

The Forrester Wave™: Mobile Low-Code Development Platforms, Q1 2017

The 11 Providers That Matter Most And How They Stack Up

by Jeffrey S. Hammond

March 27, 2017

Why Read This Report

In our 24-criteria evaluation of mobile low-code development platforms, we identified the 11 most significant vendors — Alpha Software, Appian, Capriza, i-exceed, K2, Kony, Magic Software, Mendix, Oracle, OutSystems, and Salesforce — and researched, analyzed, and scored them. This report shows how each provider measures up and helps application development and delivery (AD&D) professionals make the right choice.

Key Takeaways

OutSystems, Kony, Mendix, And Salesforce Lead The Pack

Forrester's research uncovered a market in which OutSystems, Kony, Mendix, and Salesforce are Leaders. K2, Appian, Oracle, and Alpha Software are Strong Performers. Capriza, Magic Software, and i-exceed are Contenders that offer competitive options.

Low-Code Developers Look For Fast, Flexible Tools

The market for mobile low-code development platforms is growing because more aspiring, semiprofessional, and professional developers use them to close the gap between demand for mobile apps and the talent available to create them. Tools must support a variety of mobile workloads, as well as developers with varying skill levels.

Declarative Tooling, Mobile Support, And Integration Capability Are Key Differentiators

Vendors that support multiple workloads with a high-fidelity, what-you-see-is-what-you-get (WYSIWYG) experience will lead the pack. Vendors that can provide easy but extensive integration, support mobile specific features (e.g., notifications or TouchID), and create pixel-perfect UIs will emerge as market leaders.

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by [Jeffrey S. Hammond](#)
with [Christopher Mines](#), Sara Sjoblom, Allison Vizgaitis, and Andrew Reese
March 27, 2017

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[Low-Code Platforms Deliver Customer-Facing Apps Fast, But Will They Scale Up?](#)

[Mobile-First, Low-Code Platforms Close The “App Gap”](#)

[Use A Light Touch To Govern Low-Code Development Platforms](#)

[Vendor Landscape: The Fractured, Fertile Terrain Of Low-Code Application Platforms](#)

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Mobile Low-Code Development Platforms Close The Developer Gap

Completely satisfying corporate demand for mobile apps is a challenge for many AD&D leaders. Experienced mobile developers are hard to find, design agencies' talent is expensive, and offshore sourcing makes delivering quality at high speed difficult. Mobile low-code development platforms address this by changing the nature of the work that mobile developers do through prescription of action and abstraction from detail. They close the mobile developer gap by:

- › **Expanding the pool of mobile development talent.** While each vendor's platform is different, they all provide a higher-level metaphor for building mobile user experience (UX). WYSIWYG development environments are common, as are wiring of controls and events. The resulting combination allows users who aren't classically trained, but who are technically minded, to build mobile apps with a minimum of command-line coding or experience with programming languages such as Objective-C or Java.
- › **Accelerating the efforts of professional mobile developers.** An opinionated mobile framework that prescribes architectural decisions gives experienced developers the option of trading fine-grained control for speed — when speed is paramount. While developers might choose to sweat every pixel in a prominent B2C app, that level of control might not be important for the half-dozen employee apps in the backlog for finance, sales, field service, and operations.

Mobile Low-Code Development Platforms Must Support Multiple Mobile Workloads . . .

Mobile low-code development platforms are an offshoot of the broader category of low-code platforms, designed to support the particular needs of mobile apps and several classes of mobile developers (see Figure 1).¹ These products go beyond general-purpose low-code development platforms by including features closely associated with mobile infrastructure services platforms or mobile middleware products, including support for mobile notifications, enterprise mobile management tools, and support for offline caching and filtering of data when devices aren't connected. Developers use mobile low-code development platforms to:

