



# Fuel Operations with Low-code App Platforms

**Forrester Report:** Mantra for Customer-Obsessed  
Software Leaders: Deliver More, Develop Less



# Fuel Customer-centric Operations with Low-code App Platforms

FEATURING RESEARCH FROM FORRESTER

Mantra For Customer-Obsessed Software  
Leaders: Deliver More, Develop Less

# Customer-obsessed companies are looking beyond solely leveraging technology to support client-facing interactions. In an effort further elevate the customer experience, organizations are now shifting their focus toward transforming their internal operations with low-code application platforms.

## INTRODUCTION

In the digital era, customers represent the lifeblood of an organization, and today's companies must cater to an increasingly sophisticated customer base. As a result, many companies have placed a renewed focus on elevating their overall customer experience via technology.

### IN THIS DOCUMENT

- 1 Fuel Customer-centric Operations with Low-code App Platforms
- 4 Research From Forrester: Mantra For Customer-Obsessed Software Leaders: Deliver More, Develop Less
- 23 About TrackVia

In recent years, the focus has primarily revolved around improving customer interactions at the point of sale or point of service. While customer-facing technology initiatives help strengthen customer loyalty, they only address part of the equation for maximizing the customer experience. Companies now understand that in order to operate in a holistically client-centric manner, they must also utilize technology to streamline and manage all of their interconnected and complex workflows and processes. At the end of the day, the operating model is the mechanism, which ultimately determines how well a company can provide their goods or services to their clients.

The shift to a more comprehensive view of technology to create customer value translates into the need for even more operational applications and software to be leveraged across the organization. Faced with resource-constrained IT departments, siloed point solutions, or legacy software that has proven to be too slow to implement or change, many companies are turning to low-code platforms. Thus, organizations and software leaders must re-examine their approach to developing and delivering enterprise technology.

## NEW DELIVERY MODES FOR CUSTOMER-OBSESSED OPERATIONS

In order to lessen the burden on already under-resourced IT teams, software leaders are adopting new approaches to software delivery, which include not solely relying on traditional developers but also on enlisting the help of technically inclined employees located throughout the business.

TrackVia's low-code platform caters to both of these IT and business audiences, enabling them to easily and rapidly build, deploy, manage, and update custom applications using a combination of intuitive, drag-and-drop functionality and advanced developer features, such as scripting within the app interface and API integrations.

### **CUSTOMER-FIRST TECHNOLOGY MOVES TO THE CLOUD**

As software leaders partner with their respective organizations to embed customer-centric technology into internal operations, application security, scalability and governance remain a paramount concern. As a result, companies are turning to proven, cloud-based low-code solutions.

Partnered with Amazon AWS, TrackVia is the leading low-code platform in the cloud and provides enterprise-grade control, security and scalability.

### **OPERATIONAL MOBILITY BECOMES CUSTOMER IMPERATIVE**

As the business world and its customer base continue to go mobile, companies need operational solutions that enable employees to remain connected, coordinated, and customer-centric regardless of where their work takes them.

With TrackVia's low-code platform, web and native mobile applications can be developed and managed in one location, using a central, integrated codebase, and can be deployed with single-click across all end-user devices.

# Mantra For Customer-Obsessed Software Leaders: Deliver More, Develop Less

Vision: The Application Development Strategy, Structure, And Sourcing Playbook

by John R. Rymer, Liz Herbert, and Jeffrey S. Hammond  
January 18, 2017

## Why Read This Report

Now that your application development and delivery (AD&D) teams can more quickly produce apps to win, serve, and retain customers, reorient your strategy, structure, and sourcing to support a customer-obsessed operating model. This report outlines the vision for AD&D leaders' support of *digital transformation*, the goal of enterprises large and small. This is an update of a previously published report; Forrester reviews and revises it periodically for continued relevance and accuracy.

## Key Takeaways

### **What: Apps For Customer-Obsessed Operating Model**

For AD&D leaders, Step 1 in helping to win, serve, and retain customers is providing customer-engagement apps faster. Step 2 is creating, brokering, and modernizing the operational apps sitting behind those customer experiences. The resulting customer-to-back-office ecosystems are crucial to a customer-obsessed operating model.

### **Who: AD&D Is The Connective Tissue**

AD&D is the connective tissue within enterprises, ensuring the right software is delivered and evolves over time. AD&D organizational structures must decentralize to play this role, and to keep pace with rapid technology change, contractors and studios will be a permanent feature of the AD&D landscape.

### **How: Four Delivery Approaches**

AD&D's traditional role of building custom applications is just one of four delivery approaches in the age of the customer. The others are: brokering finished apps (typically software-as-a-service); enabling business experts, partners, and customers to deliver applications; and directing teams of partners to deliver apps.

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Vision: The Application Development Strategy, Structure, And Sourcing Playbook

by [John R. Rymer](#), [Liz Herbert](#), and [Jeffrey S. Hammond](#)

with [Christopher Mines](#), [Margo Visitacion](#), [Rick Parrish](#), Allison Vizgaitis, and Andrew Reese

January 18, 2017

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## Table Of Contents

AD&D's Mission: Deliver Apps For Customer Obsession

AD&D's Charter: Deliver Solutions First, Develop Software Second

Strategy: Broker More, Build Less

Structure: Organize AD&D To Be Connective Tissue

Sourcing: Shift Focus From Cost Reduction To "Multisourcing" For CX

Four Big Barriers To Overcome

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Recommendations

Reorient To A Customer-Obsessed Operating Model

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What It Means

AD&D Will Prioritize Design And Solution Delivery Over Building

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Supplemental Material

## Notes & Resources

This research is based on ongoing conversations with software practitioners via client inquiry and interviews.

