Development Maturity in Nordic Organizations:

New Operating Models Are Needed to Improve Overall Efficiency

An IDC Nordic Executive Brief

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Speed and cost of change has become the most critical success metric in the digital world, and this has increased the need for continuous improvement of development and deployment capabilities.

At Tietoevry, we see a market shift from mere adoption of modern technologies to evolving operational models, and a larger shift toward the "cloud-native" concept of providing all IT services at scale. The main indicators are the adoption of software engineering

agile methodologies, now encompassing infrastructure services, the extensive use of elastic cloud services through APIs, and having both development and operations using common tools and processes.

As this analysis suggests, platform engineering and site reliability engineering (SRE) are the next iteration to improve overall efficiency and as such, a critical part of the larger shift toward providing all IT services at scale.

Executive Summary

A mature approach to development and deployment is critical for developer productivity and business performance.

This analysis, based on a survey of more than 300 IT decision makers in Sweden, Finland, and Norway, advises that organizations become more mature in their approach to development and deployment to support an increasingly digital business.

Developer productivity is increasingly important as organizations across all industries and size segments operate in increasingly digitalized environments. The survey found that IT and business executives acknowledge that issues related to developer productivity have a negative impact on business performance and that becoming more mature in their development and deployment procedures has a positive impact on developer efficiency.

Maturity depends on how development and deployment is aligned with the business, which technologies are used, how the technologies and tools are adopted, and which operating models are employed.

Along with hiring additional developers, technology adoption and new operating models such as agile and DevOps have improved developer productivity in recent years. To ensure that continues, organizations are increasingly seeking to reskill and upskill their current developers, extend the operating models to site reliability engineering and platform engineering, and reassess the ways developers are enabled to work efficiently.

Organizations need to assess and evolve all aspects — strategy, technology use, and operating models — to improve their efficiency. Technology adoption is not enough, however, as new operating models depend on underlying modern technologies and a strategic commitment and acceptance that developer productivity is paramount for the organization to remain competitive in a digitalized world.
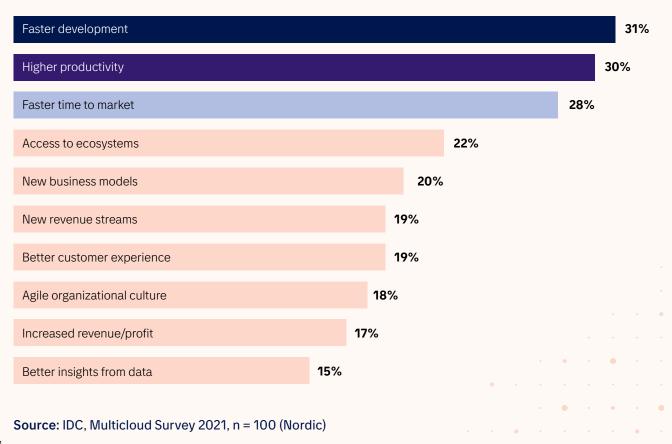
Cloud Is About Developer Productivity

Recent studies have documented how cloud is a critical pillar to digitally transform businesses (Toward a Data-Driven Future) and how cloud management, orchestration, and automation have become essential for a cloud environment that spans multiple deployment models, locations, and service providers (Multicloud Is the New Norm for Digital Infrastructure in the Nordics).

Cloud is increasingly about business and operating models. How can cloud technologies in combination with frameworks and principles such as DevOps, centers of excellence, and platform engineering be used to enhance developer productivity and improve business agility?

The term cloud computing was coined a quarter of a century ago, but the characteristics of cloud and the advantages of using cloud continue to evolve. This also means that what you need to do to get the most out of your cloud investments continuously changes.

In the earlier days of cloud, the primary advantages were cost savings and shifting capital expenses to operational expenses. Cost, of course, remains a key factor, but the main advantage of adopting cloud has shifted to improving efficiency and reducing time to market.