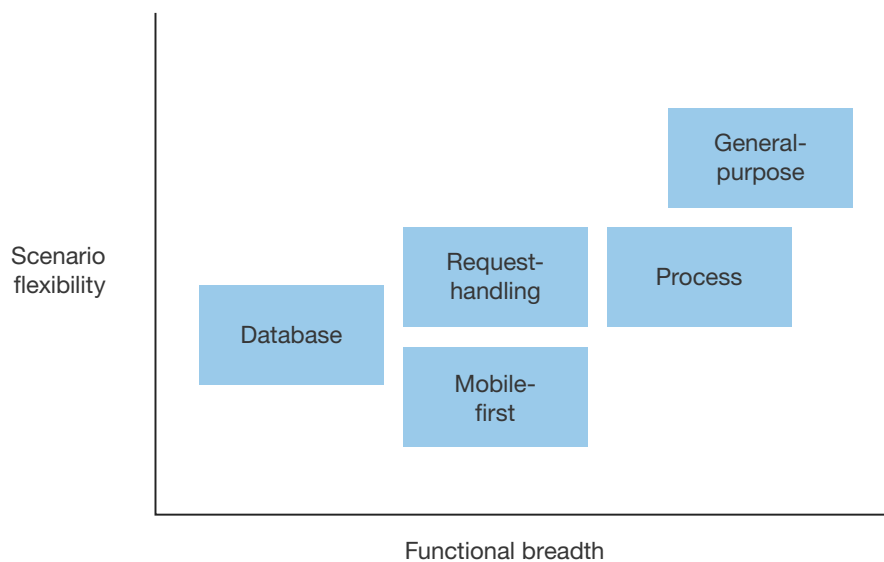
- › **Quickly build mobile apps.** At the risk of sounding obvious, most aspiring and semiprofessional low-code developers select mobile low-code development platforms because they have an idea or need for a mobile app and can't get it built by the developers in their tech management organization (assuming there are even developers on staff). For these low-code developers, the need for tools is tactical and immediate.
- › **Mobile-enable existing business processes.** Another set of mobile low-code developers wants to enable existing business processes on mobile devices for employees and business partners. Common examples include field or plant inspections, purchasing approvals, inventory management, and expense approvals. In this case, mobile low-code developers must integrate with existing systems of record, either by building an app on top of an existing web application or

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through APIs or connections into underlying database storage systems. Integration with packaged applications such as JD Edwards, Microsoft Dynamics, Oracle Financials, Salesforce, or SAP is a common scenario.

- › **Create interactive reports or dashboards.** Getting status information to people who need it, when they need it, is another common workload mobile low-code developers embrace. Notifications alert interested parties that data has changed, and large-screen mobile devices or tablets provide enough space to replicate executive briefing books or interactive reports with drillable charts and graphs. The resulting mobile apps provide glanceable information at any point in the day without requiring users to find a computer and boot up a browser.
- › **Replace pen and paper with dynamic forms.** Much of the world's information gathering still relies on data capture via standardized paper forms (for example a passport renewal or tax return). Mobile low-code development platforms allow developers to create interactive experiences, or even chatbots, that guide a user through a data collection process, capture only the information needed, and fill out the electronic equivalent of a form behind the scenes.²

FIGURE 1 Mobile Low-Code Development Platforms Are Part Of A Larger Low-Code Market

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... While Also Enabling Multiple Types Of Mobile Developers

In addition to multiple workloads, mobile low-code development platforms must appeal to different types of developers with widely varying skill levels:³

- › **The aspiring developer.** Aspiring developers have limited programming experience at most but usually have extensive experience with business productivity applications such as Microsoft Excel or PowerPoint. They require a highly prescriptive and abstracted environment because they have limited programming skills. Mobile-first solutions targeted at this group include rich WYSIWYG editors and easy wiring of events and controls, which keeps textual programming to a minimum. Cloud-based deployment is a must, as aspiring developers usually don't have their own infrastructure for deploying mobile apps — and may not have the knowledge or support of their tech management team at all!
- › **The semiprofessional developer.** Semiprofessional developers are not classically trained computer science professionals, but they do have prior programming experience as creators of websites or web applications, through experience with fourth-generation programming languages (4GLs), or by working with the extensibility mechanisms of apps such as Salesforce or Microsoft SharePoint.⁴ Tools that support event models with scripting languages are built with this group in mind. The low-code developers in this group typically include business process professionals and business analysts and apps pros. Graduates of programming boot camps are also prime targets for semiprofessional tools.
- › **The professional developer.** Professional developers have classical training in computer science and are comfortable with command-line tools and advanced DevOps practices. When professional developers want complete control over their mobile apps, they have no problem building in Objective-C, Swift, or Java. But even professional developers are willing to use a mobile-first, low-code platform as long as it employs languages, frameworks, or programming conventions they are comfortable with and has well-documented exits for coding user experience, integration, or hooking up to native platform APIs. Professional developers will use mobile low-code development platforms as a force multiplier when business peers require more apps than developers can build with traditional means. That's particularly the case for building B2E apps where pixel-perfect UI is a secondary consideration to getting the right data in the hands of the right employees as quickly as possible.

