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The State of
Application
Development

Is IT Ready for Disruption?

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Contents

Summary

In its sixth year, the OutSystems State of Application Development Report provides a comprehensive analysis of the challenges, priorities, and innovations encountered by IT teams around the globe at a time when organizational agility has never been so important.

Agility is the central theme of this year's report because businesses and their IT organizations face a multitude of disruptive forces in 2019. The threat of digital disruption and the consequent need for digital transformation has been a driver of IT strategy for years. Add to that the current uncertain global economic outlook, and it becomes obvious why business leaders are so concerned about agility today.

How will IT "step up to the plate" and ensure that their organizations have the speed and adaptability to thrive, despite uncertainty?

This context serves as the backdrop to our sixth annual survey of IT professionals as we seek to understand the state of application development better. We set out with five critical questions in mind:

1 How are organizations' app dev practices evolving to meet digital transformation and agility objectives?

2 What are the main challenges to meeting application development goals?

3 What strategies are IT teams employing to speed up application delivery?

4 Are these strategies working to overcome resource constraints and reduce backlogs?

5 Are new app dev practices such as low-code and citizen development making a difference?

Our research, conducted in March 2019, took us around the world, connecting us with more than 3,300 IT professionals in all kinds of industries. In this concise summary of the report, we focus on specific findings related to the **higher education sector**.

You can access the full 44-page report here.

Color Key:

Global Responses

Higher Education Responses

Application Development in the Higher Education Sector

Across numerous industries, more nimble competitors are nipping at the heels of long-established businesses. According to McKinsey, "nimble newbies" are attracting disaffected customers and "depleting as much as half the revenue growth and one-third of earnings" of incumbents that innovate more slowly.[1]

Increasingly, such competition is fought on a global playing field.

Universities Are Not Immune to Digital Disruption

If you think this picture applies just to organizations in the corporate world, think again. Universities need to accelerate digital innovation to compete more effectively. Those that don't will suffer the consequences of digital disruption.

In the digital age, consumers are more knowledgeable and powerful than ever before. Today's students and prospective students have seemingly unlimited insights into university performance, including:

- Student views and reviews

- Graduate destinations and salaries

- Percentage of students continuing courses year-to-year

- Course content, course structure, and assessment methods

- Costs for tuition and accommodation

Moreover, sites like Top Universities and Unistats make it easy to compare the strengths and weaknesses of universities side by side.

In this context, it's easy to see why today's students expect more from their universities academically, including better customer service and much more convenient interactions with the institution. That affects everything—enrollment, course registration, work submissions, booking of lab or studio time, and the like.

In an increasingly connected and "smaller" world, it's not surprising that more students now consider traveling abroad in search of the best value, best experience, and best employability prospects. The World University Rankings 2018 is sobering reading for many U.S. universities. Two-fifths of the U.S. institutions in the global top 200 have dropped places. By contrast, many universities in Asia are climbing up the league table. [2]

A Quest for Better Value and Better Experiences

The conclusion should be clear. Universities are in a global competition, and those in the U.S. need to focus on reducing costs while at the same time providing better value and better experiences to students.

Just like any other kind of business, these goals are synonymous with digital transformation. So, understanding and acting on the key findings in this year's State of Application Development report is therefore crucial for those concerned with digital innovation, student experience, and the competitiveness of their universities.

1. Jacques Bughin and Tanguy Catlin, "What Successful Digital Transformations Have in Common." Harvard Business Review, 19 Dec. 2017

2. www.timeshighereducation.com/news/world-university-rankings-2018-results-announced

Key Findings

Digital Transformation Is a Work in Progress

Evaluating their progress with digital transformation on a six-point scale, on average, respondents awarded their organizations a score of 3.74, meaning digital transformation efforts are typically widespread, but not yet strategic or continuous..

On average, higher education respondents scored their digital transformation maturity as 3.23, lagging all other industries except construction, machinery, and homes; nonprofit; agriculture; and government.

Disruption Is a Rising Concern

Uncertainty and disruptive threats appear to be on the rise. Asked to evaluate potential risks, senior respondents ranked changes in customer preference or behavior as their number one risk factor, closely followed by regulatory change, cyber-attack, and more nimble competitors.

Stock market volatility was the least of their concerns. Even so, 51% thought this was likely or very likely to disrupt their organization in the year ahead.

Although the most likely causes of disruption are quite different compared to private sector industries, respondents from higher education organizations shared three of the top concerns. Taking both likely and somewhat likely into account, government budget cuts, changes in customer preferences or behavior, and regulatory change were ranked as their top disruptive fears.

In Fig. 1 you can see the top fears of disruption in the year ahead, according to respondents in the education sector.
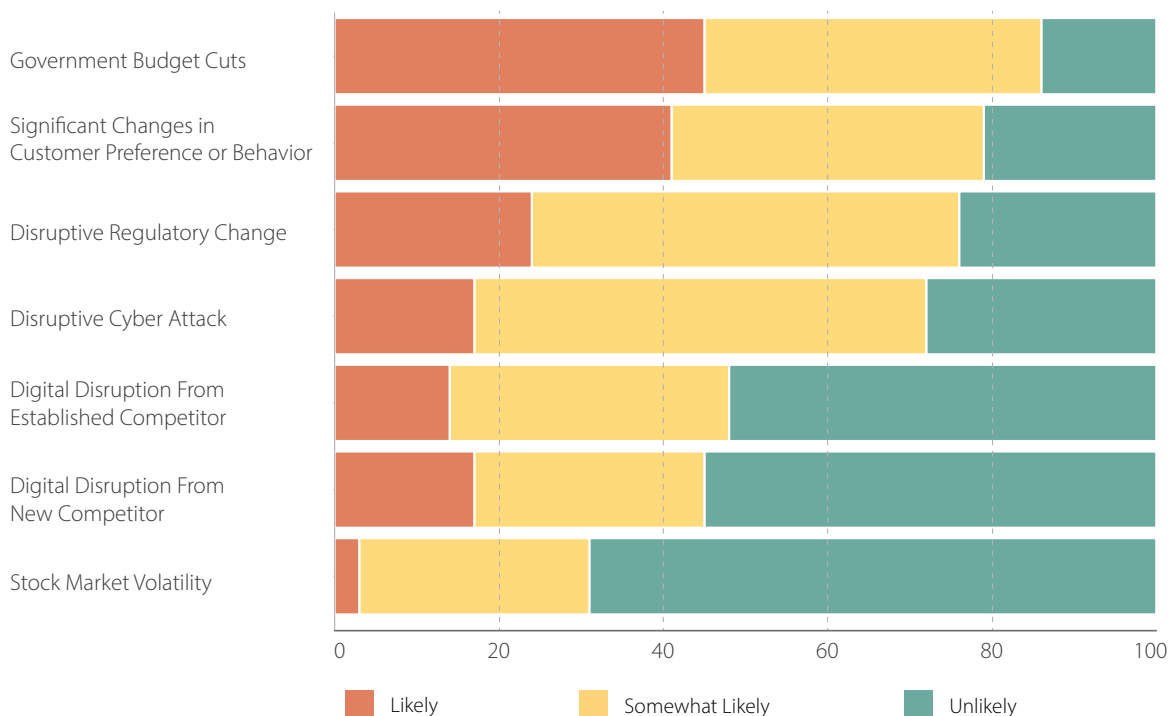

