



Low-code adoption as a driver of digital transformation

A comprehensive market overview of EMA, the United States of America and Asia Pacific regions from a large-scale survey

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Introduction

In today's age of digital transformation, companies are faced with the dual challenge of expediting their IT processes while also implementing efficient software solutions. This growing demand for innovative applications stems from companies' desire to remain competitive and differentiate themselves.

Customized software solutions present a unique opportunity to better align products and services with specific business needs and customer requirements. They contribute to the optimization of operational processes, enhance customer satisfaction and facilitate data-driven decisions. Furthermore, they offer the flexibility to adapt to shifting market dynamics, and ensure that technology investments are in harmony with the overall business strategy.

Within this context, low-code development platforms are increasingly seizing the attention of companies. These platforms also empower non-developers to create software by simply dragging and dropping within a visual environment.

The term "low-code" alludes to the minimal coding effort required when creating software applications. Instead of traditional programming, developers can now use visual models and components.

This renders manual coding redundant, replaced by intuitive graphical design.

Yet how are low-code development platforms utilized, and what challenges do companies face in their adoption? What are the security concerns globally and in different world regions, and how do companies handle compliance and governance? Which trends are emerging, and what factors play a particularly significant role in the choice of low-code development platforms?

This study seeks to address these points and look in detail at factors such as advantages, fields of application, challenges, security, compliance, and the use of modern technologies such as AI in low-code development. The data is based on a survey of 2,000 corporate decision-makers from Europe, Middle East and Africa (EMA), the United States of America, and the Asia Pacific regions. Building on a previous study entitled "**Shaping Digital Transformation with Low-Code Platforms**" (2023), selective comparative analyses and developments are addressed.





Low-code development deemed strategically crucial

81%

of the surveyed companies consider low-code development to be of strategic importance in their organization.



Europe and US differ on low-code customization needs

43%

of European companies see the lack of customization options in low-code as a challenge, whereas only 32 percent of US companies share this view.



Uptrend in company-wide low-code app guidelines

55%

of companies have company-wide guidelines on which apps are developed with low-code, this is least common in the US companies, with 47 percent. And the trend is upward.



Security emerges as top low-code challenge

42%

of companies see security risks as biggest challenge in low-code development.



Growing emphasis on defined low-code governance

47%

of respondents indicate having or planning to establish low-code guidelines and defined governance, reflecting a trend observed across all regions.



Increasing acceptance and integration in Europe

31%

of European companies use low-code as a critical component of their software development strategy. Compared to the previous study, the proportion has risen by 12 percentage points.



Corporate leaders intrigued by AI in low-code

88 % of corporate decision-makers consider artificial intelligence (AI) in the context of low-code to be of potential interest and relevance.



Microsoft Power Apps is most frequently used by companies

55 % of enterprises favor Microsoft Power Apps, followed by 48 percent opting for Oracle and 41 percent choosing Salesforce.



IT department heads drive low-code guidelines

69 % of companies assign the responsibility for low-code guidelines to IT department managers.



Managers prioritize scalability in low-code platforms

91 % of managers prioritize scalability when choosing low-code platforms, followed closely by comprehensive developer tools and features (90%) and security (90%).



Security and developer tools stand out in importance

90 % of managers underscore the significance of security and comprehensive developer tools and features.



US enterprises fall short in low-code training

51 % of companies offer comprehensive low-code training, with enterprises from the US notably lagging at just 40 percent.

01

Global trend toward low-code adoption

01 Global trend toward low-code adoption

The significance of low-code has evolved from being a peripheral phenomenon to a pivotal factor in software development. However, the adoption and evolution of low-code vary across regions, influenced by numerous factors.

Current adoption status

For approximately 31 percent of companies surveyed in this study, low-code is an integral part of their software development strategy. In this respect, companies in Africa and the Asian Pacific region (ASPAC) stand out as above-average, with 34 percent in Africa and 32 percent in ASPAC already using low-code as a central part of their development strategy. The high adoption rate in Africa could be attributed to the need for an agile and rapidly adaptable approach to meet the swiftly changing business environments prevalent in many African markets. Further influencing factors might be the lack of traditional IT infrastructures and the rising skills shortage, which propel the adoption of low-code platforms.

Developments in Europe

The adoption of low-code is also advanced among European companies. 31 percent of corporate decision-makers indicate that low-code already constitutes a significant part of their software development strategy. This marks a noteworthy increase from a previous study entitled “Shaping Digital Transformation with Low-Code Platforms,” which found that only 19 percent of European companies used low-code in their strategies.

Figure 1: Do you already use “low-code” or “no-code” development platforms in your company, or are you planning to use low-code/no-code development in the future as part of your software development?

	Total	Europe	Middle East	Africa	USA	ASPAC	
It is already a central component of our software development strategy	31 %	31 %	29 %	34 %	30 %	32 %	Low-code users
Our first projects have already been implemented	25 %	25 %	26 %	23 %	26 %	22 %	
We are currently still in the evaluation phase	14 %	10 %	21 %	19 %	15 %	16 %	Low-code planners
We are planning our first specific projects within the next 12 months	19 %	20 %	17 %	14 %	18 %	22 %	
We are planning first projects within the next 2 - 5 years	7 %	10 %	2 %	7 %	6 %	5 %	
We can imagine using it in our company in the future	4 %	3 %	4 %	2 %	4 %	3 %	
We have not yet addressed the topic or I do not know anything about the topic	1 %	1 %	1 %	1 %	1 %	1 %	
Not specified	0 %	0 %	1 %	0 %	0 %	0 %	
Base	2,000	600	150	150	700	400	

Base: 2,000 companies, rounding differences possible
 Source: Low-code adoption as a driver of digital transformation, KPMG International, 2023

Low-code users: companies currently using low-code platforms
Low-codeplanners: companies who will only use low-code in the future / can imagine doing so



01 Global trend toward low-code adoption

Specifically, the proportion of European companies using low-code as a crucial component of their software development strategy has increased by 12 percentage points, from 19 percent to 31 percent. This emphasizes the progress in acceptance and integration of low-code platforms across the European business landscape.

Only **51%** of companies provide extensive low-code training, with US companies lagging behind significantly at 40 percent, increasing the potential for ineffective low-code projects.

Training and user involvement

In addition to planning or introducing low-code, companies should also involve their employees more. Despite the straightforward operation of low-code platforms, user training is still necessary. Although this aspect can significantly influence the success of such initiatives, only about half of companies (51 percent) offer comprehensive education and training programs to encourage low-code development. Notably, companies in the US lag behind considerably, with just 40 percent offering such training, which is well below the average. Insufficient training can hinder the efficiency and acceptance of these platforms.

In the US in particular, there is a clear need for more training initiatives, which could potentially jeopardize the effectiveness of low-code projects in these companies. Companies in Europe are slightly above average with a rate of 53 percent. Nevertheless, focus should also be placed on targeted training and educational programs to increase the effectiveness of and acceptance for low-code solutions.

