PATHFINDER REPORT

Intelligent Process Automation and the Emergence of Digital Automation Platforms

The transformation of application development and its emerging role to enable new competitive advantage

FEBRUARY 2018

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About this paper

A Pathfinder paper navigates decision-makers through the issues surrounding a specific technology or business case, explores the business value of adoption, and recommends the range of considerations and concrete next steps in the decision-making process.

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Executive Summary

A current IT phenomenon is compelling nearly all organizations in all markets to seek new ways to deliver value to customers. Although the definition is fluid, digital transformation is commonly understood as the means to exploit emerging technology to improve the customer experience and enable more adaptive business models in response to the risks posed by current rivals and new market entrants.

But digital transformation goes beyond that: Changing, improving and adapting how customers engage with an organization often impacts how the organization's workforce collaborates in response, and how business partners in kind must react to new opportunities and ways of doing business. Savvy organizations use digital transformation as the means to craft new competitive advantage in all areas of their operations.

Competitive advantage is enabled when an organization either does the same things as its rivals, but differently, or it does different things that are acknowledged as superior by customers who, as a result, reward that organization with their business. In other words, how organizations do things (e.g., the business processes used to develop products/services, manufacture and distribute, serve customer needs, etc.) determines competitive advantage.

New platform and workspace visions are emerging from traditional business process management (BPM) suites and application development platforms. Next-generation 'digital automation platforms' have emerged that enable intelligent process automation, changing how business and IT teams collaborate to craft the modern cloud-native applications needed to realize digital transformation strategies. Enterprises that exploit such trends will fare well in highly competitive markets. Those that do not face an existential threat.

Business Drivers

THE DRIVE TOWARD DIGITAL TRANSFORMATION

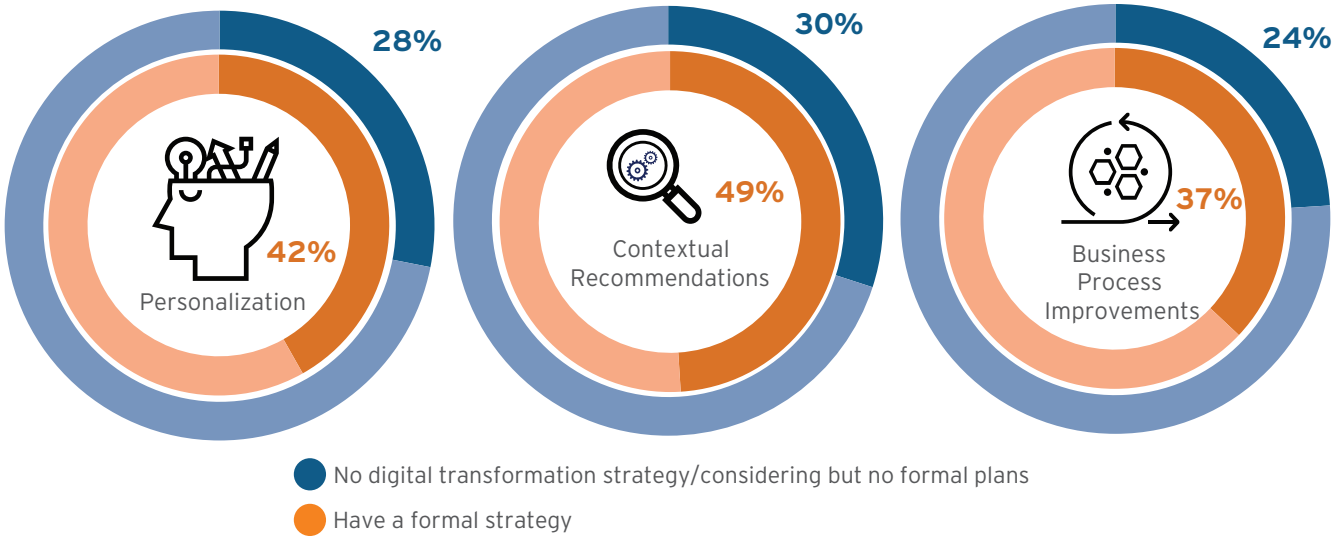
Digital transformation encompasses more than one project or singular event. It is emerging as an ongoing enterprise strategic discipline that is necessary because aggressive rivals are coming to market with new and agile businesses, many with no technical debt to slow their ambitions. These new businesses use their edge to reset customer expectations and steal market share from incumbents. They disrupt then redefine how business gets done in a market. They empower prospective customers with convenience, choices and information that changes the decision criteria used to evaluate, compare, and buy goods and services. Incumbents that sit idle face an existential threat. The need to regain or create new competitive advantage is an ongoing imperative.

