IDC

CLOUD, OPEN SOURCE, AND NEW-AGE SOFTWARE DEVELOPMENT

CRITICAL TO RESILIENCE

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Executive Summary

The new normal is about business resilience, innovation as a strategic intent, and driving digital transformation as a culture, not as a project. Digital transformation represents a significant mental shift for an organization, with technologies perceived to be disrupting traditional ways of conducting business across organizations of various sizes and in various locations. Digital transformation (DX) impacts both IT departments and the business units that interact with customers, suppliers, and government authorities.

Leveraging technologies such as cloud, open-source software, and new-age app development technologies (e.g., microservices and container-enabled low code) can help organizations disrupt the market and survive disruptions caused by market forces. Therefore, a holistic view of digital transformation, involving the critical and careful assessment of existing IT estates and the introduction of relevant new technologies and methodologies, can help organizations achieve the desired business benefits. This could require organizations to create realistic and sustainable plans to increase their resilience.

Careful efforts to increase business resilience can ensure sustained organizational growth even in uncertain times, as well as contributing to the fulfillment of social and environmental responsibilities. Resilience is about building the capacity to respond to changes rapidly and minimize the impact of unplanned disruptions. Organization resilience is incomplete without critical awareness of weak links and plans to address them. Organizations should realize that the technologies that have worked over the past century and on which predictable business has been built may become redundant sooner rather than later. We are observing a strategic shift in the expectations IT leaders, CIOs, and chief data officers (CDOs) have of their technology vendors and partners. Partners that add value and help customers create value rapidly will gain a competitive edge.

DX also involves a sustained pursuit of excellence with the aim of eliminating redundancies. Just like intelligent automation, cloud enables digital transformation, and it is on the verge of becoming the de facto infrastructure platform. Infrastructure modernization initiatives are also influencing the applications landscape, triggering disruption across sectors. Consequently, CDOs and CIOs are reviewing on-premises operational/business support systems (OSS/BSS) and exploring cloud options that make commercial sense and help avoid business discontinuity.

This IDC White Paper covers the key technologies shaping digital transformation among organizations in the United Arab Emirates (UAE), Saudi Arabia, Qatar, and Egypt. The document sheds light on the roles of cloud, open source, and new-age app development technologies in helping organizations achieve the business goals at the root of their digital transformation initiatives.
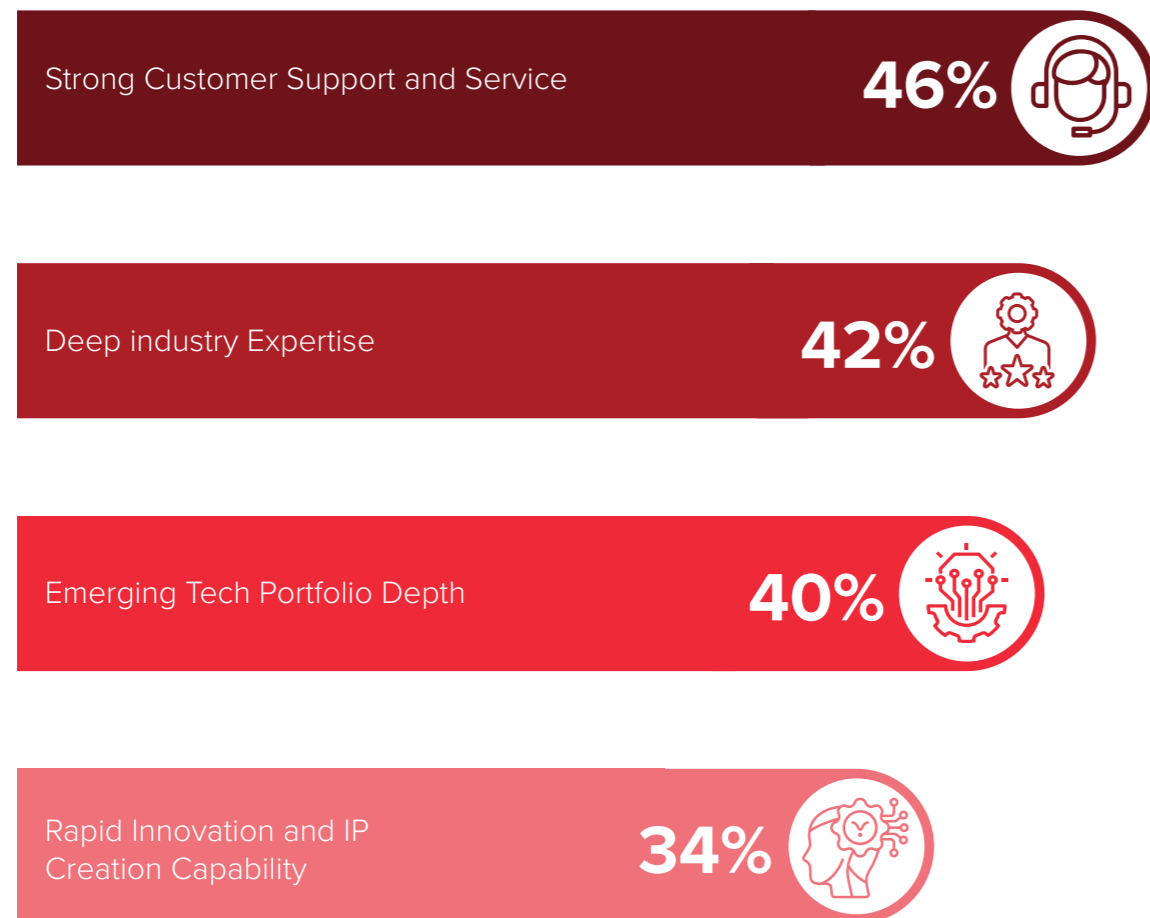
Strategic Shift in Expectations from Technology Vendors and Systems Integrators