Mobile Low-Code Development Platform Evaluation Overview

To assess the state of the mobile low-code development platform market and see how the vendors stack up against each other, Forrester evaluated the strengths and weaknesses of top vendors in the category. After examining past research, user need assessments, and vendor and expert interviews, we developed a comprehensive set of evaluation criteria. We evaluated vendors against 24 criteria, which we grouped into three high-level buckets:

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- › **Current offering.** To assess each platform's features, we concentrated on the capability of the declarative tools and the mobile features each platform supports. Vendors that provide the highly declarative tools and features mobile applications commonly require scored high on these criteria. We also included criteria to measure each platform's support for modern application development processes, including quality management processes, app deployment capabilities, mobile management features, and support for app versioning. Because deploying mobile apps on public clouds as well as on vendor-hosted solutions is important to low-code developers who want to quickly build mobile apps, we added criteria for cloud deployment, security certifications, and the capability to deploy infrastructure on-premises.
- › **Strategy.** To assess vendor strategy, we evaluated each vendor's plans to add new enterprise customers; address the needs of aspiring, semiprofessional, and professional mobile developers; and make its product a strategic platform choice for developers in both tech management and digital organizations. Further, we assessed each vendor's roster of partners that service enterprise customers; the availability of a free or freemium pricing model; and the vendor's training, community, and materials programs to empower developers to help themselves adopt the platform.
- › **Market presence.** Four factors indicate each vendor's market presence: the raw number of customers (including enterprise customers); the rate of new customer acquisitions; product revenue and growth rates; and the vendor's capability to support large enterprise clients on a global basis. Revenue and growth rates are Forrester estimates.

Evaluated Vendors And Inclusion Criteria

Forrester included 11 vendors in the assessment: Alpha Software, Appian, Capriza, i-exceed, K2, Kony, Magic Software, Mendix, Oracle, OutSystems, and Salesforce. Each has (see Figure 2):

- › **Declarative tooling for mobile app development.** "Declarative" is a relative term, covering an array of techniques for defining data, logic, flows, forms, and other application artifacts without writing code. We emphasized model-driven development, visual WYSIWYG development of mobile apps, and integration with data from existing systems of record.
- › **Trailing mobile low-code development platform revenues of at least \$5 million.** For this Wave, we concentrated on vendors that we could confidently estimate generated at least \$5 million in product sales from their mobile low-code development platforms in the last fiscal year.
- › **Referenceable customers with deployed mobile apps.** We asked each vendor to provide a selection of customer references, and we then validated customers' experiences developing apps with the mobile low-code development platform. We excluded vendors that were not prepared to provide references from consideration.
- › **Mindshare among Forrester clients.** Clients mention the vendor to us frequently during inquiries, briefings, and consulting engagements.

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FIGURE 2 Evaluated Vendors: Product Information And Selection Criteria

| Vendor | Product information |
|----------------|-------------------------------------------------------------------------|
| Alpha Software | Alpha Anywhere |
| Appian | The Appian Platform |
| Capriza | Enterprise Mobility Platform |
| i-exceed | Appzillon |
| K2 | K2 blackpearl 4.7 & K2 Appit for SharePoint |
| Kony | Kony Visualizer |
| Magic Software | Magic xpa Application Platform (with Magic xpi Integration Platform) |
| Mendix | Mendix Platform |
| Oracle | Oracle Application Builder Cloud Service |
| OutSystems | OutSystems 10 |
| Salesforce | App Cloud Mobile |

Vendor inclusion criteria

1. The vendor illustrated a strong focus on the mobile low-code platforms.
2. Forrester estimates that the vendor has at least \$5 million in yearly revenue.
3. The vendor can provide at least three customer references.
4. The vendor has mindshare among Forrester clients and is frequently mentioned in the context of inquiry, briefings, and consulting engagements.

