



# Navigating Software Solution Delivery in a Digitally Transformed World

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# Executive Summary

**Software — the lifeblood of innovative digital products and services — is being used in new and potentially unexpected ways in the enterprise. Industrial companies are embedding software into Internet of things (IoT) devices in the field; manufacturing organizations are developing software that drives efficiencies on the line; and carmakers are essentially singly focused on software innovation — by some estimates, even cars with traditional engines have hundreds of millions of lines of code. These same companies are also developing applications used by consumers and business customers that interact with scores of back-end enterprise applications that can be customized to meet their unique needs and to differentiate their businesses from the competition.**

Why is software playing such an important role for these businesses? Increasingly, it is what allows an organization to achieve its most important business outcomes. Software-driven products and services are generating significant new revenue streams, opening up new markets, increasing internal efficiency, and giving employees the tools they need to better accomplish their goals. Software also allows organizations to respond more quickly to customer needs, as well as to competitor and macro pressures.

The impact of the COVID-19 pandemic accelerated this widespread realization of the growing power of software. In IDC's February 2021 *Future Enterprise Resiliency and Spending Survey*, 56% of respondents said that investing in software development tools and capabilities to drive broader app-based innovation was a priority or top-priority tech investment over the next two years to ensure long-term resilience and success of the business.

An organization's innovative software deliverable, whether it's embedded into a physical product, offered as an application for customers, or used by employees, is increasingly composed of a complex software foundation that might include custom code, commercial software, open source software, and low-code or no-code software. Where once many companies may have primarily employed off-the-shelf software solutions, today's leading companies are significantly customizing commercial software or developing new software as a means to differentiate, disrupt, and achieve their most important business outcomes.

To study enterprise software innovation strategies, IDC surveyed 407 technology decision makers and uncovered the most important challenges they face, the drivers behind their software sourcing decisions, and the benefits they're realizing when making the right adoption choices. We learned that successful organizations are employing more technologies for more purposes — and realizing more benefits. The key is choosing the right tool for the right job, applying the best type of software tool to successfully pursue business priorities.



# Notable Findings

To better understand the current software landscape in the enterprise, we asked technology decision makers about the software foundation behind all of the software products, customized apps, services, or features they delivered in the past year.

Commercial software represents the largest portion of software deliverables, followed closely by custom software (see **Figure 1**). This result is in line with expectations: Commercial software historically would have comprised the bulk of deliverables because organizations in many sectors hadn't yet realized the potential value of customizing software in innovative ways that could differentiate their businesses. In many scenarios, commercial software — including the software organizations already have in place as well as new commercial software offerings — is still powerful and likely to remain so into the future.

**FIGURE 1**

## Commercial Software Makes Up Largest Portion of Deliverables, Followed Closely by Custom

(% of respondents)

**Q: Thinking of all the software products, customized applications, services, or features that your team has delivered in the past 12 months, what percentage of the combined deliverables were built on the following? (Mean summary, including 0)**