IDC's syndicated research across the Middle East, Turkey, and Africa highlights CIOs' changing expectations of their technology partners. More than half (56%) of CIOs in the META region expect vendors and partners to provide stable customer support and service, and 37% expect them to have deep expertise in technologies such as artificial intelligence (AI), robotic process automation (RPA), blockchain, big data analytics, and cloud. Many CIOs expect their partners to help them strategize their cloud journeys and assist with innovation. Nearly one-third (32%) of CIOs expect their partners to have rapid intellectual property (IP) innovation and creation capabilities.

Most organizations' IT estates include costly legacy applications and on-premises infrastructure. Thus, many companies are choosing hybrid ecosystems when implementing DX. To manage their hybrid clouds, these companies are prepared to develop in-house expertise or to partner with trusted technology vendors or systems integrators. Organizations are selecting hybrid cloud vendors based on their techno-commercial abilities and readiness to guide their customers' digital journeys. They are positive about vendors that can interoperate workloads seamlessly and help realize the business benefits of cloud investment.

Figure 1: CIOs exectations from their technology vendors and partners

Customers expect technology vendors to help them innovate

Strong Customer Support and Service	**46%**
Deep industry Expertise	**42%**
Emerging Tech Portfolio Depth	**40%**
Rapid Innovation and IP Creation Capability	**34%**

Source: IDC's CIO Survey, January 2022; META; N = 685; 100+ employees only

Technology Investment Priorities to Drive Digital Transformation

An IDC survey among more than 200 organizations in the UAE, Saudi Arabia, Qatar, and Egypt has identified the key technology priorities of organizations in these countries. In 2022, organizations are expected to continue to adopt cloud and to expand their knowledge and experience in this field.

Investments in workload migration to cloud will grow for almost 60% of organizations in the countries IDC surveyed for this study, indicating that they have already adopted cloud. Organizations are also prioritizing security technologies and skills. Recent IDC research, including this survey, reveal that security skills are becoming increasingly scarce, with countries in the Gulf region and Africa expected to face severe shortages.

Figure 2: Organizations' Technology Priorities

Q: Which of the following would you consider the top 3 areas in which your organization is likely to invest to address your business and IT challenges in 2022?

- **59%** Cloud adoption and workload migration to cloud
- **58%** Security technologies and/ or security skills
- **42%** Enterprise applications (ERP, CRM etc.) implementations and support
- **38%** Managed services by external providers/third parties
- **33%** Data analytics products and services

Source: IDC's State of Enterprise Survey, January–February 2022; UAE, KSA, Qatar, Egypt; N = 203; 100+ employees only

Organizations are also prioritizing investments in enterprise applications (e.g., ERP and CRM). IDC's extensive interactions with technology vendors reveal that organizations prefer cloud-based deployment options for these applications over non-cloud options. These applications play a business-critical role in organizations' IT estates, and they are undergoing major changes due to vendors' promotion of cloud-based deployment options. Another factor contributing to cloud migration is the innovative tools, reports, and dashboards available for cloud-based versions of applications.
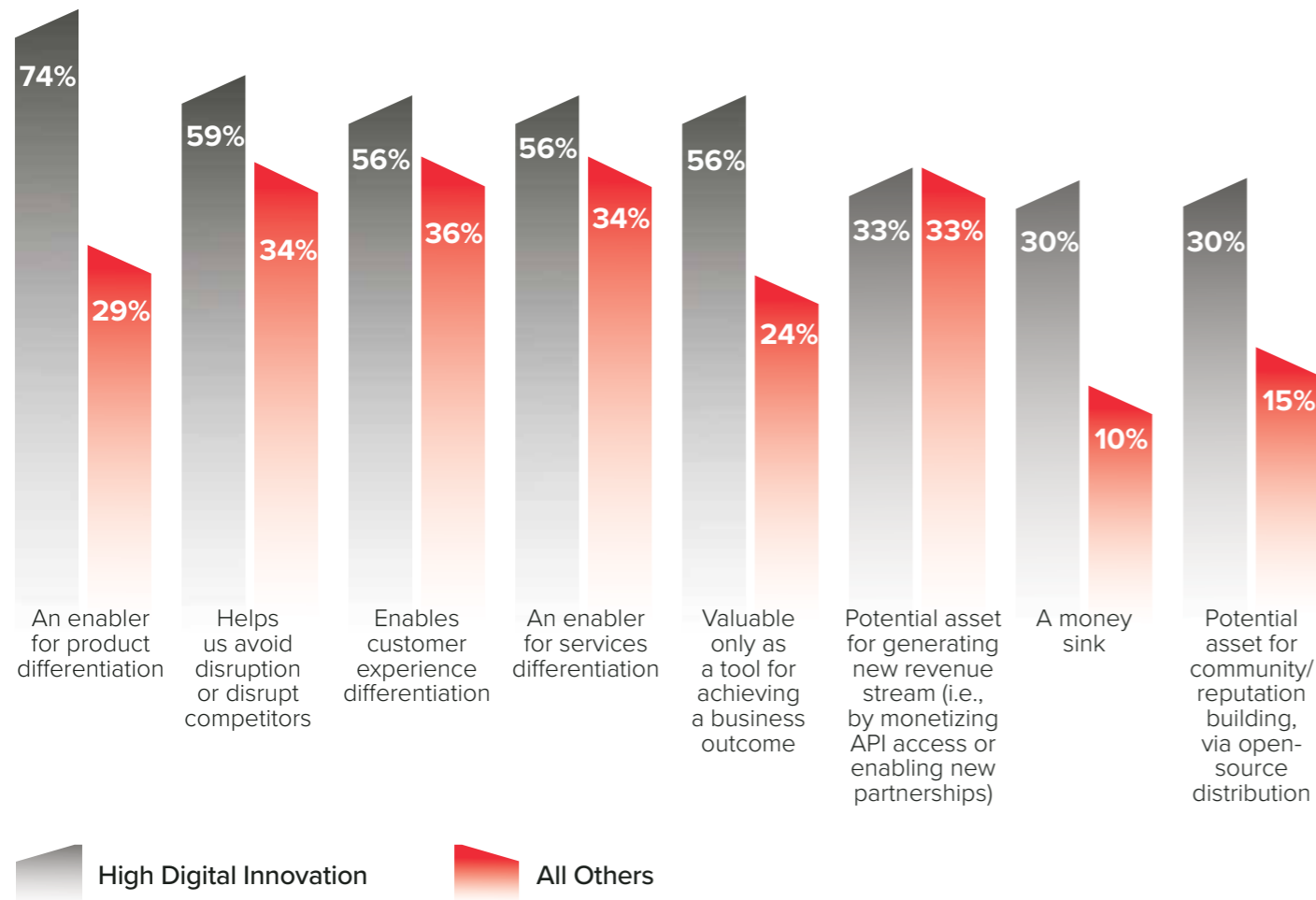
Software Development — Enabler of Innovation and Digital Transformation