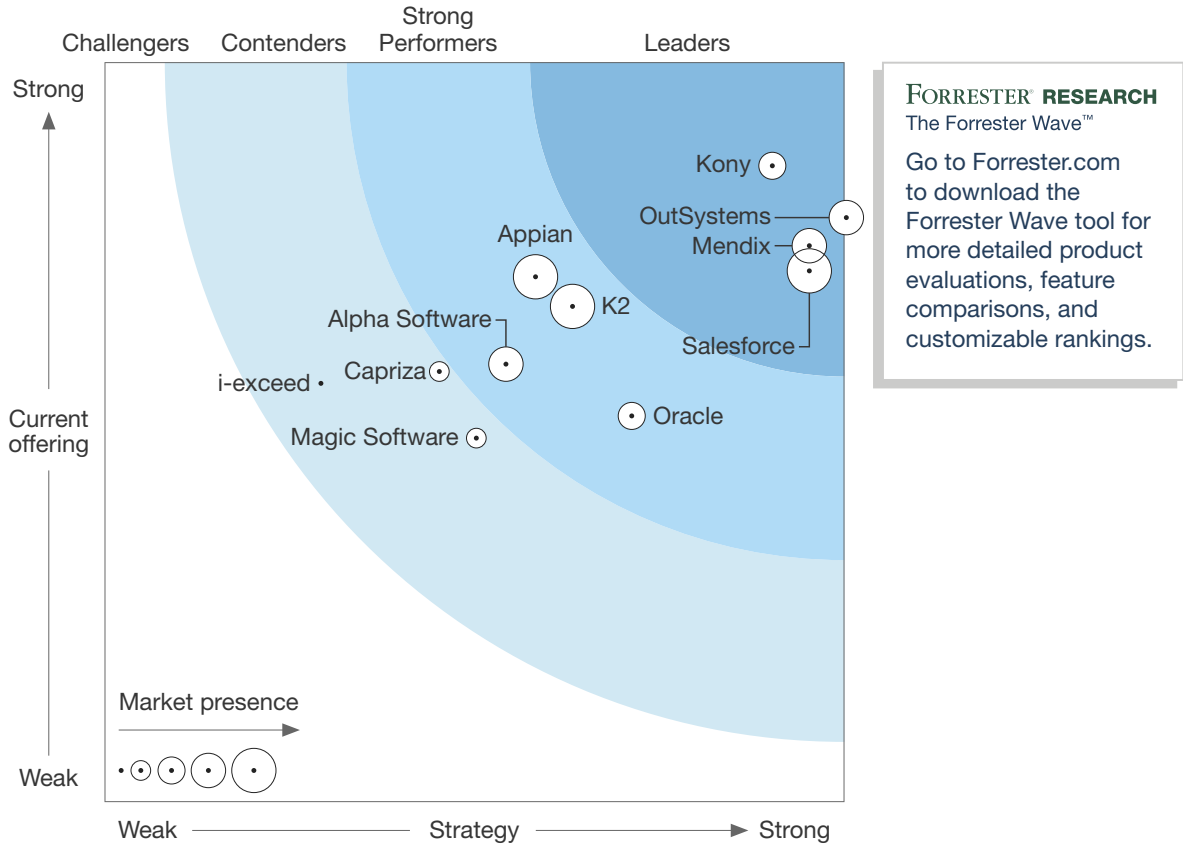
Vendor Profiles

This evaluation of the mobile low-code development platform market is intended to be a starting point only. We encourage clients to view detailed product evaluations and adapt criteria weightings to fit their individual needs through the Forrester Wave Excel-based vendor comparison tool (see Figure 3).

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FIGURE 3 Forrester Wave™: Mobile Low-Code Development Platforms, Q1 '17



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FIGURE 3 Forrester Wave™: Mobile Low-Code Development Platforms, Q1 '17 (Cont.)

| | Forrester's weighting | Alpha Software | Appian | Capriza | i-exceed | K2 | Kony | Magic Software | Mendix | Oracle | OutSystems | Salesforce |
|-----------------------------------------------|-----------------------|----------------|--------|---------|----------|------|------|----------------|--------|--------|------------|------------|
| Current Offering | 50% | 2.96 | 3.55 | 2.91 | 2.83 | 3.35 | 4.30 | 2.46 | 3.76 | 2.61 | 3.95 | 3.59 |
| Declarative UX tooling | 10% | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 5.00 | 3.00 | 3.00 | 5.00 | 3.00 | 3.00 |
| Data access and management | 5% | 3.00 | 4.00 | 3.00 | 5.00 | 5.00 | 3.00 | 4.00 | 5.00 | 5.00 | 5.00 | 5.00 |
| Integration | 7% | 3.00 | 5.00 | 3.00 | 1.00 | 5.00 | 5.00 | 5.00 | 3.00 | 5.00 | 5.00 | 5.00 |
| Content and collaboration | 5% | 1.00 | 5.00 | 1.00 | 4.00 | 4.00 | 4.00 | 1.00 | 5.00 | 3.00 | 4.00 | 5.00 |
| Reporting | 5% | 5.00 | 3.00 | 2.00 | 3.00 | 4.00 | 5.00 | 2.00 | 3.00 | 3.00 | 3.00 | 4.00 |
| Cognitive services | 5% | 1.00 | 3.00 | 1.00 | 3.00 | 1.00 | 1.00 | 1.00 | 3.00 | 3.00 | 3.00 | 5.00 |
| Workflow | 5% | 1.00 | 5.00 | 1.00 | 1.00 | 5.00 | 2.00 | 1.00 | 3.00 | 1.00 | 3.00 | 3.00 |
| Deployment options | 8% | 5.00 | 5.00 | 5.00 | 2.00 | 5.00 | 5.00 | 2.00 | 5.00 | 2.00 | 5.00 | 3.00 |
| Mobile offline | 5% | 5.00 | 5.00 | 1.00 | 3.00 | 3.00 | 5.00 | 5.00 | 5.00 | 1.00 | 5.00 | 3.00 |
| Engagement services | 10% | 1.00 | 1.00 | 3.00 | 3.00 | 3.00 | 5.00 | 1.00 | 3.00 | 3.00 | 5.00 | 5.00 |
| Quality assurance and feedback management | 5% | 0.00 | 3.00 | 3.00 | 3.00 | 1.00 | 5.00 | 0.00 | 5.00 | 0.00 | 3.00 | 1.00 |
| Versioning, deployment, and app store support | 5% | 5.00 | 3.00 | 5.00 | 3.00 | 5.00 | 5.00 | 3.00 | 5.00 | 3.00 | 5.00 | 5.00 |
| Security controls and app management | 5% | 3.00 | 3.00 | 3.00 | 5.00 | 3.00 | 5.00 | 5.00 | 5.00 | 1.00 | 5.00 | 5.00 |
| App scaling and performance | 5% | 5.00 | 3.00 | 3.00 | 0.00 | 3.00 | 5.00 | 3.00 | 5.00 | 3.00 | 5.00 | 3.00 |
| Platform certifications | 5% | 0.00 | 5.00 | 1.00 | 0.00 | 0.00 | 5.00 | 0.00 | 1.00 | 1.00 | 1.00 | 3.00 |
| Customer feedback | 10% | 5.00 | 3.00 | 5.00 | 5.00 | 3.00 | 3.00 | 3.00 | 3.00 | 1.00 | 3.00 | 1.00 |