Future growth prospects

Another distinct focus is on thorough implementation planning for the next 12 months to five years, especially in European (30 percent) and ASPAC (27 percent) companies. This high level of planning might indicate heightened sensitivity towards compliance and security aspects, which hold special importance in these regions.

The use of low-code in European and ASPAC companies is expected to surge in years to come.

While companies recognize the necessity of low-code, they need to ensure that all aspects of compliance and security are carefully considered. This reflects the strategic approach of these companies, who, in addition to innovation, also prioritize the long-term integrity and reliability of their technologies and processes. Thus, it is expected that the adoption rate of low-code in companies from the European and ASPAC regions will significantly increase in the coming years.



02 Strategic competitive advantages through low-code

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In today's digitalized business world, competitive advantages play a crucial role in a company's success. An impressive 81 percent of the surveyed companies view low-code development as strategically significant, with 80 percent acknowledging its role as a key driver for accelerating development. A comparison with the previous survey entitled "Shaping Digital Transformation with Low-Code Platforms" highlights the increasing importance of low-code both strategically and operationally across all corporate groups and sectors. This underscores the growing relevance and acceptance of low-code development in the world of business.

Regional insights

The significance of low-code development is clear in terms of various aspects across different regions. Low-code development is of strategic importance to 89 percent of companies in Africa, for example, and for approximately 88 percent, it is essential for faster software development. Due to their pragmatic approach and burgeoning economic performance, these companies must invest purposefully in technologies that boost their agility and competitiveness. Accordingly, low-code development enables African enterprises to effectively navigate rapid changes in the global market environment while maximizing their capability for swift software development.

In contrast, approximately 81 percent of US companies emphasize the strategic relevance of low-code, while the figure stands at 78 percent for ASPAC companies. In Europe in particular, 81 percent of corporate leaders highlight the significant role of low-code in fostering more agile and flexible IT operations within companies. However, only 73 percent of ASPAC companies share this assessment. This discrepancy might be attributable to varying competitive scenarios or regulatory differences across regions.

80% of companies see low-code as relevant for faster development.

Overall, these results illuminate how low-code development is perceived globally as a key component for enhancing flexibility and agility in software development and throughout an organization.

Companies consider increased process efficiency (53 percent) and employee productivity (51 percent) to be the most important benefits of low-code adoption.

Yet what advantages does the adoption of low-code offer, and what reasons do companies cite for deploying low-code platforms?

Figure 2:



How important is the topic low-code development in your company?

TOP 5

- 81%** Strategic
- 80%** To make developers faster
- 79%** To ensure IT operations
- 79%** In the context of transformation projects
- 77%** To make processes safer

Base: 2,000 companies, multiple responses, selection: very critical for success and critical for success
Source: Low-code adoption as a driver of digital transformation, KPMG International, 2023

02 Strategic competitive advantages through low-code

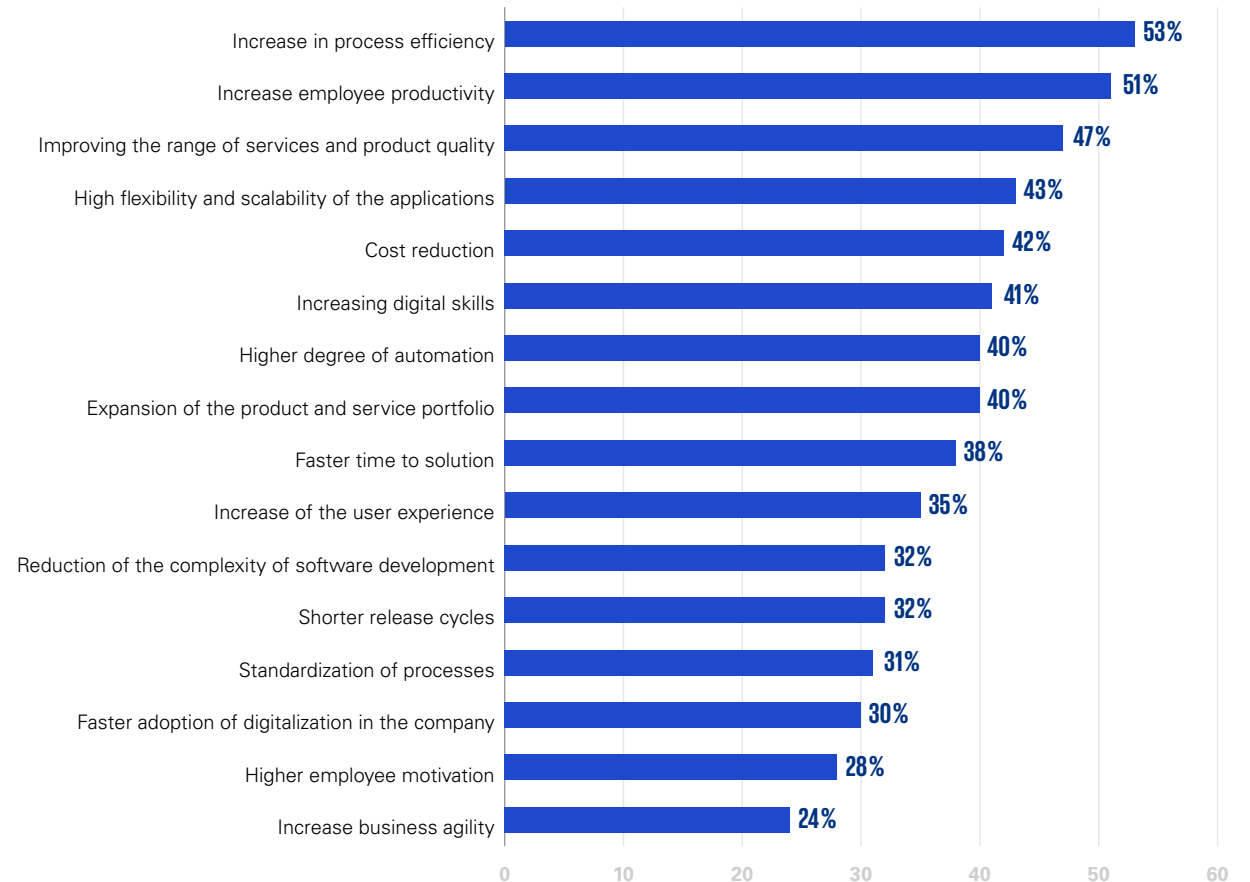
Potential benefits of low-code adoption

Companies perceive several benefits to low-code adoption, with increased process efficiency (53 percent) and enhanced employee productivity (51 percent) standing out as the most important advantages. With low-code, individual software versions can be released efficiently even with limited product knowledge. A consistent finding is that the improvement in process efficiency was cited as one of the main benefits in almost all regions, including by one in two European companies (51 percent). Only in US companies does employee productivity (51 percent) slightly edge out process efficiency (50 percent). This advantage was underscored especially in the Middle East and Africa, with 62 percent and 59 percent respectively highlighting it. This illustrates how low-code platforms contribute to streamlining business processes and improving operational efficiency.

