The backbone of a future-ready public sector organisation

Digital connectivity

Capita

Contents

Executive summary

In the past, organisations have treated networks as a critical, but not necessarily value creating, component of their IT infrastructures due to the lack of direct correlation to business benefits. However, as organisations accelerated their digital transformation journeys with cloud as the primary lever, they realised that traditional networks are becoming a bottleneck. Organisations realised that without network transformation, there could not be a successful digital transformation.

Enhancing the digital citizen experience

UK central and local government bodies also realised this, and many of them have entered into an aggressive network transformation mode.

They realised that the future of high-performing local government lies in citizen data and the insights generated from it, and their goal is to leverage digital initiatives to enhance the citizen experience while also ensuring transparency, security, accessibility, and trust. COVID-19 further amplified this need for accelerated digital transformation. Throughout the pandemic and as we build back, agencies have been aggressively reinventing their service delivery models, especially as they are required to provide 24x7 accessibility, faster delivery times, and digital processes for their citizens.

Cloud is playing a key role in helping UK government bodies achieve their digital objectives, and digital connectivity is becoming a key enabler of cloud transformation. Based on the principles of virtualised and software-defined architecture, digital connectivity amplifies the benefits of cloud by optimising the network element of the IT infrastructure.
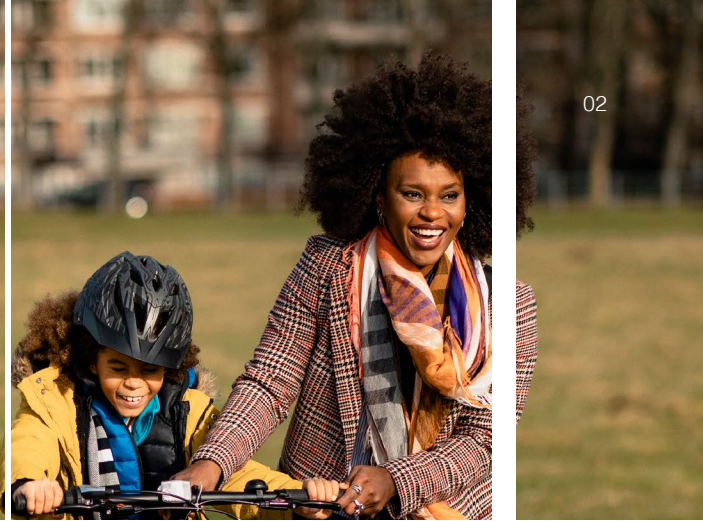
Introducing the digitally connected organisation

A cloud-driven organisation relies on software-defined technologies such as Software-Defined Network (SDN), Software-Defined Wide Area Network (SD-WAN), Secure Access Service Edge (SASE), and Network Function Virtualisation (NFV), while leveraging hybrid network managed services as the operating lever. The next stage of maturity to a cloud-driven organisation is a digitally connected organisation, which requires the implementation of next-generation network technologies such as 5G, edge computing, and IoT on top of the software-defined technologies. The operating model also needs to evolve into a Network-as-a-Service (NaaS) model, which simplifies the overall complexity and enables better business benefits.

Embracing change requires strategic commitment

It is important to understand that digital transformation requires some upfront investments, so government bodies should take a long-term view of the return on investment. However, inaction at this point could lead to potential negative impacts over the longer term, including compromised citizen experience and reduced trust, operational inefficiencies and performance issues, inability to leverage benefits of new digital technologies, and stalled initiatives, among others. Making connectivity capability a digital enabler rather than an IT requirement requires taking a proactive and strategic approach to avoid these pitfalls.

What this report covers

In this report, we explore the concept of digital connectivity as a critical enabler of digital transformation, including:

- The technology and operating model building blocks of digital connectivity

- The action steps necessary to embark upon a digital connectivity journey

- The strategic and operational parameters for public sector agencies to consider before digitalisation

- How public sector agencies can measure the success of digital connectivity

- The potential costs of inaction

Introduction
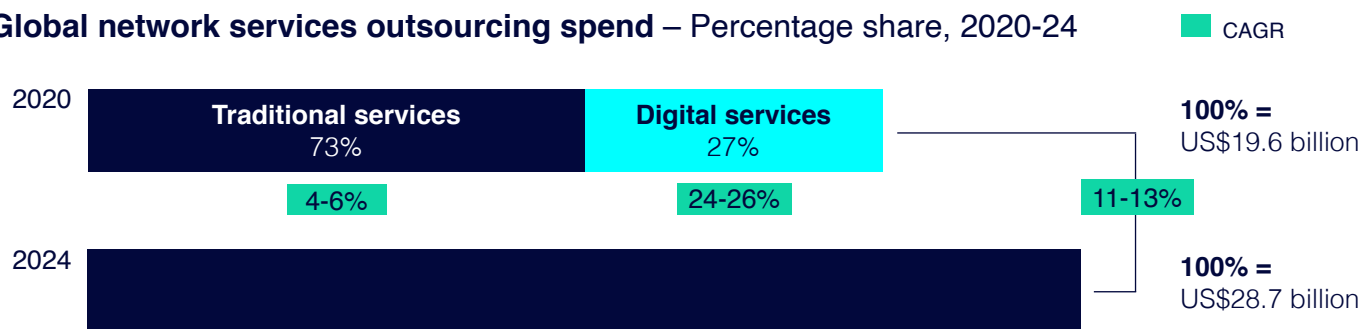## Evolution of networks within organisations

Traditionally, organisations have underinvested in network transformation, as long as basic requirements of connectivity, uptime, and security were being met. CIOs primarily made network decisions with no involvement from business executives.