n = 400, Source: IDC's Hyland Software Delivery Survey, October 2021

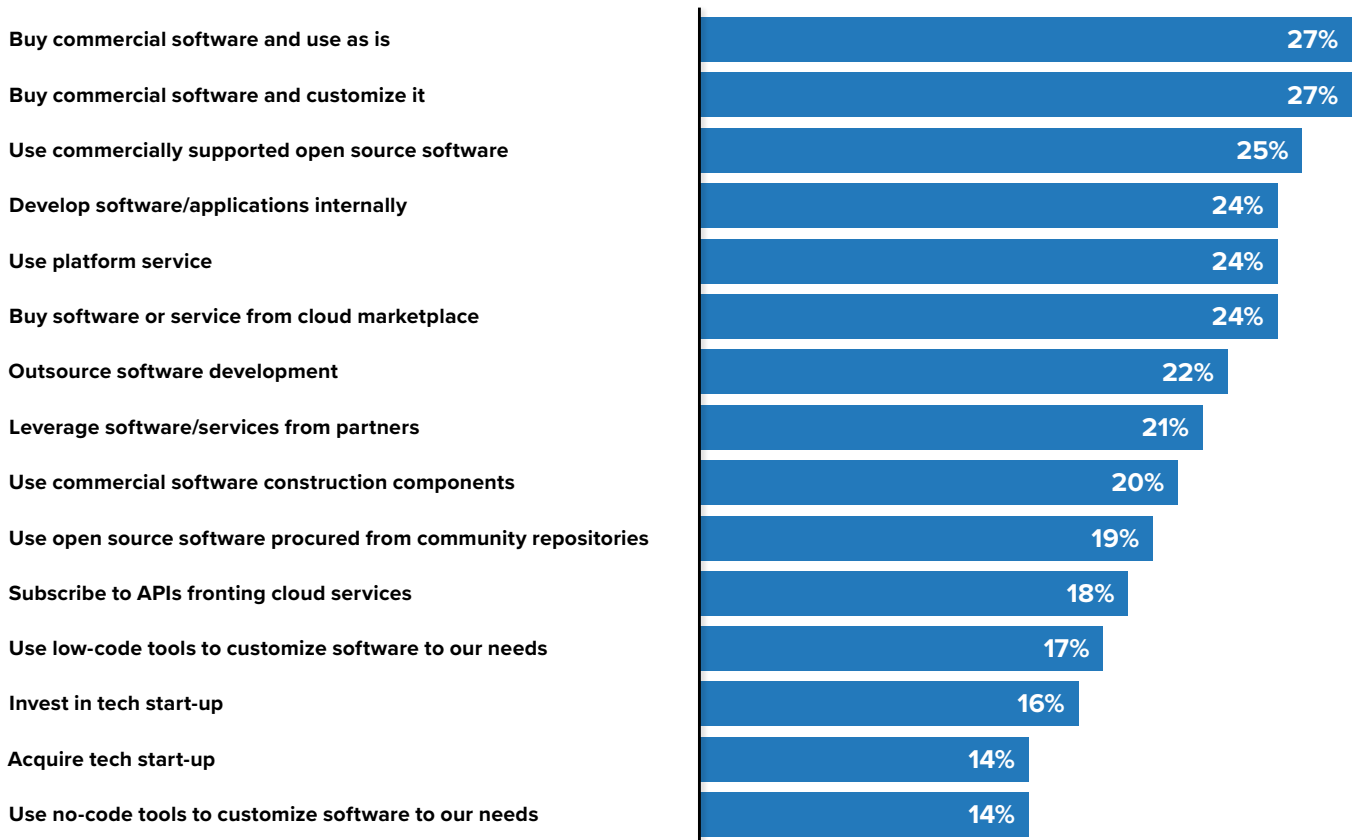
When looking at all of the software delivered by respondents in a year, 73% of the combined deliverables were built on the types of software typically chosen for ease of customization.

The responses by individual survey participants were required to add up to 100%, meaning there’s some potential overlap that isn’t captured in the responses. For instance, most no-code and low-code software is also commercial software. The same goes for open source software with commercial distributions.

In fact, this overlap of preference for commercial and customized software rose to the top in a survey question that aimed to uncover additional depth about the types of technology choices organizations make when it comes to their highest-priority software and applications. The same number of technology decision makers chose “buy commercial software and use it as is” and “buy commercial software and customize it” as the most important source of technology for high-priority software (see **Figure 2**). Those options were followed closely by using commercially supported open source software and developing software internally.

**FIGURE 2**  
**Commercial and Open Source Software Top the List of Important Sources of Technology**  
 (% of respondents)

**Q: What are the most important sources of technology used for your organization’s or team’s highest-priority software/applications?**







n = 400, Source: IDC’s Hyland Software Delivery Survey, October 2021

This concurrent interest in off-the-shelf software and customization demonstrates a common strategy that IDC hears from organizations: Many companies want to buy as much commercial software as can meet their needs, customizing only as much as is required to deliver differentiation or enable unique capabilities. This strategy is typically driven in part by a global shortage of developer skills, since many organizations must prioritize their limited developer resources toward projects with the strongest potential to deliver critical business outcomes. Time to market also plays a role, since purchasing off-the-shelf software is typically a faster route to a deliverable than building similar functionality from scratch.

Organizations are employing an additional range of technologies to deliver their most important software assets. Other top choices made by survey respondents included using platform services, buying from cloud marketplaces, and outsourcing software development. Even techniques such as “invest in tech start-up” and “acquire tech start-up” that represent strategic business decisions were chosen by a notable number of respondents as important sources of technology.

METHODOLOGY

**IDC analyzed survey results to determine the maturity level of respondents. We performed our analysis by identifying the survey questions that correlated to business outcomes, creating four categories of respondents based on their likelihood to choose responses that align with achieving business outcomes. The groups range from the most mature Software Strategy Leaders to the least mature Software Strategy Discoverers.**

-  **Software Strategy Leaders (9%):** More likely to have collaborative, enterprise-wide software sourcing or deployment strategies and likely to recognize more benefits from the new technologies they adopt. This group is also more aggressive in trying out more technologies and solving for the developer skills shortage.
-  **Software Strategy Achievers (35%):** Have begun to adopt new technologies but require experience in order to achieve the most benefit.
-  **Software Strategy Learners (37%):** Recognize that they must adopt new technologies, practices, and culture in order to make the right technology choices and get the most out of their software assets.
-  **Software Strategy Discoverers (19%):** Least likely to actively address important barriers including the developer skills shortage and least willing to adopt more technologies to deliver on important software priorities.