Fig. 1: **Disruptive Fears in Higher Education**

Source: State of Application Development 2019/2020. OutSystems ©

Demand for App Dev at All-Time High

The number of applications that respondents have slated for delivery in 2019 is 60% higher than last year's assessment. Focusing on organizations with more than 500 employees, 65% of IT professionals said they had plans to deliver 10 or more apps, 38% plan to build 25 or more apps, and 15% said they plan to develop 100 or more apps in 2019.

Compared to other industries, respondents from the higher education sector plan to deliver fewer new software applications in 2019. Focusing on organizations with more than 500 employees, 49% said they would deliver no more than nine new apps, and just 18% plan to build more than 25 applications in 2019.

Even so, even these more modest plans for application development are likely to tax higher education IT departments.

Development Time Is Faster—But Not for All

Last year, 54% of respondents said the average time to deliver a web application was four months or less. This year, that figure has risen to 61%. Mobile app development is little changed since last year with, on average, just 55% saying that they deliver apps in four months or less.

Respondents in the education sector reported faster development times compared to the global average. Sixty-eight percent claim that they commonly deliver web applications in four months or less, but just 52% think that they generally deliver mobile applications in four months or less. Given the burden of legacy IT often found in education establishments, the comparatively fast pace of application development that respondents reported seems impressive. Given the device preferences of students, it seems likely that education IT teams might want to accelerate mobile app development to keep pace with student or user expectations.

Backlogs Remain Stubbornly Long

Sixty-four percent of IT professionals said they have an app dev backlog, and for 19% of these respondents, the backlog was more than 10 apps. Only 39% said their app dev backlog had improved in the last year, and 50% say it's about the same.

The picture is similar for higher education respondents, 65% of whom complained of backlogs, and only 34% of whom thought that the backlog had improved in the past year. Despite the apparently less taxing delivery target for new applications in the sector, it seems that the majority of higher education IT teams are struggling to keep up with demand.

Development Skills Are in Short Supply

The vast majority of responding organizations have hired multiple app dev roles in the past year. Only 15% of respondents described such recruitment as easy, and for many specialties, recruitment was described as hard or very hard. Despite such recruitment, only 36% of organizations have larger app dev teams than a year ago. So, for many organizations, retention of developer talent appears to be an equally grave challenge.

Only 14% of higher education respondents said their AppDev team had grown in the past year. The most difficult to hire app dev roles were artificial intelligence/machine learning specialists, cybersecurity specialists, and full-stack developers.

Compared to global responses, proportionately more respondents said BI/analytics, UI/UX, and web developers were hard to hire, and fewer respondents thought IoT skills were hard to hire, although one would imagine that IoT skills were comparatively low priorities for most education establishments.

The full recruitment difficulty rankings as expressed by higher education respondents are shown in Fig. 2.
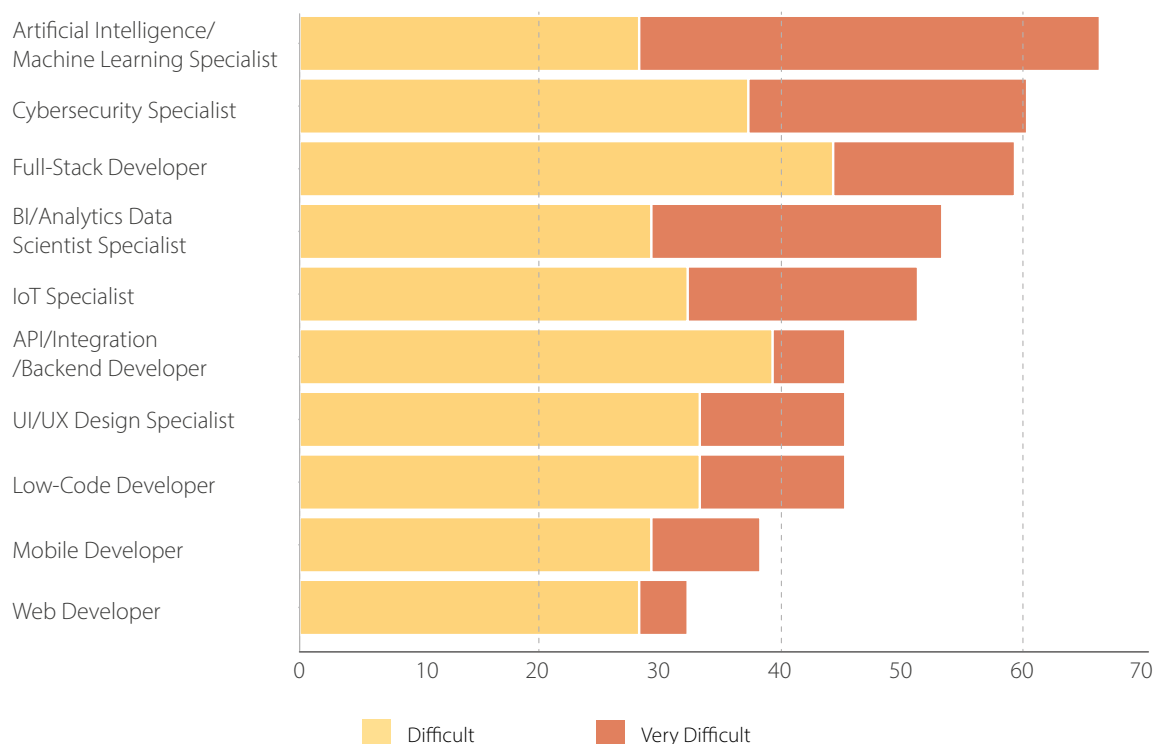
Fig. 2: **App Dev Hiring Challenges - Higher Education**

Source: State of Application Development 2019/2020. OutSystems ©

Agile and Other Customer-Centric Practices Are on the Rise

Most organizations have invested in customer-centric practices in the past year, including agile (60%), design thinking (30%), customer journey mapping (20%), and lean UX (11%). Despite these efforts, agile maturity is still lacking in many organizations, the average assessment being somewhere between "just started" and "well defined."