IDC's latest global research highlights that an organization's approach to building software development capabilities has a significant impact on its strategic goals, especially its digital innovation agenda and overall digital transformation initiatives. The companies IDC surveyed are either building in-house software development capabilities or are relying on their technology partners to leverage software development as a differentiator. They are using software development to create and deliver superior products and services rapidly and transform customer experience. Many are also using software development to drive service delivery improvement initiatives.

Almost 60% of companies consider software development as being critical to survival and growth, as it can help them neutralize any disruption created by competitors. They are building barriers to entry for their competitors and trying to avoid any barriers to entry that might be created for them.

Figure 3: Innovators Use Software Development to Differentiate and Disrupt

Q: How does your company perceive the software that it develops?

74%	29%	An enabler for product differentiation
59%	34%	Helps us avoid disruption or disrupt competitors
56%	36%	Enables customer experience differentiation
56%	34%	An enabler for services differentiation
56%	24%	Valuable only as a tool for achieving a business outcome
33%	33%	Potential asset for generating new revenue stream (i.e., by monetizing API access or enabling new partnerships)
30%	10%	A money sink
30%	15%	Potential asset for community/reputation building, via open-source distribution

High Digital Innovation   All Others

Source: IDC's Future of Digital Innovation Survey, 2021; n = 280

New-age software development methodologies, such as cloud-native app development using microservices and low-code/no-code platforms, can help organizations accelerate development and deployment. This quickens time to market and time to value.
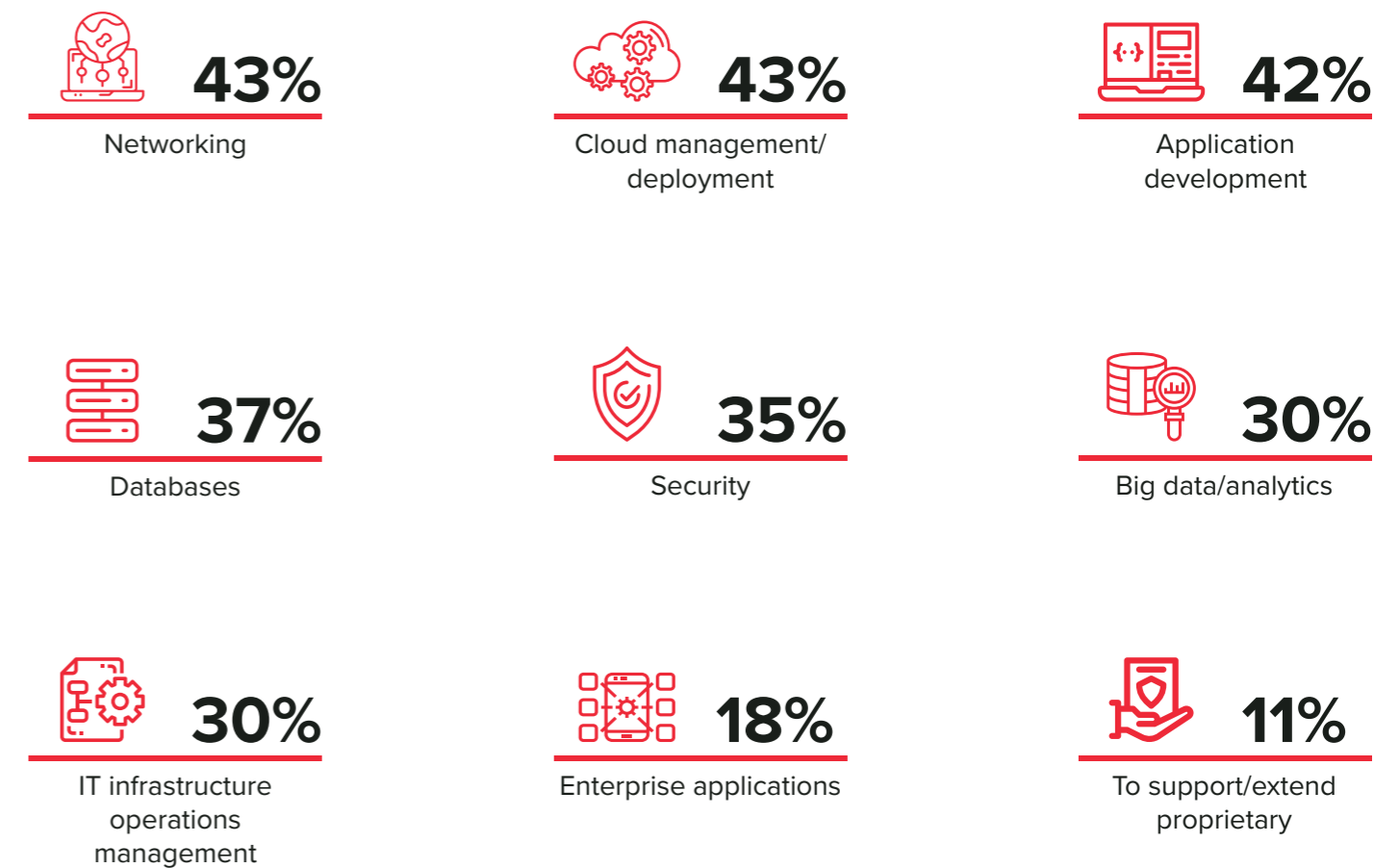
Impact of Open Source on Digital Transformation