However, the role of connectivity in establishing and sustaining a digital organisation is more critical than ever before as organisations grow and become more complex; workforces become more geographically dispersed; cloud and edge computing become more prevalent; and multi cloud, 5G technology, and IoT-enabled technology adoption grows. The impact of an organisation's network infrastructure capabilities is no longer confined to the internal workings of the organisation; a company's reputation, customer experience, and revenue opportunities can be impacted significantly by its network infrastructure.

Network transformation is also an essential pre-requisite for governments to operate smoothly and for superior citizen experience. The chart below shows enterprises' increasing focus on outsourcing their network services; a significant portion of these deals focus on network transformation.

In the next 12 to 24 months, organisations expect a 20-30% increase in their digital infrastructure spend

Global network services outsourcing spend – Percentage share, 2020-24   ■ CAGR

2020	**Traditional services** 73%	**Digital services** 27%

100% = US$19.6 billion

4-6%   24-26%   11-13%

2024	

100% = US$28.7 billion

Source: Everest Group (2021)

The rise of digital organisations

Organisations around the world are increasing their investments in digitally transforming their IT infrastructures.

In line with this trend, UK central and local government bodies are making strides to establish the UK as a digital government, with the goal of leveraging digital initiatives to provide better services to citizens while also ensuring transparency, security, accessibility, and trust.

37%
of digital deals originating
from Europe are from the UK

57%
of all public sector deals originating
from the UK involve digital components

While some UK public sector agencies were already on the path to transform their IT infrastructures, COVID-19 amplified the need and accelerated the pace of this digital transformation. The reliance on networks to create value within the organisation and deliver service to citizens increased exponentially during this time.

Moreover, COVID-19 has had a significant impact on cost structures and revenue streams, accentuating the need for government agencies to invest in transforming their technology and IT infrastructures so they can be efficient, agile, resilient, and secure.

Following the pandemic, agencies are aggressively reinventing their service models, especially as they are required to provide 24x7 accessibility, faster delivery times, and digital processes for their citizens.
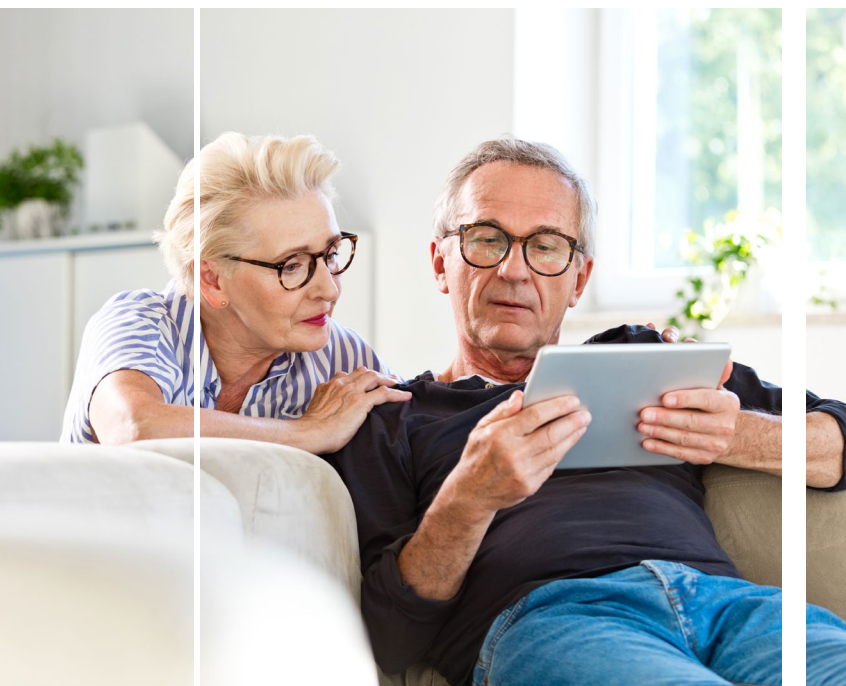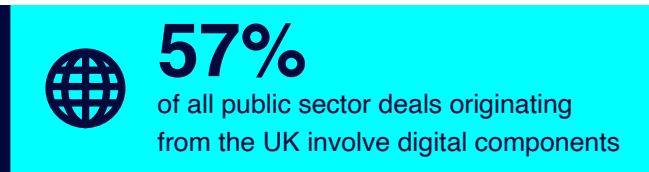
> The COVID-19 pandemic demonstrated how important it is to provide online digital services, which is vital for healthcare practitioners, supporting them with faster, more reliable access to the information and services they need, when they need them.
>
> **– Programme Director, UK department of health and social care**

Without network transformation, there is no digital transformation

Challenges and barriers of traditional network technologies and models in supporting the digital organisation include the following:

Rigid architecture and protocols

Many public agencies continue to operate with traditional network models that consist of tightly coupled control and data plane, performing pre-defined functions. This topology worked well when other IT resources such as compute, storage, and application were static and functioned in siloes, but does not work well in today's world where these IT functions are dynamic and interdependent. Additionally, the legacy network was mostly built with proprietary protocols, making it hard for organisations to implement best of breed technologies, switch technology vendors, stay abreast of industry-standard protocols, and integrate with other infrastructure elements.

