

When And How To Modernize Core Applications Using Low-Code Platforms

Enterprises Are Extending The Value Of Low-Code Development

by John Bratincevic and John R. Rymer

June 10, 2020

Why Read This Report

Application development and delivery (AD&D) pros using low-code development platforms are starting to tackle large, complex mission-critical (core) applications. As they do, they're learning important lessons about the product features and development practices these challenging use cases require. The result: A new avenue to modernizing core business applications is opening. Read this report to learn more.

Key Takeaways

Emerging Core Modernization Option: Low-Code Development

New evidence suggests that AD&D pros can build and run core business applications on at least some low-code platforms. About 15% of AD&D pros using low-code development platforms say they use them to deliver new core business apps, including enterprise resource planning (ERP). And 30% of AD&D pros using low-code report delivering apps at scale across their entire enterprises.

Low-Code Core Projects Target Key Services And Processes More Than Record-Keeping

Core applications include systems of record, shared services (e.g., payments, pricing, and scheduling), and core operations (e.g., banking ops, distribution, and logistics). Most low-code/core-app projects focus on modernizing shared services and/or core operational processes, although some also modernize systems of record.

Some Low-Code Platforms Already Meet Core App Requirements

Some but not all low-code platforms provide high availability, performance at scale, minimal data loss in outages, and security certifications that enterprise core applications require. Product alone is not enough, however. These use cases demand AD&D teams' careful attention to architecture and module design, development process, and change management.

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Related Research Documents

[Modernize Core Applications With Cloud](#)

[Now Tech: Rapid App Delivery, Q1 2019](#)

[The State Of Low-Code Platform Adoption, 2018](#)



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A New Option Is Emerging For Modernizing Core Applications

Vopak is a 400-year-old company at the vanguard of a surprising trend in AD&D: using low-code platforms to deliver new core business systems. Operating a network of 67 oil and chemical terminals in 28 countries, Vopak faced difficult new customer demands that its highly customized JD Edwards ERP system couldn't meet without significant customization. Those demands? Better cost efficiency and real-time visibility into global operations.

Vopak custom-built the new solution (actually two modules) in a reversal of its long-standing policy to buy rather than build all business applications.¹ Moreover, its choice of a low-code platform from OutSystems for the new solution was a risky bet to build the software to manage all customer agreements, orders, and terminal-operations instructions across Vopak's worldwide network. Vopak's new Core+ and Plex+ applications entered production during 2019; Vopak has raised order accuracy, slashed turnaround times, and established a foundation for new mobile, training, and maintenance tools.

New Use Case For Low-Code Platforms: Build Custom Core Business Applications

Enterprises like Vopak once had two pragmatic options to modernize their core business applications: 1) replacing them with modern packaged applications (usually software-as-a-service [SaaS]) plus customizations and 2) using traditional coding to either replace or substantially modify the old applications.² Now add to those a third option: rebuilding core applications using low-code development platforms.³

Developing custom core applications on low-code platforms isn't going to upend the multibillion-dollar market for packaged and SaaS ERP applications anytime soon.⁴ Still, about 15% of the developers using or planning to use low-code platforms in our 2019 developer survey reported delivering core business applications (e.g., ERP) (see Figure 1).⁵ Twenty-five case studies we've examined illuminate what's driving developers in this direction, starting with why they consider low-code platforms for core business applications and what kinds of core applications they target.

The four most common motivations are that low code:

- › **Speeds delivery of software crucial to digital business.** Every business needs new or revised software to digitize its customer engagements and operations. Most firms working with low-code platforms started with mobile apps and other software for customer operations but now must bring their core systems into the digital age. For Nimbi, a procurement and supply chain supplier in Brazil, the expense and risk of adding big new customers and products to its core marketplace app finally prompted the firm to rebuild its core using a low-code platform, replacing a highly customized on-premises package.

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- › **Reduces the risk and cost of enterprise core-apps projects.** Needing to modernize core apps, most enterprises choose between customizing ERP suites (perhaps legacy hosted systems) or custom-building all or part of their core apps from scratch. But low-code platforms make custom development less expensive and risky than traditional development (particularly compared with customizing packaged apps using coding).