As part of IDC’s analysis of the survey results (see methodology above), we discovered that successful, mature companies use more sources of technology for their highest-priority software or application initiatives. The most mature organizations — the Software Strategy Leaders that had attained important business outcomes — chose on average 4.5 technology sources, compared with those that were less successful in achieving business outcomes, which chose on average 2. The result indicates that mature organizations are willing and able to use more types of technologies, and that when they match the right type of software to the right use case, they are able to achieve targeted outcomes.

# The Complexity Balance

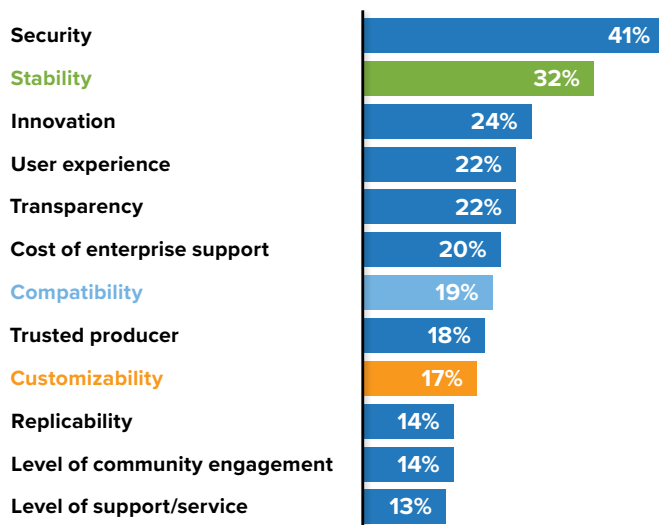
While a driver in business outcome success, having a wide variety of technologies to choose from has both pros and cons. On the upside, it means that organizations have options to address their needs, including many that historically weren't previously available to them. No longer must a team settle for a technology that doesn't allow it to produce its desired results.

However, having so many technologies at their disposal requires that teams investigate many more options in order to make a smart choice about the best technology for the job, one that meets both business and IT requirements. Once a team has chosen a type of technology, it may need to ramp up internal requirements, such as developing internal skills, to make the best of it. The team also must ensure that the new software application, tool, or technology integrates with other technology and solutions already in place.

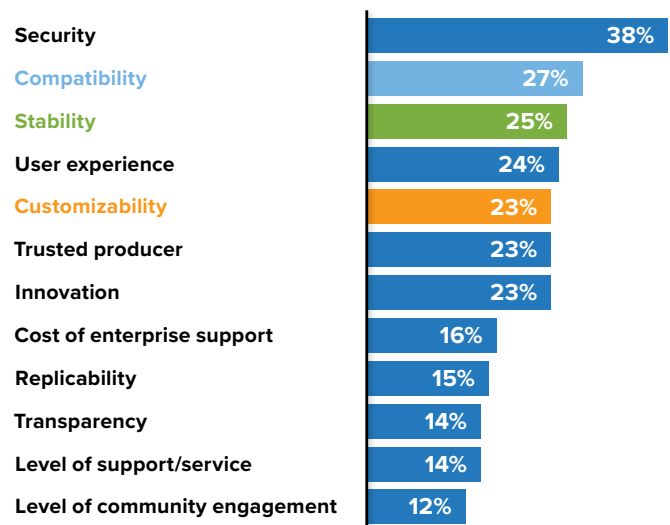
When determining which approach is the right one for the job, survey respondents pointed to influencing factors such as cost, security, and stability as important when considering low-code and open source software (see **Figure 3**). When using either type of software, security tops the list as the most important factor for organizations. But from there, slightly different priorities take hold. Innovation, transparency, and the cost of support rank higher for users of low-code software, while compatibility, customizability, and a trusted supplier are more important when choosing open source.

**FIGURE 3**  
**Security Is Most Important Factor for Low-Code and Open Source Users**  
 (% of respondents)

**Q: When using low-code software, which of the following are most important for your organization?**



**Q: When using open source software, which of the following are most important for your organization?**



n = 400, Source: IDC's Hyland Software Delivery Survey, October 2021



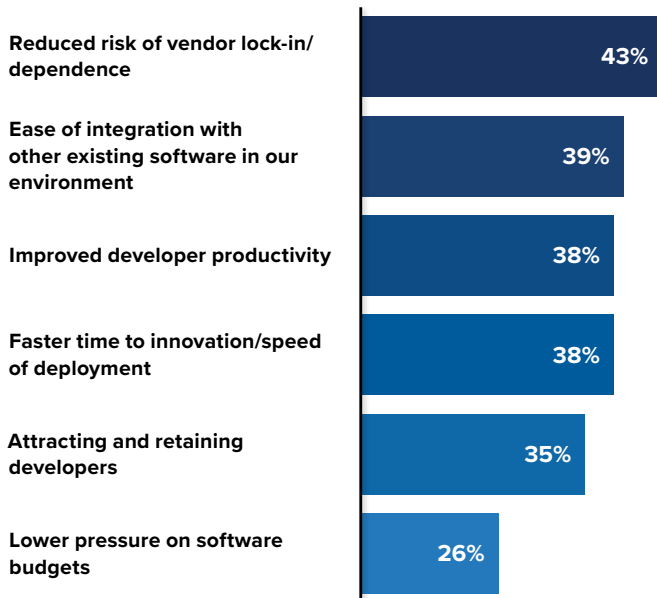
It's no surprise that trust ranks relatively high with open source. Particularly when using community-developed open source, organizations must ensure that the software is both reliable and secure in terms of preventing potential malicious activity.