Digital transformation brings to bear innovative and disruptive technologies such as big-data analytics, machine learning, artificial intelligence (AI) and business process automation, among many others. They expose hidden insights and automate operations, enabling companies to sense and rapidly respond to threats, changes and new opportunities. Innovative use of such technology is critical to regaining and creating new competitive advantage.

To understand how this is playing out, we conducted a survey asking IT decision-makers about their current digital transformation efforts. Figure 1 illustrates that 42% of enterprises with a formal digital transformation strategy craft personal customer experiences, versus only 28% with no formal effort. Also, 49% with a formal strategy build applications that are contextually aware of customer activity and offer relevant recommendations to maintain engagement and lead to increased

sales, versus only 30% with no plans. Indeed, 37% of businesses with formal strategies make their overall business process portfolio a priority to continuously improve operational effectiveness, compared to only 24% that have yet to engage a formal digital transformation strategy.

Figure 1: Operational strategies vary by digital transformation stage

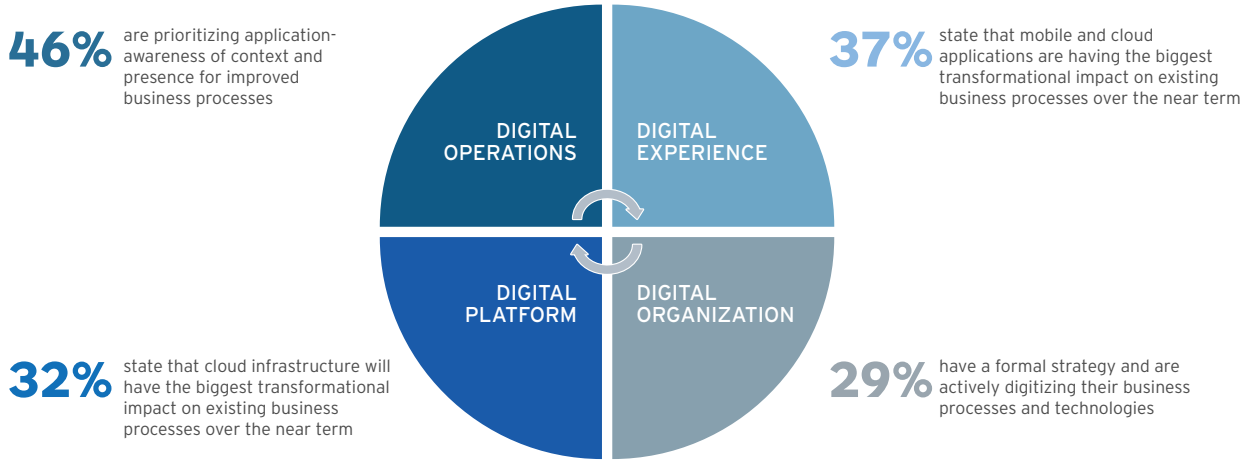


Source: 451 Research Voice of the Connected User Landscape (VoCUL): Corporate Mobility and Digital Transformation Representative Survey, 2H 2016

Personalized experience, contextual recommendations and automated process execution digitally transform how companies conduct business and deliver value to customers. Such efforts also enable more accurate and frequent observation of performance and outcomes. Iterative analysis of digital execution can stimulate awareness and insight of user behavior that can contribute to continuous innovation in ways that can heavily influence customer engagement and retention – thus helping fend off threats from aggressive rivals and unexpected new market entrants.

Industry leaders with a formal strategy are taking a four-pronged approach to digital transformation, as shown in Figure 2. While digital experience garners a lot of attention, organizations' digital transformation initiatives will not be successful without full consideration of the company's strategy, platform and operations as well.

Figure 2: Understanding the dimensions of digital transformation



Source: 451 Research VoCUL: Corporate Mobility and Digital Transformation Representative Survey, 2H 2016 (n=494)

What is common to all the dimensions of digital transition noted in Figure 2 is the need to improve, transform and digitize intelligent and adaptable business processes. Business processes are 'how' things get done to create and deliver customer value. In the age of digital transformation, 'how' companies do things requires continuous observation and analysis to proactively offer what customers expect and rivals fear. 'How' business is conducted, and 'how' things get done determines and creates new competitive advantage in the age of digital transformation.

THE NEED FOR NEW COMPETITIVE ADVANTAGE

Unfortunately, the phrase 'competitive advantage' is overused, often without explanation, so it has lost much of its meaning. People often use 'competitive advantage' interchangeably with 'competitive differentiation,' which means crafting ways for businesses to distinguish themselves from rivals. But being 'different' doesn't necessarily equate to an advantage.