Higher education respondents said their organizations had invested less in customer-centric development practices in the past year: agile (39%), design thinking (28%), customer journey mapping (18%), and lean UX (14%).

Higher education organizations reported a lower level of agile maturity at 2.36 compared to the overall mean of 2.74. Only government and a basket of "other" industries* scored lower in this self-assessment. The ranking of all industries compared to mean is shown in Fig. 3.

* "Other" industries includes advertising and marketing, agriculture, construction/machinery/homes, entertainment/sports/leisure, nonprofit, and real estate.

In the survey, level 2 and level 3 agile maturity were defined as follows:

- **Level 2** - Just started: processes not fully defined. Basic level of agile adoption. Development and testing are not fully in sync yet.

- **Level 3** - Our whole team is using well-defined agile processes, and we're consistently delivering sprint after sprint.
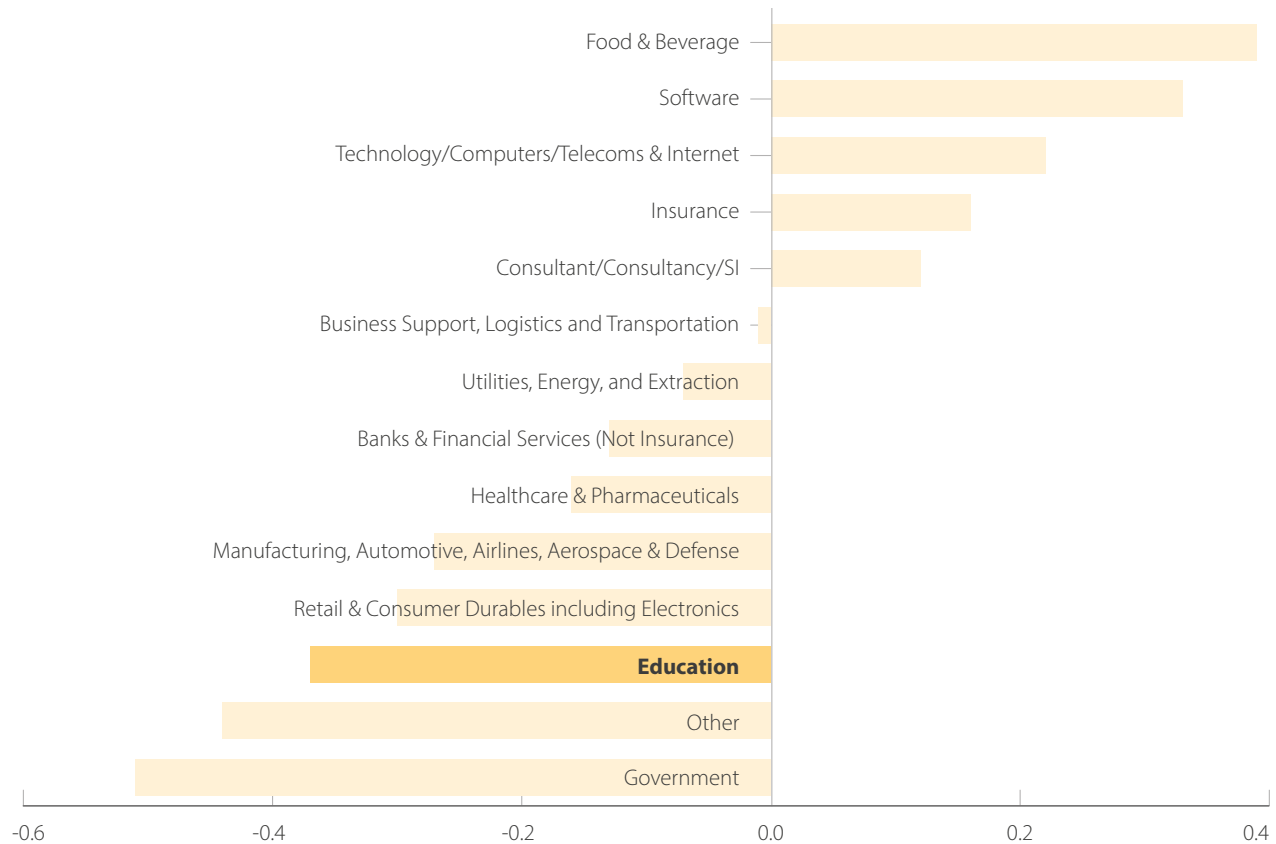

Fig. 3: **Industry Variance From Global Mean Agile Maturity Score**   Source: State of Application Development 2019/2020. OutSystems ©

Low-Code Is Mainstream

Forty-one percent of respondents said their organization was already using a low-code platform, and a further 10% said they were about to start using one. This correlates closely with the adoption forecast provided in last year's report, in which we found 34% of respondents using low-code and another 9% saying they were about to start.

Low-code adoption appears to be significantly lower in the higher education sector. Just 21% of respondents said that their organization was already using a low-code platform, and 10% said that their organization was about to start using low-code.

That leaves 69% of higher education respondents saying that they neither use, nor plan to use low-code in the near future. Given the underperformance reported by higher education respondents with respect to digital transformation maturity, backlogs and agile maturity, as well as the competition for scarce IT talent, we hope that these organizations quickly reevaluate that stance.

Low code can help them speed up application development and improve agility so that they can more easily deliver the digital experiences that students expect. Read on to discover the advantages that low-code delivers, according to our analysis of this year's survey responses.

Users of Low-Code Are Getting Significant Benefits

We compared the performance of those using and not using low-code and found notable differences across a wide number of app development performance measures. It seems that the use of low-code is delivering significant benefits for those who have adopted it. Several of these performance comparisons are summarized below.

Digital Transformation Maturity

Low-code users had a 16% higher self-assessment score for digital transformation maturity compared to those not using low-code.