Stability is also an important factor for respondents using both open source and low-code, indicating that users don't want to spend time unnecessarily managing and supporting software products. It also reflects the growing importance of user experience — the end user must find an application easy to use, reliable, and performant.

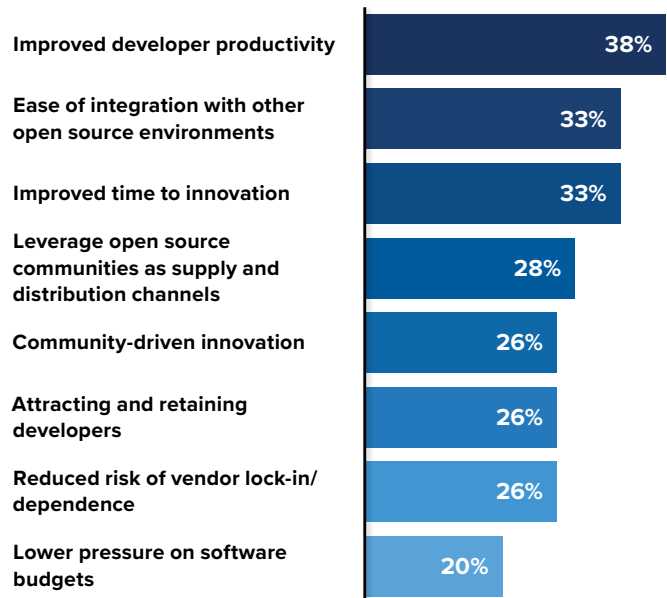
The benefits that respondents cited for low-code and open source differ slightly, too (see **Figure 4**). The reduced risk of vendor lock-in/dependence is a more significant business benefit for low-code users than it is for open source users. Improved developer productivity was the top business benefit open source users cited.

**FIGURE 4**  
**Reduced Risk of Lock-In Is Top Business Benefit of Low-Code Software**  
 (% of respondents)

**Q: What are the business benefits that low-code software brings to your organization?**



**Q: What are the business benefits that open source software brings to your organization?**



n = 400, Source: IDC's Hyland Software Delivery Survey, October 2021

# Challenges

Choosing the best software foundation for a use case isn't simply about matching requirements to capabilities. A host of other factors impact sourcing decisions.

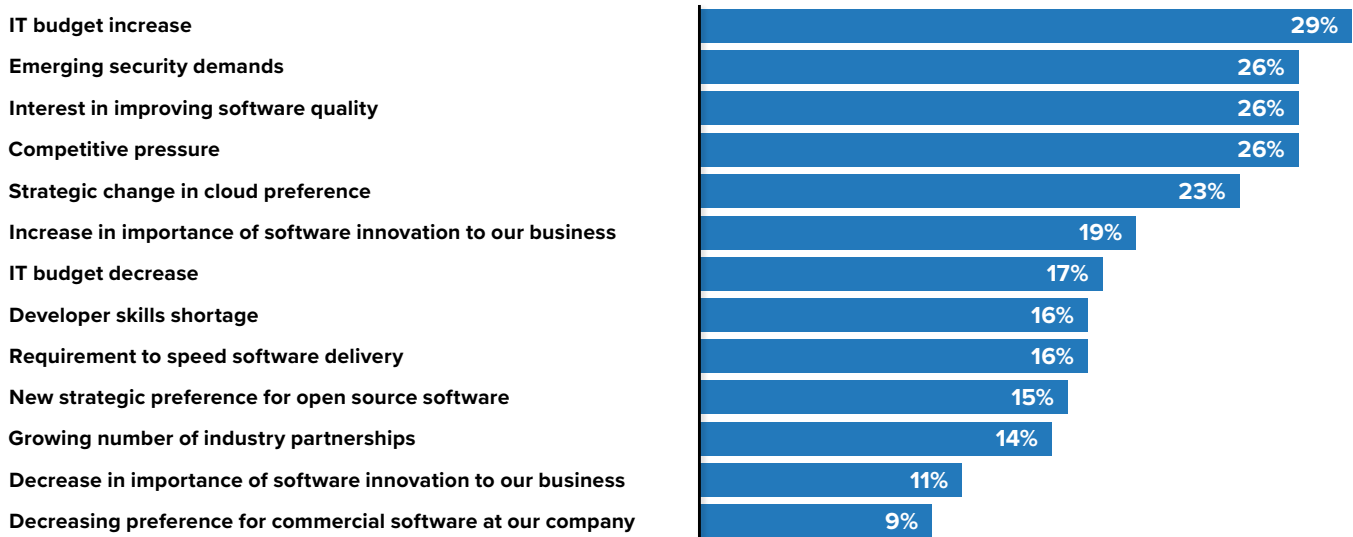
## Security, Competitive Pressure Impact Decision Making