Firms that truly create competitive advantage do so in various ways, but a rigorous study of the competitive strategies of modern industry-leading enterprises would reveal a common denominator. Each of these firms either does the same thing as its rivals, but differently, or it does different things that customers acknowledge as superior by awarding those firms their business. In other words, 'how' – i.e., the *process* by which – an enterprise delivers value that customers recognize as superior determines its competitive advantage and market success (or lack thereof).

Firms that value and manage processes as assets continuously evaluate them for effectiveness and efficiency, automate as many as practical, and rapidly adapt them (or create new) as needed when change occurs or opportunity arises. They manage and measure processes and their outcomes from end to end, and consider how their workforce, customers and partners may use them to interact. In this context, processes must be capable of adapting to the needs of any user, in any location, on any device to ensure expected outcomes. When such effort is then recognized by customers as superior to rivals, then differentiation indeed becomes advantage.

COMPETITIVE ADVANTAGE THROUGH INTELLIGENT PROCESS AUTOMATION

A common approach to nearly all digital transformation initiatives is to automate (effectively) the business processes used to create and deliver customer value. Broadly defined, business process automation is the creation and application of technology to systematically execute, monitor and control the production and delivery of products and services.

The quality of process automation can be improved with greater awareness of its effectiveness, efficiency and outcomes. Companies now seek to learn from automated process execution to enable the personalization, contextual responses and process improvements noted in Figure 2. They instrument processes with analytic tools to enable contextual awareness, with machine-learning tools to enable probabilistic determination that can foresee outcomes, and even with AI to enable autonomic self-healing operations without human intervention. Business processes so equipped enable intelligent process automation that helps craft and sustain new competitive advantage.

Technology Drivers

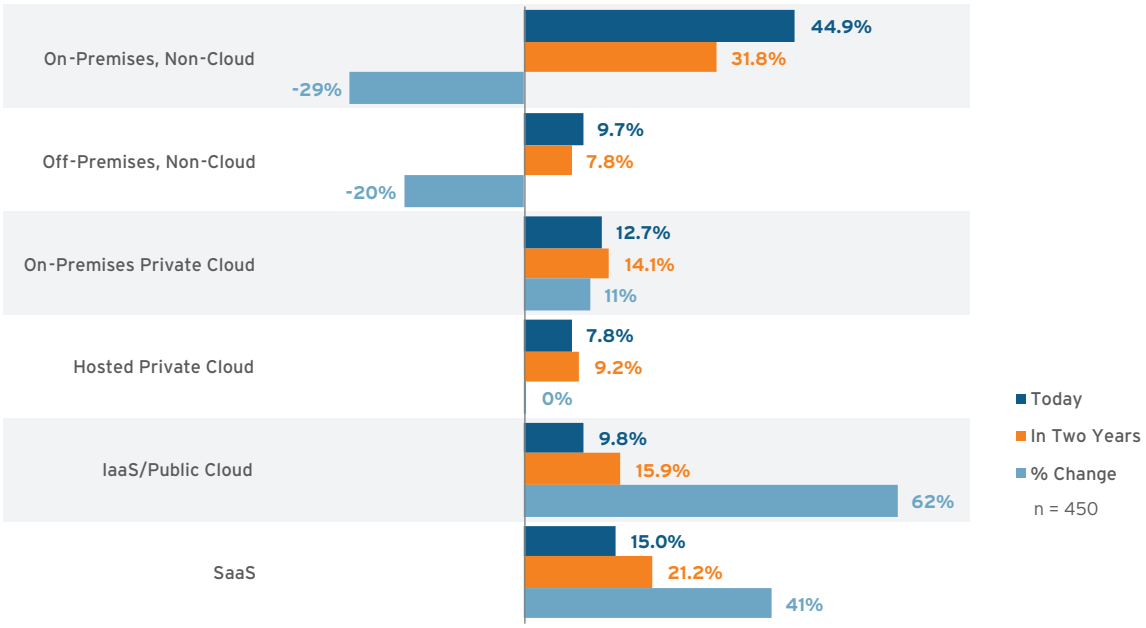
Enabling competitive advantage through intelligent process automation may seem challenging, but evolving and emerging technology now makes it practical.

NEW APPROACHES TO APPLICATION DEVELOPMENT

Today's enterprise application portfolios include many apps that were built exclusively by IT developers for use by internal employees to make them more efficient and productive. The integrated development environments (IDEs) and service-oriented architecture (SOA) platforms they used were complex and costly. The waterfall methods of managing development projects were systematic but slow. New releases took many months and resulted in a 'monolithic' design that was hard to understand and change.