All scores are based on a scale of 0 (weak) to 5 (strong).

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FIGURE 3 Forrester Wave™: Mobile Low-Code Development Platforms, Q1 '17 (Cont.)

| | Forrester's weighting | Alpha Software | Appian | Capriza | i-exceed | K2 | Kony | Magic Software | Mendix | Oracle | OutSystems | Salesforce |
|--------------------------|-----------------------|----------------|--------|---------|----------|------|------|----------------|--------|--------|------------|------------|
| Strategy | 50% | 2.70 | 2.90 | 2.25 | 1.45 | 3.15 | 4.50 | 2.50 | 4.75 | 3.55 | 5.00 | 4.75 |
| Strategy assessment | 25% | 3.00 | 3.00 | 2.00 | 2.00 | 4.00 | 5.00 | 3.00 | 4.00 | 4.00 | 5.00 | 4.00 |
| Self-service enablement | 30% | 5.00 | 3.00 | 3.00 | 1.00 | 3.00 | 5.00 | 3.00 | 5.00 | 5.00 | 5.00 | 5.00 |
| Partner ecosystem | 20% | 1.00 | 5.00 | 3.00 | 2.00 | 5.00 | 5.00 | 3.00 | 5.00 | 4.00 | 5.00 | 5.00 |
| Pricing strategy | 25% | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 3.00 | 1.00 | 5.00 | 1.00 | 5.00 | 5.00 |
| Market Presence | 0% | 3.25 | 4.25 | 1.75 | 0.50 | 4.25 | 3.00 | 2.00 | 3.50 | 2.50 | 3.75 | 4.50 |
| New customer acquisition | 25% | 4.00 | 3.00 | 2.00 | 1.00 | 4.00 | 3.00 | 2.00 | 3.00 | 0.00 | 3.00 | 5.00 |
| Number of customers | 25% | 5.00 | 4.00 | 3.00 | 0.00 | 4.00 | 3.00 | 3.00 | 3.00 | 3.00 | 5.00 | 5.00 |
| Global footprint | 25% | 4.00 | 5.00 | 0.00 | 1.00 | 4.00 | 4.00 | 3.00 | 4.00 | 4.00 | 4.00 | 3.00 |
| Revenue and growth rate | 25% | 0.00 | 5.00 | 2.00 | 0.00 | 5.00 | 2.00 | 0.00 | 4.00 | 3.00 | 3.00 | 5.00 |

All scores are based on a scale of 0 (weak) to 5 (strong).

Leaders

- › **OutSystems serves up general-purpose and mobile-specific features.** OutSystems' roots are in Portugal, but the company moved its headquarters to the US four years ago. The vendor's strong performance in our analysis reflects its commitment to enterprise customers via extensive low-code tooling for semiprofessional and professional developers. OutSystems Platform's strengths include its broad features and tools for database, integration, and collaboration, coupled with an extensive set of mobile features. Customers will find few gaps that require them to code, even when working on integration and custom user experiences — the usual trouble spots for low-code platforms. OutSystems makes it free and easy for customers to get started with its platform. Customer references like the easy maintainability of the apps they've created, and they also like the ability to use a wider range of developer skillsets to build mobile apps.