IDC research on digital transformation reveals that two out of three organizations are planning to advance their DX initiatives by one or two years. Most organizations across the Middle East and Africa are driving DX and consider DX a continuous endeavor rather than a onetime engagement. While all technology types contribute to the digital agenda, the adoption of open-source software in particular is accelerating.

IDC's latest research underscores the importance of open-source software in building organizations' ability to differentiate. IDC's study of the appetite for open-source technologies among organizations in the key countries of the Middle East covered in this research (the UAE, Saudi Arabia, Qatar, and Egypt) delivered some interesting insights, including organizations using open source for more than just app development. In fact, more than 40% of organizations have already deployed open-source software or are planning to deploy it for networking. Similar numbers of organizations are considering open-source software for cloud management/deployment (43%) and application development (42%).

Figure 4: Open Source Software Deployment and Management

For which environments are you using open-source software?

43% Networking	43% Cloud management/deployment	42% Application development
37% Databases	35% Security	30% Big data/analytics
30% IT infrastructure operations management	18% Enterprise applications	11% To support/extend proprietary

Source: IDC's State of Enterprise Survey, January–February 2022; UAE, KSA, Qatar, Egypt; N = 203; 100+ employees only

Figure 5: Management of Open-Source Software

Q: How do you manage the deployment of open-source software within your company?

73%	43%	27%
Support contracts with open-source vendors	Support contracts with service providers	In-house support team

Source: IDC's State of Enterprise Survey, January–February 2022; UAE, KSA, Qatar, Egypt; N = 203; 100+ employees only