Another benefit noted by respondents is the boost in employee productivity (51 percent), which exceeds 50 percent in companies in Europe, the Middle East, and Africa.

Low-code platforms enable efficient software development without interruptions and from a single source. Customized applications therefore mean that employee productivity can be significantly increased.

Figure 3:
What are the key benefits of low-code adoption in your company?



Base: 2,000 companies, multiple responses
Source: Low-code adoption as a driver of digital transformation, KPMG International, 2023

US companies make use of low-code for faster release cycles (35 percent) and significant cost reductions (45 percent) in software development, giving them a critical edge in the competitive market.

In US companies, the survey results indicate a clear interest in optimizing software development processes. For 35 percent of corporate leaders, shorter release cycles rank among the most significant advantages of low-code platforms. Thus, the ability to bring applications to market more quickly is more relevant for US companies than for European (31 percent) and African (21 percent) businesses. This suggests that speed and agility in software development are valued particularly highly in the US.

42% of companies cite cost reduction as a key benefit.

Additionally, 45 percent of the surveyed corporate leaders from US companies cited cost reduction as one of the most significant benefits. Unlike in ASPAC companies (41 percent) and European companies (40 percent), economic considerations play a larger role for US firms.

With low-code platforms, businesses can't only operate more efficiently, they can also achieve substantial savings in the development process. In a competitive market like the United States, this can represent a critical advantage.

Overall trends

In summary, the benefits of low-code development are recognized globally, but their significance varies by region. While businesses in some areas focus on cost savings and efficiency, others are looking for faster ways to introduce software solutions to the market.

Additional advantages mentioned include the high flexibility and scalability of applications (43 percent), the enhancement of digital skills (41 percent) and increased automation (40 percent). These findings align with the increasing awareness for the benefits of low-code which is expected to continue growing in the future, as indicated by the previous study, "Shaping Digital Transformation with Low-Code Platforms."



03 Increasing use for
success-critical
applications

03

Increasing use for success-critical applications

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The adoption of low-code development transcends geographic boundaries and extends to various application areas within organizations. On average, low-code is used by one in two companies (50 percent) for smaller and less complex applications. This proportion is approximately 62 percent for companies in the ASPAC region and only 45 percent in Europe. This can be explained by the rapid increase in startups in the ASPAC region, especially in countries such as China, India and Southeast Asia, which use low-code platforms for quick application development. In contrast, Europe has a longer history of software development with extensive matured resources, while companies in the ASPAC region might use low-code to compensate for a lack of traditional development resources.

Complex enterprise applications

Low-code platforms can also be used to develop complex enterprise applications. 47 percent of business executives indicate that low-code is currently being used for the development of such complex enterprise applications.

64% of ASPAC companies use low-code for process automation, compared with 45 percent of companies in Europe and 41 percent in the United States.

Figure 4:
To what extent do you currently use low-code development in the following areas as part of your software development processes?

	Total	Europe	Middle East	Africa	USA	ASPAC
Development of smaller, less complex apps	50 %	45 %	49 %	52 %	46 %	62 %
Containerization, microservices	48 %	47 %	44 %	51 %	45 %	57 %
Automation of business processes/workflows (departmental level)	48 %	45 %	46 %	55 %	41 %	64 %
Automation of business processes/workflows (cross-company)	48 %	44 %	45 %	51 %	43 %	62 %
Replacement/modernization of existing (legacy) applications	48 %	48 %	45 %	50 %	41 %	58 %
Development of mobile applications	47 %	44 %	51 %	50 %	41 %	61 %
Development of complex enterprise applications	47 %	50 %	45 %	51 %	38 %	60 %
Automation of business processes/workflows (enterprise-wide)	47 %	46 %	45 %	52 %	38 %	61 %
Base	1,106	335	82	86	388	215

Base: 1,106 companies, multiple responses, filter: companies that use low-code or plan to do so imminently
Source: Low-code adoption as a driver of digital transformation, KPMG International, 2023

03 Increasing use for success-critical applications

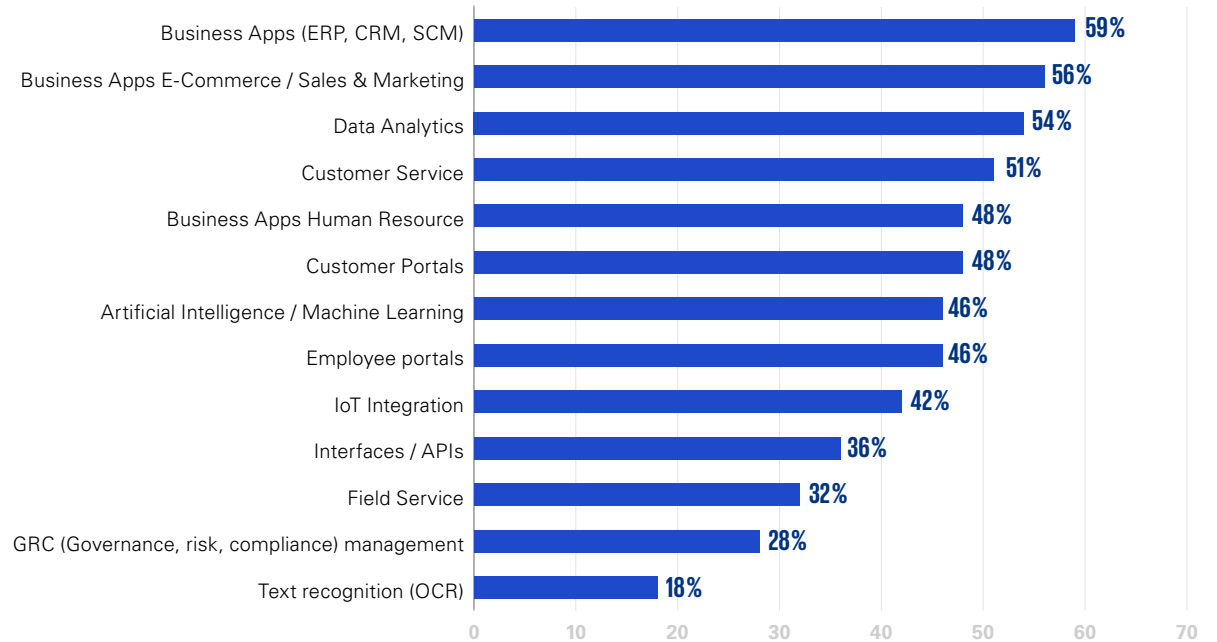
As these applications typically have a critical role in business success, different regional nuances can be observed. Only 38 percent of the surveyed US companies use low-code for such solutions, while the proportion is approximately 50 percent for European companies and 60 percent for ASPAC companies. In addition to the critical nature of these applications, the complexity and customization of the applications also influence the use of low-code. Intensive programming tasks or deep integrations with existing legacy systems might push low-code platforms to their limits.