OutSystems Platform's primary weakness is its reliance on platform partners and/or customers to provide advanced cloud-security certifications (e.g., ISO 27001, FISMA, SOX, and HIPAA). There is also a gap in support for multivariate testing, and reporting capabilities aren't as dynamic as some other products evaluated in this Wave.

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- › **Kony blends mobile infrastructure chops with a visual approach.** While Kony targeted design professionals when it introduced Visualizer in 2015, the company has pivoted and now targets low-code developers as well. Visualizer can generate native, hybrid, or mobile web apps, and the declarative WYSIWYG editor enables rapid dynamic prototyping and instant app previews. Visualizer is a good match for developers who want to build high-fidelity, consumer-facing apps, since coders have extensive control of branding and deployment of the apps they create with it. Visualizer borrows features from its professional developer cousin, Kony MobileFabric, to provide strong integration support with connectors for Oracle and SAP, as well as good support for notifications, marketing campaigns, and integrated customer feedback. One customer reference noted that Visualizer's deep capabilities and the rate which new features are introduced incited professional mobile developers to switch to it after it was introduced by the UX team.

Visualizer's biggest gaps are in its limited support for declarative business process tools and limited out-of-the-box cognitive services. And while Kony provides many components, templates, and sample apps, the developer community around the Visualizer is still forming. The company has made good strides in providing aspiring developers easy access to Visualizer and public-cloud-hosted versions of its products.

- › **Mendix combines feature breadth with mobile features enterprises need.** Mendix is an 11-year-old company founded in the Netherlands and now headquartered in the US. Mendix builds its product on Cloud Foundry, although it's fully abstracted from the low-code developer's purview. The Mendix platform includes mobile capabilities that are frequently sought by tech management teams, such as an embedded enterprise app store, flexible deployment options, and broad reporting capabilities. Mendix makes extensive use of declarative tooling to create and deliver applications and drive integration. Mendix also offers a generous free-access program to help customers get started with the platform. One customer reference has built more than 60 apps in the last two years, which would have been impossible with traditional development tools and the resources on staff.

The Mendix platform has a few functional weaknesses, the most glaring of which is its lack of security certifications. Mendix relies too heavily on the security certifications of its cloud-platform partners. Also, the vendor's size (\$25 million-\$50 million in revenue) gives pause to some global enterprises. Still, Mendix has about 500 customers, including large enterprises.

- › **Salesforce's mobile low-code platforms are part of a broader dev outreach.** Salesforce is the biggest vendor of general-purpose low-code application platforms, with an estimated \$600 million to \$700 million in annual revenue from its development platforms alone. Force.com, the Community Cloud, and the Lightning platform anchor this low-code customer base, although Salesforce also has platforms (Heroku), tools (Force.com IDE), and partnerships (with continuous-delivery tool vendors) that address coders. Salesforce's mobile low-code platform has a feature set that helps customers extend customer data managed by the vendor's software-as-a-service (SaaS) apps while blending and aggregating it with data from other systems of record. The platform also

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has a broad range of features and security certifications and offers extensive support for mobile engagement. The Einstein platform adds cognitive features that mobile low-code developers can add to their apps.

Salesforce's primary weakness as a mobile low-code platform is that it really isn't meant for mobile low-code developers who want to build a highly engaging, pixel-perfect B2C app. Instead, it points developers to code-centric approaches: the Salesforce mobile SDK for native and hybrid development and Heroku for mobile B2C apps. In addition, developers can't configure the platform's autoscaling features, nor can they install the environment on-premises.

Strong Performers

- › **K2 offers an established platform that excels across mobile, workflow, and data.** K2 has more than 2,000 active customers in more than 84 countries. K2's core strength is support for building complex apps that incorporate mobile, workflow, and data. The company provides a data-modeling environment that allows developers to create virtual data views that bring multiple systems of record together into a single view. This allows developers to create an abstract view of the data, which helps speed development and moves data integration outside of the workflow model. Additionally, K2 provides strong workflow capabilities for modeling and automating processes and assigning tasks to workers.

Although K2 provides a strong process modeling environment, the platform has limited support for quality assurance and feedback management tools, marketing campaign support, and cognitive services. K2 does not provide a self-service model for evaluating the product. The company provides a 30-day trial experience for its cloud offering, which is only available by requesting a trial through the company's website.