The risk of failed projects, busted budgets, and blown schedules also lessens when using quick incremental development and testing on low-code platforms. For example, BW Offshore built and deployed a joint-venture billing system (previously managed in several spreadsheets and manual processes) in less than a month, having rejected available packaged alternatives for being too expensive.⁶ The firm has since rebuilt some of its budget and forecasting applications using its low-code platform from Genus AS. The platform “is not expensive,” said Ole Ivar Gunderson, BW Offshore’s ERP manager.

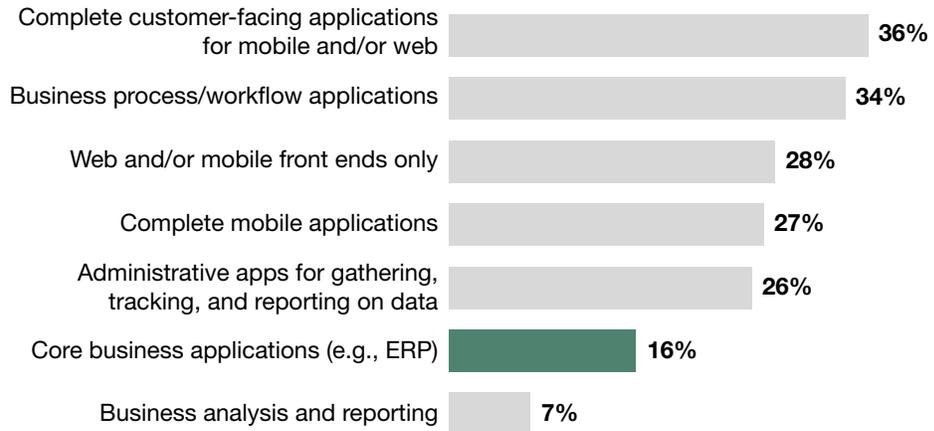
- › **Makes it tenable to tailor core systems to your business.** Packaged applications including SaaS are attractive for generic financial, personnel, supply chain, production, and customer operations but are less effective at automating operations that distinguish enterprises. Hence, firms customize packaged apps to fit their unique operations, practices, and products. Coffee Fresh, a coffee distributor in the Netherlands, replaced its 1980s ERP solution with custom applications built on the Thinkwise platform after rejecting packaged apps from Microsoft and other vendors. Thinkwise allowed “all processes implemented as we wanted,” said Hugo Nienhuis, CIO.⁷ “Financially, the custom solutions are way cheaper than the [packaged] alternatives we looked at.”
- › **Gives AD&D control over revisions, updates, and extensions.** Low-code platforms give AD&D pros the opportunity to build architectures for sustainability and extension. Generally, application change management is a strength of low-code development platforms, and the inherent flexibility of these platforms well suits continuous application improvement. Packaged apps split responsibility between vendor and customer — and have produced many notoriously unsustainable systems. SaaS can improve sustainability — if customers exercise architectural discipline over customizations and integration of third-party products.⁸ Vopak delivered a new augmented-reality interface for terminal operations personnel in weeks because it was a straightforward extension of services already running on OutSystems.

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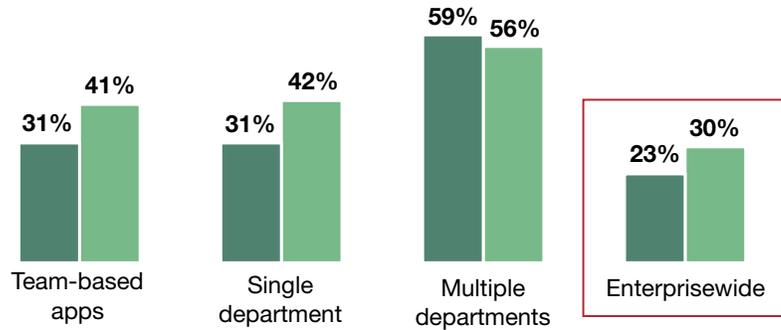
FIGURE 1 Low-Code Developers Are Starting To Tackle Challenging Enterprise Use Cases

1-1 “What types of apps do you primarily build with low-code tools?”



1-2 “What is the scope of applications your organization develops using low-code platforms?”

