

Why  
**IT** Struggles  
with  
**Digital**  
Transformation

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and What to Do About It

As we enter 2018, **two-thirds** of Global 2000 CEOs have **digital transformation** at the center of their corporate strategies.<sup>1</sup>

Yet many IT organizations continue to accumulate the crippling technical debt and spiraling complexity that holds back innovation.<sup>2</sup> Perhaps unsurprisingly, staff turnover for CIOs is on the rise. Average tenure is down to 4.3 years, according to research by the Korn Ferry Institute.<sup>3</sup>

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1. [IDC Reveals Worldwide Digital Transformation Predictions](#)

2. [IDC FutureScape: Worldwide CIO Agenda 2017 Predictions](#)

3. [The Korn Ferry Institute study of the top 1,000 U.S. companies, 2016/17](#)

## The Four Challenges That Hold Back Digital Transformation

So, what is holding back digital transformation and making life difficult for so many CIOs and their organizations? The answer to this question can be summarized in four categories.

- **Massive backlogs.** Many organizations have more work than their IT teams can deliver. According to a recent OutSystems survey of 3,200 IT professionals, 62 percent of IT managers reported having a backlog of mobile apps. In some cases, they had 10 apps or more waiting to be developed.<sup>4</sup>
- **Legacy debt.** Keep-the-lights-on activities make up a massive 70 to 80 percent of IT budgets.<sup>5</sup> Inflexible back-office systems not only use up too many resources and too much budget, but they're also hard to integrate or adapt in the ways needed to support new digital initiatives. Slow development methods associated with legacy systems make a bad situation worse.
- **Scarce resources.** Digital initiatives require specific technical skills. Since many organizations don't have them, their choices are to invest heavily in training, recruit necessary skills, or plug gaps with outsourcing. Unfortunately, with developers costing as much as \$170 an hour, these options are expensive, time consuming, or both.
- **Uncertainty.** Digital transformation (if it really is transformative) is hard because it involves genuine innovation and a different mindset. Processes, business models, service offerings are all likely to be new. Adoption by customers and partners is unpredictable. Simply put, this is a million miles from the comparative safety of incremental and linear business improvement. Embracing such uncertainty is often hard for IT organizations. New methods are needed throughout the entire development lifecycle. Risk-averse, business-case prioritization is out; design thinking and lean startup, and test and learn are in.

No wonder, therefore, that so many organizations worry that they're falling behind digital disruptors and startups. According to McKinsey, many long established firms are losing "as much as half their revenue growth and one-third of earnings growth" to more digitally-savvy competitors.<sup>6</sup>

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4. ["The State of Application Development 2017 Research Report: App Dev in the Age of Digital Transformation, Low-Code Platforms and Citizen Developers"](#)

5. [Forrester: 2018 US Tech Budget Outlook](#)

6. [Jacques Bughin and Tanguy Catlin, "What Successful Digital Transformations Have in Common." Harvard Business Review, 19 Dec. 2017](#)

## An Increasingly Complex World

If those internal pressures weren't enough, two universal truths certainly don't make digital transformation any easier:



**Everything is becoming more complicated.** There are far more apps, platforms, data, and technology to take into consideration.



**The world is changing at breakneck speed.** This applies across the board: faster product innovation, faster technology churn, and the rapid rise of new market opportunities and threats.

Let's take a closer look at how these factors add to the workload of IT organizations and make digital transformation even more challenging.

### MORE Apps

There's an explosion in demand for new web, mobile, and enterprise apps. In fact, Gartner estimates that market demand for mobile app development has been growing at least five times faster than internal IT organizations' capacity to deliver them.<sup>7</sup> In response to our survey on application development, 44 percent of IT professionals said that they will develop 10 apps or more this year, while 9 percent are on the hook to deliver over 50.<sup>8</sup>

Most IT teams simply can't keep up.

### MORE Platforms

In addition to wanting more apps, these days the expectation is that applications will run consistently on any device. Providing a brilliant digital user experience consistently across multiple platforms adds significantly to IT workload and has created a new category of tools called mobile application development platforms (MADP).