## Related Research Documents

[Chart Your Course To Customer Obsession](#)

[Cloud Powers The New Connected Economy](#)

[Delivering Software For Customer Obsession](#)

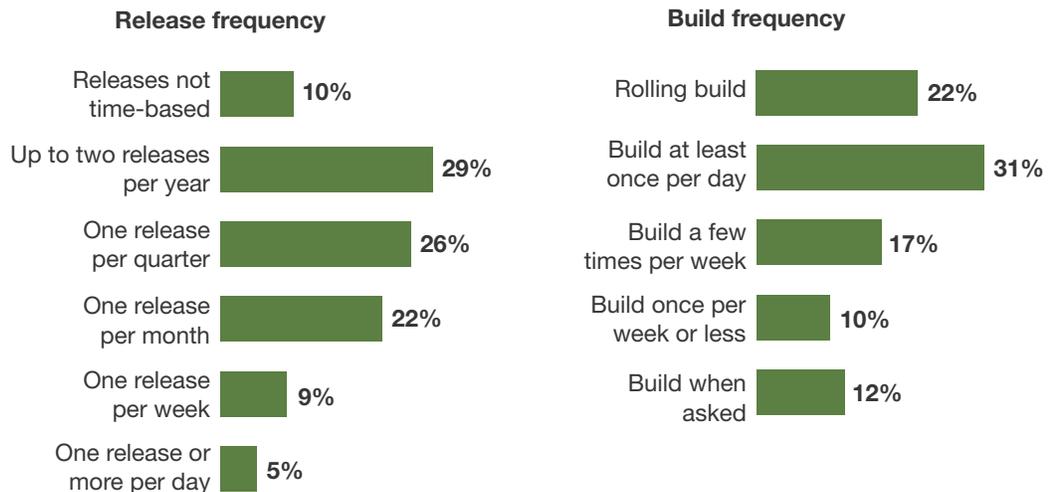
## AD&D's Mission: Deliver Apps For Customer Obsession

Most AD&D leaders are speeding delivery of software to win, serve, and retain customers — progressing from initial successes with customer-engagement apps to apps that manage operational processes.<sup>1</sup> They're making good progress (see Figure 1). The next challenge: driving this progress on engagement apps toward an applications strategy, organizational structures, and sourcing approaches that create and sustain customer-obsessed operating models.

A customer-obsessed operating model organizes people, technology, teams, governance, culture, and processes to win, serve, and retain customers. AD&D's role within it: delivering the software that enables employees, partners, and customers themselves to produce high-quality, productive customer engagements.<sup>2</sup>

**FIGURE 1** Agile Methods Adoption Speeding Application Delivery

### Build- and release-cadence trends point to speedier delivery



Base: 719 developers who work for a software company, as a game developer, for internal IT, or in technology services

Source: Forrester's Global Business Technographics® Developer Survey, 2016

### SOFTWARE IS THE MEDIUM FOR CUSTOMER-OBSSESSED OPERATING MODELS

Software enables customer-obsessed operating models by connecting the desires, goals, information, and actions of customers, enterprise leaders, partners, employees, institutions, and other participants. Software does so by providing:

- › **Context for all participants in the customer's experience.** Context is key to making customer experiences personal and relevant to customers. Partners, employees, and even other customers participating in customer experiences need up-to-the-moment context and information to effectively play their roles in the customer experience.
- › **Front-to-back collaboration and process coordination.** A mobile app relying on outdated and disconnected internal operating procedures and supporting apps is a disappointment waiting to happen. AD&D pros tackle this challenge with customer-relationship management (CRM) applications to manage core customer data. But employees and partners need appropriate collaboration channels with customers to solve problems and capture opportunities. Some pursue this process coordination within CRM apps; leading developers extend CRM with additional business process applications and social tools.<sup>3</sup>

In addition, employees and partners need appropriate collaboration channels with customers to solve problems and capture opportunities in the moment.

- › **Ability to both adapt and evolve.** Customer-obsessed operations continually evolve to address new opportunities, threats, and regulations and policies, as well as customer preferences. *Adaptation* means software that dynamically tailors visual experiences, offers and messages, and process execution paths to context and policies. In the near future, adaptation will mean software that “learns” and recommends actions or information. *Evolution* means software that lets developers quickly add, subtract, or change customer journeys, new business policies and processes, and new customer preferences.
- › **Common platforms and services that span the four domains.** Front-to-back process, data coordination, and fast app delivery require common platforms and interconnection services that span the familiar corporate (enterprise) domain, as well as consumer, commerce, and connected products.<sup>4</sup> Public-cloud platforms and artificial intelligence (AI) technologies such as machine learning and neural networks play a key role, providing a foundation for not only great apps for the age of the customer, but also for new business models and adaptive processes based on big data analytics.<sup>5</sup>

## AD&D's Charter: Deliver Solutions First, Develop Software Second

Customer-obsessed operating models require investment in new software, which would seem to play to AD&D pros' strengths as developers of applications. Strong software development and delivery talents are, in fact, required, but AD&D leadership will deploy those talents as only one of four ways to deliver applications.

## THE FOUR APPLICATION DELIVERY APPROACHES

The first principle of AD&D strategy, structure, and sourcing for customer-obsessed operating models is, counterintuitively, building less custom software. Custom software development is just one of four delivery approaches for AD&D now, each of which involves different talents, knowledge, and commitments (see Figure 2):

- › **A “brokering” approach delivers finished apps and services.** Brokering satisfies a business need by guiding adoption of either a software-as-a-service (SaaS) app or a discrete service like Google’s Natural Language API or Twilio’s telephony APIs. Brokering requires business-process expertise, understanding of the cloud-provider landscape, and mastery of the selected solution for configuration, integration, and extension — as well as costs and ongoing management.