Process automation with low-code

Low-code development platforms are also used to automate business processes and workflows at departmental level. On average, 48 percent of companies use low-code for this specific application of automation, as shown in Figure 4.

However, there are clear regional differences. Approximately 64 percent of companies in the ASPAC region show a strong interest and the rapid adoption of low-code platforms for optimizing and digitizing departmental processes. In contrast to this, the adoption rates are only 45 percent in Europe and 41 percent in the US. This suggests a stronger presence of traditional systems – or different strategies regarding process automation – in these regions. Nevertheless, the overall acceptance indicates that low-code is seen as a valuable tool for departmental-level process automation.

Figure 5:
In which areas of the company/processes do you deploy applications with low-code development?



Base: 2,000 companies, multiple responses
Source: Low-code adoption as a driver of digital transformation, KPMG International, 2023

Other applications for low-code in 49 percent of companies include containerization and microservices as modern software architectures and practices, and in 48 percent, the modernization of existing legacy systems.

Overall, there appears to be a trend here, in which the use of low-code in all areas will continue to increase and intensify. This reflects the growth in comparison to the previous study, with the adoption rates for business-critical applications in particular having significantly increased.

03 Increasing use for success-critical applications

Application areas

The application of low-code development techniques spans numerous business and process areas. Specifically, in the realm of business-critical applications such as Enterprise Resource Planning (ERP), Customer Relationship Management (CRM) and Supply Chain Management (SCM), 59 percent of surveyed companies use low-code for their development as illustrated in figure 5. Notably, companies in the ASPAC region are particularly active in this area: here, 67 percent rely on low-code, whereas in the US, 58 percent of companies utilize low-code for developing such business-critical systems. This points to different market conditions and differing acceptance of technology innovations in respective regions. Even in Europe, where business apps critical to success are developed in the traditional way and with the utmost care, a trend toward low-code can be seen. While the previous study, “shaping digital transformation with low-code platforms”, found that only 36 percent of companies developed ERP systems and 41 percent CRM systems using low-code, the proportion has now risen to 57 percent.

In addition to this, 56 percent of the surveyed companies develop business apps in the areas of e-commerce, sales and marketing using low-code, and 54 percent create applications in the realm of data analytics. Here too, regional differences can be observed.



While ASPAC companies have an above-average adoption rate of 62 percent in developing e-commerce and sales business apps, which is significantly higher than US companies (52 percent), only about half of these companies use low-code for data analytics. The rapid digitalization and e-commerce boom in the ASPAC region and the use of specialized tools and platforms for data analysis are exemplary explanations for these adoption rates. These areas of application for low-code are also relevant for European companies. In 57 percent of companies in Europe, low-code is used for e-commerce, and 56 percent use low-code in the field of data analytics. This trend might be occurring because companies need to rapidly adapt to the evolving demands and market trends, and low-code platforms offer an efficient way to achieve this.

Other applications developed with low-code include solutions for customer services (51 percent), human resources applications (48 percent), employee portals (46 percent), as well as software in the area of artificial intelligence (46 percent). Overall, the data indicates that low-code is widely distributed across a broad spectrum of business applications and processes, with the acceptance varying depending on business requirements.

04

04 Security and compliance
as challenges to be
overcome

Security and compliance as challenges to be overcome

04 Security and compliance as challenges to be overcome

Low-code development platforms offer companies the advantages of faster and more efficient software development. However, with this easy and agile approach to development, security aspects must also be considered to ensure the protection of applications and company data.

42% of companies consider security risks to pose the biggest challenge in low-code development.

Security challenges in low-code development

Security concerns are considered a central issue when using low-code development by businesses worldwide. A total of 42 percent of the surveyed business leaders indicate that they believe security issues to be one of the biggest challenges when using low-code platforms.

Regional variations in security concerns

Upon closer examination of regional differences, it is clear that European companies, in which 40 percent expressed security concerns, are slightly below average, while companies in the Middle East (45 percent) and in Africa (42 percent) are slightly above or exactly at the average. US companies expressed slightly fewer concerns, at 38 percent.

Figure 6:
To what extent is the handling of the following security aspects of low-code development platforms regulated in your company?

	Total	Europe	Middle East	Africa	US	ASPAC
Control over which applications access which corporate data	29	32	38	36	19	37
Access rights of low-code applications to corporate data	24	21	26	30	21	30
Security tests and audits	27	26	31	36	19	38
Inventory of low-code applications	22	22	25	32	16	27
Complete documentation of applications	24	22	26	36	18	31
Awareness in dealing with low-code applications	23	23	36	34	16	29

Strongly **Balanced** **Weakly**

Base: Europe n=600, Middle East n=150, Africa n=150, US n=700, ASPAC n=400, multiple responses, weighted index values, relative comparison of results within the regions
Source: Low-code adoption as a driver of digital transformation, KPMG International, 2023

04 Security and compliance as challenges to be overcome

Particularly noteworthy is the ASPAC region, where 52 percent of companies expressed security concerns regarding low-code technologies, which is the highest value among all regions. These regional disparities in risk perception reflect different security requirements and cultural views on risk management that influence the adoption and use of low-code.

Managing security aspects of low-code development

The security concerns surrounding low-code development are wide-ranging and affect various aspects of the development process. Companies can manage the secure use of such platforms internally. Accordingly, 54 percent of the surveyed companies have defined access rights to meticulously regulate the permissions of low-code platforms to company data. Beyond these permissions, control can also be exerted over the specific data that the low-code platforms can access. In this respect, 53 percent of global companies have established internal control mechanisms, and dictate which applications can access which company data. The proportion of US companies, on the other hand, is just 42 percent. This suggests that companies in the United States might have more robust internal control mechanisms or greater trust in their low-code platforms. But even in European companies where high security mechanisms have already been implemented, 58 percent regulate access to corporate data by applications.

Companies from the US have the least security concerns surrounding the use of low-code development platforms.

Security testing and audits

Security testing and audits play a crucial role in overseeing low-code development environments. 52 percent of companies use security testing and audits to oversee their low-code development environments, and one in two companies (50 percent) take inventories of such applications. While the percentage in European companies is 53 percent for audits and 51 percent for inventories, US companies are significantly below average, with 44 percent and 45 percent, respectively. These companies might rely on alternative methods to ensure security or adopt other management strategies that allow for the agile yet secure handling of low-code applications, though.

US companies' lower security concerns

In summary, US companies show fewer concerns in all the mentioned areas compared to the global average. Possible explanations for this divergence could include differences in risk perception, more robust security practices or greater confidence in the low-code platforms they use. However, it does highlight the need for all organizations to continually address the security issues around low-code.



05

05 Increasing relevance of
low-code guidelines
and governance

Increasing relevance of low-code guidelines and governance

05 Increasing relevance of low-code guidelines and governance

As low-code platforms become increasingly integrated into companies, the need to establish guidelines and governance structures to guide and manage low-code initiatives becomes more crucial.

A trend toward low-code governance and guidelines can be observed across all surveyed locations.