- › **Appian ably supports workflow-heavy mobile workloads.** Appian's approach to low-code mobile app development reflects heavy investment to beef up its business process management (BPM)-based platform to serve a wider range of developers and use cases. Appian's greatest strengths include a full-featured process modeler, cloud deployment, and mobile services that meet the needs of many business unit and operations-focused developers. Appian takes a web-centric approach to building mobile apps, and provides centralized functionality for managing and applying style sheets and branding, with good support for UI look and feel. Customer references like this web-centric approach, as it allows them to design once and deploy to multiple devices. Appian has a wide partner ecosystem, which includes strategic partnerships with the largest systems integrators, management consultants, and implementation specialists.

Appian's biggest gaps are a limited set of mobile engagement services and a development environment that isn't as WYSIWYG as some of the other vendors evaluated. In addition, Appian has only recently built in functionality for designing and developing business rules using declarative tools.

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- › **Oracle is steadily consolidating a low-code offering with its Mobile Cloud Service.** Oracle currently offers multiple low-code tools, including its Application Builder, Mobile Application Accelerator (MAX), and Intelligent Bot Builder. MAX, included as part of Oracle's Mobile Cloud Service (MCS), has the best overall set of capabilities for mobile low-code developers, with strong declarative WYSIWYG tooling and integration support. It also has good cognitive, content, and collaboration capabilities. Taken together, these capabilities make MAX a good option for existing Oracle customers where low-code developers want to build B2E, B2B, and B2C mobile apps. Self-service enablement is also good, as a developer can self-provision an instance of Oracle MCS from the web.

Although Oracle's strategy is sound and we expect to see further consolidation of existing low-code products in the near future, Oracle's push into the mobile low-code space is still in its early days. As a result, there are gaps in functionality that Oracle is moving to address. Lack of good offline support in current products is one example, and customers must purchase Oracle's MCS service to get access to MAX. Support for declarative definition of business processes is also limited, as is support for QA tools and feedback collection.

- › **Alpha Software attracts aspiring developers with an easy on-ramp and low cost.** Alpha Software targets aspiring developers with Alpha Anywhere. The product targets forms-based mobile app workloads and data-driven business apps, and is also capable of improving the productivity of experienced developers. Alpha Anywhere includes client- and server-side reporting capabilities, geolocation and mapping tools, charting, scheduling, and media handling. It supports direct integration with existing databases and web services, and includes built-in, role-based security authentication. Transparent online pricing makes it easy for business users to acquire Alpha and put it to work, and robust offline support makes it a good solution for field employee apps. In addition, customer references find Alpha responsive and give the product high marks for maturity and frequency of updates. Alpha has more than 250 organizations as customers, but company revenues are still under \$10 million.

Alpha Anywhere works well for forms-based mobile apps, but it requires developers to integrate third-party devkits for notifications and other marketing services. It also requires external mobile testing tools for quality assurance and user feedback. Alpha Anywhere also doesn't come with any security certifications, although apps built with it have passed HIPAA and PCI compliance checks. As a growing company, Alpha's partnerships are less extensive than other vendors in this Forrester Wave.

Contenders

- › **Capriza focuses on creation of layered, noninvasive mobile apps.** The strength of Capriza WorkSimple is a particular workload: It's perfect when a mobile low-code developer wants to aggregate data from one or many systems and extend it to mobile devices. Developers use the design environment to capture data from existing web applications, extract it, refactor it, and then inject it into a new mobile UX. The process preserves the existing security and business rules in

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the existing applications. WorkSimple apps are good for tactical and medium-term needs where developers want to perturb the existing systems as little as possible, or do not have access to or support from core tech management resources. Capriza exposes its “micro apps” in a single container on the front end in its WorkSimple app. Customer references note that the product is simple to learn, and they like that it quickly allows them to fully leverage existing systems of record in the mobile channel.

While Capriza’s approach works well for refactoring, the product has gaps when it comes to other mobile app workloads. Gaps include limited support for declarative design of business processes, marketing campaign management, and offline support for mobile. Capriza also is on the smaller end of the vendors we examined, with estimated annual revenues of less than \$25 million and a limited geographic footprint.

- › **Magic targets aspiring and semiprofessional mobile developers with xpa.** Magic Software Enterprises’ xpa product employs a task-based designer that developers use to create collections (or models) of classes, including UI controls, mapping to data connections, and events that encapsulate web services. Developers can use the xpa product as a standalone or with Magic xpi Integration Platform and messaging middleware. Magic draws on 30 years of experience building cross-platform development tools and has a presence in more than 50 countries, with many business partners ready to support aspiring low-code clients. The xpa product targets forms-based mobile app workloads and has strong offline capabilities, as well as good security and app-management capabilities, making it suitable for B2E and B2B mobile app development.