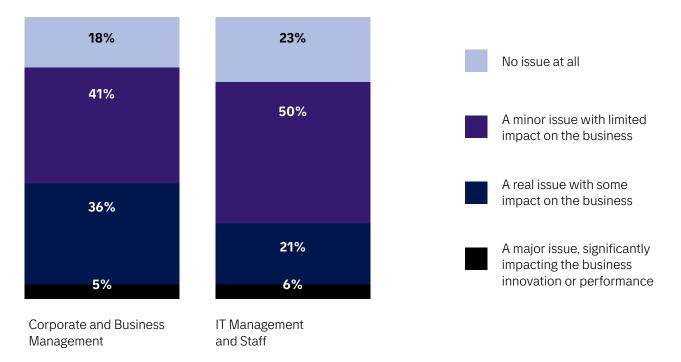## Figure 1: Business Outcomes of Migrating to Cloud

Q. Which positive business outcomes has your organization achieved from migration to public cloud?

Outcome	Percentage
Faster development	31%
Higher productivity	30%
Faster time to market	28%
Access to ecosystems	22%
New business models	20%
New revenue streams	19%
Better customer experience	19%
Agile organizational culture	18%
Increased revenue/profit	17%
Better insights from data	15%

Source: IDC, Multicloud Survey 2021, n = 100 (Nordic)

IDC's Multicloud Survey 2021 found that the three main benefits of migrating to cloud are faster development of applications and digital services, higher productivity in IT or the business, and faster time to market with new products or services. This highlights how cloud has changed and that developer productivity is directly tied to business outcomes.

Figure 2: The Impact of Developer Productivity on Business Performance

Q. To what extent is developer productivity an issue in your organization?

Corporate and Business Management

IT Management and Staff

- No issue at all
- A minor issue with limited impact on the business
- A real issue with some impact on the business
- A major issue, significantly impacting the business innovation or performance

Source: IDC, Nordic Developer Productivity and Maturity Survey, December 2021, n = 305
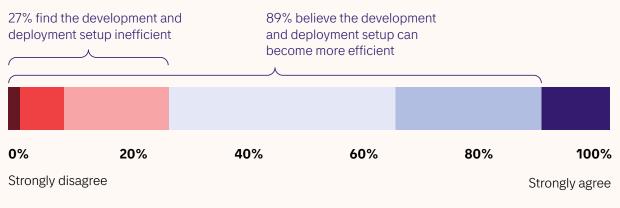
In IDC's Nordic Developer Productivity and Maturity Survey, just under 80% of surveyed IT decision makers acknowledge that developer productivity is an issue that negatively impacts the business. The fact that so many struggle with insufficient development capabilities accentuates the business' dependency on digital services and that the shift to a digital-first business is complex and challenging.

Corporate and line-of-business management are more likely than IT management and IT staff to experience or acknowledge the issues. This emphasizes that there is a genuine impact from challenges related to developer productivity and business outcomes, and that there is a need to improve development capabilities. It also indicates that IT management does not have complete insight into how developer productivity impacts the business outcomes.

Developer Efficiency Depends on Overall Maturity

Generally, companies look to achieve efficiency with different development and deployment capabilities. However, almost 9 out of 10 respondents in the survey acknowledge that improvements can be made.

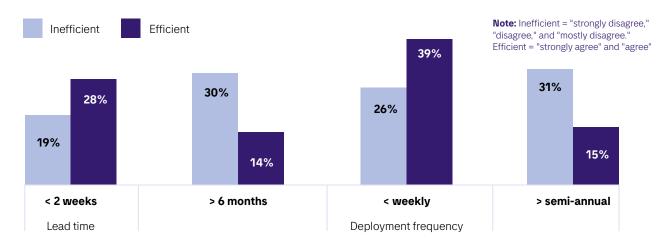## Figure 3: Perceived Efficiency of the Development and Deployment Capabilities

"The development and deployment setup in my organisation is efficient"

27% find the development and deployment setup inefficient

89% believe the development and deployment setup can become more efficient

| 0% | 20% | 40% | 60% | 80% | 100% |

Strongly disagree

Strongly agree

Source: IDC, Nordic Developer Productivity and Maturity Survey, December 2021, n = 305

Perceived efficiency reflects actual efficiency well, as those that find the setup efficient have both shorter lead times and higher deployment frequencies. For example, for those that perceive the development setup to be efficient, 28% have a lead time of less than two weeks and 39% have weekly deployments, compared with 19% and 26% respectively for those that perceive the setup to be inefficient.