Brokering in the cloud era is different from the buying of packaged applications of the past. SaaS and cloud-service brokering assumes fast implementation and customization-through-configuration, rather than coding, to preserve flexibility. Brokering component services can speed delivery of a custom-built app through composition of services via their APIs.

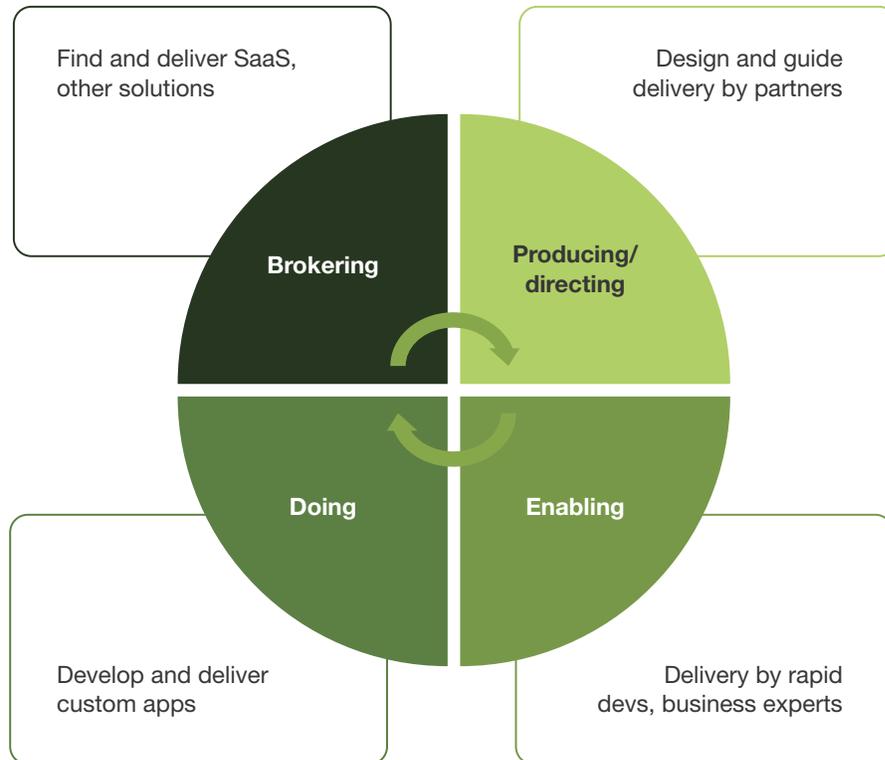
- › **“Producing/directing” relies on external partners.** In this approach, AD&D pros and their business partners envision, plan, and direct delivery of a project by mostly outside contributors. Producing/directing typically requires customer experience expertise, product management skills, and a commitment to master the application architecture and functional services used to create an app. Over-reliance external firms for both the application’s architecture and its delivery risks loss of control over future enhancements and changes.
- › **The “enabling” approach facilitates self-service by developers and business experts.** Enabling what? Delivery of applications by AD&D pros embedded in departments and business units, and sometimes by business experts. This approach requires mastery of application architecture and life-cycle management using common platform, as well as fostering competency in use of the platform by AD&D pros, business-expert customers, and partners who deliver apps on it.

To prevent these activities from creating a mess of rogue IT apps, the enabling approach relies on common managed platforms — often of the low-code variety (Salesforce’s Force.com, for example) — to support projects.<sup>6</sup>

- › **“Doing” is the familiar AD&D approach to project delivery.** The last delivery approach involves AD&D teams in the familiar role of building and delivering custom applications end-to-end. This approach is last because AD&D leaders should reserve the talents and capacity of their internal developers for only the applications that truly make the enterprise unique. “Doing” requires having developers skilled in the right languages, frameworks, and platforms, as well as the right processes and culture, to deliver the right solutions and ongoing changes on the business’ schedules.<sup>7</sup>

The “doing” approach may be founded on either coding or low-code strategies and underlying platforms.