7. "Gartner Says Demand for Enterprise Mobile Apps Will Outstrip Available Development Capacity Five to One," June 16, 2015

8. OutSystems, State of App Dev, 2017

## MORE Tech Churn

Technology is a moving target. Building modern applications typically involves a number of different coding languages and development frameworks.

Just look at the sheer number of JavaScript-based frameworks that are available—there are well over 80 now—each of which is evolving independently, resulting in potential compatibility issues. Plus, the framework you select today could fall out of favor tomorrow. For example, AngularJS, ReactJS, and Backbone are currently hot, but will they be prevalent in a year or two? The answer is anyone's guess.

The bottom line is, building future-proof applications is no small feat.

## MORE Change

Speed to market and speed of change are key competitive differentiators in a digital economy. Whereas application updates used to happen about once a year, many organizations now want at least some of their applications updated monthly, weekly, or even faster.

As a consequence, continuous delivery is the emphasis in the modernization of software development practices to include agile methods, DevOps, and automation. They are falling short, however, for two main reasons. First, achieving continuous integration and continuous delivery is hard work, and it requires significant investments in technology and personnel. Second, however hard you try, fast is not fast enough. Research from Gartner has indicated that even in businesses that provide monthly releases, 75 percent of respondents say IT is too slow.<sup>9</sup>

The bottom line is that trying to future-proof the applications you need to build is no walk in the park.. Neither is finding the resources who understand the ever-changing array of technology today's IT teams are using.

## MORE Differentiation

In the past, process standardization and cost reduction priorities were well served by packaged applications like ERP and CRM. But today's "age of the customer" priorities are not a good fit for "off the shelf" applications. Systems of engagement and systems of differentiation demand more customization and personalization.

## MORE Programming

The need for differentiation has led to burgeoning demand for programmers, especially those who can keep up with all the tools and languages required for digital and mobile development.

### ***Today every company is a software company.***

This accounts for the well-publicized global shortage of modern digital development skills and the difficulty many CIOs are having as they try to recruit, re-balance, "re-skill," and retain resources that are in hot demand.

So, what can they do about this and all the other pressures we've mentioned? How can they respond? The answer is to apply modern development approaches, including low-code development platforms, to make rapid and sustainable digital transformation a reality.

9. Jeff Schulman and Katherine Lord, "Supersession: Applications, and Infrastructure, and Operations: When Worlds Collide," Gartner Applications Strategy and Solutions Summit, December 6-8, 2016.

## Defining Low-Code

Forrester Research defines low-code platforms as those that **“enable rapid delivery of business applications with a minimum of hand-coding and minimal upfront investment in setup, training and deployment.”**<sup>10</sup> Practically speaking, developing with low-code means that you can create applications using visual modeling and design instead of writing code.

Now, you might be thinking, **“But how can low-code help me with my digital transformation agenda?”**

A significant part of the answer is speed. You can develop and deliver applications up to ten times faster.

But, rather than go on and on about speed (because, frankly, you’ve probably heard that all before), we’re going to explore how the right kind of low-code platform supports four priorities that IT organizations should focus on in digital transformation initiatives. Those priorities are:

- Enable more innovation and cope better with uncertainty.
- More successfully adopt agile.
- Architect more flexible, easier integration.
- Use DevOps practices that deliver software faster, more reliably, and with fewer errors.

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<sup>10</sup> [The Forrester Wave™: Low-Code Development Platforms For AD&D Pros, Q4 2017](#)

## Enabling Innovation

Digital transformation enables you to seize a competitive advantage or fight back in the face of disruption. Without experimentation, nothing truly innovative gets off the ground.

So, whether or not you buy in to Gartner's vision of bi-modal IT, for innovation to thrive there's an undeniable need for greater speed, experimentation, and even the permission to fail.<sup>11</sup>

## What You Need to Do

How you identify, prioritize, and initiate innovation projects needs to be different. This is not the place for exhaustive (and exhausting) process analysis, business case prioritization, and "requirements-itis."