Figure 4: Leadtime and Deployment Frequency Depending on Perceived Efficiency

Inefficient   Efficient

Note: Inefficient = "strongly disagree," "disagree," and "mostly disagree." Efficient = "strongly agree" and "agree"

	< 2 weeks	> 6 months	< weekly	> semi-annual
Inefficient	19%	30%	26%	31%
Efficient	28%	14%	39%	15%

Lead time   Deployment frequency

Source: IDC, Nordic Developer Productivity and Maturity Survey, December 2021, n = 305

The survey also shows that both the perception of efficiency and actual efficiency vary by industry. Overall, we see that industries such as finance, IT, and communications are the most efficient with both low leadtimes and fast deployment frequencies. Energy/utilities, transport/logistics, and retail/wholesale also have reasonably fast deployment frequencies but lengthy leadtimes. In particular, healthcare/welfare, manufacturing, and the public administration lag other industries in deployment frequency.

Perceived efficiency largely reflects the actual lead times and deployment frequencies. However, especially in finance, the perceived efficiency is relatively low, while it is higher than one would expect in manufacturing and public administration. The reason is the different market conditions in the different industries. In finance the "efficiency bar" is set by digitally native fintech organizations, while in manufacturing and the public sector the comparisons are with more traditional peers.
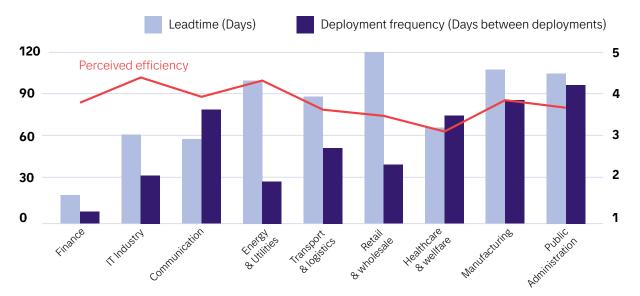
Figure 5: Development Efficiency by Industry

The most decisive factor for efficiency, however, is the overall maturity. This is a function of strategic alignment, technology use, and operating model adoption. There is a clear correlation between deployment frequency and maturity as organizations in the most mature decile have an average deployment

frequency of two weeks, while in the least mature segment this is more than two months. Average lead times are more than twice as long among the least mature organizations than among the most mature, and we find an almost linear correlation between maturity and perceived lead time.
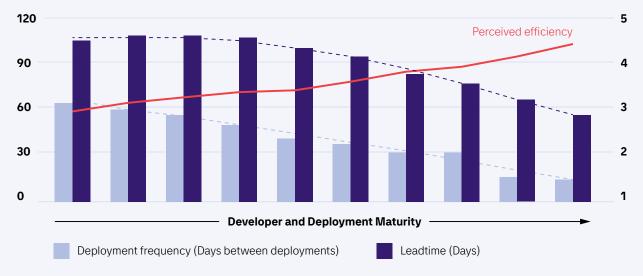
Figure 6: Development Efficiency Depending on Overall Maturity

Source: IDC, Nordic Developer Productivity and Maturity Survey, December 2021, n = 305

To reiterate, the survey shows that maturity in development and deployment is the most decisive factor for the development efficiency and that to improve efficiency, organizations need to become more mature — in the strategic alignment, technology adoption, and operating models used.

Maturity: A Combination of Strategy, Technology, and Operating Models

Maturity is decided by how development capabilities are integrated and aligned with the business, which technologies and tools are adopted, and which operating models and ways of working are employed.