4.00

3.74

16% Low-Code
Advantage

3.44

Overall Average   Using Low-Code   Not Using Low-Code
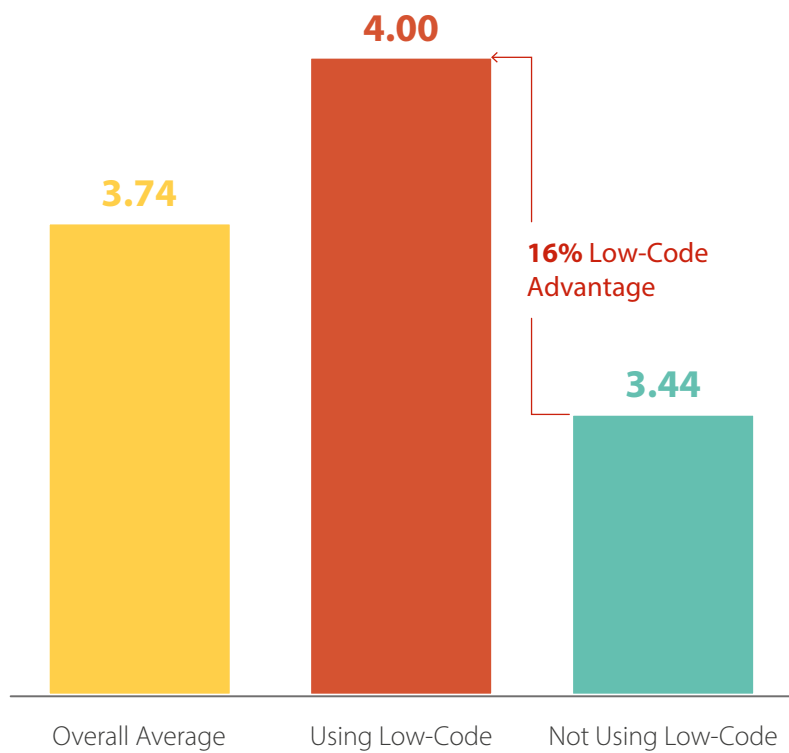
Fig. 4: **Digital Transformation Maturity Advantage for Low-Code Users**   Source: State of Application Development 2019/2020. OutSystems ©

The Proportion of App Dev Devoted to Innovation

Low-code users said that more of their app dev effort was devoted to innovation instead of maintenance, outperforming those not using low-code by 5%.
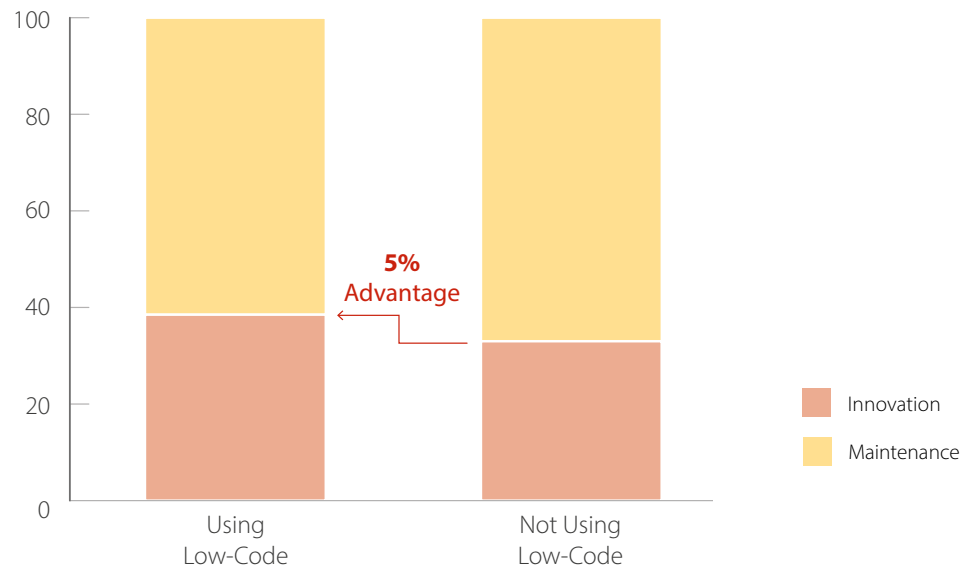
Fig. 5: **Innovation vs. Maintenance - Low-Code Users' Advantage**   Source: State of Application Development 2019/2020. OutSystems ©

Software Release Cadence

Users of low-code said that they release new software versions more frequently, being nearly 7% more likely than those not using low-code to release monthly or more frequently.
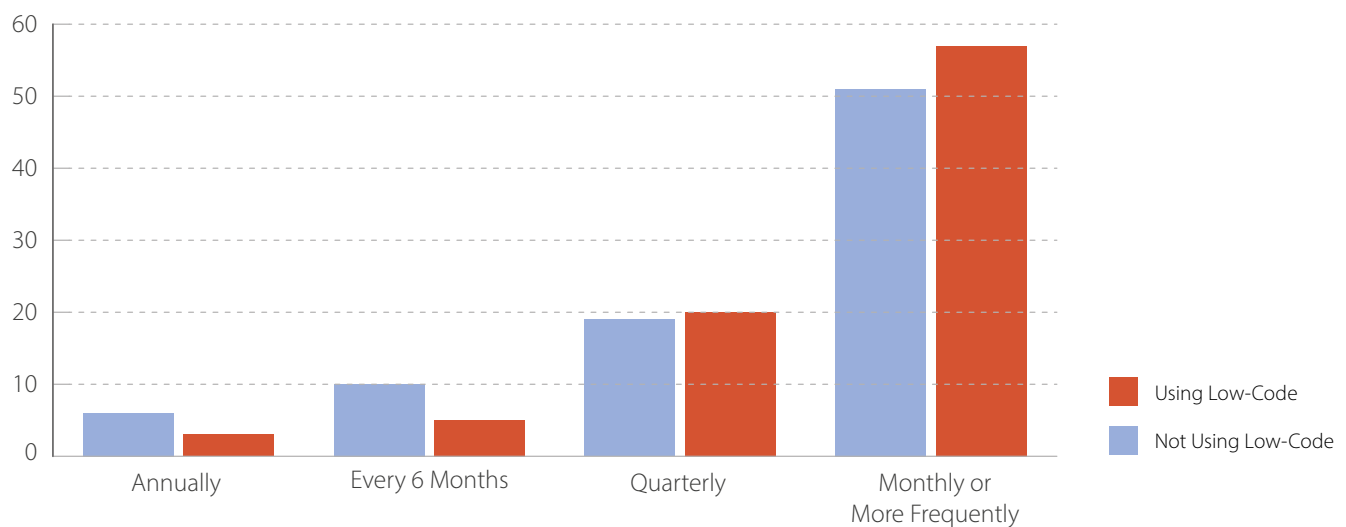
Fig. 6: **Release Cadence: Low-Code Advantage**   Source: State of Application Development 2019/2020. OutSystems ©

Business Satisfaction With Software Release Frequency

Thirty-seven percent of low-code users described their business as satisfied with their frequency of software release, compared to just 26% of those not using low-code.

