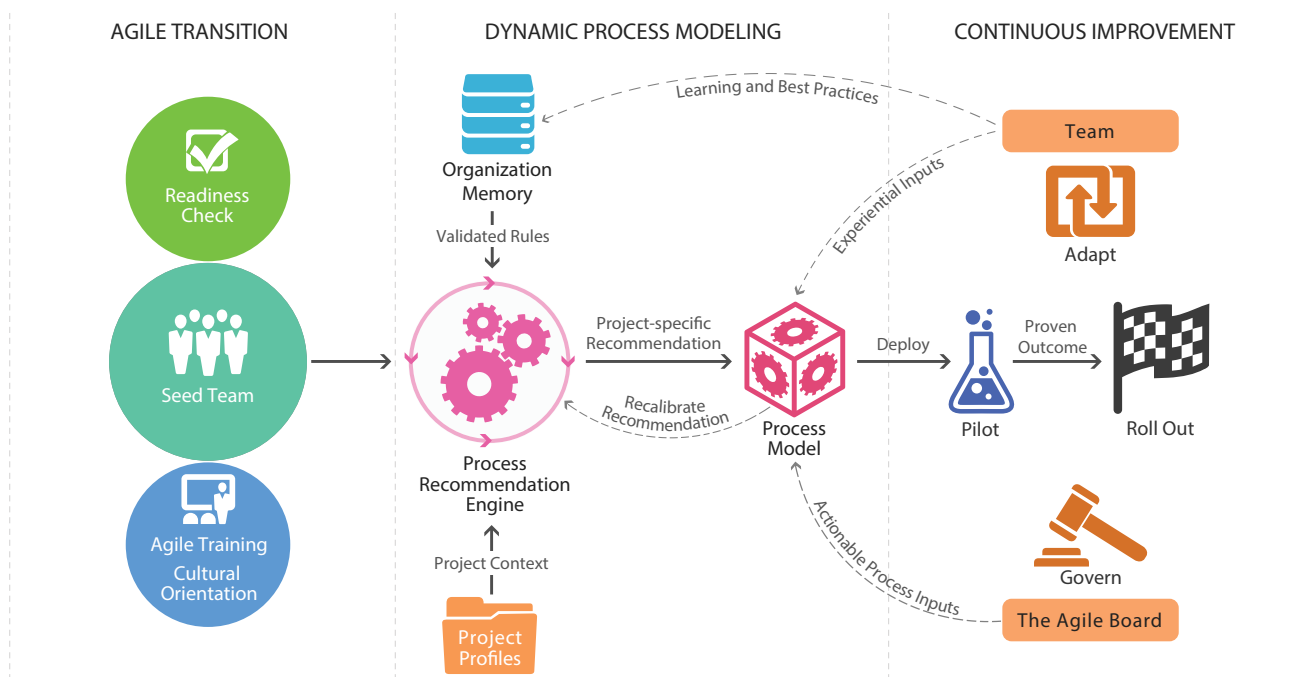


Figure 2: The Agile transformation journey

process set in a continuous cycle of past learning experiences and exceptions alongside action-oriented future inputs, as depicted in Figure 2, improves process efficiency, and facilitates superior project outcomes. The adaptive model can be piloted and validated in a variety of projects, followed by an organization-wide rollout depending on proven outcomes.

### Setting up integrated feed-forward execution

Conventional beliefs that repeatable processes yield repeatable results do not necessarily guarantee the desired outcome in a complex and dynamic delivery eco-system. The complete cycle of activities, from ideation to operations, needs to be considered early on and executed holistically. Identifying and maintaining sufficient headroom for requirement elaboration before iteration is imperative to maintaining a delivery rhythm, among other factors. A best practice followed by a major mobile manufacturing company considered requirement elaboration three weeks ahead of an iteration. Contribution to release documentation was incrementally

done over two days in the last week of each iteration. This resulted in hassle-free increments and support transitions.

In Agile projects, it is common to overlook design and architecture elaboration. A fragmented view of system design increases technical debt exponentially over the course of the release. It is therefore important to identify all possible design risks at the beginning of a release and address them at the earliest. Adequate design attention provided at the early stage of a release helps contain rework and cost overruns. Figure 3 illustrates an integrated Agile execution model.