Hardware centric

Legacy network models are hardware-defined and governed by manual configurations, which makes both interoperability across layers challenging and provisioning and orchestration of network devices very expensive. This challenge, in turn, leads to operational slowdown and increased operating expenditure. Hardware-centric networks are unable to keep pace with digital technology and connectivity requirements.

Ever-increasing bandwidth demands

With the increasing scale of public sector organisations and digitalisation of various compute components, network traffic has increased exponentially and so has the need for high-speed accessibility. Together, these challenges have resulted in traffic congestion and latency issues that cannot be resolved by adding proportionate Virtual Private Networks (VPNs) in the agency. Addressing this problem requires technology and platform upgrades, configuration changes, and dynamic scaling, all of which are extremely difficult with traditional connectivity models.

Support for digital technologies

Multi-cloud computing, interoperability, edge computing, anywhere anytime accessibility, 5G support, burgeoning IoT enabled devices, and disparate and dynamic application needs all require next-generation network support. Existing network technologies and architectures struggle to provide the necessary strong foundation.

Security and compliance

As data sources and data traffic continue to surge, network infrastructure security and compliance are gaining importance. Traditional networks are not equipped to handle the complex security vulnerabilities that come with adopting digital technologies.

> " The network problems we have faced during the digital implementation and pandemic show that the network's underperformance has serious consequences for the quality of services. We need a digital-native network infrastructure with a cloud-first approach to meet the public's requirements.
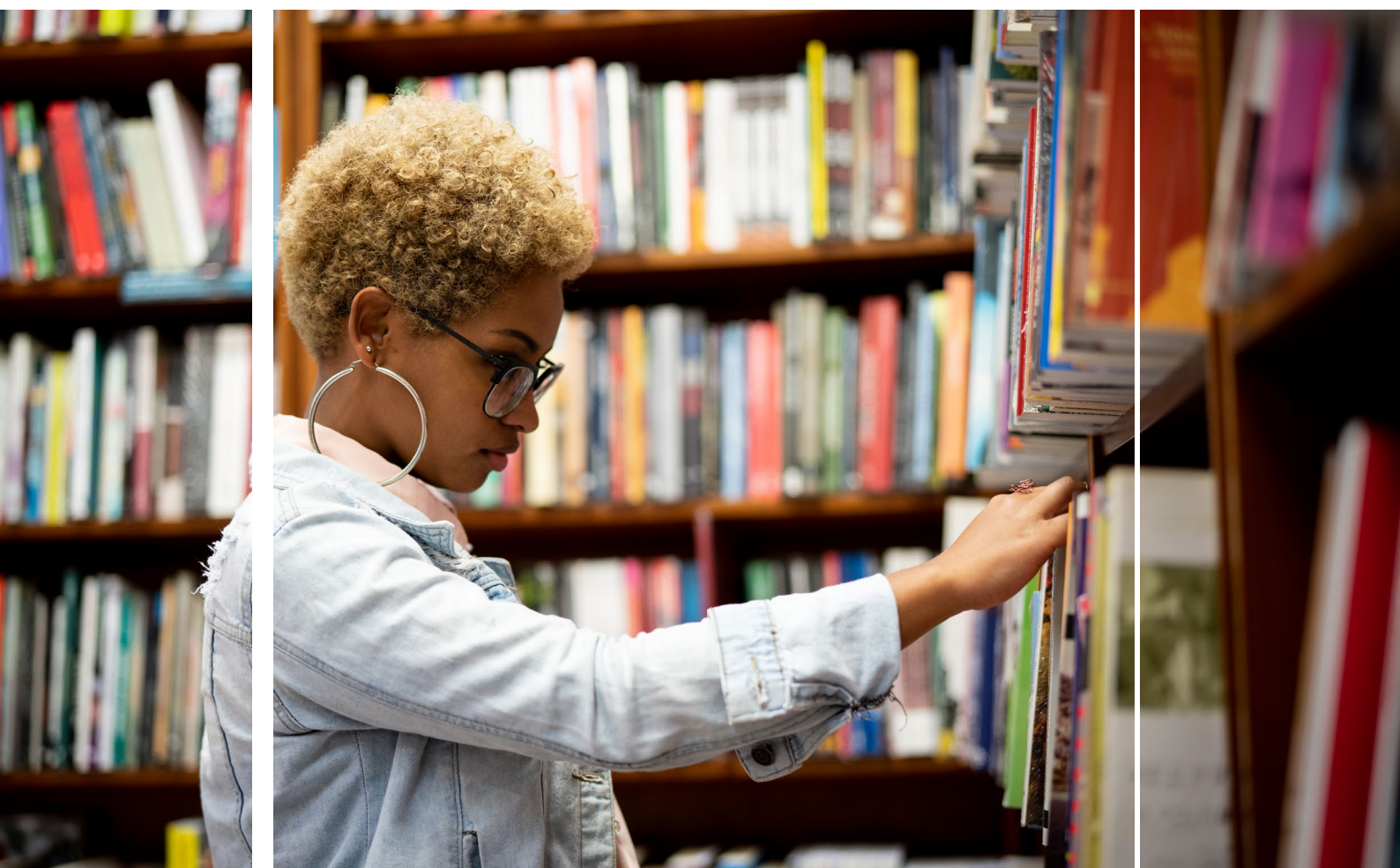
– CIO, UK public sector organisation