Source: State of Application Development 2019/2020. OutSystems ©

Fig. 7: **Business Satisfaction With Release Cadence - Low-Code Users' Advantage**

Organizational Agility

Low-code users had an 8% higher organizational agility self-assessment score compared to those not using low-code.

Fig. 8: **Organizational Agility Advantage for Low-Code Users**

Source: State of Application Development 2019/2020. OutSystems ©

Agile Maturity

Low-code users were 20% more likely to rate their agile maturity as level 3, 4, or 5 compared to those not using low-code.

Fig. 9: **Agile Maturity Score - Low-Code Advantage**

Backlog

Low-code users were 12% more likely to say that their backlog had improved in the past year compared to those not using low-code.
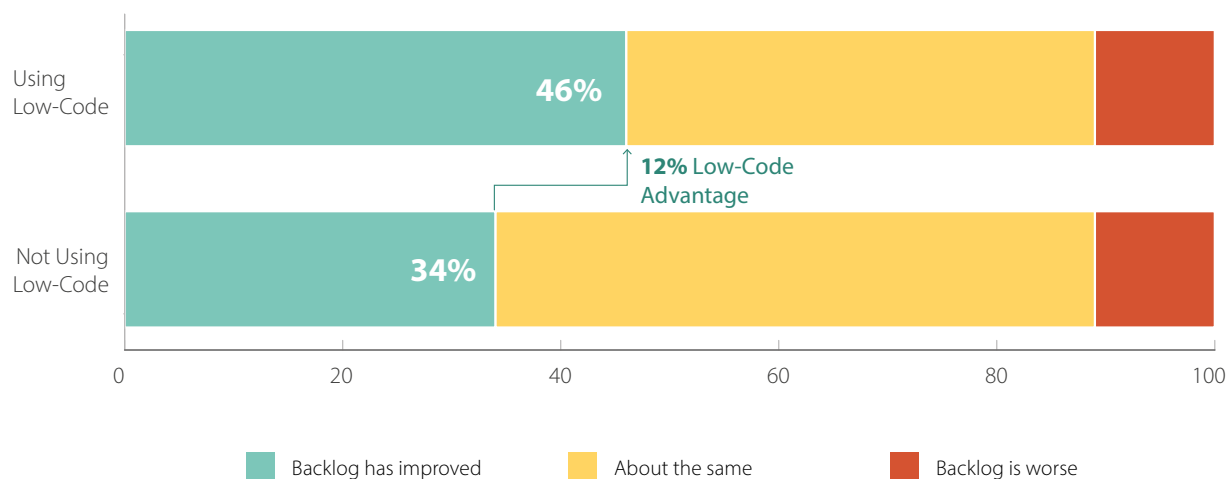
Fig. 10: **App Dev Backlog Improved – Low-Code Advantage**

Web Application Development Speed

Low-code users were 11% more likely to deliver web applications in 4 months or less compared to those not using low-code.

11%
Low-Code
Advantage

68%
57%

Using Low-Code   **Not Using Low-Code**

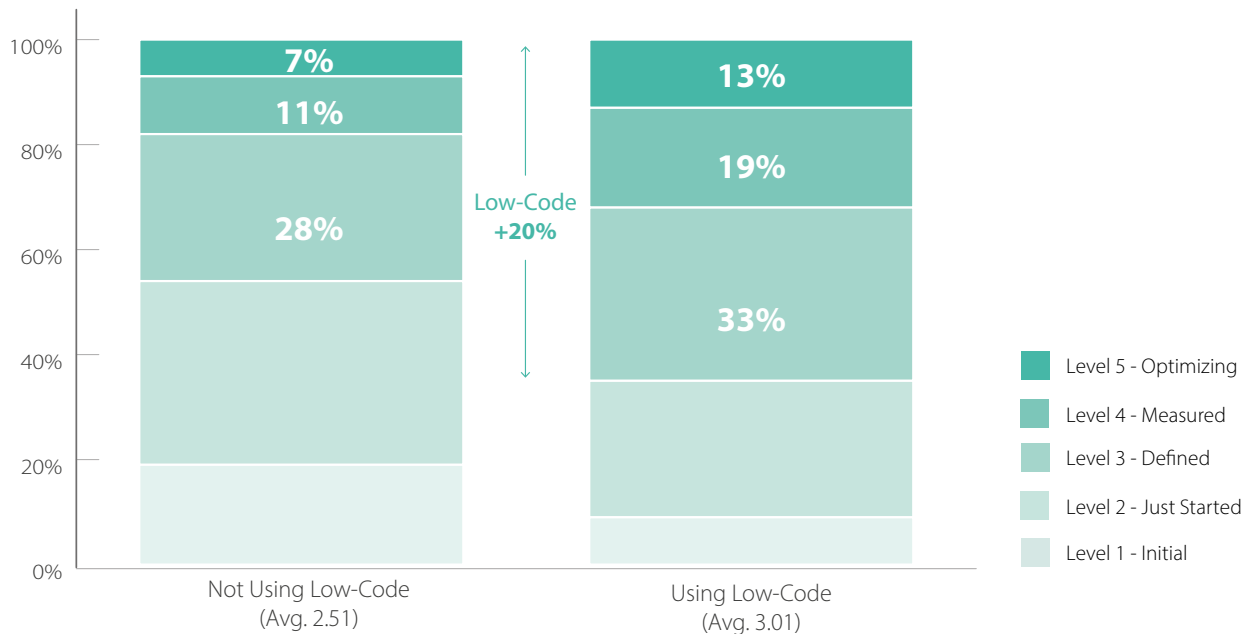- 4 months or less
- 5–6 months
- 7–12 months
- Over 12 months

Fig. 11: **Web App Development Time - Low-Code Advantage**   Source: State of Application Development 2019/2020. OutSystems ©

Mobile Application Development Speed

Low-code users were 15% more likely to deliver mobile applications in 4 months or less compared to those not using low-code.