### Requirements-itis:

"The inflammation or bloating of the requirements—a disease that causes poor choices, unacceptable delays, and failed projects."<sup>12</sup>

—Forrester, The New Way To Choose Business Applications

For these reasons, IT leaders, systems integrators, and consultant firms are investing in new skills and methods, including design thinking, lean startup, customer journey mapping, and user experience design. Much of that investment can go to waste, however, if hand-coding and long development queues persist because they make it hard for IT management to let go of outdated work prioritization methods.

11. <https://www.gartner.com/it-glossary/bimodal>

12. Forrester - The New Way To Choose Business Applications

## How Low-Code Supports Innovation

The right low-code development platform will help you thrive in this paradigm of digital experimentation and uncertainty. Here's how:



**Speed.** With development up to 10 times faster than hand-coding, there's far more chance of IT getting on top of its development queue. Time is the oxygen for experimentation.



**Design thinking.** Design thinking requires visual prototyping and close cooperation between target users and developers. Low-code is fast enough to create visual mockups that elicit high quality requirements and feedback.



**Lean startup.** Creating a minimum viable product with low-code is fast enough to engage in "test and learn" without fear of vast quantities of development being thrown away if you pivot.



**User experience design.** The right low-code platform supports the fast, visual modelling of responsive web user interfaces and mobile apps, putting user experience at the heart of the development process. Built-in user feedback ensures that rapid, collaborative design iteration doesn't depend on developers and users sitting side-by-side.



**Scale.** The right low-code platform enables you to scale prototypes and user interface mockups into fully integrated enterprise applications. That makes visual prototyping part of mainstream development instead of an optional sideshow.

"Since adopting OutSystems, we spend less time coding and more time understanding business and user experience requirements. aLow-code lets us adapt UI much quicker, so we can prototype more options and find what works best for our users."

—Steven Schmidt, Logitech, Enterprise Collaboration Manager



## Improving Agile Adoption

According to Forrester, agile adoption grew to 59% in 2017, which is nearly a threefold increase since 2015.<sup>13</sup> Yet barriers hold back further progress. The biggest culprits are the complexity of multi-skilled development teams and the difficulty of sustaining high levels of business engagement. Low-code platforms can reenergize agile practices by removing these barriers.

### Helping Multi-skilled Development Teams Work in Unison

In many IT departments, you'll find some developers focused on front-ends, others focused on back-ends, some focused on integration, and probably yet another team focused on mobile app development.

Each has its specialized tools, frameworks, and coding languages. This inevitably leads to a regime of silos, making collaboration and synchronization more difficult. The remedies to try and make agile work across the team burn considerable time:

- **Hardening sprints for bug-handling**
- **Team member cross-training**
- **Iterative knowledge transfer sessions**
- **Subject matter expert duties, etc.**

A capable low-code platform turns all developers into full-stack developers. Whether they're focused on front-end, back-end, or mobile, there's a single low-code IDE and a single skill set to master.

This presents a tremendous newfound flexibility in how you organize and assign development tasks in your team and makes collaboration between team members much easier.

Low-code's visual, declarative approach to development means training developers to use it is likely to take less time than the alternative measures. Your development team then has much more time for mastering agile methodology, especially once they've cleared the development backlog.

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<sup>13</sup> [Forrester: Predictions 2018: New Technologies Propel Software Development, Nov 2017](#)

## Sustaining Business Engagement in Agile

One of the notable differences that users of low-code report is the superior engagement with business users. There are several reasons for this:

- 1 Pace.** Because development is so much faster, gone are the days of business users writing a lengthy requirements statement and then not seeing anything in return for months on end.
- 2 Prototyping.** A picture is worth a thousand words, which is why visual prototyping is so important. It always helps elicit a better understanding of requirements. Let's face it: users often don't know what they want until they see it. This is especially true for digital engagement apps, where user experience is a number one priority. Low-code development makes visual prototyping part of the mainstream development effort, not a side-branch or luxury.
- 3 Visualization.** Business people have no trouble quickly understanding user interfaces, processes, and logic that are visually modeled. Side-by-side development and feedback sessions become not only rewarding, but also something to look forward to. That's a great recipe for keeping key business users engaged in the development process.

