

THE FUTURE OF INNOVATION:

Perfecting Software Delivery for a Digital Economy

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Executive summary

The ability to rapidly develop digital innovation is clearly recognised as a core competitive requirement. Software is central to digital innovation and organisations must become software producers at increasing speed and scale. Digital innovation factories and supply chains are the new organisation imperatives to help drive digital resilience. Digital innovation and application delivery ambitions are stifled due to lack of integration into legacy application environments, lack of business integration, high levels of manual work, the quality of data and insights, and access to relevant skills.

Digital innovation at scale is hard. This ebook is intended to help organisations prepare for digital innovation excellence. It focuses on how to drive your digital innovation agenda; adjust your technology, processes and skill sets, and place digital innovation capability as a strategic business differentiator.

What you will learn from this ebook

1

Understanding digital innovation excellence

3

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5

Scaling and optimising digital innovation capabilities

2

How to approach automation

4

Organising for cloud native

This should be a blueprint for optimising your technology, processes and skill sets to implement digital innovation excellence in a phased manner by:

- Designing a consistent automation strategy that makes use of DevOps practices to drive an automation-first mentality
- Integrating and orchestrating cloud and non-cloud assets to drive new value-add
- Optimally managing cloud operations and building 360-degree observability and control
- Developing and nurturing an internal culture that obsesses about efficiency and agility improvement
- Building cohesion and reuse across teams to drive synergies at enterprise scale

Why are software development and delivery capabilities central to the new organisational reality?

1. Digital dominance: European GDP is digitally driven

2020 has been a catalyst for change driven by unprecedented global disruption. Across Europe organisations are winning or losing based on their digital capabilities and their ability to respond to the immediate need to innovate and adapt operations, processes and culture. Now more than ever creating customer value is tied to an organisation's ability to develop, deploy and run high-quality applications — or, if you will, digital products and services — with increasing frequency. As a result, organisations look to drive cultural and operational change, unite engineering and development teams with the business, and provide a framework to not only speed up digital innovation, but also support operational resilience and digital response.

Spurred on by the reaction to disruptions caused by the global pandemic, the European economy remains on track to become a digitally driven. Even before the pandemic this path was well mapped out; the difference now is that this timeline has been bought forwards, making digital dominance and capabilities essential to organisational survival.



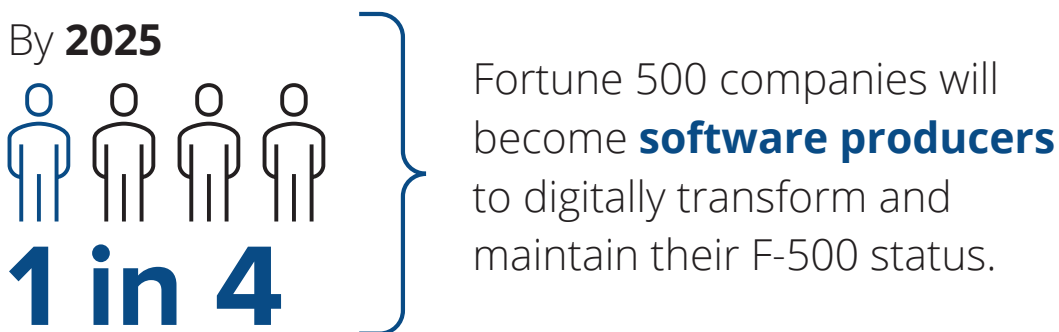
The majority, 60%, of European GDP will be digitalised by 2023, driving \$1.8 trillion of IT spending in Europe from 2020 to 2023.



2. Digital competitiveness: the ability to deliver digital innovation at scale

The ability to rapidly develop digital innovation (digital products and services) is clearly recognised as a core competitive requirement. Software development capabilities to drive product and service innovation are identified as the top 2021 investment priority. Business leaders recognise that software is central to digital innovation and that organisations must become software producers at increasing speed and scale.

As a result, organisations are redesigning the app delivery function as a strategic business capability — not only to meet the demands of a digitally driven economy, but to increase competitiveness by controlling a larger share of organisational digital value creation. This means one of the next big organisational challenges is how to operate more like a software company and develop the skills and capabilities to become both a user and producer of software.

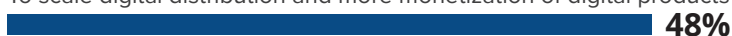


3. Digital ecosystem: the ability to scale digital distribution and monetisation of digital products and services

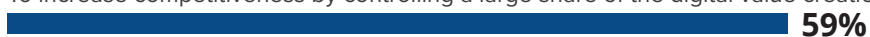
As organisations evolve to become both users and producers of software, the role of software development and delivery expands. Not only are organisations plugging into software development and delivery capabilities to increase organisational competitiveness through controlling a larger share of digital value creation, but software increasingly becomes part of the business' core product and services offerings.