They are also using open source for databases, cybersecurity, and IT infrastructure operations management, as well as to create enterprise-wide big data platforms — all with the aim of staying ahead of the competition.
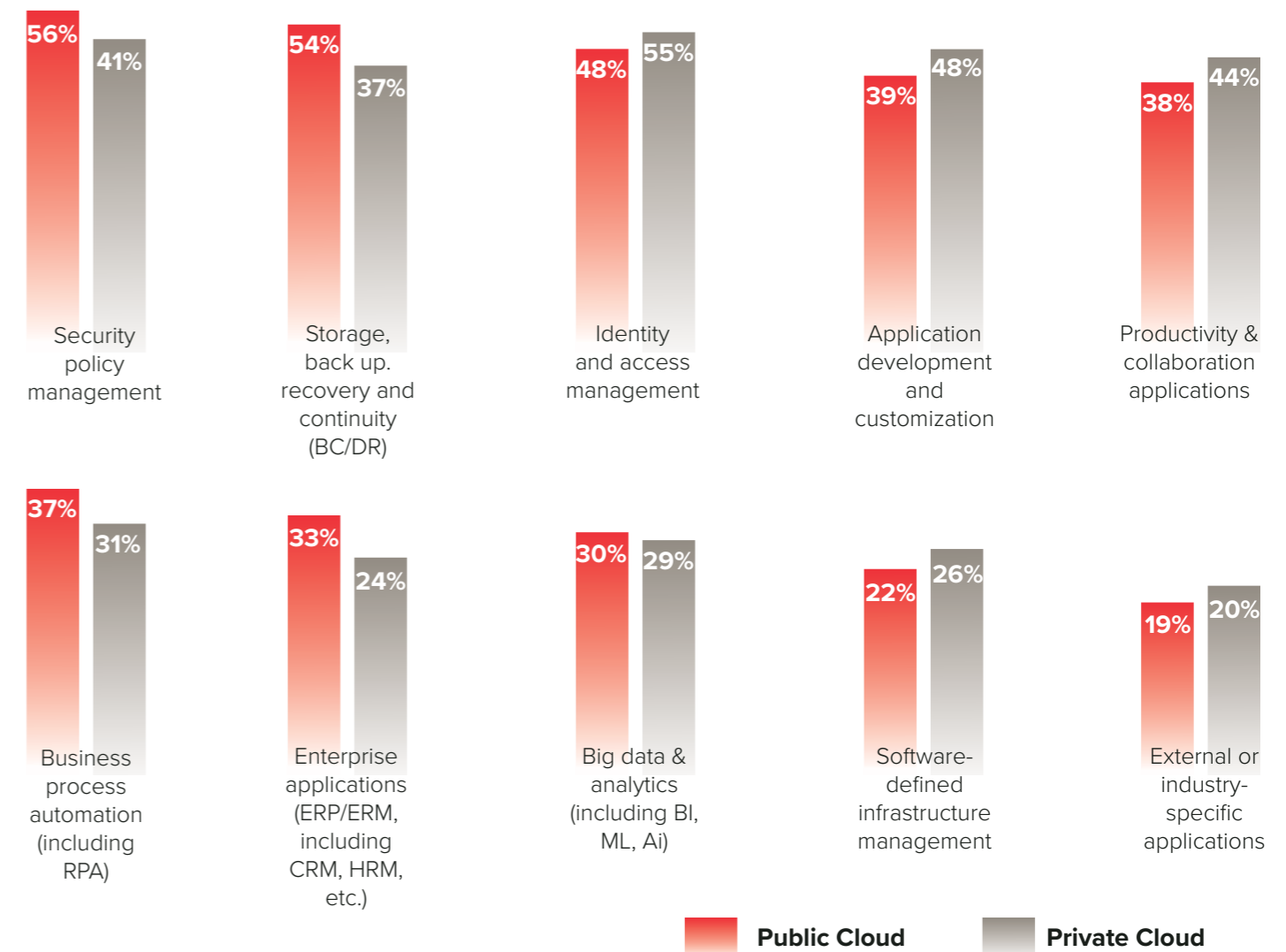
Another interesting insight about open-source adoption is that most adopters (73%) expect vendor support. Some companies (43%) are willing to sign support contracts with service providers that partner with the technology vendor. However, the majority (73%) also have support contracts with OEMs that support their own products.

Hybrid Multi-Cloud — the Foundation Platform for Digital Transformation

The accelerated cloud adoption IDC has observed over the last few years indicates that cloud is rapidly becoming the default infrastructure platform. Organizations in the Middle East and Africa are inevitably exploring cloud options for business continuity purposes, if not for day-to-day operations.

Figure 6: Workloads Expected to Run on Cloud

Which of the following would you consider the top 3 areas in which your organization is likely to invest to address your business and IT challenges in 2022?

	Public Cloud	Private Cloud
Security policy management	56%	41%
Storage, back up. recovery and continuity (BC/DR)	54%	37%
Identity and access management	48%	55%
Application development and customization	39%	48%
Productivity & collaboration applications	38%	44%
Business process automation (including RPA)	37%	31%
Enterprise applications (ERP/ERM, including CRM, HRM, etc.)	33%	24%
Big data & analytics (including BI, ML, Ai)	30%	29%
Software-defined infrastructure management	22%	26%
External or industry-specific applications	19%	20%

Source: IDC's State of Enterprise Survey, January–February 2022; UAE, KSA, Qatar, Egypt; N = 203; 100+ employees only

The above figure shows that most organizations' important workloads are increasingly hosted in the cloud. Public cloud is gaining popularity for security and business continuity workloads such as DR, storage, and backup, while private cloud is becoming popular for development environments and collaborative applications — in addition to identity and access management (IDAM). With cloud being preferred to on premises for RPA, big data analytics, artificial intelligence (AI), and machine learning (ML), cloud is helping organizations accelerate their innovation journeys.

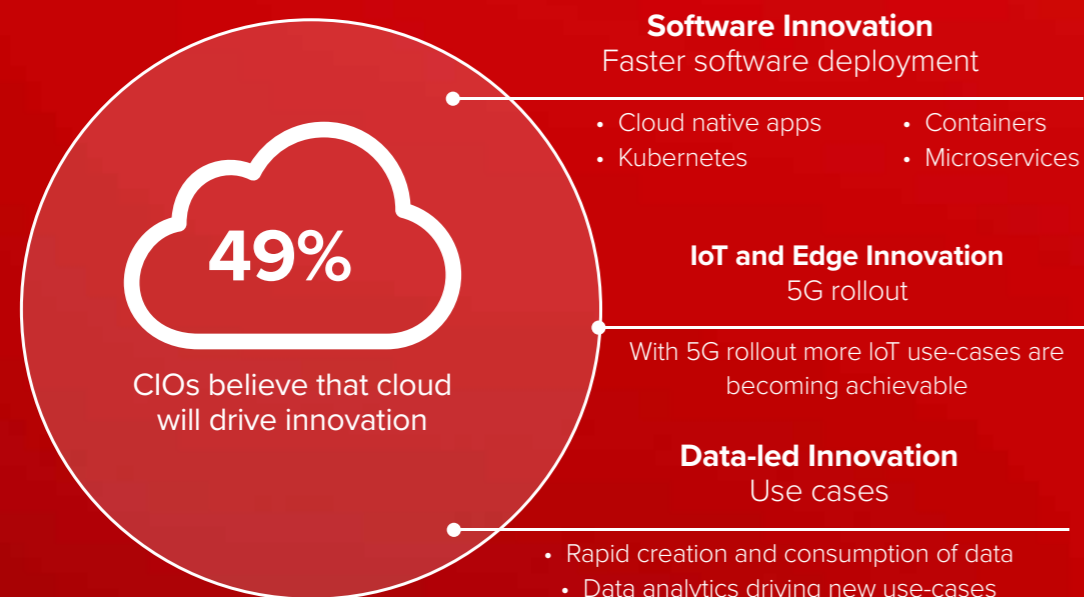## Cloud — the New Springboard for Innovation