"Since adopting OutSystems, our internal customers have learned they need to stay involved. The old days of handing over a large requirements document and waiting months is gone. Once development starts, we expect our customers to be available to review and test. Creating low-code apps is a partnership where everyone needs to stay committed and involved."

—Steven Schmidt, Logitech, Enterprise Collaboration Manager

## Architecting Flexible Integration

Most organizations are on a mission to improve their service-oriented architecture (SOA) to make it easier to adapt their technology to meet business strategy. This is particularly important for digital transformation, where the difficulty of legacy integration is consistently cited as the biggest barrier to progress.<sup>14</sup> In this respect, the capability of different low-code platforms varies. You'll want to read the small print.

The right low-code platform provides the ability to visually model and rapidly create back-end services for REST and SOAP consumption. The result is a three-layer service architecture, including external APIs, core services, and integration services. It's widely accepted that composable apps, decoupled front-ends, and the abstraction of loosely coupled services are a recipe for flexibility.

The right low-code platform prevents you from burying integration code in application code and thereby escape a major contribution to legacy debt and inertia. Put simply, powerful support for integration without limits means organizations can innovate and differentiate while leaving slow-evolving legacy systems in place.

### **FICO Origination Manager Built With OutSystems**

FICO built their Origination Manager software using OutSystems because they needed flexible, bulletproof integration. With rapid regulatory changes in hundreds of jurisdictions and new data sources coming online all the time, flexible integration and fast iterative release cycles were a must.

## Achieving DevOps Success

DevOps practices are on the rise, as they help organizations deliver software faster, more reliably, and with fewer errors. However, only 27 percent of people surveyed by DORA (DevOps Research and Assessment) describe themselves as working on a true DevOps team.<sup>15</sup> For many organizations, the complexity of integrating and mastering a potentially huge array of DevOps tools is burning too much time and money.

That's because over time, many organizations have acquired lots of different tools to support DevOps. The result can be a bewildering and complex array of products for code validation, version control, continuous integration, automated deployment, test automation, security testing, and performance monitoring. No wonder businesses now want simplicity.<sup>16</sup>

Once again, the capabilities of different low-code platforms vary considerably. When comparing the low-code offerings, organizations should ensure they have the following capabilities.

- **Version control.** All versions of applications and modules are stored automatically in a central repository. Milestones can be tagged, and version history includes who and when work items were checked in or out. There's support for rollback and any prior version can be downloaded.
- **Collaborative development.** Modular development support enables large multi-developer teams and multi-team organizations. Where necessary, developers can even collaborate on the same module.
- **Build validation.** Whenever you deploy, an impact analysis is executed to validate if the deployment can be performed without affecting other applications running in the target environment. Resolution of all conflicts and dependencies is supported.
- **One-click deployment.** Having validated the build, one click should be all it takes to generate and compile optimized code, analyze databases and create required differential SQL scripts, and distribute compiled applications to front-end servers. Updating databases, hot-deploying new versions, and synchronizing environments should also be one-click processes.
- **Testing and QA.** Self-healing and impact analysis capabilities and the automated generation of high-quality code mean less testing should be necessary than with traditional development. However, the right low-code platform also includes a unit testing framework for implementing, executing, and managing unit tests and offers integration with other testing tools that teams typically use.
- **Monitoring.** Comprehensive auditing and monitoring tools are built in to enable proactive management of application performance, making it easier to detect problems by identifying real-time performance issues.
- **Feedback.** Built-in app feedback supports continuous delivery.

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15. [2017 State of DevOps Report - DORA](#)

16. [Forrester, Predictions 2018](#)

## The Right Kind of Low-Code for Digital Transformation

The low-code application development market has been variously described as fractured, fertile, and fast evolving. Indeed, 76 different vendors were featured in Forrester's vendor landscape report published in mid-2017. Those vendors can broadly be positioned in one of three categories:

- **Specialty mobile development tools**
- **Lightweight tools, aimed at business (or "citizen") developers**
- **Platforms for application development and delivery (AD&D) pros.**

So, which of these is best suited to support your quest for digital transformation? And, do you need one, two, or all three as part of your portfolio mix?