These challenges create an extraordinary need for public sector agencies to digitally connect their physical and virtual resources in a way that is robust, reliable, agile, and secure. Also, the increasing demand for services, rising costs to serve, declining revenue, and changing citizen behaviour, as highlighted in the diagram below, drive an immediate need to reimagine the existing network infrastructure.

Challenges within public sector organisations driving network transformation

⚠ **Increasing demand for services**	£ **Rising costs to serve and curtailing revenue**	👤 **Changing citizen expectations**
• Rising unemployment	• Aging local government processes	• Increasing pressure from citizens to be digital first
• Aging population	• Incoherent and disintegrated cross-agency systems and processes	• Higher expectations from councils to offer a citizen experience similar to banks, utilities, and retail
• Increasing working residents seeking healthcare support	• Declining revenue from citizen services due to COVID	
• Surging long-term COVID care demand	• Slowed recovery rates	

Source: Everest Group (2021)

Digital connectivity model
Building blocks of a digitally connected organisation

To overcome the challenges of a traditional network and meet citizens' changing expectations and demands, public sector organisations need to evolve towards becoming digitally connected.

As highlighted below, evolution to a digitally connected organisation from a traditional organisation is a two-step process with becoming a cloud-driven organisation being an intermediate, but extremely important, step. Most public sector organisations are well placed to chart their digital connectivity journeys given that they are still in the early phases of transformation. We discuss these two transformation stages and related technology and operating model levers in more detail below.

Cloud-driven organisations

As organisations become cloud-driven, they undergo multiple changes including technology architecture, operating models, transmission policies, underlying protocols, and storage mechanisms, among others. Traditional Multi-Protocol Label Switching (MPLS)-based networks using hub and scope design principles are not able to stand up to these changes and hinder organisations from reaping the benefits of cloud transformation. To address these concerns, organisations need to deploy technology and operating model levers, as explained in further detail below.

Digital connectivity model

Most public sector organisations are **here** in their digital connectivity journeys

	Operational cost		Value creation
	⊕ **Traditional organisation**	⬆⬇ **Cloud-driven organisation**	📶 **Digitally connected organisation**
Technology levers	Fixed-function network devices, MPLS	SDN, SD-WAN, SASE, NFV, network automation	5G, edge computing, IoT
Operating model levers	Managed network services	Hybrid network support	Network-as-a-service
Business impact	• Enable IT functioning • Meet traditional service levels and uptime	• Agility, flexibility, and reliability • Enable interactive collaboration • Improve QoS and business agility • Reduce CapEx, optimise OpEx	• Improve time to market • Generate business value • Enable business innovation • Boost business responsiveness • Enhance business productivity

Source: Everest Group (2021)

Technology levers

In a cloud-driven organisation, software-defined technologies such as SDN, SD-WAN, and NFV replace proprietary hardware-based network functions such as routers, firewalls, switches, MPLS, ethernet, and load balancers

This change enables organisations to locate network functions in proximity to applications and users instead of being restricted to the data centre, which enables flexibility in deploying new network functions and features in an agile manner.

However, the software-defined technologies cause the network to become decentralised and increase the number of endpoints, increasing the security risk. To counter this risk, organisations are adopting the SASE model, which converges security, network functions, and identity, including secure web gateway, firewall-as-a-service, DNS, SD-WAN, and zero-trust network access into the cloud-native as-a-service model. The policies are enforced in a software-defined manner depending on the identity of the user, the user's access privileges, and application sensitivity, and is handled in a software-defined way.

Operating model levers

These new software-defined architecture models result in increased complexity in resource provisioning and management of the hybrid technology landscape, prompting organisations to outsource network management and support to managed service providers instead of handling it in-house.

Managed services providers and communications service providers partner with network solution vendors to provide a whole range of managed equipment and services solutions based on the number and location of sites. Network managed services and hybrid network support help organisations fully leverage the benefits of virtualisation while providing unified monitoring and management, service orchestration, dynamic provisioning, optimised routing, secured transport connectivity, vendor-agnostic support and maintenance, and a commercially viable delivery model.

" We want our SIs to be engaging with different vendors and get more educated on newer technologies and offerings. We want them to understand the complete spectrum of network needs and tell us where we can get bang for the buck.

– CIO, healthcare services firm

Digitally connected organisations

Digital connectivity is the next evolutionary stage of a cloud-driven organisation. It is based on the principles of virtualised and software-defined architecture and supports dynamic virtual machines and applications on cloud. Such a network eliminates congestion and enables multi-cloud access, infrastructure agility, dynamic network calibration, and bandwidth optimisation. From a network operations perspective, digital connectivity enables simplified management and orchestration, centralised policy control, performance management, self-healing, and self-driving capabilities.