Software delivery is also expanding to support the ability to scale digital distribution and monetisation of digital products and services through the digital ecosystem. This means that software can be delivered as a service, through direct sales channels, via APIs, open source repositories or via developer.com style platforms. Software is truly permeating the organisation, and digital innovation factories and supply chains are the new organisation imperatives to help drive digital resilience.

To scale digital distribution and more monetization of digital products and services



To increase competitiveness by controlling a large share of the digital value creation



To differentiate/innovate the product and/or services portfolio



To re-engineer software process related to core products



Optimising capabilities to operate more like a software company

Understanding the future of digital innovation value streams: from sourcing to distribution

Digital innovation is, to a large extent, software innovation and this has profound implications for technology organisations. Many organisations are skilled at consuming and customising packaged software but are less equipped to produce software-driven innovation at the scale and velocity the business needs. Traditional tools, practices, supplier relationships and deployment models pose significant constraints. In the transition to becoming a software producer, organisations need to develop capabilities, competencies, strategies and execution plans across four key areas identified by IDC as plan, source, develop and distribute. Collectively, these comprise a methodology that IDC refers to as the digital innovation supply chain.

Future of Digital Innovation

Plan

In the new world of digital innovation, software development must be embedded in business plans and strategies, and interwoven into product management organisations, plans and processes. IT must clearly shift from support function and supplier of technology to becoming embedded in product development and the delivery fabric of the business. To create digital innovation at higher frequency, organisations need to carefully plan how software will be sourced and developed from diverse internal and external sources. Planning is an essential means of creating focus, alignment and compliance.

Distribute

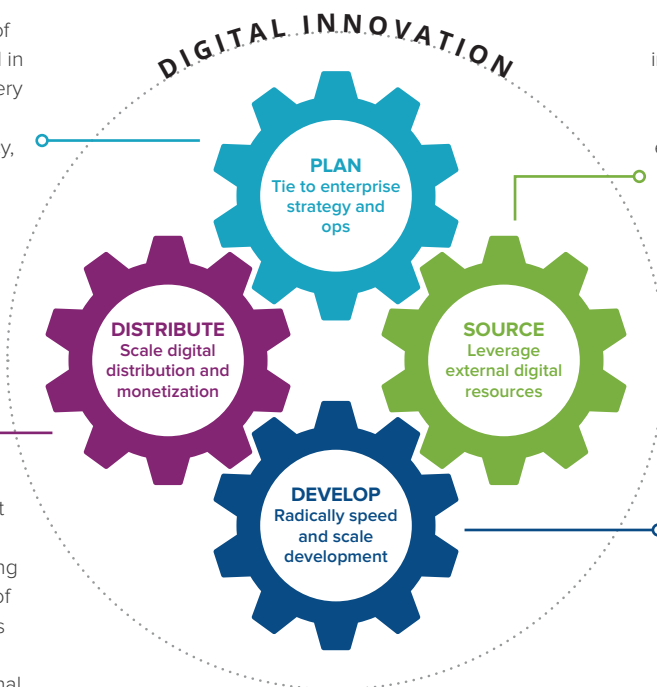
Distributing and deploying software within enterprises is challenging, but digital innovation requires CIOs to confront the challenges of distributing software in new ways into an array of new environments, target audiences and business ecosystems. The distribute phase includes both internal distribution (injection of software assets into core products) and external distribution to organisations or individuals outside the entity that created the software assets.

Source

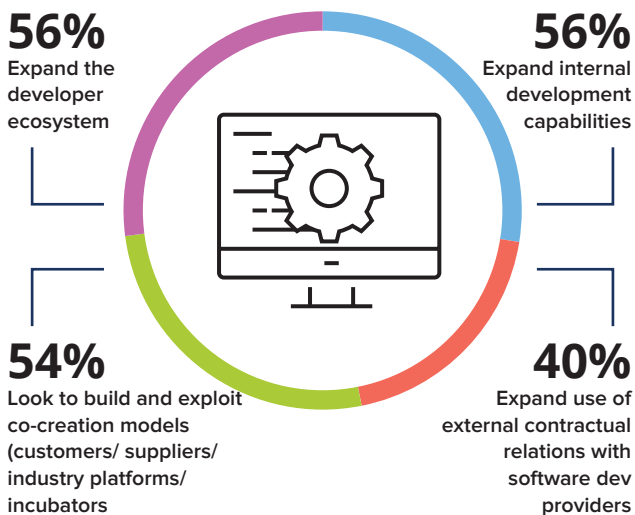
Traditional relationships are no longer adequate. CIOs must go far beyond relationships with vendors, suppliers and IT developers to find cutting-edge technologies and solutions that are robust and secure enough for enterprise deployment. Digital innovation requires a faster, more fluid approach using ecosystem dynamics to create systems of value creation, exchange and consumption. Sourcing can include integration of external software assets directly into a project being created by the organisation or incorporation of external software assets via an API.