IDC's research shows cloud is increasingly becoming a springboard for innovation, with organizations considering it as a way of accelerating their digital initiatives and creating much-needed resilience. The COVID-19 pandemic has pushed the cloud conversation from "aversion" to "adoption" in just two years, with many organizations adopting cloud primarily to ensure business continuity in uncertain times. In addition to establishing business continuity, organizations in the countries covered in this study (the UAE, Saudi Arabia, Qatar, and South Africa) are leveraging cloud to accelerate their time to market and respond to rapidly evolving customer needs.

Cloud adoption was broadly at the discovery, evaluation, and pilot stages in 2020 and 2021. Now it is maturing, with more complex workloads — including business-critical applications — migrating to the cloud in the later part of 2021 and in 2022. The IT landscape in the Middle East and Africa is evolving, with more workloads moving to either private cloud or public cloud. IDC predicts that 80% of organizations will have more than one cloud in the next 12–18 months, and the majority will increase their cloud deployments during that time.

Attitudes to cloud adoption vary by country and region. For example, IDC has found that 65% of CIOs in Saudi Arabia regard cloud as foundational for DX. In contrast, less than half of CIOs in the Middle East, Turkey, and Africa (META) as a whole see cloud as foundational to DX or believe cloud drives innovation.

Market forces are accelerating cloud adoption, with customers, suppliers, and technology vendors pushing organizations to innovate rapidly. On-premises options' limited functionalities are leading more than one third (37%) of organizations in the META region to consider cloud. Nearly half (46%) of CIOs in the META region believe cloud enables agile responses to internal and external customers. Leveraging cloud to boost employee productivity — especially for those working remotely — is a priority for one-third (34%) of organizations. The government also plays a key role in cloud adoption. More than one-third (35%) of CIOs in the META region say the establishment of clear cloud regulations would accelerate their adoption of cloud solutions.

Figure 7: Cloud — the New Springboard for Innovation

49%
CIOs believe that cloud will drive innovation

Software Innovation
Faster software deployment
- Cloud native apps
- Kubernetes
- Containers
- Microservices

IoT and Edge Innovation
5G rollout
With 5G rollout more IoT use-cases are becoming achievable

Data-led Innovation
Use cases
- Rapid creation and consumption of data
- Data analytics driving new use-cases

Source: IDC's CIO Survey, January 2021; META; N = 645; 100+ employees only
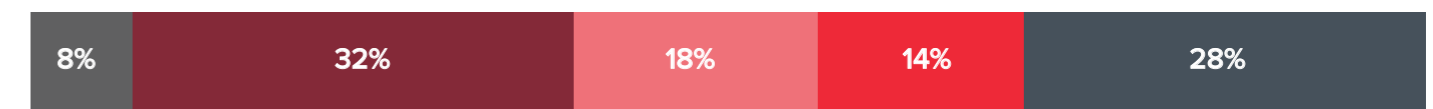
Cloud Adoption to Accelerate Software-Led Innovation

IDC's survey of over 200 organizations revealed that cloud adoption is expected to accelerate the use of agile software development tools and technologies. Technologies such as Kubernetes and Docker and platforms that help organizations develop applications using microservices and containers are expected to shift the application landscape rapidly from monolithic to cloud native. The figure below highlights the significant preference for cloud-based deployments over on-premises deployments for the technologies driving software-led innovation. Around 69% of the respondents that have deployed Kubernetes orchestration have deployed it in a cloud environment (public, private, and hybrid cloud combined).

Figure 8: Container and Microservices Deployment Environments

Q: Which of these technologies do you currently use, and in which environment is each deployed?
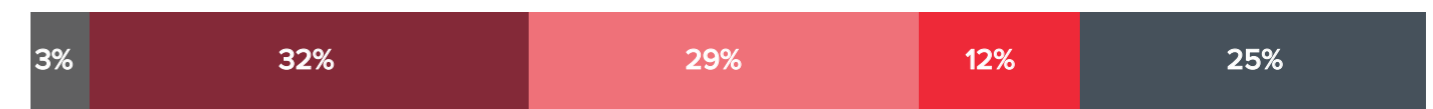