It is clear that this topic is being addressed and pushed more intensively by businesses, with nearly 47 percent of the surveyed companies indicating that they either have or plan to have both low-code policies and defined low-code governance in place. A glance at a similar previous study shows that this proportion has risen by 19 percentage points, from a previous figure of 28 percent. This underscores the growing significance of structure and oversight in low-code development, and may reflect the maturity and acceptance of low-code in companies.

A trend towards low-code governance and guidelines

At the same time, just over one in three companies (34 percent) state that they have or plan to have low-code policies but do not have a defined low-code governance. Here too, a noticeable decline of 13 percentage points can be observed, from 47 to 34 percent. This trend suggests that companies recognize the benefits of low-code policies and can presently see the need for stronger and clearly defined governance.

In addition to this, 18 percent of corporate leaders neither have nor plan to have low-code policies or governance, down from 21 percent in the previous study. This indicates that an increasing number of companies worldwide now acknowledge the importance of structure and oversight in the realm of low-code.

Implementation of low-code policies and governance

While companies recognize the necessity for low-code policies and governance, the question arises as to how these policies and governance structures are specifically implemented in practice. Control frameworks for policies and procedures exist in 54 percent of the surveyed companies. Regional differences can be seen in companies in Africa (63 percent), Europe (54 percent) and the US (51 percent). Overall, this finding points to systematic and structured approaches aimed at ensuring that low-code initiatives comply with established standards and procedures.

Additionally, 53 percent of the surveyed companies define clear security requirements and regulations, and another 53 percent conduct regular audits to evaluate policies and procedures. This emphasizes the role of security in low-code development. Companies establish clear guidelines and regulations and take active steps to protect their applications and ensure compliance with these guidelines.



Figure 7:

What measures do you use to implement your low-code guidelines and low-code governance?

- A control framework exists for policies and procedures **54%**
- Defined security requirements and rules **53%**
- Regular audits are conducted to evaluate policies and procedures **53%**
- Defined responsibilities with regular training sessions **52%**
- Applications and APIs must comply with industry standards **49%**
- Defined and tested backup and recovery plans in place **49%**
- Regular review of handling of sensitive data and data retention **47%**
- Annual risk assessments **42%**
- Third-party vendors comply with standards **27%**

Base: 2,000 companies, multiple responses
Source: Low-code adoption as a driver of digital transformation, KPMG International, 2023

05 Increasing relevance of low-code guidelines and governance

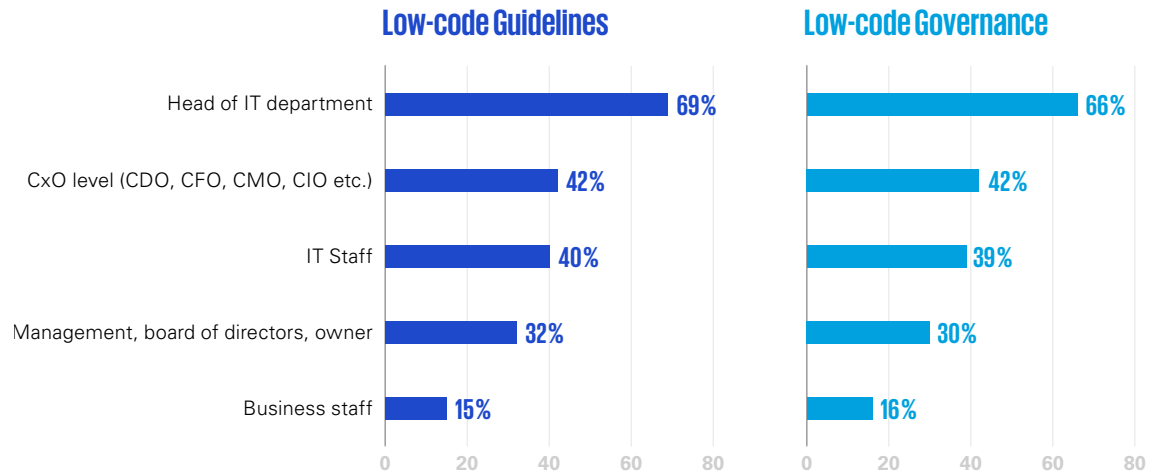
Other measures include ensuring that applications and APIs meet industry standards (49 percent), having defined and tested backup and recovery plans (49 percent), and regularly reviewing the handling of sensitive data and data storage (47 percent).

Who is responsible for what?

The implementation and management of low-code policies and low-code governance in companies require clear responsibilities. The surveyed companies make it clear that heads of IT departments are very often primarily responsible for the compliance and implementation of both low-code policies (69 percent) and low-code governance (66 percent). This emphasizes the technical nature of these platforms and the need for subject experts to lead in this area.

CxO-level executives, including positions such as Chief Digital Officer (CDO), Chief Financial Officer (CFO), Chief Marketing Officer (CMO) and Chief Information Officer (CIO), have significant responsibility for low-code governance and policies in 42 percent of the companies. Given the strategic significance of low-code initiatives, it is imperative for leadership to ensure that they align with the company objectives. IT personnel are also responsible for policies in 40 percent of companies, and for low-code governance in 39 percent.

Figure 8: Who in your company is responsible for compliance/implementation of your low-code governance and who is responsible for your low-code guidelines?



Base: 2,000 companies, multiple responses
 Source: Low-code adoption as a driver of digital transformation, KPMG International, 2023

In summary, these results suggest that the responsibility for low-code policies and governance is situated both at the strategic and operational levels. This reflects the comprehensive importance of low-code in the modern corporate landscape and the necessity to involve both leadership and technical experts in the process.