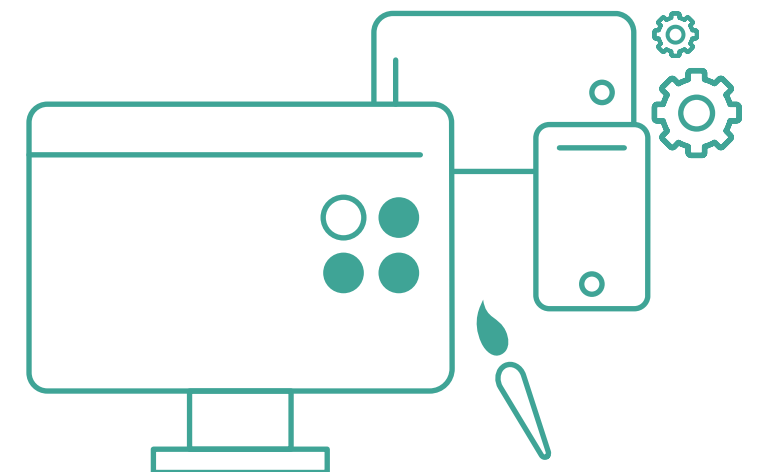
The answer to that quickly becomes apparent when you ask yourself three questions. Let's consider these questions and their answers in turn.

### Question 1:

Is Our Digital Agenda Solely About Mobile Innovation?

**No. Although mobile is important, the full scope of digital transformation will include web, mobile, front-end, back-end, and everything in between.**

In a world that is increasingly mobile first, there's no sense in having a low-code platform that cannot address the full spectrum of development. Digital transformation calls for agility and flexibility, so you need a low-code platform that is equally capable of creating web and mobile apps with a single skill set.



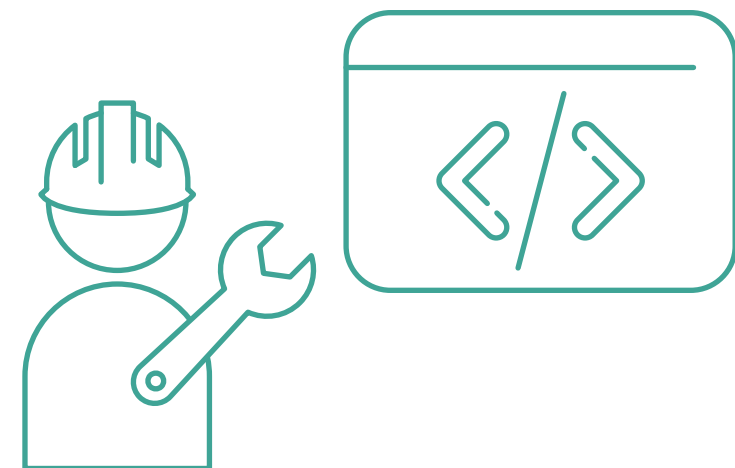
## Question 2:

How Do We Best Harness the Abilities and Enthusiasm of Business Expert Users?

**Isolated pockets of citizen development will not significantly help digital transformation.**

Digital transformation entails customer facing apps, integration to systems of record, and continuous iterative innovation. As discussed above, agile innovation requires user engagement and customer-centric development, but achieving that—at scale, over the long term—does not come about by IT “letting go of the reins.”

Although there’s a place for lightweight “no-code” and workflow tools to address dysfunctional departmental processes built on spreadsheets and email, that’s not digital transformation as we know it.



## Question 3:

Does Digital Transformation Need Governance, Scale, and Security?

**Yes. Governance, scale, and security are required for the long term.**

Digital transformation is a widespread, long-term effort. It is not about a few apps that seldom change. Governance will be key, including support for multiple developers, projects, and continuous delivery. Also, critical for success are integration, scale, and security.