15%
Low-Code
Advantage

64%
49%

Using Low-Code   **Not Using Low-Code**

- 4 months or less
- 5–6 months
- 7–12 months
- Over 12 months
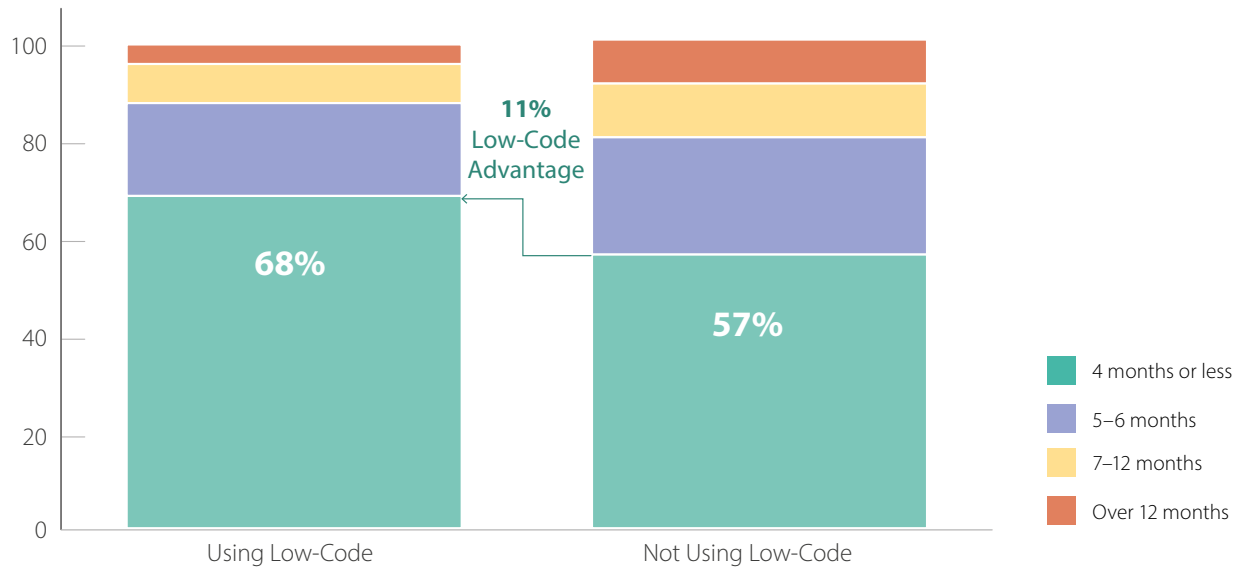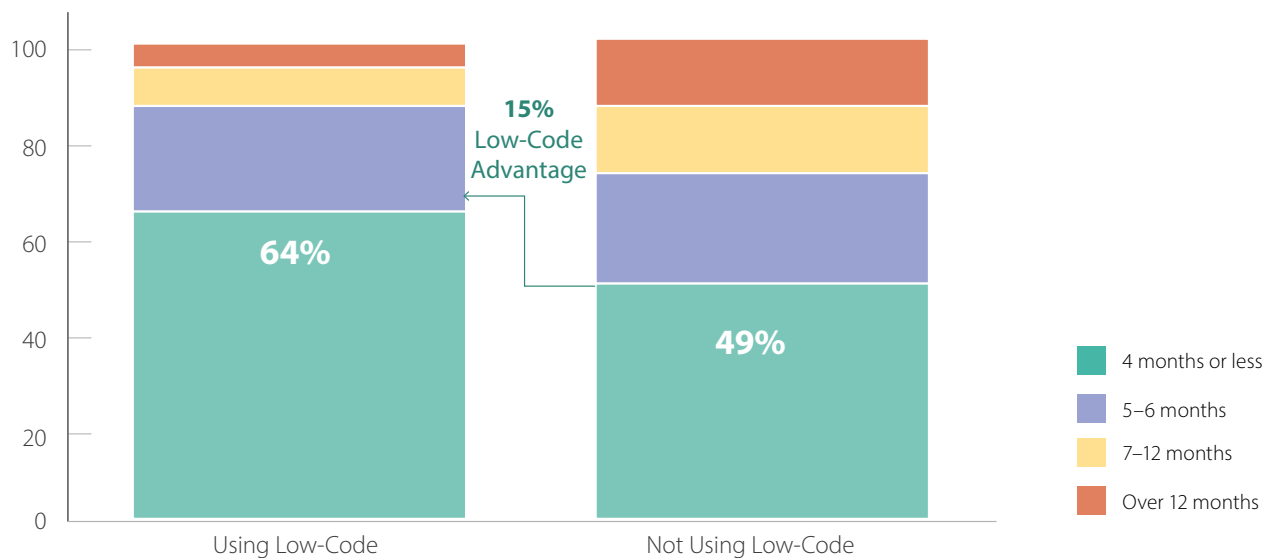
Fig. 12: **Mobile App Development Time - Low-Code Advantage**   Source: State of Application Development 2019/2020. OutSystems ©

Governance of Citizen Developers – Low-Code Advantage

Low-code users appear to have more success at governing citizen development in their organization compared to those not using low-code.

In summary—

37% Thirty-seven percent of low-code users described significant success at governing such development, a 9% advantage compared to organizations not using low-code.

35% Thirty-five percent of respondents whose organizations were not using low-code described ineffective governance of such users who could pose a risk to their organization. By comparison, users of low-code exhibited an 11% advantage.

Not Using Low-Code — 9% / 19% / 18% / 17% — 35%

Using Low-Code — 16% / 21% / 15% / 10% — 37%

4. We govern citizen development rigorously. We have approved tools or platforms that these people must use, and we provide training and guidance to maximize success.

3. We govern citizen development lightly. We have approved tools/ platforms that we encourage these people to use.

2. We try, with limited success, to govern citizen development and point them in the direction of favored tools/platforms.

1. There is little control or oversight from IT, which could pose a risk to our organization.
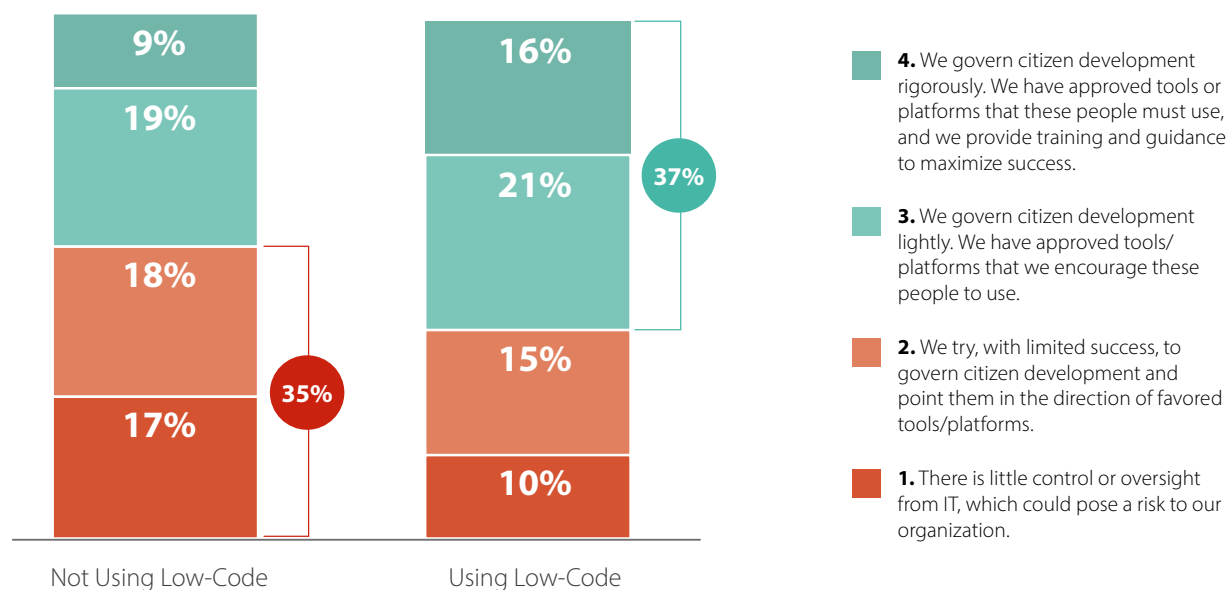
Fig. 13: **Degree of Governance of Citizen Development**