Technology levers

- In addition to the software-defined architectural changes in a cloud-driven organisation, technologies such as 5G, edge computing, and IoT form the key enablers of a digitally connected organisation.

- The combination of private 5G and edge computing shifts key processing functions from the core to the edge. These technologies also help optimise an organisation's network requirements in terms of data flow, bandwidth, acceptable latency, and throughput

- 5G networks also enable network slicing, allowing multiple virtual network slices built on physical networks to act as individual networks customised to varied application and user requirements. This will become increasingly relevant in the hybrid work from home environment of tomorrow.

Key principles of digital connectivity

Agility driven
Quickly responsive to changing data and application needs

Business focused
Business outcome driven services orchestration and provisioning

Innovation led
Evolved and optimised connectivity infrastructure

Efficiency based
Cost and operational efficiency through analytics and automation

Source: Everest Group (2021)

Operating model levers

- These advances will prompt organisations to consider purchasing networks, computing resources, and value-added services in a subscription-based Network-as-a-Service (NaaS) model, enabling them to achieve increased availability, reliability, and speed while optimising their spending.

- Although the model may be considered futuristic today, it will redefine how organisations create and consume network capabilities, acting as a one-stop-shop where the entire network infrastructure can be ordered and managed via a single portal in real time.
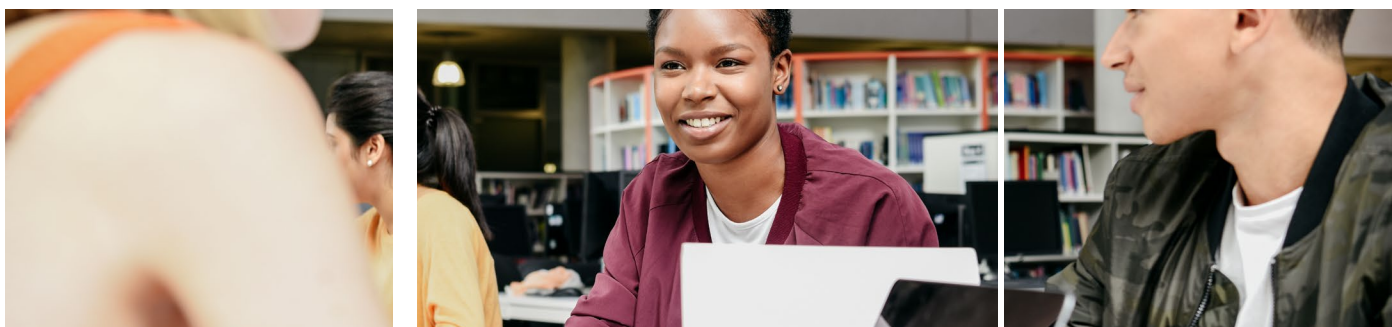
Comparison of traditionally and digitally connected organisations

To help organisations gain further clarity on where they stand in their digital connectivity journeys, this table draws out the key differences between a traditional and a digitally connected organisation. In traditional organisations, the focus remains primarily on the data centre network infrastructure because most of the data is processed and accessed from the on-premises data centre and branch offices via fixed lines and the internet.

On the other hand, in a digitally connected organisation, the role of the network evolves from transmitting and receiving information to dynamically connecting endpoints and generating insights to create business value. All of this is achieved without compromising speed, quality of service, latency requirements, or security.

Traditionally connected vs. digitally connected organisation

Traditional organisation		Digitally connected organisation
Rigid centralised architecture and fixed function network devices; vendor-specific ecosystem	Technology	Open decentralised architecture and software-defined network devices
Data hosted and processed at on-premises data centres	Nature of data hosted	Data hosted and processed in hybrid multi-tenant cloud and edge environments
Decentralised management; manual network provisioning and operations	Mode of operations	Centralised and agile management; automated network provisioning and operations
Network traffic and IT driven; focus on connection, uptime, and latency	Network priorities	Business-intent driven; focus on citizen experience, flexibility, and agility

Source: Everest Group (2021)

CIOs across industries understand that their investments in IT transformation can reap benefits only if that transformation is network-led. Examples of industry-specific value creation through focus on digital connectivity in the public sector include:

- **For public sector agencies** such as defence, education, health and welfare, transport, and justice and policing, it can lead to faster rollout of public services, seamless citizen experience, enhanced law enforcement, increased use of digital channels, and improved regulatory compliance

- **For state-owned banking and financial institutions**, it can result in improved transaction experience, strong governance, and robust data privacy

- **For local government bodies**, it can enhance residents' trust, improve inclusivity, speed and ease accessibility, and increase service excellence