The answers to this question and the others point to low-code platforms for AD&D professionals as being best suited to support your quest for digital transformation.



## CIOs Face the Opportunity of a Lifetime

Successful CIOs will lead by expanding their digital skill sets and managing technology like a venture capitalist. Their evolved positioning will ultimately make the role of the chief digital officer obsolete.<sup>17</sup>

—Forrester, Nov 2017

## Enterprise Strength Meets Fast

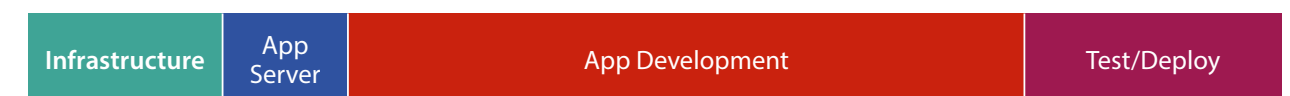
Even if it supports the four CIO priorities for digital transformation and offers the extra-strength of a solution for AD&D professionals, unless low-code really is fast and can really be trusted to deliver enterprise strength apps at scale, frankly it's not going to move the dial. So it's time to examine how OutSystems really shortens the software development lifecycle and why you can trust it to deliver enterprise strength and scale.

## Automation and the Software Development Lifecycle

For several years automation has been used to shorten the time required for application development. Infrastructure as a service (IaaS) uses automation to make provision of new servers in the cloud instantaneous. Platform as a service (PaaS) uses automation to give developers everything necessary to start coding without delay. DevOps tools use automation to greatly speed up the process of pushing new code to production.

All of this begs the question, how can automation be brought to bear on application development itself? After all, this is the longest, most costly, and most risky phase of the software development lifecycle.

Total Application Development Time:



<sup>17</sup> [Predictions 2018: CIOs Make The Chief Digital Officer Obsolete](#)

- **Automation: A Missed Opportunity for Application Development?**

The objective of agile development practices is to make the definition of requirements and the development process more efficient. But, such methods don't involve automation. Surely, that's a missed opportunity?

IaaS vendors broadly take the stance that adopters of IaaS will want to code as before. Microsoft put it this way:

“Build the way you want to, using the tools and open source technologies you already know.”

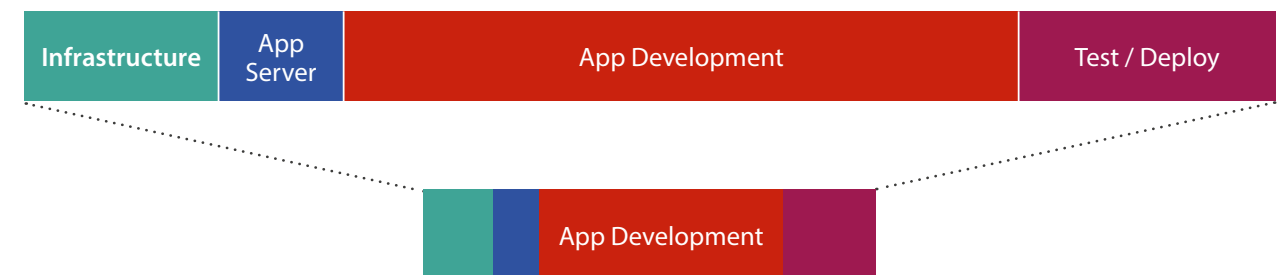
<https://azure.microsoft.com/en-us/overview/what-is-azure>

Frankly, if you follow that advice, you'll need to hire many more developers if you want to clear the development backlog and create headroom for digital innovation. Probably not the easiest thing to achieve considering the scarcity of digital development skills and the high salaries such developers are able to command.