Our survey found that a number of challenges — as well as more positive drivers — are causing shifts in the technologies that organizations choose. Emerging security demands, competitive pressure, and budget decreases are among the challenges that survey respondents cited for shifting their approach to sourcing technology in the next two years (see **Figure 5**).

**FIGURE 5**  
**Budget Increases, Security Demands Drive Shifts in Sourcing Decisions**

(% of respondents)

**Q: What is driving any shift in your organization's approach to sourcing technology in the next two years?**



n = 400, Source: IDC's Hyland Software Delivery Survey, October 2021

However, an increasing IT budget was the top response, with the availability of budget potentially opening the door to the selection of new technologies that allow organizations to better reach their goals. Organizations in many sectors have seen IT budget increases in response to the COVID-19 pandemic, with technology in many cases enabling new revenue streams to compensate for those impacted by the pandemic. The pandemic helped to boost the value of digital technologies in many organizations.

## The Developer Skills Shortage

IDC commonly hears organizations report that the lack of access to skilled developers drives sourcing decisions as well. According to IDC's *Worldwide Developer Forecast*, the worldwide shortage of full-time developers will increase from 1.4 million in 2021 to 4.0 million in 2025. When we asked how organizations planned to address a development skills shortfall, the top responses were: use more commercial software, use more open source software, rely on partners to develop custom code, and give more developer duties to staff outside of the IT department (for example, by using low-code techniques or robotic process automation) (see **Figure 6**, next page).

All of these options can ease the potential impact related to a lack of available development skills. Using commercial software enables the delivery of key functionality without taking developers away from focusing on delivering capabilities that may differentiate, disrupt, or bring important value to the business. Options such as open source, partnerships, and low-code techniques similarly free up scarce developer resources for priority work.

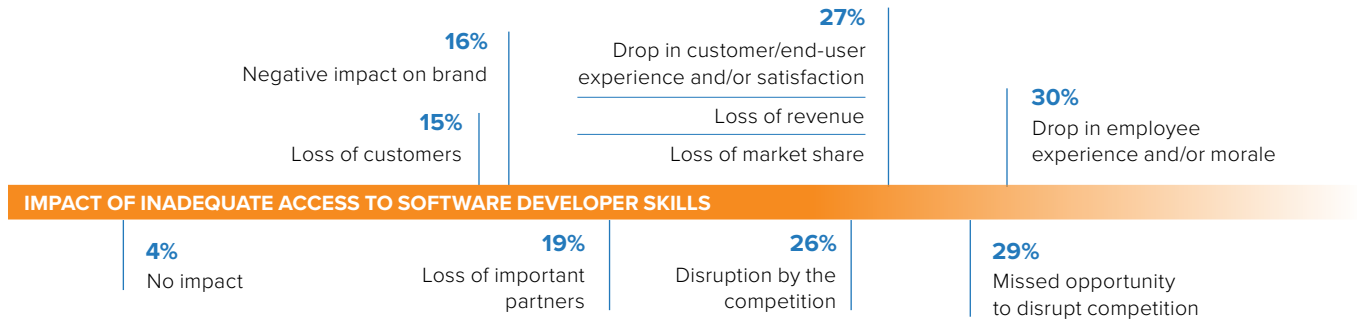
The skills shortage has a broad impact, both internally and externally. In fact, the top impact that respondents cited due to inadequate access to software developer skills was a drop in employee experience and/or morale. That internal impact occurs when employees don't have access to the software they need to effectively fulfill their job requirements; that lack of access may be due to limited developer resources available to deliver software.

**FIGURE 6**

**Drop in Employee Experience, Morale Are Top Impacts of Developer Skills Shortage**

(% of respondents)