Develop

This shift to software producer places new demands on software development and delivery capabilities. Organisations shift to digital platforms and solutions that can increasingly be described as a mashup of purchased and open source components, internally developed apps and microservices, and software developed by customers or even competitors. The bottom line: development is a complex process of creating, assembling and integrating software from many sources and locations.



Understanding the current approach to software development and delivery to drive digital innovation



New roles and challenges for the CIO

The emergence of software and digital technology as a core driver to business competitiveness is a challenge unto itself and requires IT executives to tackle and be cognizant of several new forces. Today digital innovation and application delivery ambitions are stifled due to lack of integration into legacy application environments, lack of business integration, high levels of manual work, the quality of data and insights, and access to relevant skills. As the importance of software expands both within and outside the organisation the CIO plays a larger role in ensuring architectural coherence, security, compliance, scalability and digital autonomy. Importantly, the new world of digital innovation requires that CIOs significantly change IT culture, talent, practices, tools and supplier relationships to deliver software innovation at scale. In this context CIOs need to be aware of challenges ahead:

Core CIO challenges to digital innovation



IT capability identification. For CIOs to play a practical role in digital innovation this requires identifying the right capabilities, such as the technologies, talent, architectures, processes and information needed to provide digital services. Some of these capabilities will not exist and this requires setting out a road map for digital talent, platforms, data access and services.



Exploding tool chain complexity. As software innovation becomes an enterprise and business ecosystem concern, CIOs and LOB executives must shift from buying and extending software from a relatively finite number of vendors to sourcing software components and services from multiple sources. Reaching the right balance between toolchain simplification and the freedom to experiment is hard, but get it right and software delivery performance can accelerate enormously. CIOs will need to provide guidance and playbooks that empower teams to make informed choices about the tools and technologies they use.



Reuse and automation. To achieve scale, reuse and automation become critical. To reap the benefits of enterprise scale, organisations must focus on what they can reuse and where. For many, this is a tech responsibility, as the end goal or requirement is to make these capabilities self-service and automatable.



Designing the innovation factory. IT organisations need to move from a project-by-project approach to one of creating digital product “innovation factories”. These innovation factories must align human and technology resources and produce software and software-enabled products on a continuous basis.