The survey reveals that few organizations have a maturity score at 1 or above 4, and that the most common score is around 2. This means that we have a relatively small group of organizations with a very immature approach, but also that a very few have been able to take full advantage of all the possibilities to improve and optimize their development and deployment setup.
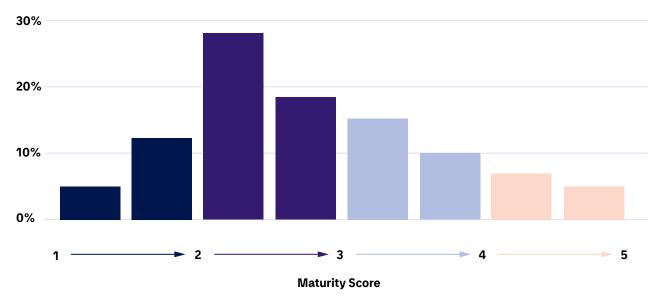
Figure 7: Share of Organizations Depending on Maturity Score

Source: IDC, Nordic Developer Productivity and Maturity Survey, December 2021, n = 305

A high overall maturity level can only be achieved by having a strategic focus, using the right technologies, and implementing appropriate operating models. Comparing the different maturity levels, we find that strategic alignment is the key differentiator in the early maturity stages, technology use is key in the middle stages, and it is the operating models applied that separate the top maturity segments from the rest. This does not mean there is a generic set order in which different initiatives should be taken, but that the maturity of development and deployment is a journey that typically starts with acknowledging the business value of development capabilities and aligning these in the wider business, followed by adoption of new architectures and tools, before changing work processes, collaboration forms, and employee responsibilities to achieve the highest possible level of maturity.

Business Alignment

The degree to which development and deployment processes are aligned with the business ranges from no formal structures to fully integrated and aligned with the business strategy. Most organizations have an approach in between these two extremes, but overall we find that the maturity in terms of business alignment is rather low. As many as 40% do not have a companywide structured approach, and an additional 30% lack alignment with the business.

Figure 8: Business Alignment of Development and Deployment

Q. Which of the following best describes the software development and deployment processes in your organization?

15%	**25%**	**30%**	**12%**	**18%**
Pockets of software development activity as and when needed — no formal structure or approach	Many siloed software development initiatives across the organization — a more formal approach but lack of scale and integration	Integrated software development initiatives across the organization — more structured approach including more formal programs	Industrialized and integrated software development capabilities with some business alignment	Unified software development capability across the entire organization with full alignment to the business strategy

Source: IDC, Nordic Developer Productivity and Maturity Survey, December 2021, n = 305

Integration and business alignment are heavily dependent on the maturity level. Organizations with pockets of development only are primarily found in the least mature decile, where they make up more than 80%. Organizations with industrialized or unified development account for the largest share in the top 20% tier only.

Figure 7: Share of Organizations Depending on Maturity Score

Source: IDC, Nordic Developer Productivity and Maturity Survey, December 2021, n = 305
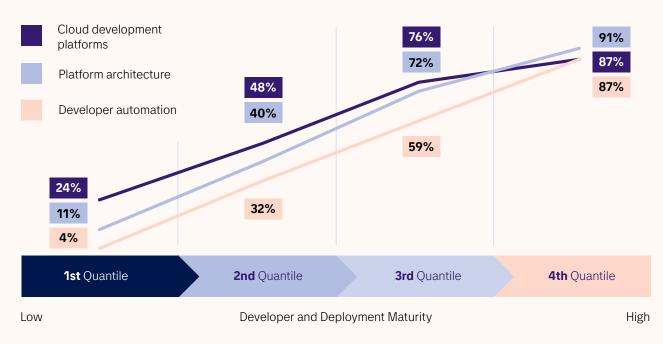
Technology Adoption

Nordic organizations' use of cloud is both prevalent and advanced. Organizations do not just shift workloads to the cloud but employ multiple deployment models and modernize workloads to fully benefit from the possibilities offered by cloud technologies. The advanced approach to cloud is accentuated in this survey, showing that as many as 60% have adopted cloud-native technologies such as containers, microservices, APIs, and functions or use cloud development platforms.

Adoption of code management and collaboration as well as platform architectures is almost at the same level, while automation of deployment, test, or dependency management — and especially the use of no-code/low-code tools — is at a lower level.