■ Planning to implement within the next 12 months
 ■ Implemented/expanding



Base: 1,645 global developers who have plans to adopt/have adopted low-code development platforms
 Source: Forrester Analytics Global Business Technographics® Developer Survey, 2019

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In Core Apps, Low-Code's Sweet Spot Is Key Services And Processes

The 25 cases we examined include both large global enterprises and smaller firms. Most of these have decades-old investments in core business systems. Tackling any change to these systems requires AD&D pros to pick their battles and prove that low code is up to the challenge and custom development is the best option. Most tackle two of the three types of core business applications — at least to start.

Zeroing In On The Three Types Of Core Business Applications

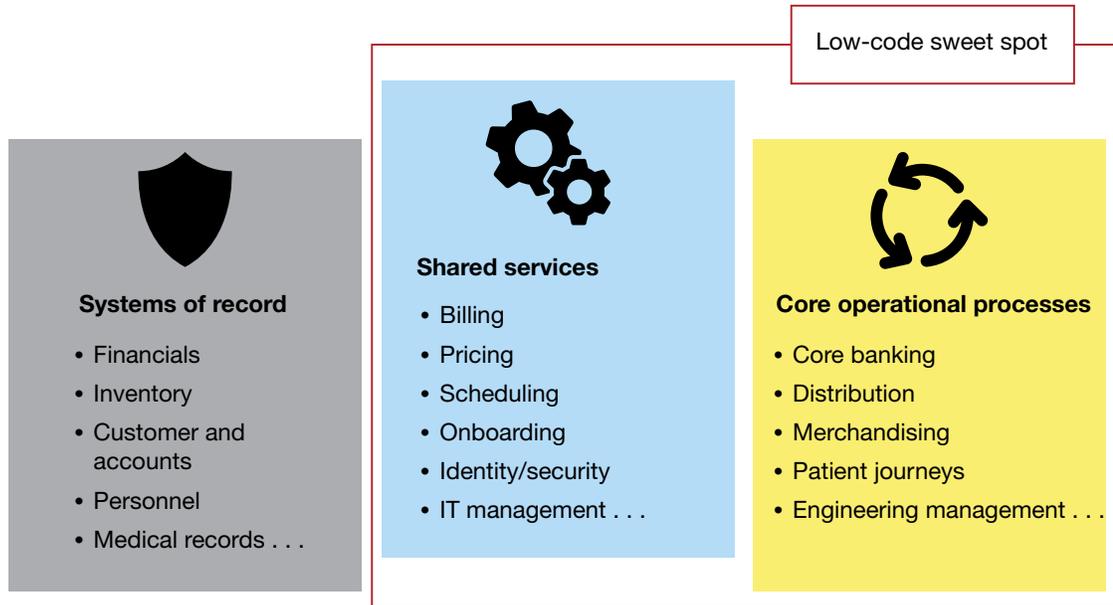
Clients use the term *core applications* to describe three types of applications, which are all generally included in ERP suites from companies such as Infor, Oracle, and SAP (see Figure 2):⁹

- › **Systems of record ensure the integrity of foundational business data.** Built on database and transaction-processing technology, the primary purpose of these systems is record-keeping. Systems of record incorporate logic and processes that ensure financial, employee, inventory, customer, supplier, and similar data are kept up to date and consistent.
- › **Shared services provide key functions to many business processes.** These applications manage key business functions like billing, pricing, payments, onboarding, scheduling, and IT functions like asset management and security. Shared services typically either inform or are incorporated into larger business processes. For example, scheduling is crucial to managing logistics operations.
- › **Core operational processes automate what we do as a business.** These applications automate an enterprise's most important business process(es) — those that define its purpose. Processes to manage core banking functions, merchandising, logistics, etc., are all in context and even more specific variations on these generic business themes.

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FIGURE 2 The Three Types Of Core Applications And Low-Code Platforms' Sweet Spot



Two Core Types — Shared Services And Core Processes — Need What Low Code Offers

In the majority of our case studies, AD&D pros working with low-code platforms target key shared services, core operational processes, or both. These applications integrate with but don't replace existing systems of record. Some low-code development platforms have demonstrated abilities to handle systems of record, but projects to replace systems of record are rarer because:

- › **Shared services/core processes need modernization more than systems of record.** The problem — inability to flex with business actions — lies in the shared services and/or core processes, not in the record-keeping systems. For example, a recent challenge for EDP, a large European utility, was accepting electronic payments. The firm managed payments using an SAP ERP module and concluded that modifying that module would be more expensive and take more time than building a new payments module in a low-code platform.¹⁰
- › **AD&D pros choose to innovate at the edges to learn new skills.** The need to build new skills and development processes is another reason AD&D pros focus first on shared services and/or core business processes. Indeed, most enterprises tackling core applications enlist the help of consultants from their low-code vendors to help deliver the first project(s) as a way of starting skills transfer to internal teams. This was Vopak's approach.