By contrast, modern applications are built using rapid agile programming techniques. IT developers team with business experts and together also craft applications for use by business partners and customers designed to engage and accelerate business activity and generate new revenue. Applications run in multiple execution venues and across hybrid architectures. Cloud-first development and deployment is common as noted by the accelerating shift toward the use of cloud services illustrated in Figure 3.

Figure 3: Application environments – percentage of workloads running in cloud today vs. in two years



Source: 451 Research – The Voice of the Enterprise: Cloud Transformation, Workloads and Key Projects (n=450)

Cloud-native application development has become the preferred model for crafting the innovative applications required of digital transformation strategies. Modern programming techniques exploit shared-distributed cloud architectures, portable container technology and discrete microservices designed to quickly assemble logic, automate processes and adapt when needed. Applications move from development to production almost instantly when continuous integration and continuous delivery (CI/CD) technology is used to automate their provisioning, configuration management and deployment. Moreover, IT organizations are pushing their development and operations teams and systems closer together to form a DevOps capability that can readily adapt to changing conditions in support of the digital transformation strategy.

So too, BPM suites and application platform-as-a-service (aPaaS) environments are amid a metamorphosis to converge and transform into intelligent process-oriented application development and runtime platforms. They now enable a 'low code' approach that uses graphical drag-and-drop tooling and preconfigured templates to compose, rather than code, applications. IT vendors in these markets are now positioning their new offerings as the means to enable digital transformation – creating next-generation development environments we refer to as 'digital automation platforms.'

THE EMERGENCE OF DIGITAL AUTOMATION PLATFORMS

A digital automation platform (DAP) is a set of tools and resources structured within a uniform framework to enable developers to rapidly design, prototype, develop, deploy, manage and monitor process-oriented applications – from simple task-related workflows to dynamic unstructured collaborative activity streams and even highly structured cross-functional enterprise applications. To do so, DAPs are equipped with a range of new capabilities that go beyond those of their BPM and applications development predecessors.

DAPs include new means to assist in user interface and application design; synthesize the use of new and emerging technologies found in next-generation devices; and simplify the means for collaboration among business and IT professionals to jointly design, prototype and develop applications. They can make applications 'smarter' using machine-learning and AI technologies that can learn from process execution to improve automation of tasks and decisions, and extract insight from data payloads.

The new capabilities within DAPs that enable intelligent process automation include:

- A modeling environment for collaborative (business and IT) process design, analysis and simulation using visualization, prepackaged templates and graphical design techniques with drag-and-drop tooling to build software.
- Application design assistance technology for user interface design, feature development and usability.
- Support for container and microservices development, integration and orchestration.
- Tooling to generate and use metadata needed to support machine-learning and AI algorithms.
- Business rules management to define key performance indicators, policies and thresholds to ensure performance and execution compliance for processes and process outcomes.
- User-defined workflow creation for ad hoc collaboration of task-oriented activities.
- Integration with orchestration engines, configuration management and CI/CD tools.
- Deployment across multiple execution venues (on-premises, managed services, hybrid cloud).

Implications for AppDev and DevOps Strategies

A core attribute of a modern DAP is its ability to visualize automated process designs. This greatly improves the collaboration productivity among business and IT professionals, enabling them to perform rapid iterative prototyping and improvement.

COMPOSITION VS. CODING

DAPs use what are often called 'low code' techniques that abstract away from the developer (not completely, but to a large extent) the need to use one or more programming languages to write software. Low-code techniques include visual models, prepackaged templates and graphical design capabilities with drag-and-drop tooling to build software or integrate software and IT infrastructure. DAPs are equipped with libraries within which are sample models and templates, connectors, plug-ins, code samples, APIs and other components/objects to accelerate development and integration. In essence, they enable software to be 'composed' rather than 'coded.' Once designs are complete, DAPs can generate and put into production executable code, essentially combining both development and runtime IT environments into a somewhat simplified DevOps platform.

The overall benefit of a DAP is speed. In general, they can potentially shave 50-90% off development time vs. a coding language. We believe low-code DAPs will craft nearly half of all applications developed in the coming years because they take less time to porotype, test and deploy to production. They are also adaptive and can rapidly enable intelligent process automation when combined with machine-learning and AI capabilities.