For all technologies we see that use is often limited, indicating that many organizations are on a journey to evolve the development and deployment capabilities. The high level of interest in using technology supports this argument.

Figure 10: Adoption of Selected Technologies by Maturity

Q. Does your organization use the following technologies related to the development and deployment processes?

Legend:
- Cloud development platforms
- Platform architecture
- Developer automation

Data points:
- Cloud development platforms: 1st Quantile 24%, 2nd Quantile 48%, 3rd Quantile 76%, 4th Quantile 87%
- Platform architecture: 1st Quantile 11%, 2nd Quantile 40%, 3rd Quantile 72%, 4th Quantile 91%
- Developer automation: 1st Quantile 4%, 2nd Quantile 32%, 3rd Quantile 59%, 4th Quantile 87%

1st Quantile | **2nd** Quantile | **3rd** Quantile | **4th** Quantile

Low — Developer and Deployment Maturity — High

Source: IDC, Nordic Developer Productivity and Maturity Survey, December 2021, n = 305
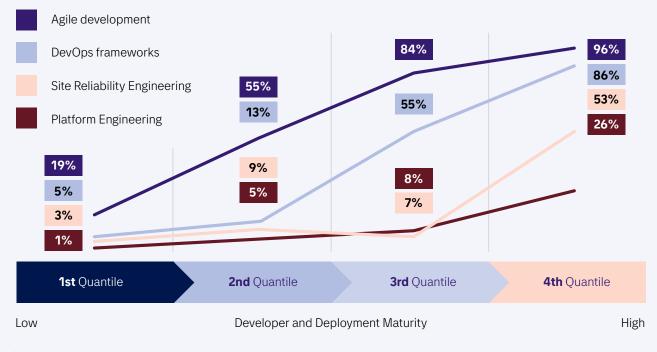
Across all technologies, we find higher adoption rates among the more mature organizations. For example, we see that automation of deployment, test, or dependency management is embraced only by 4% of the 25% with the lowest overall maturity, but by 87% of the 25% with the highest overall maturity.

Operating Models

Regarding the surveyed operating models and standards, we also find substantial differences in overall use. Agile development principles are used to various degrees by nearly two-thirds of organizations, while just 10% have adopted platform engineering. As with the technologies, operating models are often used to a limited degree only — again emphasizing that the maturity of development and deployment is gradually evolved by adopting new technologies and processes as well as by extending the use.

Figure 11: Adoption of Selected Operating Models by Maturity

Q. Has your organization adopted the following principles related to the development and deployment processes?

Source: IDC, Nordic Developer Productivity and Maturity Survey, December 2021, n = 305

The adoption of operating models also varies with the overall maturity. Agile development principles, for example, are used by virtually every organization among the 25% most mature, but by only 19% of the 25% least mature. DevOps is rarely adopted by the least mature half is but prevalent in the most mature half. Also, looking at the less prevalent principles — site reliability and platform engineering — only the most mature organizations have embraced these. Therefore, for the less mature companies, site reliability engineering and platform engineering provide an opportunity for further maturity improvement.

All in all, we find that the differences between the least and the most mature organizations are immense, and that while an organization can become more mature by better integration of development capabilities and broader technology adoption, becoming even more mature also necessitates a change in work processes and operating models.
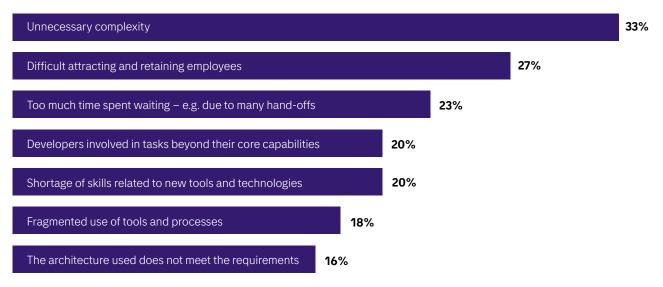
Maturity Enhancement Means Extending Focus to Operating Models

There is no doubt that organizations with a mature development and deployment approach are more productive and efficient. However, this does not equate to developer productivity issues having less impact on the business. One reason is that more mature organizations are typically more dependent on the digital business, so the consequences of an issue are more profound.