Docker containerisation
8% | 32% | 18% | 14% | 28%

Docker orchestration
4% | 22% | 21% | 26% | 28%

Kubernetes orchestration
1% | 23% | 27% | 19% | 30%

Serverless
24% | 21% | 36% | 16% | 3%

Microservices
3% | 32% | 29% | 12% | 25%

Virtualization technology
15% | 24% | 31% | 16% | 14%

API management
6% | 27% | 39% | 17% | 10%

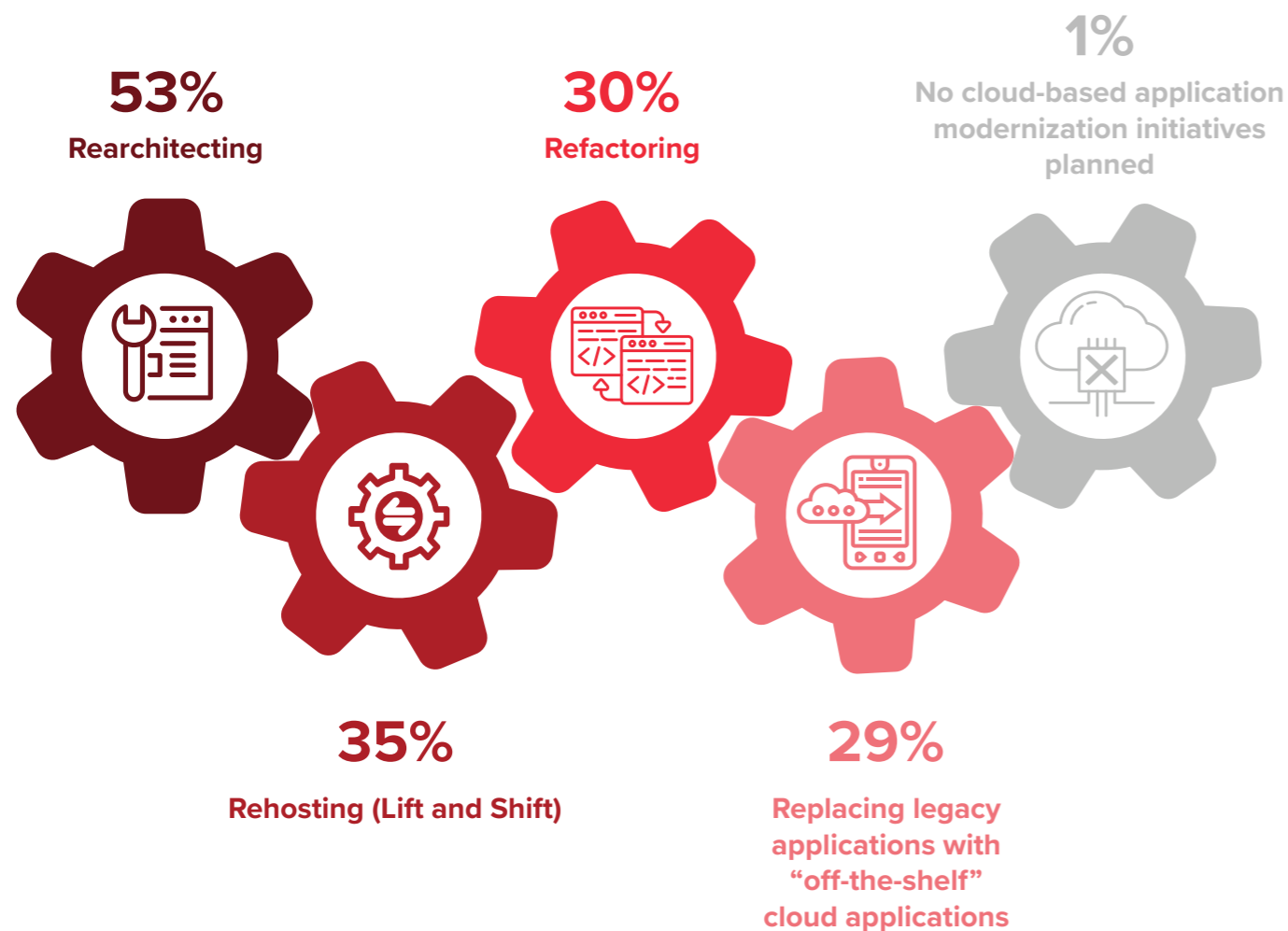Legend: On-premises | Private cloud | Public Cloud | Hybrid (both) | Not using

Source: IDC's State of Enterprise Survey, January–February 2022; UAE, KSA, Qatar, Egypt; N = 203; 100+ employees only

Accelerated Application Modernization Using Cloud

IDC surveyed more than 200 organizations in the UAE, Saudi Arabia, Qatar, and Egypt to understand application modernization initiatives in the region. This includes rearchitecting (revamping existing enterprise architecture), refactoring (making component-level changes to IT architecture), and replacing monolithic legacy applications with cloud-native apps. Altogether, 53% of the surveyed organizations are planning to rearchitect their applications, while 35% of are planning rehosting initiatives (lifting and shifting traditional applications and/or infrastructure from on-premises to cloud). This data speaks volumes about how cloud is disrupting app modernization. Rearchitecting is a complex process that demands extensive review and management support. Business users also need to allow for downtime to accommodate these activities.

Figure 9: Application Modernization Initiatives

Q: In terms of cloud usage, in which of the following application modernization initiatives do you plan to invest significantly over the next 12–18 months?

53%
Rearchitecting

30%
Refactoring

1%
No cloud-based application modernization initiatives planned

35%
Rehosting (Lift and Shift)

29%
Replacing legacy applications with "off-the-shelf" cloud applications

Source: IDC CIO Survey Jan-Feb 2022; UAE, KSA, Qatar, Egypt N=203; 100+ employees only.