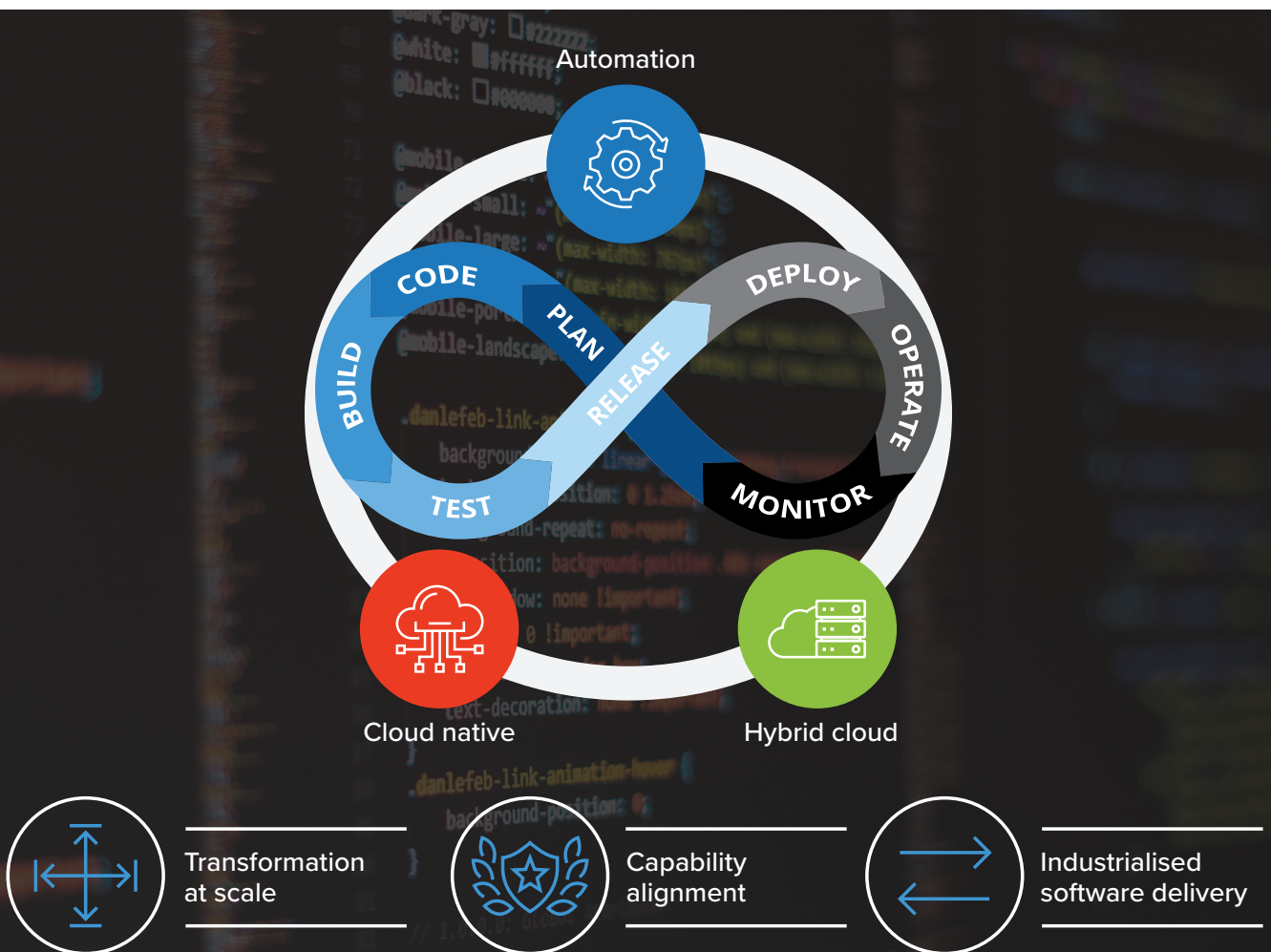
Agile and DevOps. Agile and DevOps practices go hand in hand with digital innovation. The challenge for CIOs is to ensure that enterprise-scale DevOps is achievable. To enable DevOps to become business as usual, organisations must rethink business alignment and governance processes, but also consider tool complexity, culture, organisational goals and sourcing models. As digital solutions become increasingly complex and are created by workers both inside and external to the organisation, CIOs will have to find ways to manage development processes, especially agile ones, to keep all parties aligned and in sync.

Framing software development and delivery excellence: identifying the three pillars for digital innovation success

Digital innovation at scale is hard. In charting the way forwards organisations must think carefully about the organisational, technology and process design changes that need to be made. Solid game plans need to be in place that can tie software delivery strategies to organisational strategy and operations. Architecting the vision, understanding the opportunities, addressing modern app architectures and deploy options, as well mapping resources (dev talent, code, automation, security, etc.) and the ability to distribute innovations, lie at the core.

The ultimate state of digital innovation excellence is one that supports successful organisational transition to a digital innovation factory capable of continually producing software-enabled digital products and services. This requires an innovation pipeline and road map, agile/DevOps processes, effective product management, and continuous integration and delivery. Based on current organisational evolution and progression, IDC identifies three core pillars underlying digital innovation success and readiness:

- 1 Automation
- 2 Hybrid cloud strategies
- 3 Cloud-native architectures



Rethinking automation to drive a digitally lean organisation

Automation fuels innovation — a must for every app modernisation strategy

At the core of digital innovation success is the need for automation to drive velocity, consistency and quality at scale. However, in 2020 over 70% of European organisations continue to identify manual processes as the clear bottleneck in app delivery. This makes automation the top priority to support organisational ambitions to deliver software-based digital innovation.

#1 Automation rationale




“ To support ambitions to deliver apps, including cloud native, via hybrid and multicloud environments. ”

Automation helps to unite, integrate and measure workflows end to end across diverse environments and teams. It helps to solve container at scale challenges, accelerate developer productivity and minimise complexity across tool pipelines.




Bottom line: Automation is multifaceted with both technology and business benefits to be gained. Organisations able to progress towards a unified automation strategy are better able to support organisational agility, responsiveness and development capabilities.