Common digital connectivity benefits across industries

Improved **security**

Agile **management** and greater transparency

Improved **application performance**

Efficient **resource utilisation**

Optimised network **traffic routing**

Higher use of **automation and analytics**

Greater **speed** and **flexibility**

Source: Everest Group (2021)
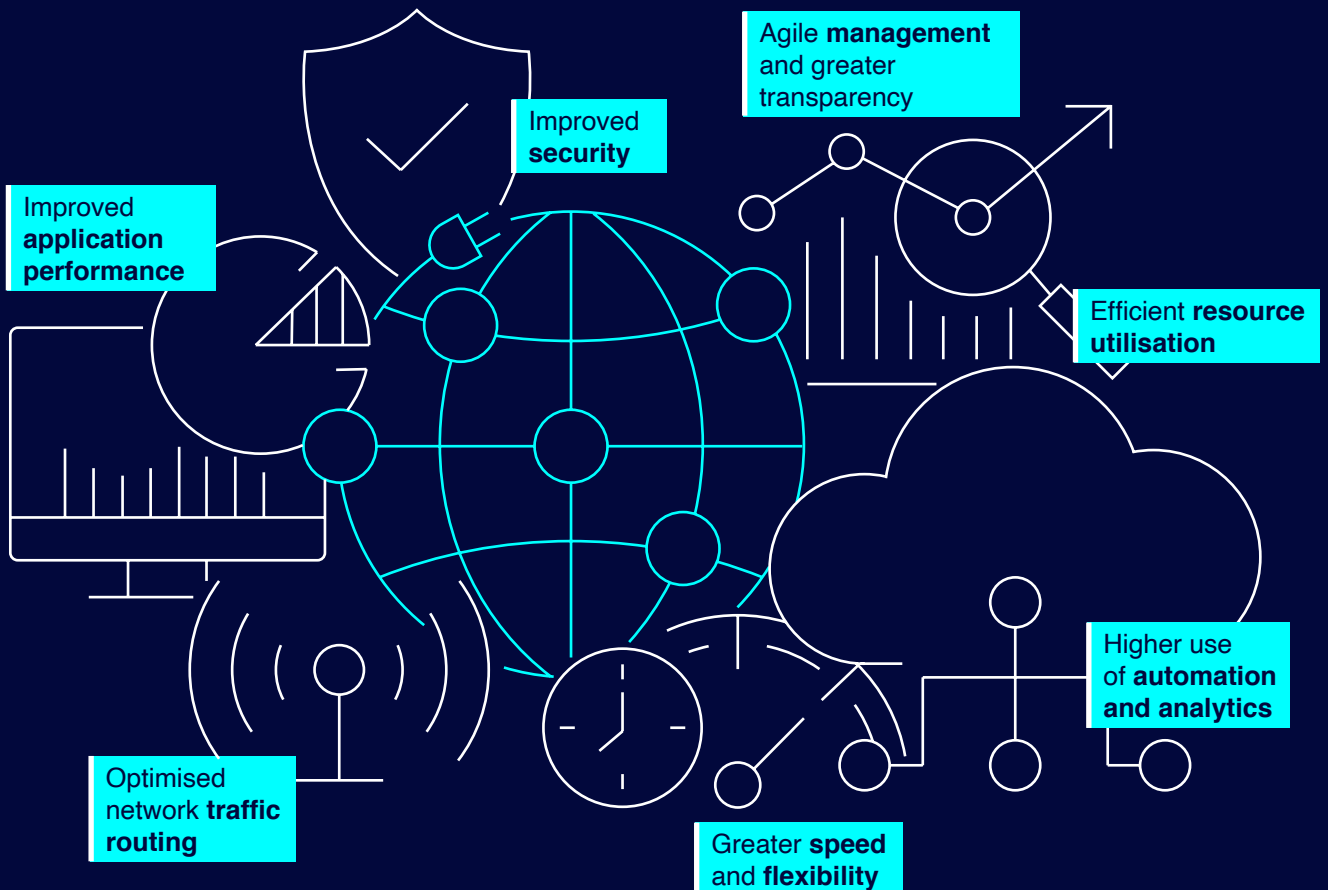
Conclusion and organisation blueprint for success