Customer experience and business-performance are at the center of an integrated Agile execution. Emerging BizDevOps strategies supported by the growing trends of service automation and collaboration technologies help Dev and Ops teams align with business. Advanced tools such as The Arrow<sup>3</sup>—the customized Kanban Board—help agile teams keep the integrated priority pyramid intact. An understanding and right application

of communication strategies such as Communication Square (Friedemann Schulz von Thun<sup>4</sup>) support seamless partnership between teams.

At the end of each release, actionable recommendations are fed forward to the future releases. As opposed to retrospectives and feedback where teams learn by reliving and reflecting on past experience, a prospective feed-forward loop facilitates learning through action.

### Deploying appropriate governance

The shift in focus from ‘What progress has been made against the plan?’ to ‘How much value is generated by the given release?’ requires a product portfolio-based governance approach. Resource allocation methods—based on conventional output-based metrics such as the size of code or components developed per person per day—are increasingly being replaced by concepts such as Incremental Funding. This guides the allocation of resources in proportion to the value outcome.



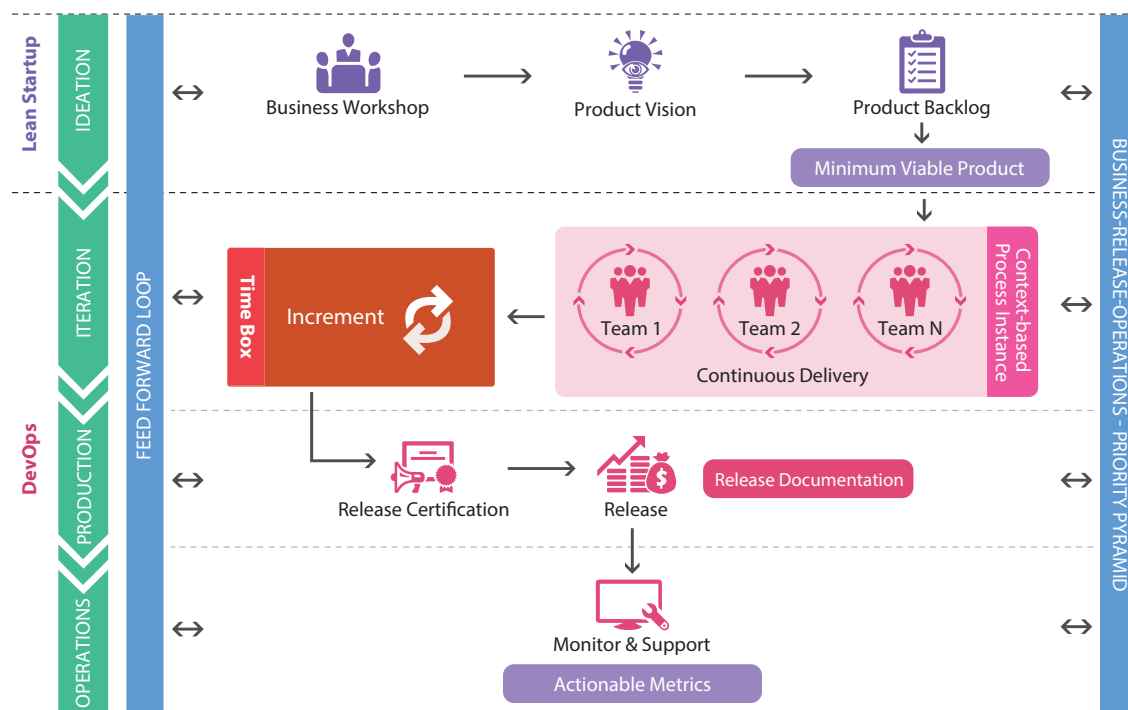


Figure 3: Integrated Agile execution model

In Agile organizations, it is common to observe aberrations such as continuous elaboration getting substituted for unplanned project revisions, or mid-course correction within a defined time-box often substituted to compensate for the lack of clear vision. To prevent such ad hoc substitutions of Agile philosophies, governing continuous Agile awareness is crucial.

Another critical function of Agile governance is to keep the adaptive culture alive. Deliberate attempts to scale Agile without enabling a shared communication model and collaborative platform can prove counterproductive. This can lead to reinstating the formal control of hierarchy. Identifying and replacing inappropriate team controls with controls of motivation and collaboration can help drive and sustain organizational agility.