The main challenges inhibiting developer productivity relate to complexity, access to skills, and inefficient use of developers' time. Complexity and attracting

employees are core challenges regardless of maturity. In addition, the less mature struggle with inefficient processes and lack of relevant tools and collaboration. The more mature, on the other hand, are hampered by not having access to the necessary technical skills and by dealing with various types of compliance requirements, as they embrace more modern technologies and have development closely integrated with the overall business.

Figure 12: Challenges Inhibiting Developer Productivity

Q. What are the primary challenges inhibiting developer productivity?

Challenge	
Unnecessary complexity	33%
Difficult attracting and retaining employees	27%
Too much time spent waiting – e.g. due to many hand-offs	23%
Developers involved in tasks beyond their core capabilities	20%
Shortage of skills related to new tools and technologies	20%
Fragmented use of tools and processes	18%
The architecture used does not meet the requirements	16%

Source: IDC, Nordic Developer Productivity and Maturity Survey, December 2021, n = 305

Today's challenges cannot be solved by using last year's approaches. Overall, we find that hiring more developers and training the existing ones have been critical for overall developer capacity and productivity in recent years, together with adopting cloud architectures.
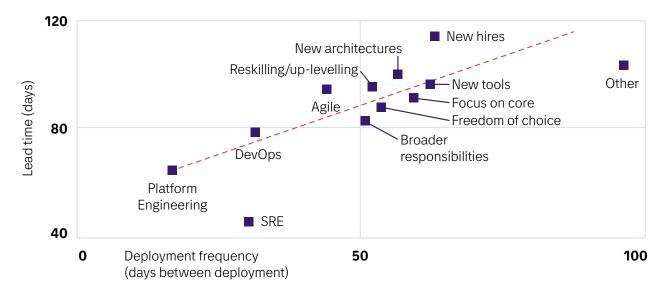
Different factors have helped the different maturity groups improve developer productivity. The most mature organizations emphasize more factors than the less mature ones, showing that the more mature acknowledge that further improvements require multiple efforts. Adoption of cloud architectures and embracing agile and DevOps in particular have contributed the most to the more mature organizations.

Improvements in the less mature organizations have been fueled by adopting new tools and by changing

developers' tasks and responsibilities — by giving them broader responsibilities or greater focus.

Comparing current developer productivity with the factors that have contributed the most, we find that those who have benefited from SRE and platform engineering have the shortest lead times and fastest deployment times. This does not mean that all organizations will benefit from immediately adopting these, but that they are needed to continue to improve once the relevant technologies and processes have been put in place. Mature organizations in particular need to look to explore and adopt SRE and platform engineering to continue the maturity journey and further improve developer productivity.

Figure 13: Developer Productivity Depending on Recent Initiatives to Improve
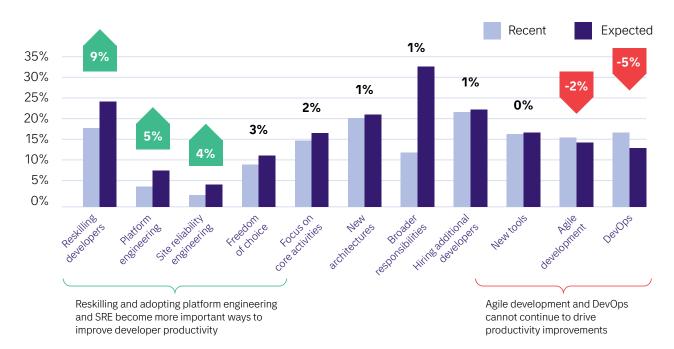

Source: IDC, Nordic Developer Productivity and Maturity Survey, December 2021, n = 305

Improving developer productivity is not an easy task. More than half of the respondents in the survey find that improving developer and deployment efficiency is difficult, and nearly 80% acknowledge that it is a complex process involving deploying new technologies and changing processes and organizational structures.