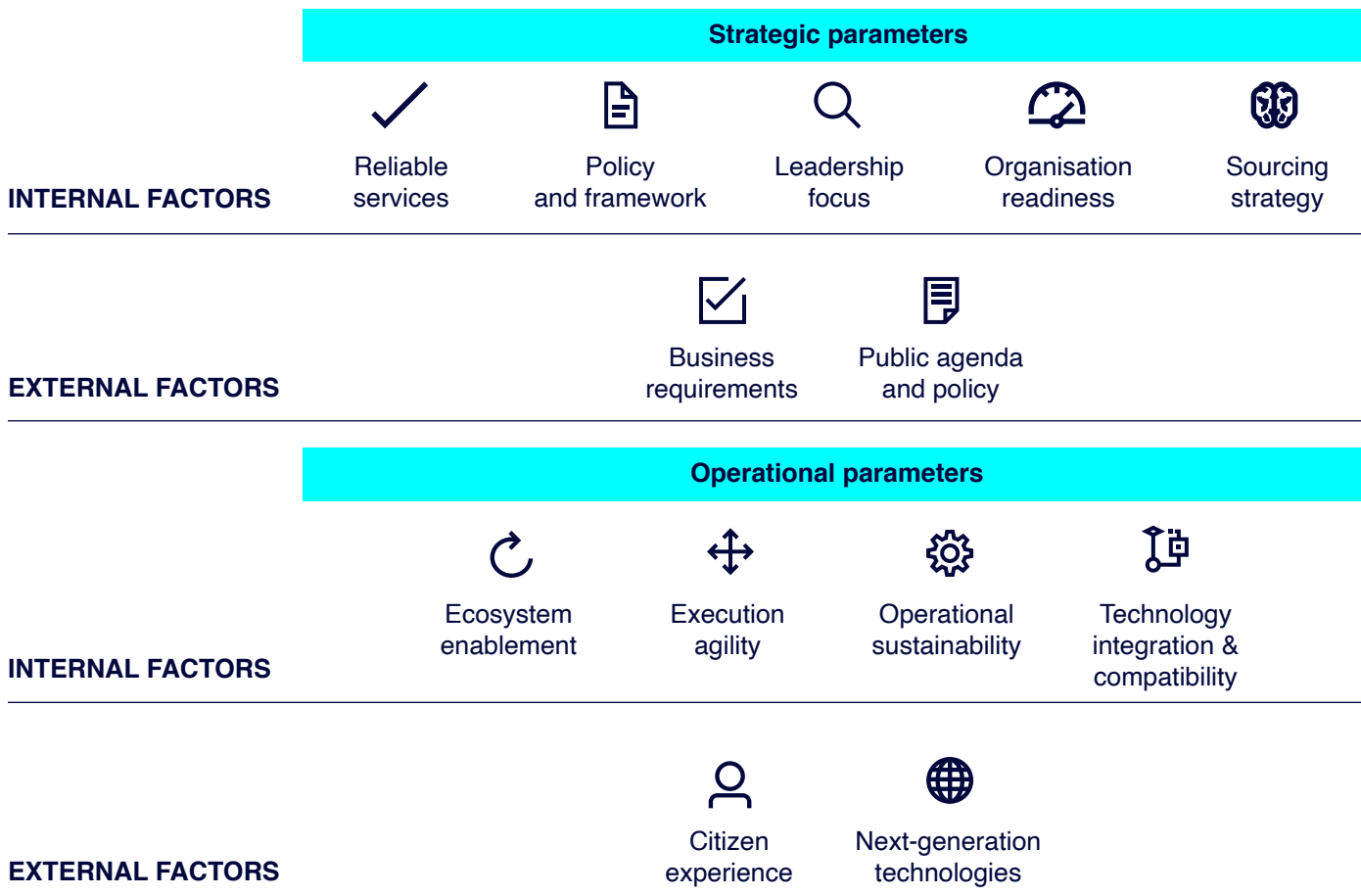## Decision-making framework for implementing digital connectivity

Driving network transformation to empower a digitally connected organisation is complex, as it requires decommissioning the existing network infrastructure, redefining network architecture and topology, investing in new technologies and processes, and enabling workforce and culture. It can be even more daunting for public sector organisations that face the hurdles of departmentalised systems, bureaucratic processes, and limited budget. Public sector agencies are also reluctant to invest in network transformation given their siloed nature.

A digital network transformation journey requires a well-devised strategy with clear objectives, a defined target state, and a comprehensive roadmap. An application-led and edge-driven approach interconnected with the other elements of the IT infrastructure landscape is necessary to achieve the full potential of this transformation.

Public sector organisations need to answer some pressing questions related to the current and to-be states, why they need digital connectivity, and how they plan to carry out the transformation before they embark on their transformation journeys. They should investigate strategic and operational parameters, both external and internal, before investing in digital connectivity.

Strategic and operational considerations for public sector agencies before investing in digital connectivity

Strategic parameters				
✓	📄	🔍	⏱	🧠
Reliable services	Policy and framework	Leadership focus	Organisation readiness	Sourcing strategy

INTERNAL FACTORS

	☑	📝	
	Business requirements	Public agenda and policy	

EXTERNAL FACTORS

Operational parameters			
↻	✛	⚙	🔌
Ecosystem enablement	Execution agility	Operational sustainability	Technology integration & compatibility

INTERNAL FACTORS

	👤	🌐	
	Citizen experience	Next-generation technologies	

EXTERNAL FACTORS

Source: Everest Group (2021)

Strategic parameters

Internal factors that public sector organisations should consider when deciding on their digital connectivity journeys include focus on reliable public services for citizens, current levels of organisational readiness for transformation, leadership focus and commitment, internal policies and frameworks, and the overall sourcing strategy.

Similarly, organisations should consider external strategic parameters such as regulatory requirements and public agendas before charting their digital connectivity roadmaps. Organisations should try to align these parameters with their digital connectivity goals from the beginning of their transformation journeys.

Operational parameters

On the operational side, organisations need to focus on execution agility, operational sustainability, technology integration, and ecosystem enablement. Ecosystem enablement requires the entire ecosystem of vendors, partners, and internal IT to come together and work towards the common goal of digital connectivity. Also, organisations need to leverage the best of next-generation technologies and work to improve the citizen experience as their end goal.

Organisations can follow the four steps highlighted in the following graphic to start to plan their journeys to digital connectivity.