**Q: What business impact does inadequate access to software developer skills have on your organization?**



n = 400, Source: IDC's Hyland Software Delivery Survey, October 2021

## Disconnect Between IT and the Business

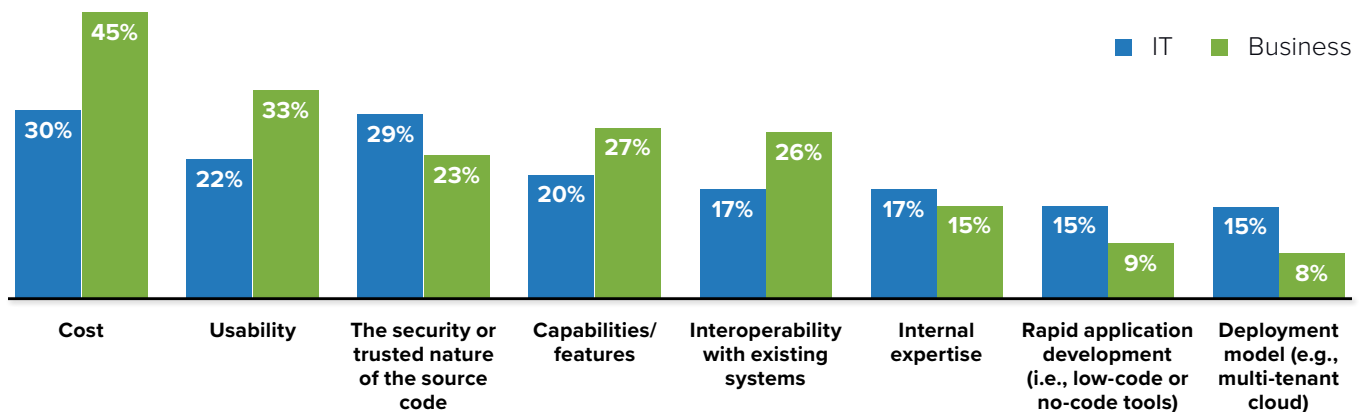
Many organizations lack a strong collaboration between the IT and business teams; in some organizations, the relationship is outright hostile. Our recent survey demonstrated a disconnect in terms of differing perspectives between the teams. For instance, when evaluating third-party software, IT and business respondents varied significantly on important topics including usability, interoperability, and deployment model, with IT respondents far less interested in cost, usability, and capabilities than their business counterparts (see **Figure 7**).

**FIGURE 7**

**Security, Deployment Model Are Most Important to IT; Cost, Usability Top the List for Business**

(% of respondents)

**Q: What are the most important considerations when evaluating third-party software at your organization?**



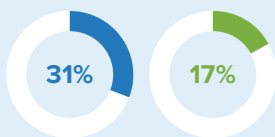
n = 400, Source: IDC's Hyland Software Delivery Survey, October 2021

We also found notable differences when it comes to recognizing the value of both open source software and low-code software, with IT respondents more likely to prefer both compared with their business counterparts. For instance, when asked about the most important considerations when evaluating third-party software, 15% of IT respondents cited rapid app development such as low-code or no-code tools, compared with 9% of business respondents (see **Figure 8**).

Notably, nearly twice as many IT respondents said that one way they plan to address a development skills shortage is to use low-code, no-code, robotic process automation, or other techniques to move some developer duties to staff outside of the IT department. This finding may indicate that IT is more acutely aware of the development skills crunch as compared with their counterparts in the business. It also underscores a broader awareness among IT respondents of the availability and potential of tools like low-code and no-code to empower non-developers in the business.

**FIGURE 8**  
**IT Has Stronger Preference for Low-Code Tools, Compared with Business Respondents**

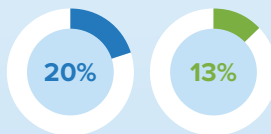
**Q: How is your organization planning to address any shortfall in development skills?**



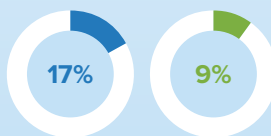
Give more developer duties to staff outside of the IT department (e.g., using low-code or no-code techniques, robotic process automation, or classic technique)

■ IT ■ Business

**Q: What are the most important sources of technology used for your organization's or team's highest-priority software/ applications currently?**

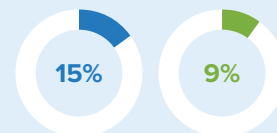


Use low-code tools to customize software to our needs



Use low-code tools to customize software to our needs, next two years

**Q: What are the most important considerations when evaluating third-party software at your organization?**



Rapid app development (i.e., low-code or no-code tools)

n = 400, Source: IDC's Hyland Software Delivery Survey, October 2021

IT respondents are also more likely to see value in open source software to help address the shortfall of development skills (see **Figure 9**, next page). Open source software developed by communities is significantly more valuable to IT respondents, with twice as many citing open source software procured from community repositories as an important technology for high-priority software applications.



IDC research indicates that changes brought on by COVID-19 have driven open source adoption. More than 40% of U.S. IT respondents to IDC’s March 2021 *Open Source Software Use Survey* said their use of open source software increased moderately or substantially due to the pandemic, with an additional nearly equal amount identifying no meaningful change in their open source use. Only a small portion planned any decrease in open source usage.

**FIGURE 9**  
**IT Values Open Source More Compared with Business Team Members**



n = 400, Source: IDC’s *Hyland Software Delivery Survey*, October 2021

The disconnect between IT and business respondents could impact outcomes. While individuals and teams may have awareness of different solutions, they should align on key topics relevant to the business overall, including top challenges and goals. With alignment related to these topics in place — achieved through purposeful communication — teams can share their individual, valuable perspectives regarding techniques to achieve shared goals, and in doing so make the best decisions together.