06

Regional challenges in using low-code

06 Regional challenges in using low-code

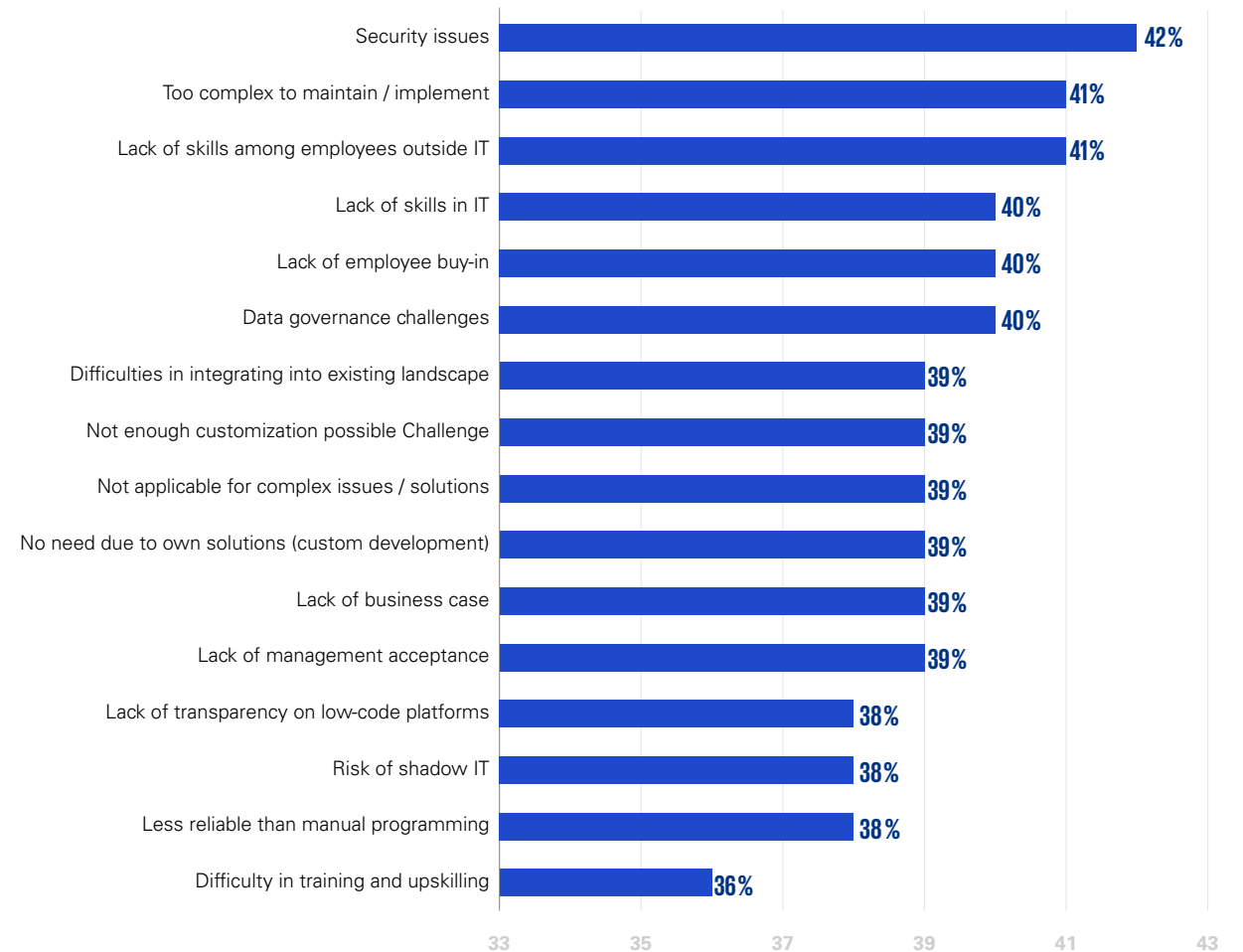
06 Regional challenges in using low-code

In the contemporary digital landscape, many companies are looking for ways to accelerate and simplify their software development processes. Low-code development platforms have emerged as a promising method to achieve just that. However, despite the numerous advantages, there are also challenges that companies must face when dealing with this development approach.

Security concerns

As previously noted, potential security concerns top the list of challenges for 42 percent of companies, although these tend to be less pronounced among companies in the US (38 percent) and Europe (40 percent). This is understandable, as security is of paramount importance in today’s world, and companies must ensure that their low-code platforms meet the highest security standards. In addition, 41 percent of business leaders consider the complexity associated with the maintenance and implementation of low-code solutions to be a challenge. This is rated highest by companies in the ASPAC region (50 percent) and lowest in Europe (39 percent). Although low-code platforms are often touted as easy to implement and maintain, it can sometimes be challenging to efficiently integrate these solutions into existing IT infrastructures and processes, a concern voiced by 39 percent of those in charge.

Figure 9:
What challenges can you see when using low-code development in your company?



Base: 2,000 companies, multiple responses
Source: Low-code adoption as a driver of digital transformation, KPMG International, 2023

06 Regional challenges in using low-code

Skills and competencies gap

An additional challenge is the skills and digital competencies gap among employees outside the IT department, which concerns 41 percent of companies. Moreover, 40 percent express reservations due to insufficient IT knowledge among staff. While more than half of ASPAC companies (51 percent) and 40 percent of European companies see digital skills as a challenge, only one in three companies from Africa (33 percent) considers this as problematic. Although low-code platforms can simplify development processes, users still need to have a basic understanding of such processes. Therefore, even with low-code, there are learning curves that businesses must take into account from a corporate perspective.

43 % of European companies consider the lack of customization options in low-code as a challenge, whereas only 32 percent of US companies share this view.

Usability for complex problems

For nearly 39 percent of the surveyed business leaders, low-code is not usable for complex problems and solutions. Along similar lines, another 39 percent view the limited customization and personalization capabilities offered by low-code platforms to be a challenge.



Only 32 percent of companies in the United States feel limited in this respect, while in Europe, over 38 percent expressed concerns in this area. This implies that European companies may be looking for more advanced customization features from low-code platforms to address their specific needs.

Lack of transparency, management acceptance, and shadow IT

Other potential challenges include a lack of transparency (39 percent), lack of management acceptance (39 percent), and the risk of shadow IT (38 percent). These challenges can impede the adoption of low-code in companies.

Overall, these regional differences underscore the need for the providers of low-code platform to design their solutions to meet the specific requirements and infrastructures in different regions. It also indicates that the flexibility and adaptability of low-code platforms will continue to be crucial factors in terms of their acceptance and successful implementation in companies worldwide.

07

Convergence of low-code and modern technologies

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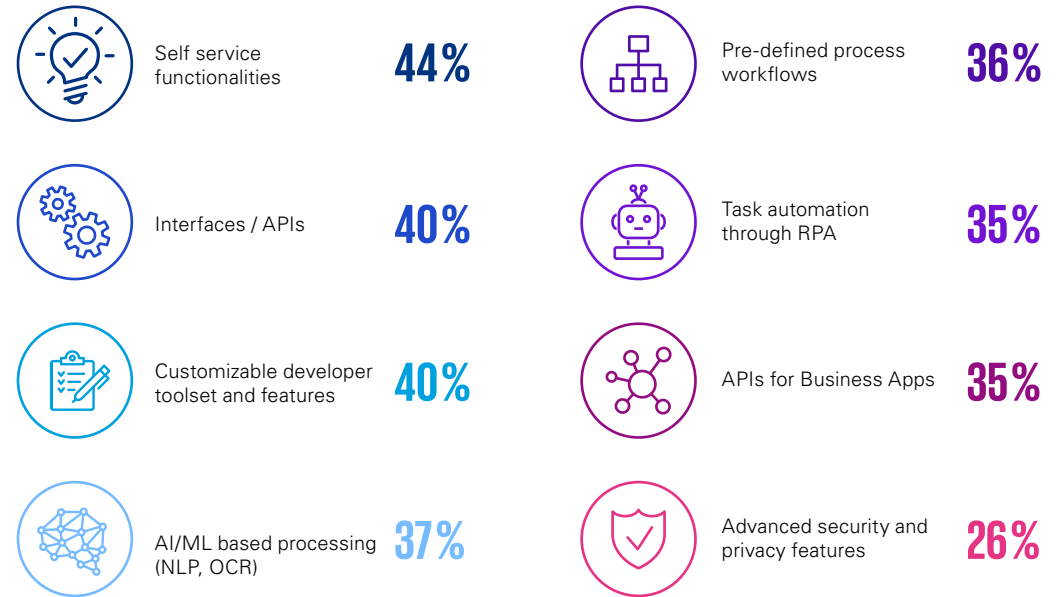
In the ever-evolving technology landscape, low-code platforms are poised to transform the way in which software applications are developed. This simplicity can be linked and enriched with other technologies in the course of digital transformation. For instance, artificial intelligence has revolutionized the technological landscape globally in recent years. Thus, companies can automate their processes using AI, improve decision-making processes, and achieve higher levels of efficiency. When combined with low-code platforms, AI can profoundly change the way in which software is developed. Only 12 percent of the surveyed companies indicate that they do not engage or wish to engage with the AI topic in the context of low-code. Therefore, the subject of artificial intelligence is of potential interest to 88 percent of business leaders.