**FIGURE 2** AD&D's Four Approaches To Delivery For Customer Experience Ecosystems



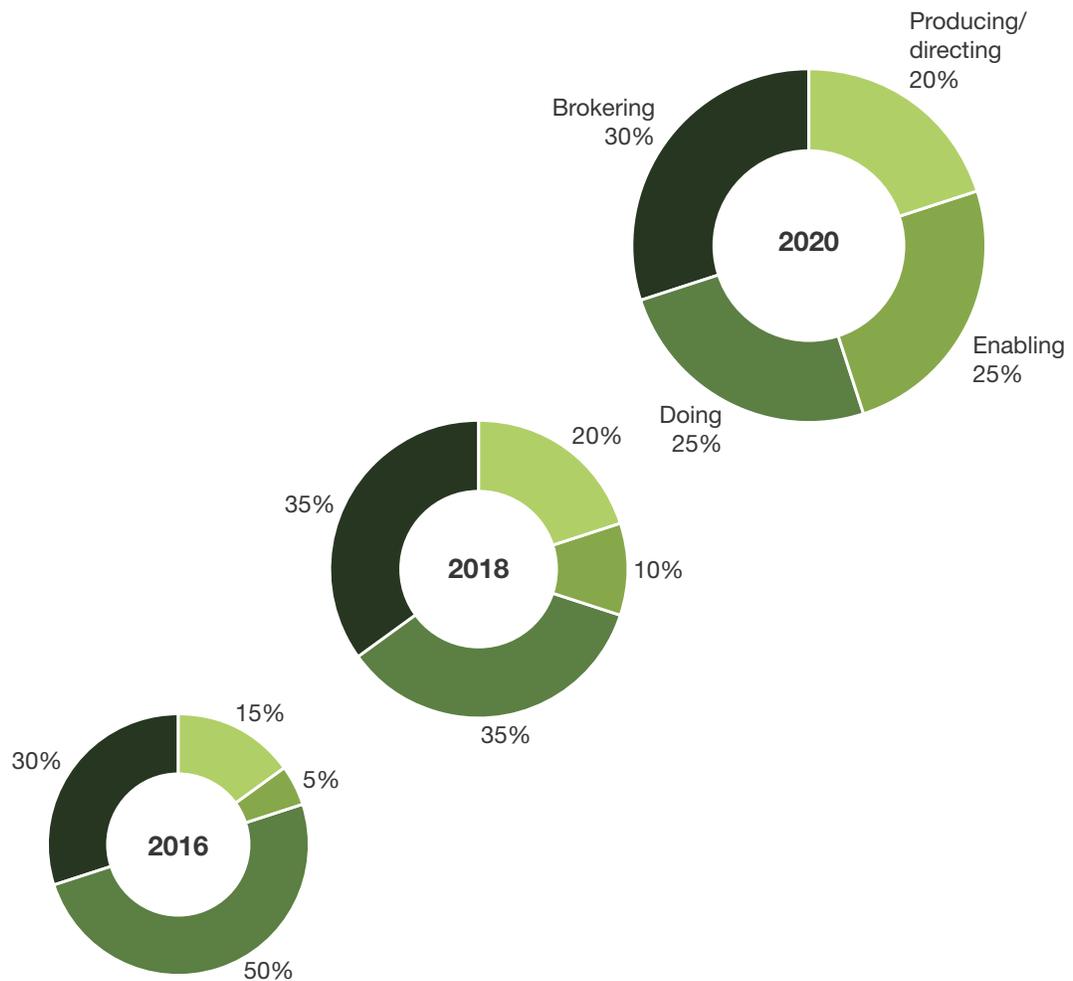
### FOR MOST, THE DELIVERY PORTFOLIO MIX WILL SHIFT FROM “DOING” TO THE OTHER APPROACHES

Every enterprise maintains a balance of the four delivery approaches and will shift it over time to achieve a customer-obsessed operating model. We expect most organizations to expand their brokering, producing/directing, and enabling activities while dialing down the doing approach. (see Figure 3). Why?

- › **AD&D can't build all of the apps required for customer obsession.** Even the largest development shops can't build all the software enterprises need. The massive need — and the need for speedy delivery — biases most AD&D strategies toward subscribing to SaaS and contracting with systems integrators and studios, while reserving internal teams for the apps and supporting services that are distinctive in winning, serving, and retaining customers.
- › **AD&D will need new architectures and technologies for differentiating applications.** Because enterprises need software structured to allow quick changes and updates, the new software will employ application architectures, platforms, and technologies to support that goal. Microservice designs for coding projects (increasingly deployed in containers); composition using open source libraries, third-party APIs, or both; and use of low-code platforms are at the forefront of these changes.<sup>8</sup>

- › **It will be harder to find, hire, and retain developers with the right skills.** The US Bureau of Labor Statistics estimates the need between 2012 and 2022 to be 522,000 new software development jobs.<sup>9</sup> That gap is even wider for high-demand development skills in mobile, cloud-native applications, and data science. Universities and colleges won't fill this need, so firms will have rent the developer talent they need, directly on the open market or through service providers.

**FIGURE 3** Expected Evolution Of Delivery Approaches For Typical Enterprise



## Strategy: Broker More, Build Less

The days of custom-built everything — from enterprise resource planning (ERP) to websites to customer-facing apps — are over. But a strategy that relies too much on buying packaged apps or leveraging SaaS won't work, either, since it won't give your enterprise the innovation and motivating customer experiences it needs. What this means for AD&D leaders:

- › **Broker internal and external solutions — and reevaluate options often.** Shift focus to brokering and orchestrating the right solutions and solution components. Look often for software and services to incorporate into your plan, considering even solutions that line-of-business (LOB) leaders have independently adopted. You'll need team members with strong skills in partnering with and managing vendors. Look for shorter, pay-as-you-go contracts when long-term commitments to a vendor, product, or service make no sense.
- › **Focus development efforts on software that differentiates your firm to customers.** AD&D wastes too much valuable in-house development talent on activities that don't add business value. Worse, time and money wasted developing such systems is time and money unavailable for the projects that will differentiate the brand and drive a great customer ecosystem. Instead, AD&D execs should focus their resources on areas that uniquely differentiate customer experiences, both in software used by customers and in supporting offering, inventory, fulfillment, payment, and other operations.
- › **Engineer for changes that matter to customers.** Customers expect you to keep pace with them, meaning the software enabling customer experiences must be fast to deliver, easily adapted by customers on their own, and readily changeable. The best approach to app design allows people to change parameters, rules, views, and flows via configuration (not coding). Further, architectures using loosely coupled services — increasingly microservices — and integrations will most readily accommodate deep changes to the apps.<sup>10</sup>