Setting up successful collaboration between the IT and business teams, however, represents a notable challenge for many organizations, particularly those with teams that have historically had a rocky working relationship. The stakes are high: When business and IT act in opposing fashion, goals aren’t met, deliverables are slowed, and the company suffers.

# Recommendations

So how do you make the right choice of software to fit the right use case?  
IDC recommends the following:

## **Assess your company's current approach to software sourcing.**

A good starting point is to take stock of your company's current maturity status. Do you have a well-formed software sourcing strategy that has been developed collaboratively between business and IT stakeholders? If you don't, and you identify more closely with Software Strategy Discoverers or Software Strategy Learners (see methodology on page 7), you'll want to develop a strategic sourcing plan. That plan should include many of the recommendations below, starting with building a stronger collaboration between IT and the business, considering the adoption of more types of technologies, and adopting the best practices defined by technology early adopters.

## **Build a strong collaboration between the business and IT.**

Technology decisions are best made in collaboration with the business and IT teams. While business groups will have the best insight about outcomes they are looking to achieve from a software implementation, IT has the best insight into the types of software that can best meet the requirements.

Building collaboration can be difficult, but process and organizational changes can help. Communication is key; when either team embarks on a new project that involves technology, it should engage with the other team from the very start. Doing so ensures that both perspectives are heard and can be accommodated.

Also, building collaboration into individual job descriptions can help. For instance, an IT team member may be asked to attend regular meetings of a business team as a way of gaining a better understanding of its needs and also sharing insight and requirements of the IT team.

## **Keep security top of mind.**

With high-profile security incidents in the headlines, it's no wonder that security is a critical topic when it comes to choosing software and software tools. The nature of security threats is evolving just as the potential impact appears to be growing in severity. At the same time, the enterprise technology landscape is only growing more complex, requiring organizations to think carefully about their security posture each time a new piece of software is added to the environment.

IDC finds that in the same way there is a learning curve to using new types of software, there's a learning curve associated with securing it. For instance, when organizations for the first time develop custom software that is designed to be used by end-user customers, there may be new security and compliance implications related to distributing the software or securing personally identifiable information data.

In our survey, when respondents were given the option to choose security, 70% of the time security was the top response, appearing second in the remaining 30% of questions; that is, the topic of security never ranked below number 2. When asked about the most important factor in buy-versus-build decision making, the most important factor when using open source and low-code software, and the top requirements when choosing a content services vendor, respondents most often chose security.

## **Don't be afraid to experiment.**

Technology advances quickly, with the array of available options continuing to grow. While there's risk involved with adopting new technologies, doing so may often have rewards, including the potential to gain first-mover advantage against the competition. Organizations that accept that risk while also advancing a culture that allows for failure as part of the process of innovating tend to be more successful.

In our study, we found that organizations are currently employing a wide range of technologies for their highest-priority software, including buying and customizing commercial software, using commercially supported open source software, and developing software internally.

Notably, however, respondents from more mature organizations chose twice as many technologies as the least mature respondents when we asked them to identify the most important sources of technology used for their highest-priority applications. These mature organizations accept the risk involved with trying something new and are likely to accept the potential that some decisions will lead to failure. Experimentation involves learning from failure.

Also, the fact that these organizations choose more technologies implies that they're aware that different use cases require different solutions. A company that chooses only open source or only commercial software won't be as successful as a company that fits the right tool to the right job: A team with a few business analysts and unique needs may be best served by a low-code tool they can customize themselves, whereas another team with more straightforward needs may achieve best results from commercial off-the-shelf software.