Digital Transformation Challenges

Organizations in these countries have embarked on their digital journeys, are using open-source software, and are adopting digital-first strategies, but they are also facing certain challenges.

For example, 61% of organizations have irrelevant and outdated key performance indicators (KPIs). This means these KPIs no longer help organizations to measure the contributions of their departments and people to transformation efforts. The below figure further highlights the challenges facing organizations. Almost one-half of the organizations surveyed lack the necessary digital transformation capabilities, and almost all organizations identified the limited availability of skilled workers as a challenge. This is delaying the digital transformation process and negatively impacting the strategic objectives of companies in the region. Nearly half of the organizations stated they are not taking a long-term approach to the digital transformation process.

Almost 41% of organizations are struggling with siloed transformation initiatives. In these cases, lines of business and functions compete and often do not share their plans or data with each other.

Figure 10: Digital Transformation Challenges

Q: What are the top challenges that you face while driving your Digital Transformation initiatives?
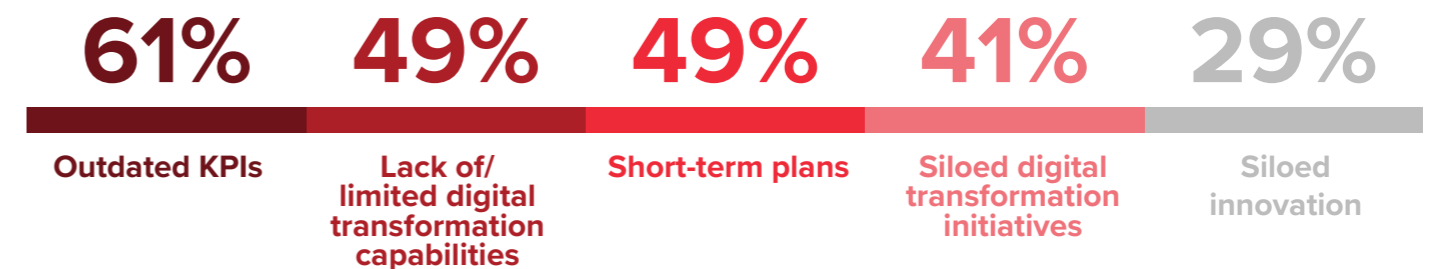
61%	**49%**	**49%**	**41%**	**29%**
Outdated KPIs	Lack of/ limited digital transformation capabilities	Short-term plans	Siloed digital transformation initiatives	Siloed innovation

Source: IDC's State of Enterprise Survey, January–February 2022; UAE, KSA, Qatar, Egypt; N = 203; 100+ employees only

Outdated KPIs:
The KPIs we use to measure our digital efforts are the same KPIs our organization has always used.

Lack of/Limited digital transformation capabilities:
We have not developed the new capabilities required to run a digital enterprise.

Short-term plans:
Our digital roadmap focuses on the short term and does not factor in our industry's long-term transformation.

Siloed DX initiatives:
We treat DX as a special project, or we run DX out of a special department, which undermines the perception of DX as being everyone's responsibility.

Siloed innovation:
We have a fragmented approach to applications and data and have not brought digital innovation together across the organization under a single technology architecture.

Essential Guidance

To transform digitally and build resilience, organization leaders should bring all stakeholders together, with each contributing to all stages of the process.

Organizations should consider the following recommendations before embarking on an enterprise-wide transformation.

- **Critically assess your DX needs:** Every organization has a different digital maturity level. Depending on the organization's goals and the complexity of the business, the organization should study the existing IT landscape and identify transformation programs that meet its business needs today and will continue to do so over the next four or five years, such as cloud, the Internet of Things, AI, new-age software technologies, and API integration.

- **Embrace hybrid multi-cloud:** Once DX business goals have been established, create a cloud adoption plan. IDC believes modular cloud adoption helps users accept this technology more readily. Identify the most suitable deployment options and workloads. Hybrid multi-cloud ecosystems are inevitable due to the workload kinds that companies have and their data privacy needs. A gradual approach will prevent the cloud adoption process from becoming overwhelming.

- **Leverage open source wherever possible:** Several organizations are leveraging open-source software to accelerate their product development and deployment and to meet their security and IT infrastructure needs. IDC believes that perceptions about limited support and security-related concerns regarding open source may be misplaced. In fact, many vendors use enterprise-grade open-source software solutions and offer support along with subscriptions. This can optimize IT spending while maintaining the focus on security and compatibility. Optimized spending can enable repurposed budget to start projects that add to the digital innovation agenda.

- **Use new-age app development technologies to decrease time to market:** Cloud-native app development, microservices, and containers are making app development much easier and helping organizations reduce the time to market for products and services. Time to value is also being shortened, .as customers can try products and convey their feedback sooner. Leveraging these app development technologies can help companies disrupt the market or avoid the disruption caused by competitors.

- **Involve stakeholders early:** This approach has been shown to maximize the ROI of complex process transformation initiatives. Involving key stakeholders in the early phases of a project reduces resistance and improves the likelihood of success. Project teams can incorporate ideas from external stakeholders before launching initiatives.

- **Study the impact of technological change on business initiatives:** Implementation partners can identify and propose use cases for implementing certain technologies, but organizations' project teams should critically assess the proposed use cases and the impacts of the related technologies on business initiatives, as well as ensuring that the use cases align with current and future business needs.

About IDC

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