Automation benefits

Tech-led

-  Higher test reliability
-  Improve Biz observability
-  Manage code complexity

Business-led

-  Enhances customer experience
-  Boots business innovation
-  Accelerates Response to business disruption

Identifying the bottlenecks and rethinking for a unified automation strategy

The reality is that most organisations take a siloed approach to automation, resulting in limited learning and reuse across teams.

Automation progress

DevOps automation	23% use automation tools across dev and ops.
Continuous integration	07% have achieved continuous integration with automated build and release management
Multicloud automation and orchestration	10% have integrated on-prem and public cloud infrastructure provisioning, configuration and orchestration management.

Rethinking automation strategies

Three ways to rethink for digital innovation success

Reuse, consistency and self-service are your friend

Adopt automation reuse across projects and establish integrated automated processes between development and operations teams, being sure to document a singular automation strategy. Aim to create automated development and deployment processes that use self-service portals. Automation helps to unite cloud strategies across both cloud and non-cloud worlds under a single set of processes and policies to improve consistency, scalability and speed with self-service capabilities.

Accelerate CI/CD maturity

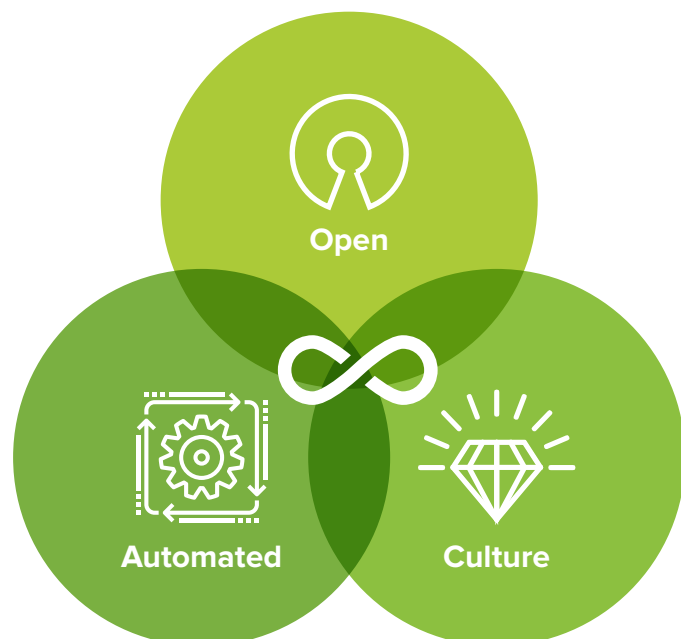
Automation around CI/CD and application release orchestration remain (for the most part) siloed to the teams that use them and for the purpose of the job to be done. Those organisations with higher software dev maturity prioritise a unified automation strategy to drive faster progression to digital innovation excellence. If organisations want to stay on par with software-driven peers, then advances in CI/CD maturity are a must. CI/CD eases the pain in accelerated app delivery, providing enhanced business observability and faster fault detection, and manages increasing code complexity.

Nurturing your culture is just as important as the technology

Create an automation culture that is obsessive about optimising the flow of work. Focus on capturing the flow of work across the software delivery value stream and use this to identify optimal areas of process integration. The end goal is a unified and consistent automation strategy that unites, integrates and measures end-to-end activities and performance across the organisation. Align DevOps teams with the business on common business value KPIs and drivers that will be used to measure success. Introduce and build visualisation dashboards to help drive communications and measure progress with metrics.



Unite, integrate and measure end-to-end activities and performance.



Leading with hybrid cloud to build an optimally integrated business

The cloud journey and hybrid cloud's role in underpinning the future enterprise:

For
1 in 2
organisations
in Europe, hybrid cloud
is a central element
of the strategy to
accelerate software
delivery in 2021



For any organisation with a complex IT landscape, hybrid cloud is an indispensable component in its modernisation strategy as it works to transition to software-led business operating models.

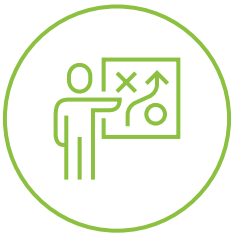
The role of hybrid cloud in facilitating the journey to digital innovation excellence is many-sided and:

- Ensures that investment in existing IT landscapes is maximised. Great hybrid cloud should leave no one (no assets) behind. Modern workloads in the cloud are orders of magnitude more valuable when they bind with aging but mission-critical application systems.
- Acts as an integration bridge between IT estates of different ages and architectures, and by connecting data and IT assets uncovers digital business value that would be otherwise left unexploited.
- Provides the background for organisations to evolve at their own speed to cloud. Hybrid cloud also provides the ideal framework to enable organisations to modernise in a phased manner, where learnings from each transitional phase are used to tune plans and expectations for the next.