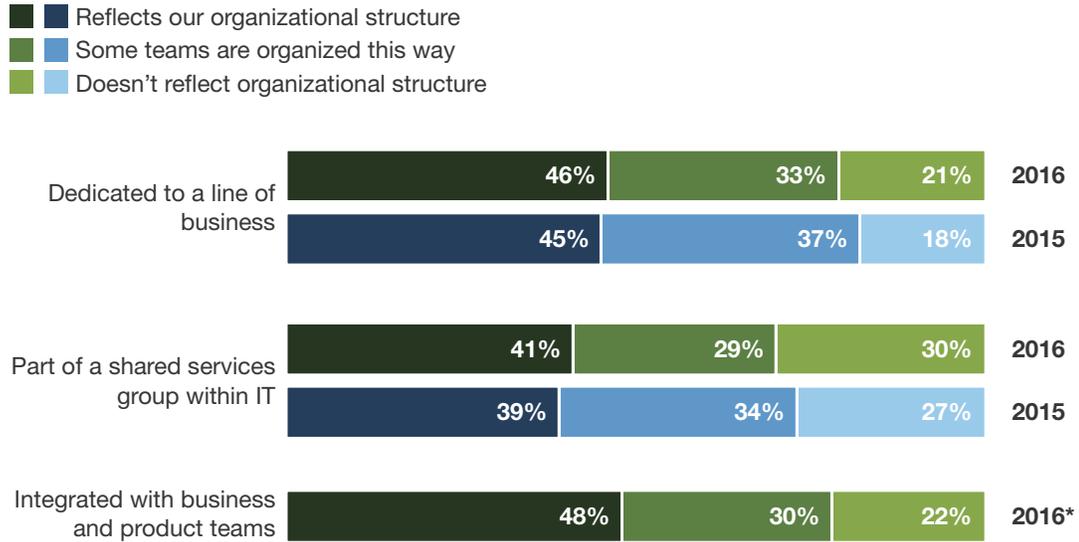
## Structure: Organize AD&D To Be Connective Tissue

The dynamic decision-making about software throughout customer experience ecosystems will demand that much of AD&D be decentralized. Leaders of product lines, marketing, support, sales, channels, and other customer-facing functions have both urgent needs for software and the autonomy to obtain it. Delegating projects to contractors and using low-code platforms reduces the expertise, time, and cost to deliver many of the apps, forms, workflows, dashboards, tracking, and other custom software these business groups need. Customers, partners, regulators, and other players in the ecosystem likewise exercise great autonomy over the apps they use to pursue their goals. Thus, AD&D organizational structures will:

- › **Place AD&D talent close to decision-makers driving customer strategy.** The org pendulum has swung to decentralized AD&D — for good reasons (see Figure 4).<sup>11</sup> Technology financial management, enterprise architecture, platform engineering, application architects, and data specialists will remain shared-service organizations for the sake of efficiency.
- › **Favor the shared-platform(s)/business-aligned teams org structure.** Of the three major organizational models for AD&D, the shared platforms model stands out as best for supporting software for customer-obsessed operating models. Why? The model empowers delivery teams to deliver for their customers as needed while providing the cost leverage of common platform services.<sup>12</sup>
- › **Support collaboration via service contracts.** AD&D teams and pros collaborate with others in technology management, as well as with business leaders, customers, and partners through service contracts.<sup>13</sup> Service providers act like vendors, providing APIs, functional services, and data to app teams that need them (consumers). Service provider incentives and funding will align with consumer satisfaction and emerging needs.
- › **Break down boundaries as needed.** Teams must be fluid and open for fast software delivery. AD&D pros adopting modern application delivery practices work on with teams incorporating enterprise architects, infrastructure pros, and business experts to deliver applications. Consultants, customers, and partners are the next steps in eliminating communications and trust boundaries. The IDEA team concept will help.<sup>14</sup>
- › **Adopt product management practices.** Product managers conceive and sustain products over years, employing a do-learn-react process. AD&D teams embedded in business units will need product managers, even if the role is implicit. AD&D pros managing shared services must do the same to keep up with the demands of the several contributors to customer experience apps.<sup>15</sup>

**FIGURE 4** Business-Dedicated AD&D, Already Common, Will Expand

**“How are development team(s) organized at your company?”**



Base: 332 and 705 global developers who work in an internal IT role

Source: Forrester's Business Technographics® Global Developer Survey, 2015, and Forrester's Global Business Technographics Developer Survey, 2016

\*2015 data not collected.

## Sourcing: Shift Focus From Cost Reduction To “Multisourcing” For CX

Traditional enterprise applications sourcing overemphasized costs and relied on strategic vendors for suites of functions. The customer-obsessed operating model requires innovation and flexibility to change suppliers as needed. We recommend a multisourcing approach that recognizes composable services exposed through cloud APIs, open source components, and cloud-delivery models.<sup>16</sup>

Sourcing for customer-obsessed operating models demands that AD&D leaders:

- › **Get serious about application portfolio management.** The on-again, off-again commitment in application portfolio management needs to be on again — initially to rationalize the apps — and vendor — portfolio. Why? AD&D needs an application inventory to know which apps to rationalize and which to promote. Project and program portfolio management will transition to product-management practices managing investments spanning calendar-year budgeting to better reflect strategic planning. Next up? Migrating apps to the cloud to gain the most business value.

- › **Put cloud front and center in the sourcing strategy.** Public cloud services will continue to rise — accounting for a bigger portion of applications, services, and even developer tools strategy.<sup>17</sup> Beyond cloud sourcing that AD&D is directly responsible for, AD&D pros will need to participate in technology management-led and business-led decisions about using the cloud — to ensure architectural fit, skill set fit, and alignment to the broader applications strategy.

Don't fall into the trap of looking to cloud only for cost savings; seek business agility, ability to drive customer experiences and operations, and innovation as well.

- › **Expand your sourcing to gain innovation and ideas from smaller suppliers.** Move beyond the “top-tier partners” mentality to consider smaller players that provide innovation in both products and thinking. Look to emerging models such as crowdsourcing, freelance networks, staffing at the feature-team level, and sprint-based team cost models.