Many of the same factors that have improved developer productivity in recent years are expected to ensure further improvements in the coming years. However, there are exceptions — the most notable is the expectation that reskilling and upskilling developers becomes the most important factor. The reason is that hiring new employees becomes increasingly difficult as demand for developer skills

clearly surpasses supply. This also means that retaining employees becomes increasingly difficult, and upskilling and reskilling may prove insufficient to secure the necessary developer resources, and companies need to consider outsourcing parts of the development activities.

There is also a shift from working principles toward the work of the individual developer. Relatively few expect DevOps and agile principles to continue to drive improvement, while there are growing expectations to change developers' responsibility — enabling them to focus while expanding the use of site reliability engineering and platform engineering.

Figure 14: The Change in Relevant Factors Improving Developer Productivity from Recent Compared to Coming Years

Q. Which of the following have had/will have the largest impact on improving eveloper productivity in recent/coming years?
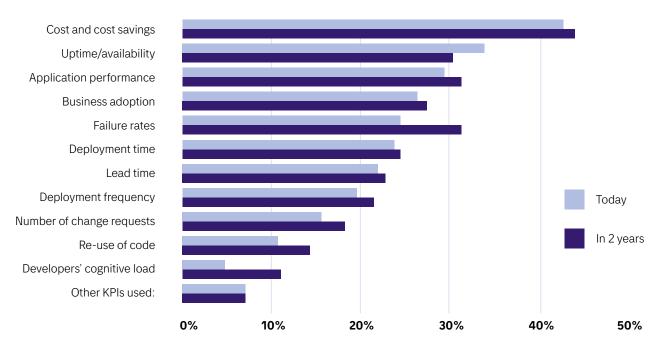

Reskilling and adopting platform engineering and SRE become more important ways to improve developer productivity

Agile development and DevOps cannot continue to drive productivity improvements

Source: IDC, Nordic Developer Productivity and Maturity Survey, December 2021, n = 305

Implement the Right KPIs to Assess Progress

Improving development and deployment capabilities and efficiency requires organizations to make progress on multiple parameters. Adoption of new tools must go hand in hand with the implementation of new processes, developing new roles and responsibilities for the individual developer, and integrating and aligning the development process with the business strategy.

To progress, it is essential to understand and assess the current performance — and measure this with KPIs that underpin the direction that the organization has set.

Development and deployment capabilities are typically assessed from a resource and IT point of view, such as cost, availability, and performance. However, more development-centric KPIs such as lead times and deployment frequency are also being put in place, while a developer-centric KPI such as cognitive load is rarely used.

Figure 15: The Use of KPIs to Assess Developer and Deployment Capabilities

Q. Which KPIs does your organization use to measure the cost, value and performance of the application delivery/development and deployment today, and how do you expect it to be in two years?

More mature and efficient organizations tend to use more KPIs than less mature and efficient organizations. They do not stop assessing cost or availability, but add KPIs about application performance, deployment frequency, reuse of code, and even developers' cognitive load.

Conclusion

Developer productivity is essential for organizations to remain competitive and relevant in an increasingly digital world, and organizations must change the way they set up development and deployment capabilities to address current challenges and continue to evolve the capabilities.

This means becoming more mature — aligning and integrating development capabilities with the business, taking advantage of new technologies, and embracing new ways of working.

The most mature — and most efficient — organizations already realize that continued progress comes from evolving the operating models and continuing the evolution from agile and DevOps to also embrace SRE and platform engineering.

About the Study

This document was written by Anders Elbak, associate director at IDC Nordic, and presents the results of a survey conducted by IDC Nordic for Tietoevry in December 2021. The survey aimed to provide insights on how development setup impacts business outcomes and what organizations must do to become more mature and efficient.

The survey includes 300 decision makers and influencers across IT and business in medium and large organizations in Finland, Norway, and Sweden. The survey process — from questionnaire design to data analysis and interpretation — was managed by IDC to ensure that the results are valid and the conclusions unbiased.

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