AI and low-code integration

More than half of the surveyed companies (54 percent) are actively using AI and low-code for specific applications, such as sentiment analysis and documentation. This demonstrates that the combination of AI and low-code not only offers value in theory but also in practice, and is actively used by many companies. Companies in Europe (55 percent) and the ASPAC region, with a share of 61 percent, are particularly active in this area.

More than one in two companies already actively uses artificial intelligence in combination with low-code for specific applications.

Figure 10: What functionalities are missing in low-code platforms that you would like to use?



Base: 2,000 companies, multiple responses
Source: Low-code adoption as a driver of digital transformation, KPMG International, 2023

Exploration and research

Some 47 percent of surveyed business leaders are exploring the opportunities for collaborations between AI and low-code. This suggests that many companies recognize the potential of AI combined with low-code but are still in the evaluation or decision-making phase.

Future plans for AI

Just under half of the companies (47 percent) plan to leverage AI, particularly generative AI, to support low-code application development. This reflects a clear expectation from companies regarding the future possibilities of AI in low-code development.

Integration of other modern technologies

Overall, the integration of AI into low-code development platforms is set to become increasingly crucial in the years to come. Many companies are already starting to recognize the potential of these synergies. In addition to AI, however, there are many other modern technologies that can potentially be combined with low-code. There is a need for specific functionalities that meet the current technological trends and requirements. By integrating these new functionalities, low-code platforms could not only become more efficient, but also more attractive to developers.

Desired functionalities

Approximately 44 percent of the surveyed companies consider self-service functionalities to be particularly relevant and want these features to form part of user-friendly platforms. Interfaces and APIs (40 percent) as well as customizable development tools and functions (40 percent) also have a high priority, indicating a need for flexibility and expandability in low-code platforms. Additionally, 37 percent of corporate decision-makers indicate that they need AI and machine learning-based processing (NLP, OCR) and 35 percent require task automation through robotic process automation (RPA). This refers to systems that automate routine and repeatable business processes.

Potential integrations

In addition to AI/ML-based processing and task automation through RPA, there are several other areas of technology that can be integrated into low-code platforms via APIs to meet the need for flexibility and expandability. Blockchain technology, for example, could enable the development of decentralized applications and smart contracts. Similarly, by integrating with IoT platforms, real-time applications could be created that collect and process data from connected devices. Connecting to cloud services expands the capacities of low-code applications in terms of storage and computing power. And while big data and data analysis tools support the efficient processing of large amounts of data, chatbots and natural language processing could enhance user communications and interactions.

Future significance

In summary, the integration of AI and other technologies into low-code development platforms is expected to become increasingly crucial in the coming years. Companies are already recognizing the potential of these synergies, and the convergence of low-code with modern technologies will play a pivotal role in the future of software development.



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Low-code in corporate practice

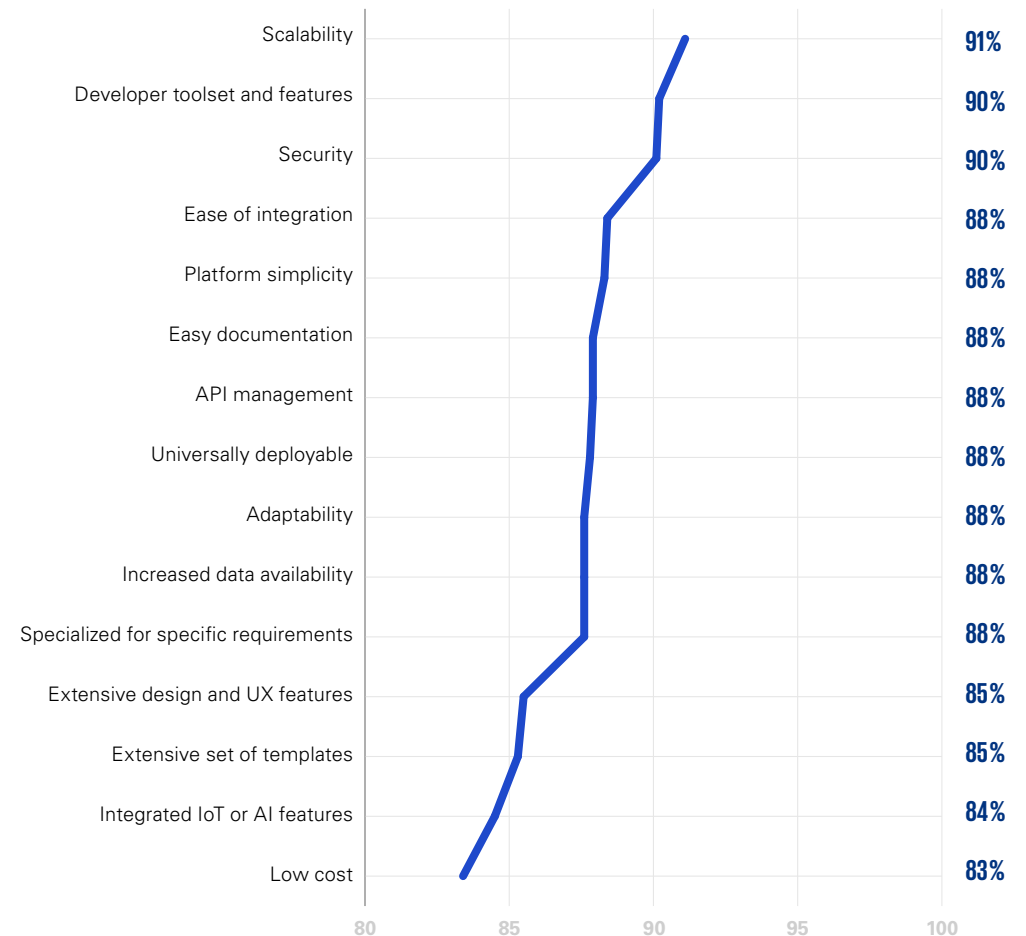
08 Low-code in corporate practice

The increasing importance of low-code platforms is largely because applications can be developed more quickly and with less manual coding. In business environments in particular, where agility and rapid adaptability are of paramount importance, low-code platforms offer an attractive solution. Yet what criteria are decisive for companies when deciding on such a platform?