Look to smaller vendors for business value, more than cost savings.

## Four Big Barriers To Overcome

Achieving the major points in our vision for application development strategy, structure, and sourcing will require AD&D leaders and their cohorts to overcome four big barriers:

1. **Culture: Attain and sustain flexibility and trust.** In a fast-changing environment, flexibility and autonomy depend on trust between the contributors to any given solution. Customer experience (CX) leaders who show an understanding of software development realities will gain the trust of AD&D pros. AD&D pros with talent, passion, and transparency will earn the trust of CX leaders. Keeping commitments helps, too. Both sides of the partnership need strong negotiating skills to jointly clear delivery delays, typically by resetting priorities and schedules. AD&D pros bear their share of responsibility for building trust with transparency, reliable performance, and plain language.
2. **Financial governance: Fund apps based on real customer results.** Static, annualized financial governance won't work in funding software for customer-obsessed operating models. Financial priorities must be driven by real value first, history second, and politics not at all. Within budgets, spending must be flexible enough to scale up to accommodate a big success, as well as scale down for developments that fall short of expectations. The transition to modern financial management is a difficult transition few enterprise AD&D groups have mastered.<sup>18</sup>
3. **Metrics: Focus on incentives, eschew false precision.** In a customer-obsessed operating model, AD&D leaders focus on incentives first and metrics second.<sup>19</sup> If you want AD&D employees to expand their talents, give them autonomy to do so — to start. Will measuring attendance at training classes ensure the talent development you're looking for? AD&D incentives and metrics in customer experience software are more art than science now, but progress from the Agile movement will lead to a solution to this gap.<sup>20</sup>

4. **Security: More participants, more insider risk.** With a potentially wide variety of customer-obsessed operating model partners invited to participate in software delivery, the number of insiders on any given project will rise. And more insiders means more insider security risks. This risk may be greater than the risk of security breaches in public cloud apps and platforms.

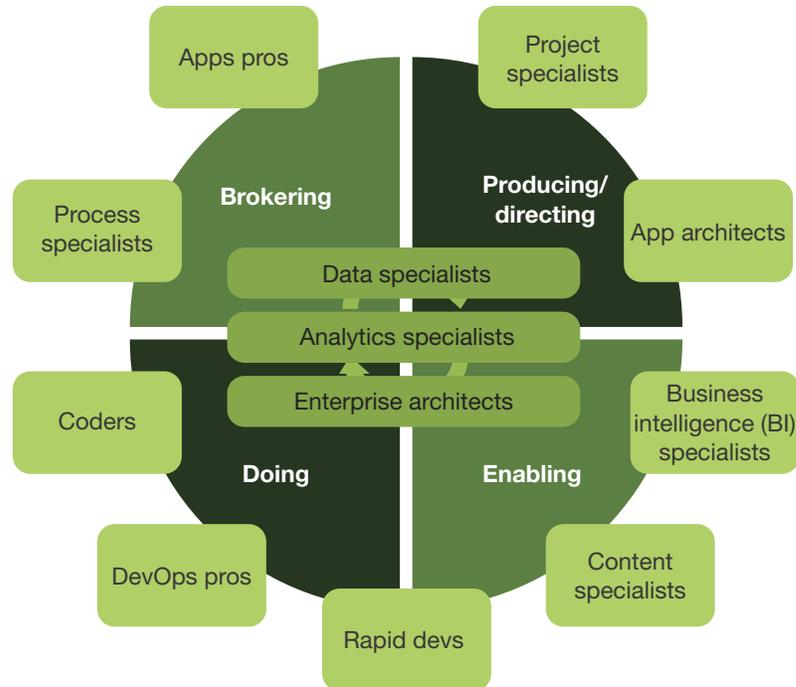
## Recommendations

### Reorient To A Customer-Obsessed Operating Model

Delivering apps to activate and sustain customer-obsessed operating models is the new goal for AD&D strategy, structure, and sourcing. Reorienting to achieve this goal requires first reaching an understanding of your enterprise's customer experiences and supporting operational processes. Only then can AD&D leaders understand their place today and over time in that ecosystem. To apply our vision to your enterprise's specific circumstances, do three things:

- › **Engage with your customer leaders on a vision that includes AD&D at large.** Most organizations have AD&D teams working on their customer-facing applications, but that's not enough to address the complete experience, including operations. Connect teams delivering customer-facing projects to teams responsible for key operations apps to optimize and evolve the entire chain of events and players in your enterprise's customer experiences.
- › **Inventory your AD&D team's delivery mix using our four-approaches model.** We know that many organizations contract with outside firms to get the software they need, but we suspect that enabled business experts and line-of-business power users can deliver these apps more accurately and at a lower cost — if you provide them with the right managed platform. Further, we expect most AD&D groups can, and should, do a lot more brokering of solutions, particularly for nondifferentiating applications.
- › **Plan your mix of role-players, identifying the ones who must be employees.** Use the four delivery approaches to plot your most important AD&D role-players for each delivery category (see Figure 5). The following figure shows our view of the average organization (see supplemental material for definitions of each role in Figure 5). Then match your expected evolution of delivery approaches over time to these roles to help plan evolution of your AD&D staff. Which roles will rise in importance? Which are missing? Which can be fully outsourced and which must be filled by employees? This is a living, evolving structure you'll often revisit and refine.