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- › **Changing systems of record poses a high risk of business disruption.** Systems of record — particularly ones in use for decades — support hundreds of automated and human processes. Each of these dependent processes is a source of potential business disruption for any change to the system of record, requiring months of testing, and a full replacement takes even longer. “Untangling the hairball” is simply too risky to be a serious proposition.
- › **Systems of record are politically sensitive (if not off-limits).** AD&D teams tackling core business applications are pioneers with a lot to prove to their IT colleagues. At this early stage of the low-code experience, rebuilding the systems managing foundational business data is simply too hard a sell. Also, such proposals can run afoul of entrenched groups supporting these systems — and their vendors.

The Case For Rebuilding The Complete Core, Including Systems Of Record

Roughly one-third of our case studies involved rebuilding all three types of core applications, including systems of record. Depending on circumstances, this can be the wiser (and easier) long-term approach. Why? Rebuilding all three types of core applications on a single low-code platform:

- › **Reduces software license costs.** This is business-case-dependent, but even factoring in one-time development costs, low-code platforms generally offer significantly lower license costs than traditional ERP suites (especially with their inevitable customizations).
- › **Simplifies integration.** Using a single low-code platform for the complete core means that these applications (and any others built on the platform) can be natively integrated, possibly with just a few clicks. This dramatically speeds and simplifies any future development where access to core data is needed.
- › **Better leverages the development org.** The single-platform approach allows more work to be done with fewer developers, while multiple platforms necessitates a wider range of skills and a potentially larger staff. Furthermore, supporting multiple interwoven platforms creates project complexity, where a simple dev task could require a coordinated team: the low-code developer, the legacy-system-of-record developer, and a third developer to write the integrations.
- › **Confronts the inevitable.** Systems of record must be modernized eventually, or there will be problems. For example, A-B Emblem, an embroidered-patch manufacturer, used a low-code platform to develop core purchasing apps but did not rebuild its system of record for accounting and order management. When the firm’s old system of record crashed and lost data, the firm had to urgently (and painfully) compress required planning and change management to finish the modernization.¹¹

By contrast, Coffee Fresh had ERP that was working but took a proactive approach to stay ahead of the curve. It first rebuilt CRM, then rebuilt complex field service modules to further make the case, and finally used the learnings from these applications to rebuild the rest of the ERP.

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Recommendations

Use Seven Key Practices To Build Core Apps With Low-Code Platforms

What can we learn from the AD&D teams currently delivering core business applications with low-code platforms? First and foremost: These projects require the business case, resources, and knowledge to build and maintain custom foundational business applications. Second, they require mastery of the most challenging functional and nonfunctional requirements — and on unfamiliar application platforms. Experienced AD&D groups understand much about delivering core applications but must learn new skills and practices. Incorporate seven practices into your approach:

- › **Separate the three types of core apps.** This is a first step toward a modern architecture that will yield the flexibility the business needs, including the ability to scale up and down gracefully. For example, if you embed multiple unique payment modules in different core operations processes (rather than just one shared payment service), you're doing it wrong.
- › **Employ modern architecture practices to tame complexity and scale.** Core applications rely on complex business logic and the need to scale to thousands of internal users, huge volumes of transactions, or both. The core applications that can no longer serve these two requirements *while also* supporting rapid business changes are the ones crying out for modernization. However, “hairball” application architectures don't scale and are slow and expensive to change even if built on a low-code platform. Thus, employ modern architectural principles — loose coupling of services and microservices, layering of services and process domains, and master data management. “Getting the architecture right was tough, but the payoff was huge, as the incremental cost of adding a new service is very low,” said the IT leader at a European postal authority.
- › **Favor platforms that help with uptime as well as application and data-loss recovery.** *Mission-critical* means reliable service, fast application recovery, and minimal data loss after an outage. Look for failover features in a low-code platform to enable high uptime, operational monitoring tools, and disaster recovery features like first-failure data capture. Seek help from vendors (and their partners) in understanding the configuration and use of platform features that enable application reliability.
- › **Rely on vendors with commitments to security and auditing.** Securing core applications requires controls over identities, roles, access rights, and data protections at a minimum. But the low-code platform vendors that invest in obtaining independent security certifications (like HIPAA and FedRamp in the US) are most likely to provide the deep level of security controls and tools you require.