Because of its pivotal place on the digital innovation road map, hybrid cloud is a clear priority on the transformation agenda. Half of the organisations in Europe place hybrid cloud as a key constituent in their strategy to accelerate software delivery.

71% of European
organisations deliver
IT workloads via hybrid cloud

Architecting for hybrid cloud: understanding the challenges and benefits



Design with the strategic business objectives in mind.

When planning for hybrid cloud contextualise the higher-level business objectives of the organisation. Starting small suffices in a tactical setting but having a clear view of the strategic business goals is important to shape technical decision making when defining hybrid cloud, including the implications it has at the core and at the periphery of the organisation. The breadth and depth of the hybrid cloud blueprint will dictate the level of complexity entailed at processes, teams, infrastructure, tooling and application asset levels.



No compromise in governance and compliance.

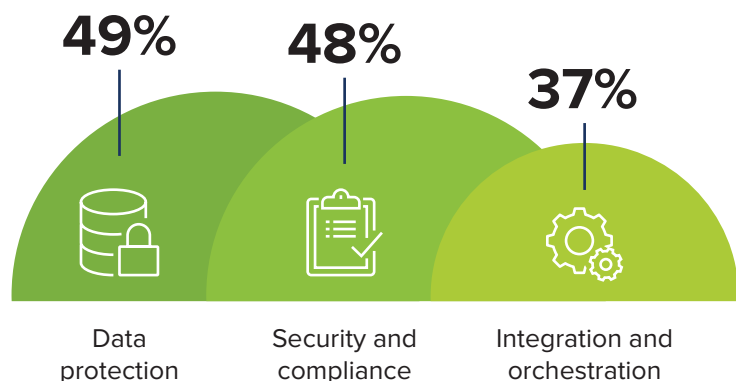
Framing the right policies and governance over hybrid landscapes requires a lot of thought, and automation is key to achieving improved visibility and management. Building the control panel requires a comprehensive approach to cloud, where cloud and non-cloud environments are intertwined and governed jointly. Hybrid brings some challenges when it comes to observing data flow through the system. To solve this, organisations need to design their hybrid architecture to tackle constraints imposed by integration, compliance and governance.



Run with efficiency.

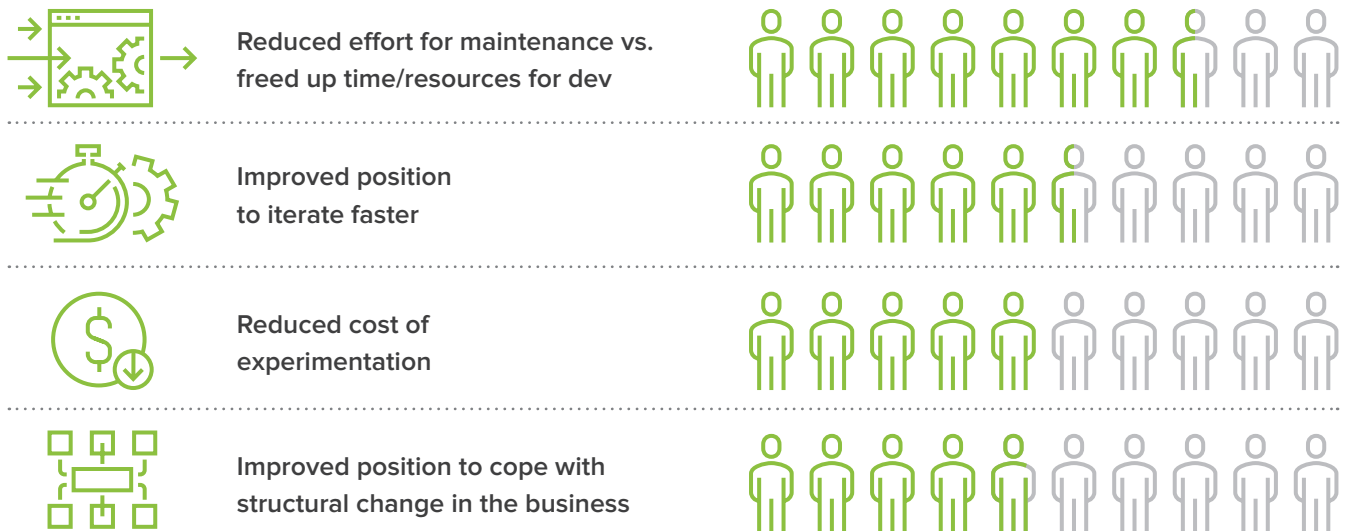
Integration is a prime consideration when designing for hybrid cloud, but to reap the full benefits of hybrid cloud, organisation should equally plan for optimisation. Taking a holistic approach will ensure that all the cogs of the machinery are considered when fine-tuning hybrid cloud operations.