 **Seek out best practices around new technologies.**

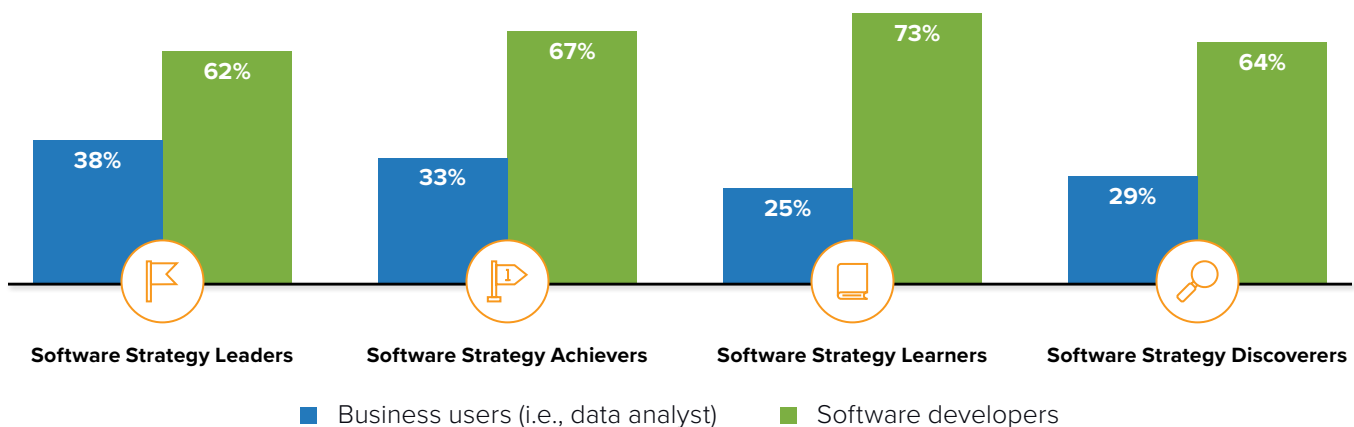
When it comes to adopting types of software that may be new to your organization, learning about best practices is key to getting the most out of the new software. One example is the adoption of low-code tools. Historically, vendor marketing and user perception around low-code tools was that they should be used by business stakeholders. Because users don't require the skill set of a professional developer, the tools have been pitched as a way for business end users to customize tools to their own specifications, without having to ask for support from IT. The thinking was that this approach would allow business users to obtain exactly the outcome they wanted without potentially waiting for limited IT developer resources.

However, IDC research indicates that a significant majority of end users of low-code development tools are not business users — 69% of survey respondents said that software developers are the primary users of the tools. As businesses rely more heavily on software, their developers are looking for ways to work more efficiently, and using low-code tools is one way they can do so. Low-code tools allow developers to more quickly customize and deliver software that business teams need.

When we further analyzed our survey results, we discovered that Software Strategy Leaders were more likely to say that business users, like data analysts, were the primary users of low-code development tools (see **Figure 10**). In fact, these more mature users were nearly 10 percentage points more likely than Software Strategy Discoverers to have business users as primary users of low-code development teams.

**FIGURE 10**  
**At Mature Organizations, Business Users Are More Likely to Be Primary Users of Low-Code Tools**  
 (% of respondents)

**Q: What group in your organization is the primary user of low-code development tools?**



n = 400, Source: IDC's Hyland Software Delivery Survey, October 2021

This difference between Software Strategy Leaders and Software Strategy Discoverers indicates a maturity curve among organizations that adopt low-code tools and may also point to the more common entry point for the tools. The less-mature organizations may be those that have adopted low-code tools only recently, and those tools are primarily used by their software developers. As such, software developers are likely to be the ones deciding to bring such tools into the organization or influencing the purchase decision. However, once developers become comfortable with the tools, they may be able to introduce them to business users like data analysts and support those users as they gain experience with the tools. In this more mature scenario, the goal is for a business user to be the primary user of low-code tools, with software developers available to help when needed and also to ensure that company compliance and policy are adhered to.



### **Balance benefits of additional technology with need to manage complexity.**

While organizations should be willing to experiment with new technologies and choose the right tool for the right job, there is danger in increasing complexity to a degree that it slows down innovation. Businesses that spend too much time managing technologies, including their integrations and requirements for new skills, are wasting resources that could be better used.

To get the balance right, businesses should be willing to be flexible. For example, policies restricting or requiring certain types of technologies should be changeable as the needs of the business evolve. Overhead related to integration and maintenance should be considered when introducing a new technology. Doing so will help achieve a balance between adopting technologies that enable outcomes with injecting too much complexity into the IT environment.



# Conclusion

Software is the engine that drives most companies today. But harnessing the right software for the right job is critical to success. More and more organizations are building the internal capacity to deliver innovative software applications and services, and doing so involves strategic decision making when choosing a technology and approach. Leading organizations are employing commercial, open source, and low-code software where each makes the most sense, potentially customizing all types of software to meet their needs. Successful companies will have delivered software applications and services that differentiate and disrupt, while enabling them to achieve important business outcomes.

# Methodology

IDC surveyed 400 respondents who work for companies with revenue of \$1 million or more and are based in the United States, Canada, France, Germany, and the United Kingdom. Half of the respondents had technology-focused roles; the other half did not have technology-focused roles but influenced or made decisions about buying software. The survey was designed to study the types of software that successful organizations use and how they determine which types of software to use.

# About the Analyst

**Nancy Gohring****Research Director, Future of Digital Innovation, IDC**

Nancy Gohring is research director for IDC's Future of Digital Innovation market research service. She focuses on software innovation programs in the enterprise and their potential to drive efficiencies into corporate processes, generate new revenue streams, respond to customer demand, and improve competitiveness. Her research examines ways that enterprises can best execute on the four pillars of software innovation — plan, source, develop, and distribute — and highlights leading enterprises that have developed successful new approaches to these competencies.

[More about Nancy Gohring](#)

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