### Making Agile work better

It is important to embrace a form of Agile that is best suited and adaptive to an organization's needs and culture. Imposing meticulous adherence of Agile as a mere process defeats the very spirit of agility.

Embarking on an integrated Agile journey supported by an extensible process framework and a continuous feed-forward culture is truly transformational. This can create a lasting impact on large enterprises. Such a comprehensive context-driven model can be tuned for both agility and stability modal objectives, offering inherent support to the new normal 2-speed enterprise IT.

### About the Author



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### Specialization:

Agile practitioner and coach; Retail and Banking; Channel development; Enablement programs; Agile transition and transformation

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- Works in Professional Services team – Digitate
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<sup>1</sup>Agile web operations, How are Lean, Agile, and DevOps related to each other?, July 2012, August 2015, <http://www.agileweboperations.com/lean-agile-devops-related>

<sup>2</sup>Speed in Software Development, Published in June 2014, <https://www.targetprocess.com/articles/speed-in-software-development/>

<sup>3</sup>Introducing The Arrow Kanban Board, Published in July 2015, <http://www.infoq.com/news/2015/07/arrow-kanban-board>

<sup>4</sup>The Communication Model by Schulz von Thun, <http://cnas.euba.sk/wp-content/uploads/2013/08/EL-Pre-reading.pdf>

# How Intelligent Neural Automation Can Be a Game Changer



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There is a need for new technologies and products that can enable enterprises to utilize automation designed to accommodate change, diversity, and a high degree of complexity

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Pervasive digitization, rapidly changing consumer behavior, and heavy competition are dictating new imperatives for businesses. Speed and agility are emerging as key factors for ensuring success in the digital era. While digitization has created several transformation opportunities, it has also brought in many technology and operational challenges. In most enterprises, the emergence of new technology has increased the complexity of applications and business processes. Data volumes are also rising, leading to fundamental shifts

in decision making. Most enterprise IT teams comprise multiple layers that operate in silos. This has led to a lack of transparency, deployment of multiple workflows, and delayed approvals, which in turn, makes the IT function sluggish. It also increases operational risks due to system failures, technology misconfigurations, and human errors.

Conventional methods for running technology and operations are falling short in such a complex environment, and are pushing the business case for

automation of technology and operations. IT has played a significant role in automating business processes. However, the traditional methods of running IT and operations still involve a significant amount of manual work. For instance, organizations continue to depend on the tacit knowledge, experience, and intuition that people gather over a period of time. In addition, automation has been applied in pockets making it difficult to scale the benefits gained through such initiatives.

It is evident that there is a need for new technologies and products that can enable enterprises to utilize automation designed to accommodate change, diversity, and a high degree of complexity. This new and more intelligent approach to automation that accelerates the realization of benefits is what we call neural automation.

### Can IT systems mimic the human brain?

Under the neural automation approach, systems acquire the ability to sense, think, and act, much like humans. They are designed to understand the enterprise environment by collecting data and using innate skills to make decisions on their own. Typical characteristics of such a sophisticated system could include:

- **Connectivity** – The system could have the ability to collect and assimilate data from a large number of enterprise data sources enabling contextual awareness about the enterprise environment.
- **Adaptability** – It could connect with and adapt to the existing enterprise environment and would not require standardization or changes to tools or systems.
- **Intelligence** – A neural automation system could ideally mimic the way our brain works and thus break complex activities into smaller,

simpler tasks. It could perform each of these tasks and compose them together, in real time. Since it is also contextually aware, it would have the ability to predict emergent scenarios and take proactive actions.

- **Resilience** – The system could reconfigure itself to easily accommodate changes or failures.

### The intelligent, context-aware, automated system administrator in action

The neural automation system sits on a platform built with a rich catalog of capabilities that work together to automate IT operations and business processes. This platform seamlessly integrates with the enterprises' existing technology and tools landscape through bidirectional e-bonding and adapters.

The system can perform functions such as:

- Blueprinting to create a comprehensive view of current enterprise IT infrastructure and operations
- Performing routine administrative activities
- Enabling incident resolution to triage and self-heal incidents
- Conducting health checks to validate the readiness of business operations
- Provisioning to automate installation and configuration
- Verifying adherence with regulatory or security standards and controls

Neural automation systems can be built to understand networks, databases, applications and servers, interact with each other, as well as detect points of stress in an IT system. Using its ability to connect the dots and recognize patterns, the system diagnoses problems and recommends possible solutions.