**FIGURE 5** Most Crucial AD&D Roles For The Four Delivery Approaches



### What It Means

## AD&D Will Prioritize Design And Solution Delivery Over Building

AD&D teams that drive software for customer-obsessed operating models will look more like lean startup teams — with a high ratio of designers and architects to developers and a focus on delivering the capabilities that matter to customer experiences. We predict that:

- › **AD&D will shift its focus to capabilities, not applications.** Applications are too monolithic and too static — and take too long to deliver. Enterprises' need for new software that activates customer-obsessed operating models, continuous development and delivery methods, and software architectures employing loosely coupled independent microservices push us away from applications and toward software capabilities. Examples of capabilities include tasks or activities performed by customers (such ordering an item), data sets and analysis of interest, and functional services that further customer experience (such as a mobile app).<sup>21</sup>
- › **Designers will take on work done today by developers.** The designer and developer roles will converge. To shape this, AD&D leaders need to pay as much attention to providing dynamic work environments and motivating incentives as they do to compensation.

- › **Delivery teams will align with service groups and customer journeys.** The overall structure of AD&D will change, too. Instead of monolithic AD&D groups, the organizational structure will shift to small centers of excellence aligned to capabilities (groups of services) or customer journeys.
- › **Software's complexity will shift to the service-interaction layer.** Composing applications by composing services requires resolving identity, security permissions, API, process, and data semantics, operational control, and other potential differences between services. This is the next frontier of software complexity.

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## Supplemental Material

### **SURVEY METHODOLOGY**

Forrester's Global Business Technographics® Developer Survey, 2016, was fielded in January 2016. This online survey included 1,867 respondents in Australia, Brazil, Canada, China, France, Germany, India, New Zealand, the UK, and the US.

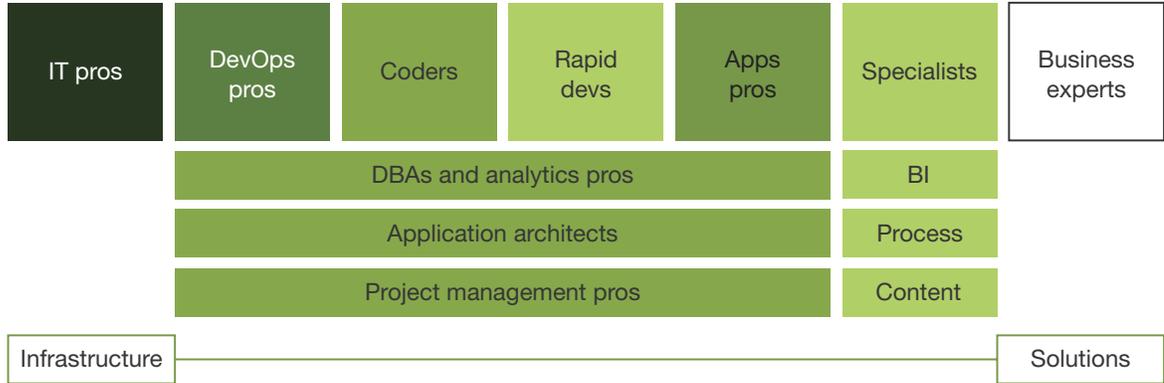
Forrester's Business Technographics ensures that the final survey population contains only those with significant involvement in the planning, funding, and purchasing of business and technology products and services. ResearchNow fielded this survey on behalf of Forrester. Survey respondent incentives include points redeemable for gift certificates.

Please note that the brand questions included in this survey should not be used to measure market share. The purpose of Forrester's Business Technographics brand questions is to show usage of a brand by a specific target audience at one point in time.

### **DEFINITIONS OF AD&D ROLES**

The AD&D role is populated by many sub-roles, each of which executes distinct responsibilities in developing and delivering applications (see Figure 6).

**FIGURE 6** A Deeper Look At AD&D Role Players



<b>Apps architects</b>	Architects who specialize in application architectures.
<b>Apps pros</b>	AD&D pros who are experts in selecting, configuring, and managing vendor-provided applications and SaaS solutions.
<b>Analytics specialists</b>	AD&D pros who specialize in algorithms producing operational business insights. Sometimes called “data scientists.”
<b>BI specialists</b>	AD&D pros who specialize in business-performance analysis/reporting applications and the platforms and infrastructures that support those applications.
<b>Coders</b>	AD&D pros who deliver applications primarily by writing code in a programming language.
<b>Content specialists</b>	AD&D pros who specialize in content-centered applications and the platforms and infrastructures that support those applications.
<b>Data specialists</b>	Includes database administrators (DBAs), as well as specialists in nonrelational data management technologies.
<b>DevOps pros</b>	AD&D pros who deliver applications primarily by writing code in a programming language and who have additional talents in deep frameworks, libraries, and system configuration.
<b>Enterprise architects</b>	Architects who specialize in architectures and practices to support many applications and lines of business.
<b>Process specialists</b>	AD&D pros who specialize in business-process design and management.
<b>Project specialists</b>	Project managers.
<b>Rapid devs</b>	AD&D pros who deliver applications primarily using low-code platforms.