Source: State of Application Development 2019/2020. OutSystems ©

Survey Demographics

The survey was promoted primarily to IT professionals who were not OutSystems customers to ensure we surveyed a broad cross-section of organizations and not just OutSystems fans. To achieve this, we turned to third-party media.

Roles

Respondents were developers, CIOs, IT managers, and other professionals, representing thousands of companies from around the world who agreed to share objective feedback based on their experiences.
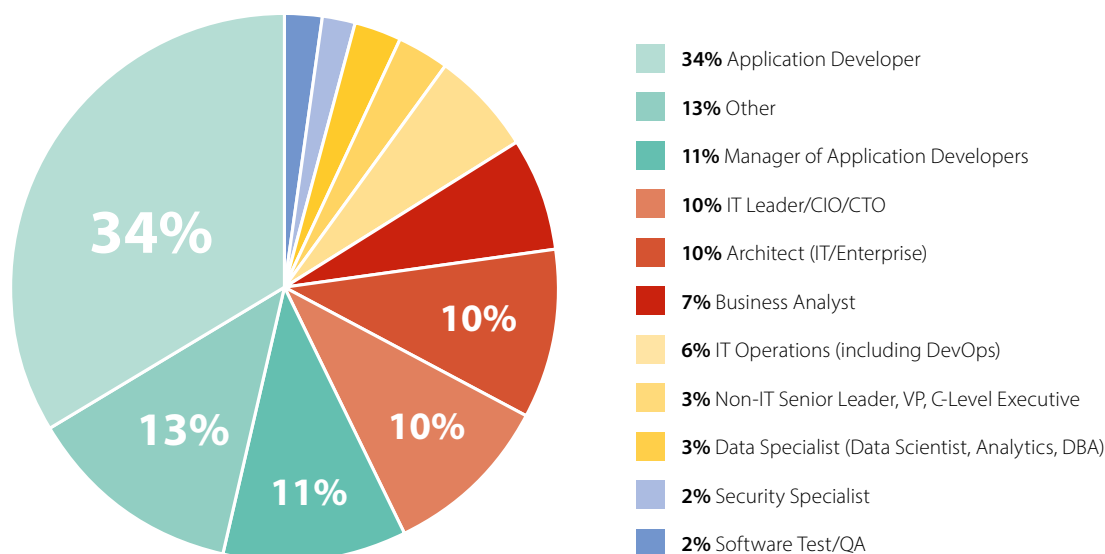

- **34%** Application Developer
- **13%** Other
- **11%** Manager of Application Developers
- **10%** IT Leader/CIO/CTO
- **10%** Architect (IT/Enterprise)
- **7%** Business Analyst
- **6%** IT Operations (including DevOps)
- **3%** Non-IT Senior Leader, VP, C-Level Executive
- **3%** Data Specialist (Data Scientist, Analytics, DBA)
- **2%** Security Specialist
- **2%** Software Test/QA

Fig. 14 **Primary Job Function**

Source: State of Application Development 2019/2020. OutSystems ©

Geography

Thirty-five percent of responses came from North America. Roughly 70% of the respondents' organizations have headquarters in either Europe or North America, 17% in Asia and the Pacific, and the remainder spread across the rest of the world.
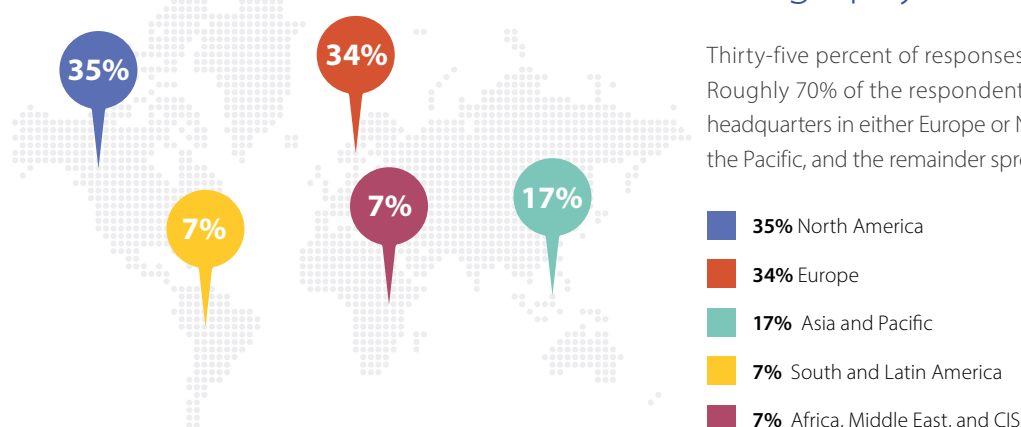
- **35%** North America
- **34%** Europe
- **17%** Asia and Pacific
- **7%** South and Latin America
- **7%** Africa, Middle East, and CIS

Fig. 15: **Geography**

Source: State of Application Development 2019/2020. OutSystems ©

50% **25%** **8%** **16%**

Size of Organization

Responses came from organizations of all sizes, approximately half with under 500 employees, and one in six came from organizations with more than 10,000 employees.