Intelligent automation is expected to deliver the following business outcomes:



**80-90%**  
improvement in  
the time to  
perform any  
activity



**40-50%**  
reduction in cost



**100%**  
accuracy in the  
prediction of  
operational risks



**100%**  
elimination of  
human errors



## Business scenario # 1 – Addressing retail store system failures and simplifying troubleshooting

Some of the ways in which an intelligent neural automation system can easily handle commonly occurring system issues in a retail store without manual intervention are showcased in Figure 1.





Challenge	Manual resolution	Resolution using neural automation system
 <p>Hanging of the POS register impacting customer transactions</p>	<ul style="list-style-type: none"> <li>The support team checks POS services and tries to restart the register.</li> <li>Performs manual rebooting/hard rebooting if necessary.</li> </ul>	<p>Applies neural analysis and self-heals itself.</p>
 <p>Performing business checks and ensuring holiday readiness at the store level</p>	<ul style="list-style-type: none"> <li>The support team checks the URLs of all applications to determine if it is up.</li> <li>Performs server and database health checks if required.</li> </ul>	<p>Performs health check of services, applications and infrastructure—on demand, on schedule, or through event triggers.</p>
 <p>Eliminating pricing discrepancy between headquarters and the store</p>	<p>Store executives check with headquarters to update pricing when the POS services are unavailable.</p>	<p>Proactively monitors all crucial store services and restarts the service, if required.</p>
 <p>Fixing store endpoint device issues such as profile/configuration, crashing or freezing, replacement request, etc.</p>	<ul style="list-style-type: none"> <li>Uses Level 1 support for troubleshooting.</li> <li>In case of failed attempts, the issue is escalated to Level 2 teams using elevated access rights.</li> <li>Support teams only confirm if the device is active, update the records, and close the incident.</li> </ul>	<ul style="list-style-type: none"> <li>Leverages reusable capabilities abstracted from device policies and recovery procedures.</li> <li>Generates context based on the understanding of the device ecosystem.</li> <li>Applies neural analysis and Artificial Intelligence (AI) to correlate device issues across all layers and develop a pattern to assess related issues in the underlying environment.</li> <li>Updates the record and closes the incident.</li> </ul>

Figure 1: The role of neural automation in addressing store system failures

## Business scenario # 2 – Speeding up employee onboarding

Employee or contractor management activities, including onboarding, are usually performed manually. Typically, it requires around three to four days to onboard a new employee or contractor. This can be a significant issue for a retailer, who may have to hire more people to manage peaks in customer demand and seasonal volumes. As shown in Figure 2, neural automation systems accelerate the onboarding process and ensure that employees are productive from day 1.

## Intelligent automation for driving better business outcomes

Neural automation systems can intelligently automate manual tasks, thereby reducing the total cost of enterprise IT and operations. It has the ability to drive change and enhance organizational resiliency by detecting, predicting, and preventing operational risks. Neural automation systems also create a personalized, self-service IT experience for everyone—any time, anywhere, and on any device.