- **OutSystems: The Automation Needed to Shorten the Software Development Lifecycle**

With OutSystems, you're able to compress the entire software development lifecycle as follows:

Total Application Development Time:



- **Infrastructure:** By default, customers activate their OutSystems subscription on the OutSystems cloud and start developing and delivering applications immediately. But, OutSystems can equally be used with other cloud (private or public), on-premises, or hybrid deployments.
- **Platform:** Developers use a single, integrated development environment that covers the entire development lifecycle.
- **Application development:** Every aspect of OutSystems is crafted to help build better apps faster. Impact analysis and a self-healing engine improve development quality.
- **DevOps:** OutSystems provides a host of DevOps capabilities, including quality assurance, deployment, monitoring, and management.



## Unbeatable Speed

Here are just a few of the high productivity visual development capabilities that help you deliver high-quality, enterprise-strength applications much more quickly.



**Full-stack visual development.** Drag-and-drop the functionality you need for UI, business processes, logic, and data models to create full-stack, cross-platform apps. No lock-in ever. Add your own code when needed.

[See what visual development looks like](#)



**One-click deployment.** Deliver apps and update them with one click. OutSystems automatically tracks all changes and handles database scripts and deployment processes, making life a whole lot easier.

[See what happens when you click the button](#)



**Mobile made easy.** Replace the complex world of building apps with offline data synchronization, native device access, and on-device business logic with ultra-fast visual modeling.



**In-app feedback.** Make your apps better, faster. Users can share voice and written feedback right inside the application, simplifying the whole change management process.



**Automatic refactoring.** OutSystems analyzes all models and immediately refactors dependencies. Modify a database table and all your queries are updated automatically (which is pretty cool).

“We reduced our development hours by 75% and got to market 3x faster using OutSystems.”

—David Lightfoot, VP of Product Management at FICO

## Delivering Enterprise Strength and Scale

So, the remaining question is: can you trust OutSystems to deliver enterprise-strength apps that scale?

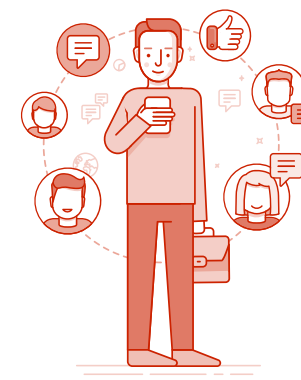
Although we've tried really hard to provide a factual, and unbiased point of view, there's still a chance that you might prefer to hear this answer from someone else. Someone neutral.

For example, you might want the analyst point of view:

<b>Gartner</b> A leader in the Mobile Application Development Platforms (MADP) Magic Quadrant.	<b>FORRESTER®</b> A leader in two Forrester Waves™ for Low-Code Development Platforms.	<b>Gartner</b> A leader in the High-Productivity Application Platform as a Service (aPaaS) Magic Quadrant.
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[outsystems.com/company/analysts](https://outsystems.com/company/analysts)

Or, you might want to hear it from some customers.



### Happy Customers!

At OutSystems, "Happy Customers" is not just a slogan - it's why we exist. It inspires us, humbles us, and challenges us in all that we do: to build the best products, to deliver over-the-top service, and to make you successful.

[outsystems.com/happy-customers](https://outsystems.com/happy-customers)

Or you might want to just go ahead and put us to the test. After all, *"the proof of the pudding is in the eating,"* and we're happy to agree with Forrester when they say:

"Low-code platforms should require minimal upfront investment in setup, training and deployment."

**FORRESTER®**

## The Last Word

Around the world, IT teams are feeling the pressure created by digital transformation. As the demand for apps accelerates, traditional approaches to app development simply don't cut it. Instead, IT teams need to find innovative new ways to enable their business to do more.

As we have explored, low-code application development platforms are an effective way forward. They increase the capacity of IT teams to deliver. And, they support the lean startup, agile, and DevOps practices that you're already investing in.

With the right low-code platform you can:

- **Deliver more and get on top of your development backlog.**
- **Re-skill development teams to escape the digital skills drought.**
- **Lower your IT costs and reduce legacy debt.**
- **Enable innovation and agility.**

When it's all said and done, low-code will put you in the driver's seat for a faster and more successful digital transformation journey.

The right low-code platform will open the door to a world of opportunities for creating powerful applications that will help put you in the driver's seat as you continue your digital transformation journey.



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