Gaps in Magic’s xpa platform’s capabilities include limited support for reporting, mobile engagement, declarative definition of business process flows, and cognitive services. Support for QA and collection of user feedback is also minimal. Magic xpa also doesn’t come with any platform security certifications. And while Magic has a large number of resellers and smaller service providers in its network, relationships with larger systems integrators and independent software vendors are minimal.

- › **i-exceed is an up-and-coming vendor that Java shops will like.** i-exceed is a technology products and services company operating mainly in Asia. Its flagship product is Appzillon, an omnichannel, low-code product that includes solid mobile app capabilities. Appzillon is built on open technologies, and Java development shops will find that the product integrates nicely with their existing infrastructure, as app infrastructure is deployed as a WAR file. The designer is near WYSIWYG, with each mobile screen supporting a header, body, and footer. Developers can customize app look and feel using CSS templates and design different screen layouts based on responsive breakpoints. Appzillon has good support for offline apps, user engagement, and content and collaboration capabilities. It also has good support for localization, as UX controls use labels that can be loaded from language-specific resource bundles. Customer references give Appzillon high marks, praising the templates, training, and support. Banking clients in particular will find the industry-specific templates useful.

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While i-exceed serves approximately 45 clients, including five Fortune 1,000 companies, with Appzillon, its annual revenues are still below the \$10 million mark. Gaps include limited support of autoscaling and a lack of platform certifications. A lack of pricing transparency for the current product also makes it difficult for aspiring developers to acquire and evaluate the product. We also found that i-exceed, one of the smaller vendors we evaluated in this Wave, has a limited ecosystem of partners.

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Supplemental Material

Online Resource

The online version of Figure 3 is an Excel-based vendor comparison tool that provides detailed product evaluations and customizable rankings.

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Data Sources Used In This Forrester Wave

Forrester used a combination of three data sources to assess the strengths and weaknesses of each solution. We evaluated the vendors participating in this Forrester Wave, in part, using materials that they provided to us by December 2016.

- › **Hands-on lab evaluations.** Vendors spent a day with a team of analysts, who performed a hands-on evaluation of the product using a scenario-based testing methodology. We evaluated each product using the same scenario(s), creating a level playing field by evaluating every product using the same criteria.
- › **Product demos.** We asked vendors to demonstrate their products' functionality. We used findings from these product demos to validate details of each vendor's product capabilities.
- › **Customer reference surveys.** To validate product and vendor qualifications, Forrester also conducted reference surveys with three to five of each vendor's current customers.

The Forrester Wave Methodology

We conduct primary research to develop a list of vendors that meet our criteria to be evaluated in this market. From that initial pool of vendors, we then narrow our final list. We choose these vendors based on: 1) product fit; 2) customer success; and 3) Forrester client demand. We eliminate vendors that have limited customer references and products that don't fit the scope of our evaluation.

After examining past research, user need assessments, and vendor and expert interviews, we develop the initial evaluation criteria. To evaluate the vendors and their products against our set of criteria, we gather details of product qualifications through a combination of lab evaluations, questionnaires, demos, and/or discussions with client references. We send evaluations to the vendors for their review, and we adjust the evaluations to provide the most accurate view of vendor offerings and strategies.

We set default weightings to reflect our analysis of the needs of large user companies — and/or other scenarios as outlined in the Forrester Wave evaluation — and then score the vendors based on a clearly defined scale. We intend these default weightings to serve only as a starting point and encourage readers to adapt the weightings to fit their individual needs through the Excel-based tool. The final scores generate the graphical depiction of the market based on current offering, strategy, and market presence. Forrester intends to update vendor evaluations regularly as product capabilities and vendor strategies evolve. For more information on the methodology that every Forrester Wave follows, go to <http://www.forrester.com/marketing/policies/forrester-wave-methodology.html>.

Integrity Policy

We conduct all our research, including Forrester Wave evaluations, in accordance with our Integrity Policy. For more information, go to <http://www.forrester.com/marketing/policies/integrity-policy.html>.

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Endnotes

- ¹ To learn more about the tools and technologies needed to support AD&D leaders' business technology (BT) agenda, please see the Forrester report "[Customer Obsession Will Remake AD&D Tools And Supporting Technologies.](#)"
- ² To read more about chatbots, please see the Forrester report "[Executive Q&A: Boost Your Chatbot IQ.](#)"
- ³ For more details on the development skills, team composition, and structure that help app development leaders address customers' mobile moments, please see the Forrester report "[Organize For Mobile Development Success.](#)"
- ⁴ To see more about the vendor landscape of the mobile-first, low-code platform market — and how the various vendors in it can help AD&D leaders close their developer gap, please see the Forrester report "[Mobile-First, Low-Code Platforms Close The 'App Gap'.](#)"

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