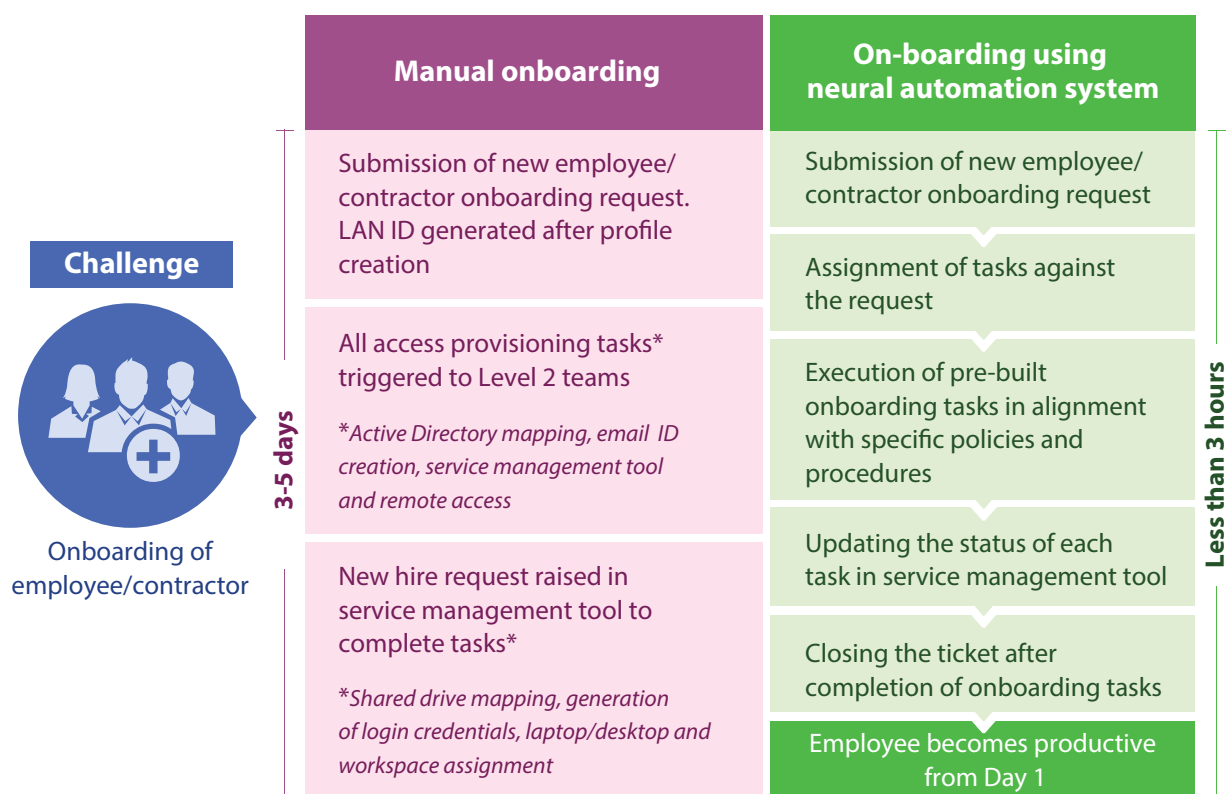


Figure 2: The role of neural automation systems in employee onboarding

## Using neural automation to accelerate human creativity and business value

A neural automation system is an industry and technology-first 'Services-to-Software' model. It sets the path to reimagine the way IT services are being delivered today, by moving away from a people-centric to a technology-centric model. Neural automation will be the key to accelerating decision making, and applying human creativity and ingenuity to more value-added and complex tasks, resulting in increased business value. Skilled resources will transition from executing routine tasks to undertaking system training and handling exceptions.

“  
Neural automation furthers human intelligence and helps it move from 'doing things better' to 'doing better things'  
”

### About the Author



**Dr. Harrick Vin,**  
Vice President at TCS; Global Head of Digitate

#### Previous roles:

- Chief Scientist of the Tata Research Development and Design Centre (TRDDC) at TCS.
- Global Head for Innovation and Transformation for IT Infrastructure Services at TCS.
- Professor of Computer Sciences at the University of Texas at Austin for 15 years.

#### Achievements:

- Over the past 25 years, has developed several innovative solutions in many areas in computing
- Three venture-backed startups in the US during 1999-2004
- Authored more than 150 technical papers in leading international journals and conferences

## About TCS' Retail Business Unit

With over two decades of consulting and IT support experience with global retailers, TCS helps retailers improve business processes and cash flows to drive top and bottom line growth. Eight of the top 10 U.S. and seven of the top 10 U.K. retailers partner with us on business transformation programs aimed at reimagining and growing the business.

Leading retailers leverage TCS' new generation Point of Sale (POS), OmniStore™ and our Advanced Digital Merchandising Suite, Optumera™, that amalgamate our strong business acumen, domain knowledge, and technology competency.

Our Innovation Labs harness technology trends such as digital technologies to incubate and develop innovative solutions for retailers. Backed by a strong asset base and an information hub that offers daily insights on the industry, retailers, and their competitors, we deliver industry relevant consulting, solutions, and IT services and support.

## Contact

For more information on TCS' Retail Solutions and Services, please visit <http://on.tcs.com/TCS-Retail>

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