Product-specific factors play an increasingly important role in the decision for a low-code platform.

When choosing a low-code platform, corporate decision-makers place considerable value on a variety of factors. Here are the key findings: for 91 percent of respondents, scalability is the top priority. This means low-code platforms must be able to keep pace with the growth and changing requirements of a company. Therefore, decision-makers are looking for solutions that are useful in the initial phase and scalable and adaptable over time.

Figure 11:
How important are the following factors for you when deciding on a low-code platform for your business?



Base: 2,000 companies, multiple responses
Source: Low-code adoption as a driver of digital transformation, KPMG International, 2023



Top priorities when deciding on a low-code platform

Scalability

For 91 percent of respondents, scalability is the top priority. Low-code platforms must be able to grow and adapt with a company's changing requirements, making solutions that are initially useful and easily scalable over time highly desirable.

Security

Security is a crucial factor for 90 percent of decision-makers. Companies prioritize platforms that ensure the safety of their data and applications.

Comprehensive developer toolset and features

A comprehensive set of developer tools and features is also essential for 90 percent of those surveyed. Decision-makers are looking for platforms that provide the necessary tools for developing robust and powerful applications.

Other important factors

Additional relevant product-specific factors, each cited by 88 percent of respondents, include the simplicity of the platform, ease of integration, the presence of straightforward documentation and versioning, as well as backend integration and API management. Relatively less critical but still highly relevant, those in charge see integrated IoT or AI features (85 percent) and costs (83 percent). Thus, fundamental factors such as functionality, security, and scalability are clearly at the forefront.

Compared to a previous study, it's evident that all these factors have significantly increased in importance. Companies now place a higher value on a balanced combination of functionality, security, and user-friendliness when selecting a low-code platform.

Enterprises plan to use low-code platforms from Microsoft Power Apps (55 percent), Oracle (48 percent) and Salesforce (41 percent).

Commonly used low-code providers

When it comes to the planned use of low-code development platforms, the results show clear differences in the planned use of the respective providers. Around 55 percent of the surveyed companies plan to use or consider the Microsoft Power Apps platform. This underscores the strong market presence and the trust companies place in the Microsoft platform. In second place for planned or preferred platforms is Oracle (48 percent) followed by Salesforce (41 percent). These two providers are also well-known in the technology sector and offer comprehensive low-code solutions that evidently resonate with many companies. Other providers such as ServiceNow (31 percent), OutSystems (23 percent), and Appian (22 percent) are also considered by a significant number of companies.

Overall, the results highlight that companies tend to favor a mix of established technology firms and specialized providers when choosing their low-code development platforms.

Figure 12:
Which providers of low-code development platforms/tools do you plan to use?

	Total	Europe	Middle East	Africa	USA	ASPAC
Microsoft Power Apps	55%	51%	57%	61%	56%	58%
Oracle	48%	43%	50%	48%	52%	48%
Salesforce	41%	40%	35%	32%	49%	35%
ServiceNow	31%	30%	34%	23%	31%	34%
OutSystems	23%	20%	33%	33%	18%	29%
Quickbase	22%	21%	26%	25%	17%	28%
SAP BTP	22%	24%	29%	22%	15%	27%
Appian	20%	15%	27%	39%	18%	24%
Mendix	20%	21%	23%	21%	16%	24%
MGM	20%	20%	27%	15%	18%	23%
Intrexx	20%	18%	18%	27%	21%	17%
Pega	19%	18%	23%	20%	17%	20%
Unqork	13%	11%	19%	14%	13%	16%
Others	2%	2%	0%	5%	2%	1%
Base	2000	600	150	150	700	400



Base: 2,000 companies, multiple responses
Source: Low-code adoption as a driver of digital transformation, KPMG International, 2023

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Conclusion

09 Conclusion



In the dynamic landscape of digital transformation, companies are faced with the urgent need to optimize their IT and development processes and actively drive innovation. Low-code development platforms have emerged as pivotal tools to meet the demands of the modern business world.

These platforms, by accelerating application development, empower companies to respond swiftly to market demands and realize significant cost savings. The results presented make it clear that a company's successful strategic orientation is supported by low-code. IT staff are thus relieved and can devote themselves to other important tasks.

However, this also makes it increasingly difficult for companies to ensure optimal compliance and governance. When introducing low-code, it is essential to implement policies and governance structures to ensure that developed applications are secure and comply with company standards.

Overall, companies must select the respective low-code platform based on specific business requirements. Investing in training for IT teams can facilitate the transition to low-code and increase efficiency. Integration should also be at the forefront to ensure that the chosen platform can be seamlessly integrated into the existing IT infrastructure.



In view of the growing importance of security aspects, it is essential that companies focus more on the topic of security. The implementation of clear governance structures is particularly advisable in order to ensure a high level of security throughout the entire development process.

In summary, low-code platforms offer transformative opportunities for companies to strategically position themselves and effectively address both internal and external challenges. Through strategic planning and implementation, companies can benefit from the advantages and secure a competitive edge in an increasingly complex market environment.

09 Conclusion

Study design and sample

This study „Low-code adoption as a driver of digital transformation“ was designed and conducted in May/June 2023 by techconsult GmbH on behalf of KPMG AG Wirtschaftsprüfungsgesellschaft. For this purpose, 2,000 user companies that develop software themselves or have it developed for their company by external service providers were surveyed. The survey focused on the use, development and challenges, trends, and requirements of low-code platforms and their role in the provision of modern applications in companies. The resulting findings are described in this study.

Figure 13:
Your company headquarters are located in which region?

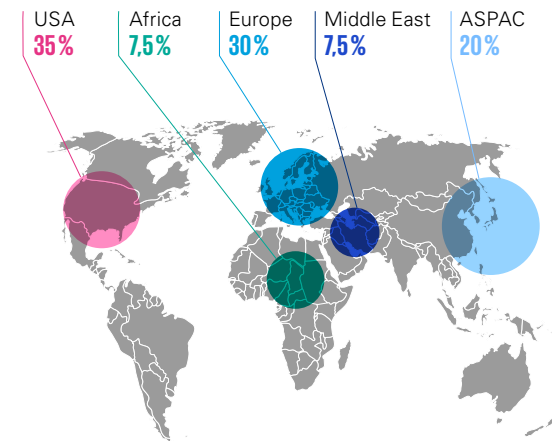


Figure 14:
Which industry should your company be assigned to?

- Industry (incl. Chemistry, Pharma) **8%**
- Healthcare **4%**
- Banks and insurance companies **13%**
- Trade **5%**
- Service (incl. Research and development, Agriculture and food research) **8%**
- Information/Communication Technology **50%**
- Energy and water supply **3%**
- Transport and logistics **8%**
- Public administration **2%**

Figure 15:
What is the total number of employees in your company?



Base: 2,000 companies, rounding differences possible
Source: Low-code adoption as a driver of digital transformation, KPMG International, 2023

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