BUSINESS AND IT COLLABORATION: A NEW APPROACH TO INNOVATION

Low-code DAPs can accelerate and lower the cost of innovation by placing powerful tools in the hands of subject-matter experts and knowledge workers otherwise untrained in software development. Such business professionals are often referred to as 'citizen developers' – people directly responsible for execution and results. By arming them with a low-code DAP, IT organizations within enterprises can help such employees test hunches, fail early (or better yet, succeed early), refine and continuously improve – averting IT bottlenecks while accelerating the pace and quality of innovation.

Use Cases: New Competitive Advantage

DAPs are more than just feature-rich development platforms for intelligent process-oriented applications. They will evolve as uniform development, integration and runtime environments that enable intelligent process automation across nearly all industry use cases.

FINANCIAL SERVICES

Many financial services firms struggle when integrating the systems across diverse customer information systems and product offerings. DAPs can play an instrumental role in enabling intelligent process automation across life insurance, pension and investment offerings. Indeed, many such offerings are tailored to specific geographical regions but require access to common transactional systems. DAPs provide a common platform to craft and maintain such interfaces, integrate decision logic into business applications, and simplify the management of shared business processes across diverse distributed financial services platforms.

HEALTHCARE

Hospitals, clinics and healthcare authorities must coordinate information and process execution across electronic health record platforms, insurance systems and patient billing applications within a highly regulated and ever-changing environment. DAPs offer an adaptive foundation to automate the data and process flows required for coordinated patient care across associated healthcare IT systems.

TRANSPORTATION

Many modern transportation services are composed of a network of contracted transportation companies, mass-transit partnerships, mileage-reimbursement programs and independent drivers. Service delivery requires continuous access to current information about resource availability used for logistic scheduling. DAPs can rapidly craft adaptive applications to coordinate the scheduling, monitoring and reporting of transportation services, reduce agent scheduling interaction times with customers, and speed logistical calculations required to arrange and fulfill access to transportation services.

PUBLIC SECTOR

Government agencies generate massive amounts of data that needs to be put to use to make more intelligent decisions and rapid response. Doing so requires the means to unify data from multiple distributed sources for analysis. Moreover, by improving analysis, agencies can detect events early, enabling them to respond quickly and accurately. DAPs can play a critical role in orchestrating the data management processes needed of analytics platforms and rapid-response systems.

Conclusion and Recommendations

CONCLUSION

The need for better approaches to serve customers and, thus, fend off threats from rivals has spawned the digital transformation era. Digital transformation demands that IT practices and technology change to be more responsive and adaptive. Application development tools and techniques must be able to rapidly compose and automate intelligent business processes that learn from execution and outcomes and improve so they can better serve users –especially those designed for customers.

This will be the new role of emerging DAPs – to unite collaborative teams of business and IT professionals that together digitize business operations, enable intelligent process automation, and continuously craft new competitive advantages that delight customers and strike fear among rivals.

RECOMMENDATIONS

1. Socialize and educate key management personal, line-of-business leaders, department heads and subject-matter experts who are charged with running operations about how business application development is changing to enable more intelligent process automation.
2. Socialize and educate key IT management team members and developers about the evolving track of traditional application development and BPM suites to the more adaptive low-code DAPs now available on the market.
3. Socialize and educate both business and IT teams about how DAPs can facilitate collaboration and enable rapid solution development, prototyping, testing and deployment of modern cloud-native container and microservices-based business process applications.
4. Evaluate DAPs and assess them for the capabilities noted in this report, then select one to execute a proof-of-concept (POC) project.
5. Choose a process design or improvement project where business and IT staff can collaborate on solution development and prototyping using cloud-native designs that include the use of containers, microservices, container orchestration tooling and CI/CD platforms.
6. Execute the POC as part of a DevOps initiative to determine the capabilities of the chosen DAP to improve process execution and application usability. Before engaging, measure relative process key performance indicators and usability metrics to determine a baseline from which to measure improvement.
7. Deploy, improve and design/redesign processes as required using the DAP as a next-generation DevOps environment.

Congratulations – you are now on your way to enabling new competitive advantage using a next-generation DAP to enable intelligent process automation.

About the Author

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Carl leads 451 Research's coverage of integration and process management technologies in hybrid cloud architecture, as well as how hybrid IT affects business strategy and operations. The markets covered in his research include enterprise architecture management tools, hybrid cloud integration technology (including iPaaS and API management) and BPM software.

Prior to joining 451 Research, Carl was Principal Analyst at BPMethods, where he advised clients on business strategy and process management. While there his book, Strategy and Business Process Management: Techniques for Improving Execution, Adaptability, and Consistency, was published by Taylor and Francis Group in 2012.

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