Many core applications must be audited for data privacy and process conformance — some continuously. Most low-code platforms provide audit features to help manage application changes, but privacy and conformance audits significantly raise the bar. Platforms with features to support these audits save development teams from having to build and maintain that functionality themselves.

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- › **Favor vendors with financial stability, growth, and reference customers.** New low-code platform vendors continue to emerge, but rebuilding your core applications on a platform from a nascent (or failing) vendor is a bad idea. Instead, choose a vendor that: 1) has an established business; 2) is growing; 3) is dedicated to low-code development of core applications; and 4) has credible reference customers.
- › **Involve businesspeople in the development process.** The day-to-day users of core systems — your businesspeople and/or partners — have long lists of grievances and improvements for your new applications. All of the AD&D leaders behind the cases we gathered used Agile design and development processes involving businesspeople. Also, creating a sense of ownership by allowing end users and influencers to get their DNA on the apps will dramatically improve user adoption.
- › **Treat end users as customers through high-touch training.** Effective user training is essential. The ideal model for training is in-person, one-on-one, and hands-on, with end users driving the application and freely asking even the most basic questions of an expert as they go. If this ideal method is impossible, use small training groups and a “train the trainer” approach that gives departments a local expert or super user to answer their inevitable questions.

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Survey Methodology

The Forrester Analytics Global Business Technographics® Developer Survey, 2019, was fielded in January and February 2019. This online survey included 3,294 respondents in Australia, Canada, China, France, Germany, India, the UK, and the US.

Forrester Analytics' 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. Dynata 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 Analytics' Business Technographics brand questions is to show usage of a brand by a specific target audience at one point in time.

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Endnotes

- ¹ Vopak retained its system for functions including invoice management. The new low-code applications integrate with JD Edwards.
- ² See the Forrester report “[Modernize Core Applications With Cloud.](#)”
- ³ Rebuilding is one of five core modernization approaches using cloud technologies. The others are replatforming (lift-and-shift), improving then moving, moving then improving, and replacing with SaaS.
- ⁴ And for good reasons: 1) Packaged core applications have well satisfied needs for general functionality in human resources, financial management, and other fields; 2) most SaaS offerings are more flexible and easier to update than older on-premises products; and 3) apps vendors are leading the charge to embed machine learning and other AI technologies into business solutions — so customers don’t have to.
- ⁵ Source: Forrester Analytics Global Business Technographics Developer Survey, 2019.
- ⁶ The new application integrates with BW Offshore’s ERP system. The packaged alternatives that BW Offshore considered would have completely replaced the existing ERP system.
- ⁷ An obvious prerequisite for AD&D teams undertaking tailored core systems is knowledge of the data and processes required to build those systems and capacity to deliver. Not all firms have capacity, and some don’t have the requisite knowledge. Systems integrators and other services firms help fill both of these potential gaps, applying their traditional role in enterprise software to low-code platforms.
- ⁸ Deeply committed Salesforce customers have long faced this issue. For more, see the Forrester report “[Five Ways To Cut The Risk Of Going All In With A Salesforce Customer Platform.](#)”
- ⁹ Forrester’s latest research on the market for core applications labels them digital operations platforms. For more, see the Forrester report “[Look Beyond ERP: Introducing The DOP](#)” and see the Forrester report “[Now Tech: Digital Operations Platforms, Q1 2020.](#)”
- ¹⁰ The new module automates the process of accepting payments via various methods as well as managing payments data.
- ¹¹ A-B Emblem has enjoyed success in modernizing its core with Kintone’s platform. However, Kintone has far fewer features for enterprise core AD&D than the platforms in this report.

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