## Endnotes

- <sup>1</sup> Our vision report for the application development strategy, structure, and sourcing playbook for 2015 emphasized initiatives to foster faster delivery schedules. Speedy software delivery and change are prerequisites for customer-obsessed operating models. See the Forrester report [“Accelerating App Development And Delivery To Formula 1 Speeds.”](#)
- <sup>2</sup> For a view of this challenge from the perspective of customer experience professionals, see the Forrester report [“The Customer Experience Ecosystem Redefined.”](#)
- <sup>3</sup> Salesforce, most notably, promotes this extended view of CRM as a customer platform. For more, see the Forrester report [“Salesforce Is Bidding To Be Your Strategic Customer Platform; Should You Accept?”](#)
- <sup>4</sup> A common pattern: A customer-facing mobile app informed by real-time contextual data drives revenue via eCommerce services and activates operations via existing systems of record. Such new digital business scenarios demand interconnections between domains, and threaten unprecedented integration complexity and cost. This report presents our framework for identifying platform services and vendors that can help your teams bridge the four digital domains: consumer, commerce, connected devices, and corporate applications. For more Forrester’s digital app platform model, see the Forrester report [“The Next App Platforms Will Bridge Corporate, Consumer, Commerce, And Connected Devices.”](#)
- <sup>5</sup> Cloud is evolving from an internal-facing point solution to an enabler of connected cloud economies. In this next phase of cloud, leading CIOs will orchestrate cloud ecosystems — which connect employees, customers, partners, and devices — to serve rising customer expectations. These cloud ecosystems have the potential to disrupt business models and revolutionize the customer experience. In this new cloud landscape, firms in every industry will shift from being simply cloud adopters to becoming cloud companies themselves. See the Forrester report [“Cloud Powers The New Connected Economy.”](#)
- <sup>6</sup> Low-code platforms combine visual and declarative application development with fast, cloud-based access to speed application development. For more, see the Forrester report [“New Development Platforms Emerge For Customer-Facing Applications”](#) and see the Forrester report [“Vendor Landscape: The Fractured, Fertile Terrain Of Low-Code Application Platforms.”](#)
- <sup>7</sup> The process and cultural changes of modern application development and delivery are so challenging that some groups look beyond training to immersive approaches to implement them. See the Forrester report [“Tackling The Cultural Challenges Of Agile And DevOps Transformations.”](#)
- <sup>8</sup> “There is a quiet revolution underway in software development . . . combining openly available services fronted by APIs, service-rich platforms, and new deployment technologies can now create high quality solutions.” See the Forrester report [“From Application Design To Application Composition.”](#)  
  
For more on how teams are adopting microservice designs, see the Forrester report [“How To Capture The Benefits Of Microservice Design.”](#)
- <sup>9</sup> For precise data, check the following. Source: “Employment Projections,” U.S. Bureau of Labor Statistics ([http://www.bls.gov/emp/ep\\_table\\_102.htm](http://www.bls.gov/emp/ep_table_102.htm)).
- <sup>10</sup> AD&D teams that adopt cloud platforms and/or continuous integration/delivery (CI/CD) practices have begun adopting microservices designs to allow rapid change to their code. “A microservice is a software component that does one thing (and only one thing) well, is self-contained, and communicates with other microservices through APIs or messages independent of the specific programming language.” See the Forrester report [“How To Capture The Benefits Of Microservice Design.”](#)
- <sup>11</sup> AD&D pros generally, and developers in particular, usually share the same interests as line-of-business leaders and executives pushing for a continuing stream of product and service innovations. There are exceptions, of course, but delivery pros are generally motivated to get projects done and solutions implemented. This is true for developers

building new code, application specialists delivering SaaS and other solutions, and architects designing and guiding solutions to be delivered by external firms. See the Forrester report [“Reforming AD&D Organizations For Customer Obsession: The Three Models.”](#)

<sup>12</sup> Shared service AD&D is one of three models enterprises adopt to promote prompt and continuing delivery of software to win, serve, and retain customers. See the Forrester report [“Reforming AD&D Organizations For Customer Obsession: The Three Models.”](#)

<sup>13</sup> For example, infrastructure and operations teams will provide compute, storage, networking, and middleware service APIs to app teams, customer intelligence teams will provide analytics services APIs, and back-office systems teams will provide APIs to their apps.

<sup>14</sup> Customer expectations are soaring as the mobile mind shift accelerates. In order to meet those expectations, CIOs must work closely with their business peers. Where to start? We suggest a four-part organization composed of multiple IDEA teams, supported by a steering committee, a center of excellence/community of practice, and an infrastructure services teams. See the Forrester report [“CIOs: Organize For Mobile Success.”](#)

<sup>15</sup> “The front end of modern AD&D financial governance is a constantly evolving series of decisions about which new capabilities, extensions, and enhancements to acquire and the means to do so — either custom-developed, purchased, or a combination of both.” Commercial software vendors rely on product management practices; enterprise AD&D teams now need these practices as well. See the Forrester report [“Modern Financial Governance For Modern Application Delivery.”](#)

<sup>16</sup> Forrester Research offers a methodology called strategic rightsourcing (SRS), an application-first, workload-focused approach that recognizes evolving methods of application delivery, including composable services based on interconnected APIs and alternative SaaS-based models. SRS offers agility and flexibility — benefits of the cloud — even in situations where the involved services are not cloud-based. See the Forrester report [“Portfolio Evaluation Is The Key To Migrating Applications To The Cloud.”](#)

<sup>17</sup> “Public cloud services are the biggest disruption in the tech market in the past 15 years — and adoption is accelerating.” For the details of our forecast, see the Forrester report [“The Public Cloud Services Market Will Grow Rapidly To \\$236 Billion In 2020.”](#)

<sup>18</sup> See the Forrester report [“Modern Financial Governance For Modern Application Delivery.”](#)

<sup>19</sup> For an example of metrics that motivate, see the Forrester report [“Case Study: Ultimate Software Reinvents Its Development Shop To Stay On Its Game.”](#)

<sup>20</sup> For more on the progress in AD&D metrics contributed by the Agile movement, see the Forrester report [“Agile Metrics That Matter.”](#)

<sup>21</sup> For example, a service that allows a customer to send a supplier a request via text from within an account management experience. Other examples include services to process videos and collaborate on documents with customers.

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