- **50%** < 500 Employees
- **25%** 500–4,999 Employees
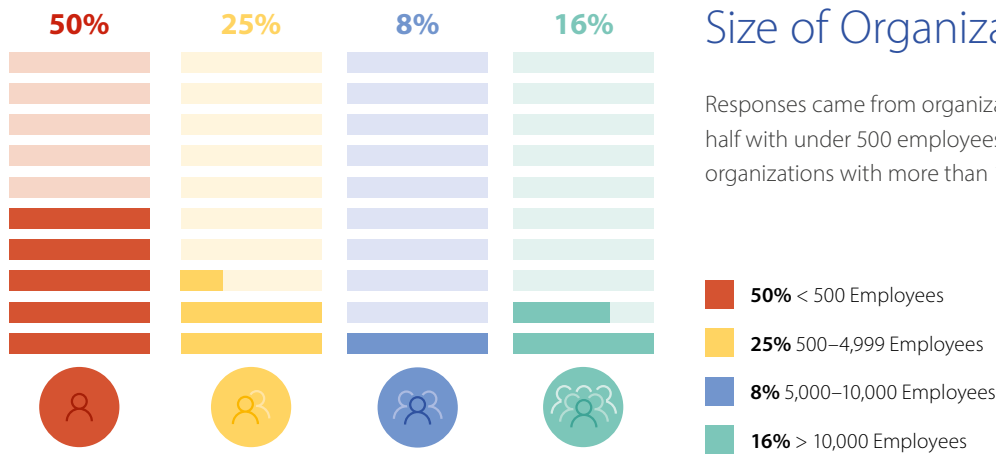- **8%** 5,000–10,000 Employees
- **16%** > 10,000 Employees

Fig. 16: **Company Size**

Source: State of Application Development 2019/2020. OutSystems ©

Industries

All industries were represented in the survey, the top seven being software, technology (including computers, telecommunications, internet), consultants and system integrators, government and education, manufacturing (including automotive, aerospace, and defense), and banks and financial services.
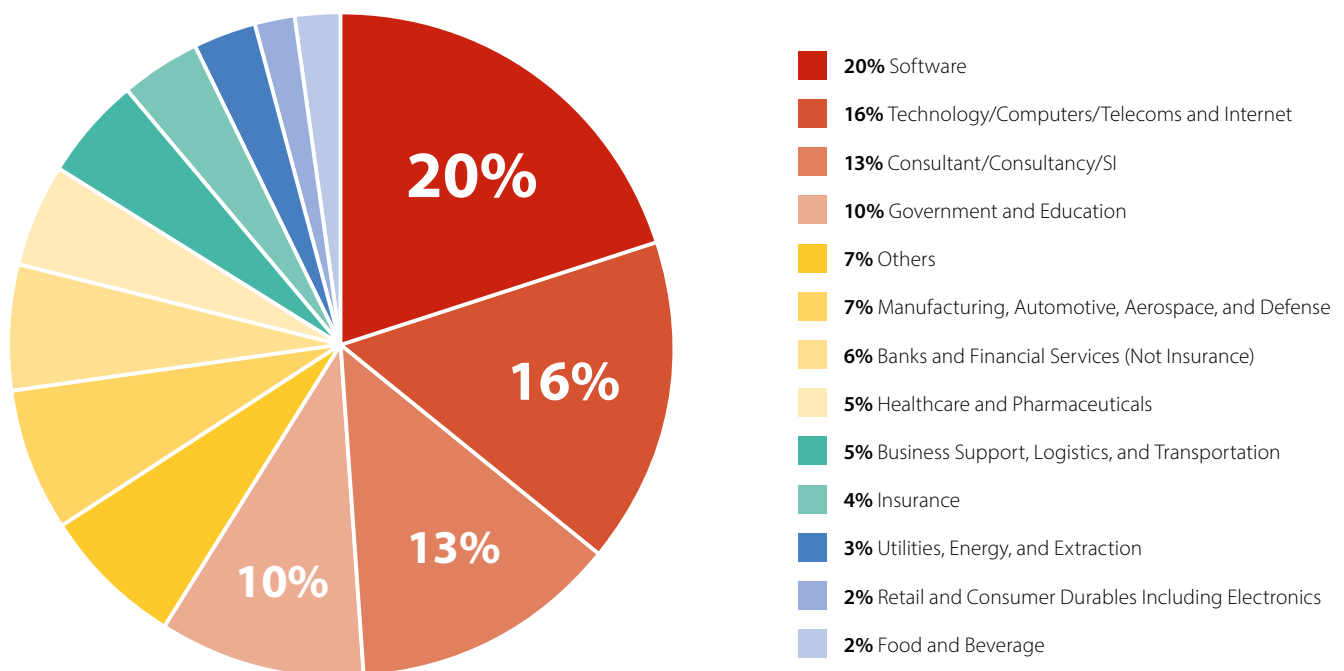
20% **16%** **13%** **10%**

- **20%** Software
- **16%** Technology/Computers/Telecoms and Internet
- **13%** Consultant/Consultancy/SI
- **10%** Government and Education
- **7%** Others
- **7%** Manufacturing, Automotive, Aerospace, and Defense
- **6%** Banks and Financial Services (Not Insurance)
- **5%** Healthcare and Pharmaceuticals
- **5%** Business Support, Logistics, and Transportation
- **4%** Insurance
- **3%** Utilities, Energy, and Extraction
- **2%** Retail and Consumer Durables Including Electronics
- **2%** Food and Beverage

Fig. 17: **Industries**

Source: State of Application Development 2019/2020. OutSystems ©

Get the Full Report

The full report answers many more questions besides those explored in this higher education sector summary. You can access the full report here to learn much more, including:

What are organizations' top goals for digital transformation?

- What progress are organizations making with digital transformation, and how does that vary by industry sector?

- Which disruptive forces are of most concern to organizations in different industries in 2019?

- What proportion of applications planned for delivery in 2019 is new, as opposed to maintenance or replacement of apps that already exist?

- What are the most important types of app that organizations plan to deliver in 2019?

- What approaches and technology are organizations investing in to speed up application delivery?

- What are the top challenges that organizations blame for application delivery delays?

- What app dev skills are organizations hiring?

- How difficult is hiring for various app dev roles?

- Which app dev skills will organizations acquire through consultants and outsourcing providers in 2019?

- What app dev training and development priorities do organizations have in 2019?

- What kinds of use are organizations making of low-code application development platforms?

- Are citizen developers being governed effectively in organizations?

- What reasons do organizations give for using or not using low-code?

- What fears regarding low-code still worry potential IT buyers?

About OutSystems

OutSystems is the number one platform for low-code rapid application development. Thousands of customers worldwide trust OutSystems as the only solution that combines the power of low-code development with advanced mobile capabilities, enabling visual development of entire application portfolios that easily integrate with existing systems.

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