Most challenging data services to execute in hybrid and multicloud environments



Source: IDC EMEA, Multicloud Survey 2020

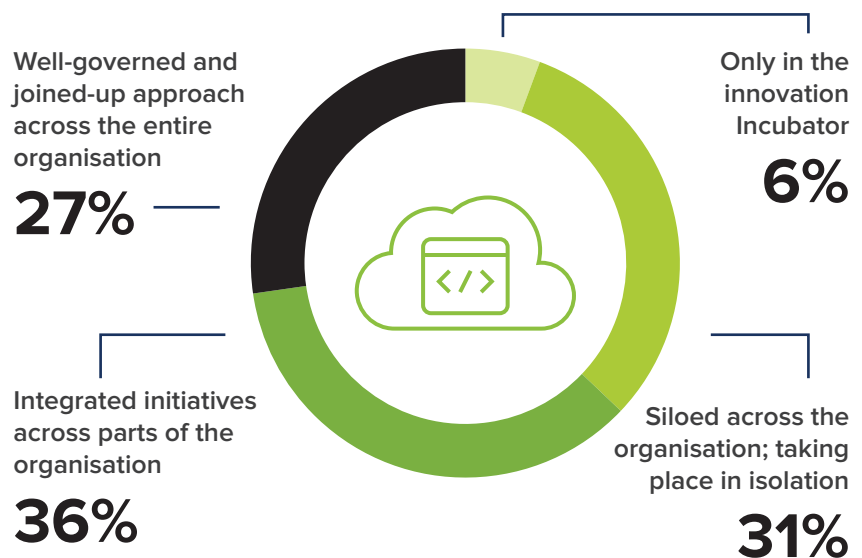
Embracing cloud-native app development for business agility



We are headed fast towards a world in which new application functionality becomes cloud native by design. By 2024, 7 in 10 net new apps launched in production will be cloud native by default.

This is driven by the potential economic gains of going cloud native, but more importantly by gains in time to market and agility. Rapid release and a perpetual iterative product development pattern become defining attributes of an operating business framework powered by cloud native. This operating model improves organisations' ability to innovate and connect with their customer audiences.

To stay competitive in the market, organisations realise they need to evolve their operating business framework and, in the process, adjust their delivery engine based on cloud-native tenets. By 2022, over 60% of organisations in Europe plan to have in place integrated cloud-native programmes run across parts of their operations, with close to half of these organisations running these programmes in a governed and joined up way.



Accelerate your transformation to cloud native



While ambitions to transform delivery mechanics are very high, organisations need to be aware of the challenges that await them on the journey to cloud native. Technical and organisational complexity abounds when building cloud-native application landscapes at scale and organisations can easily get swamped in complications if they do not adequately plan and invest.

Adopt a delivery framework designed to cope with complexity at scale. Optimising the delivery architecture is the hardest puzzle to solve. Heterogeneous tooling, multifaceted and often manual workflows, integration with the existing application estate and minimising the expansion of technical debt are only some of the considerations when architectural decisions need to be made. Ensuring that your organisation puts in place a suitable delivery framework can help ease architectural complexity and facilitate a focus on building and delivery of application functionality, rather than drowning in underlying infrastructure intricacies.

Governance and security-first cloud native. Having to juggle between a myriad of highly dynamic moving parts makes it difficult to achieve corporate peace of mind. Under a development environment set up for hyperspeed and hyperagility, ensuring control, security and observability is hard. In the absence of a solid management platform that can guarantee corporate oversight and a safe operating environment, organisations operate in the dark and become vulnerable both from a business and security standpoint.

Drive consensus for transformation. Operationalising the delivery model needs close inspection, as cloud native at scale demands changing the organisational model. The complexity behind aligning teams, functions, workflows and tooling landscapes should not be underestimated. With that, organisational objectives, measurement metrics and investments need to be cohesive and coordinated. One in three organisations in Europe say changing their operating model was one of their biggest cloud-native challenges.

Call to action: starting out

Top guidance for building digital innovation repeatability

Audit and assess

- Understand the competitiveness of your current capabilities, their **placement within your business operations** and how that benchmarks your organisation against its peers.
- Based on this **gap analysis**, pay attention to the pressing areas that need to be resolved, but do not lose sight of the higher-level business goals. This will help to define the required steps to enable you to advance on the readiness map. This entails building a dynamic plan with a clear set of targets to hit within a clearly defined timeline. Strategise beyond the immediate horizon and ensure you get a broad view of your business ambitions, the challenges and the required resources to embark on the transformation journey

Integrate and orchestrate activities

- *Drive automation and cloud-native programme cohesion*
- *Build value from across the IT estate with hybrid cloud*

Ensure cohesion gets built into your software development programmes and that there is a coordinated approach to facilitate future programme synergies.

Make sure there is discipline and alignment within your automation projects, where underlying DevOps and agile processes are automated to enable continuous delivery and deployment. Identify your cloud sprawl and plan for a comprehensive management of the hybrid estate where the focus should be on integration and the value of new data resulting from connected IT assets. To create readiness for rapid release of new code into your app systems, retune your software delivery design to facilitate fluid workflows between teams and functions.



Call to action: advancing the agenda

Top guidance for running digital innovation at scale

Align and unify programmes

- **Align to the strategic business plan.** Advance the automation, hybrid cloud and cloud-native app development programme in full alignment with the core business blueprint. Strategic business mandates need to dictate the prioritisation of projects and programmes and shape the higher-level road maps for automation, hybrid architecture and hyperspeed software development.
- **Foster cross-functional best practices.** Document and refine learnings into best practices and disseminate knowledge throughout the organisation in a systematic way. Beyond nurturing practice communities, ensure KPIs and business objectives are set up to encourage a culture of collaboration and knowhow sharing/co-creation.
- **Organise for hyperagility.** Clear the organisation of any possible roadblocks (e.g., bureaucratic processes/reporting, rigid communication lines, convoluted workflows) to ensure your teams are set up for hyperagility. This includes minimising friction when tweaking organisational design, and gaining all-participant buy-in. Drive mindset change towards iterative innovation/development, fail-fast and collective value build.

Manage/operate life cycle

- **360-degree, dynamic cloud and development life-cycle management.** Bake control and intelligent management into the cloud and app development operations. Poor observability and oversight of activities can not only slow progress, but it can also lead to governance and compliance complications.
- **Industrialise value flows without compromising agility.** On the back of automation, implement industrialised workflows to optimally manage hybrid cloud operations and processes across the cloud-native app development value chain. Industrialise with agile techniques in mind: protecting the elasticity of innovation clusters (e.g., developer, product teams) is critical.

“Industrialising operations while ensuring teams remain nimble is key to achieving strong competitiveness.”

Call to action: operating in a mature environment

Top guidance for optimising for digital innovation

Optimise and excel

- **Shift towards business-outcome-first delivery models.** Evolve the organisational mindset, KPIs and execution models where programmes are driven by business outcome rationales as opposed to IT agility objectives. This also includes gaining full involvement of the business leadership in strategy definition and programme execution. The business imperative becomes ingrained in the delivery architecture and there is a clear business mandate for the digital innovation leadership to drive strategic business differentiation.
- **Streamline the value stream.** Measure, at every step, the business value that new code delivers to the organisation. This should include the cost attached to code development and release. It should also enable you to map how the effects of code development reverberate across teams and business functions (e.g., commercial potential, value disruption, business value amplification). To qualify and analyse the business value of code, besides analytics tooling and dashboarding you will need to have the right culture and KPIs to enable a highly traceable delivery model.
- **Achieve true code portability.** Plan for “portability by design” where your code and data estate can be transported across environments with minimal business disruption. This will strengthen your bargaining position with vendors, minimise platform dependence risks and reinforce your contingency plans.
- **Design for hybrid 2.0.** Architect with technical debt in mind, as the lifetime of technologies will continue to shrink under intense vendor innovations and shortened product development life cycles. With edge, serverless and event-driven disruptive cloud landscapes, make technical debt a key consideration in your architectural constraints. Edge computing needs particular attention to ensure it does not develop into separate programmes operating in isolation.
- **Bring in the bots.** Start experimenting with machine-learning solutions that can augment development, testing and operations, and encapsulate those into operations that make the most sense. This should enable teams to further improve productivity and velocity. AI-driven IT operations covering monitoring, automated remediation and systems optimisation are rapidly maturing, but also consider AI-assisted development.



Strategic business differentiation replaces IT agility as the top mandate in a mature digital innovation setup.



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