Action steps to embark on a digital connectivity journey

Assess
Identify business &
technology objectives for
digital connectivity and
align partner ecosystem

Design
Formulate transformation
strategy, design
transformation plan
and roadmap

Execute
Deploy for pilot units/
users; organisation-wide
implementation

Analyse
Test connectivity,
analyse performance,
and generate insights

Source: Everest Group (2021)

Assess

- Assess the current maturity
  level of organisational
  connectivity

- Assess the current network
  landscape

- Assess the cost/benefits/
  risks of implementing digital
  connectivity

- Assess the impact on
  business operations while
  decommissioning and
  transforming

- Assess the existing talent
  profile vs. the skill set
  required to transform and
  support the target state

Design and execute

- Identify the right partner(s)
  and service provider(s)

- Identify target sites and
  impacted departments

- Identify mission-critical
  applications and their
  bandwidth and speed
  requirements

- Benchmark current technology
  and processes against
  industry standards and
  competitors

- Deploy for pilot units/users,
  followed by organisation-wide
  implementation

Analyse

- Analyse the impact of digital
  connectivity on an ongoing
  basis

- Deploy success and
  governance mechanisms
  (see more details in the next
  section)
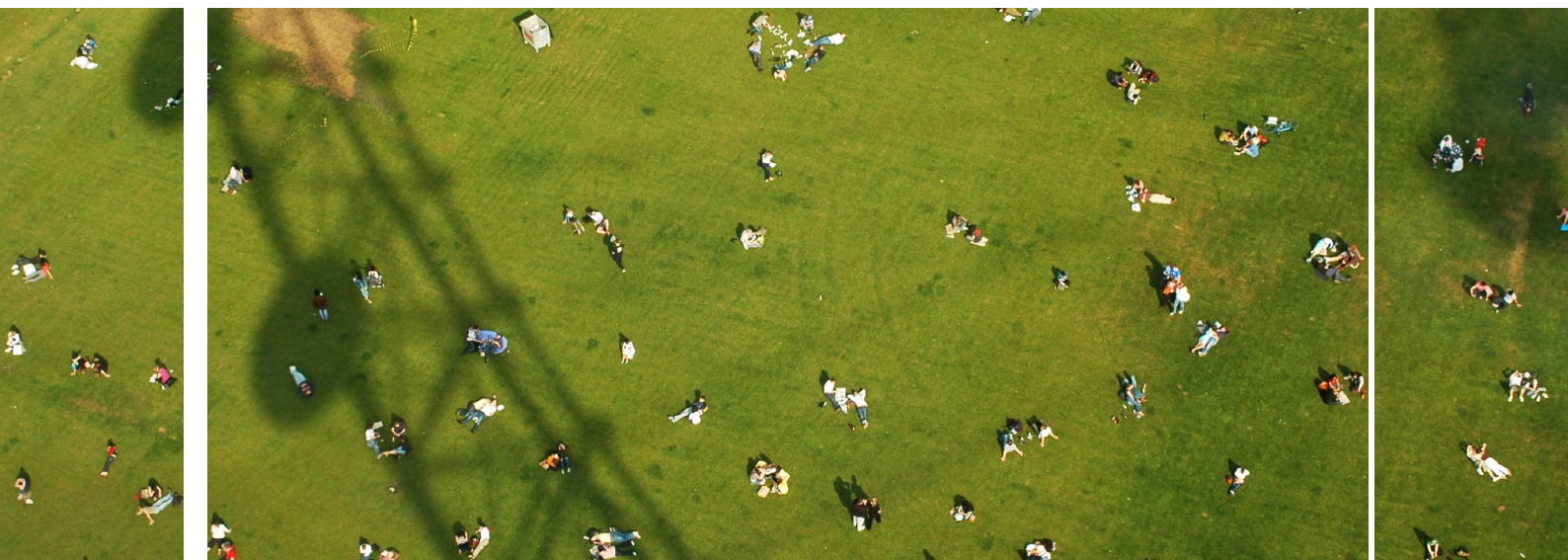
Measuring success and governance mechanism

In order to derive maximum value from digital network transformation, organisations need to implement a comprehensive set of value metrics that are:

Business-aligned: The impact of digital connectivity initiatives needs to be measured from the perspective of the overall business. The chosen metrics should establish a strong correlation between IT infrastructure services KPIs and relevant business performance dimensions.

Operational: An agile network infrastructure delivery model should enable organisations to seamlessly orchestrate discrete tool sets, deploy applications more quickly, improve flexibility, and securely orchestrate services while leveraging software-defined and virtualised network elements innovation.

Citizen-centric: The digital connectivity strategy needs to be planned and implemented with the consumer of services at the centre. Organisations need to acknowledge the relationship between connectivity and citizen experience. Network performance has a direct impact on employee and customer satisfaction, which can be measured by XLAs, NPS, and a user experience index. It is important to choose metrics that reflect real-time citizen experience.

Examples of next-generation metrics for digital connectivity

Business-focused

- % increase in ease of accessibility
- % spend reduction
- % reduction in time to roll out new services
- % increase in services fulfilment

Operations

- % increase in employee efficiency
- % increase in network availability and uptime
- Mean time to detect failure and resolve issues
- % reduction in security breaches
- % reduction in time to deploy applications
- % reduction in compliance issues
- % reduction in time for automatic provisioning
- % reduction in incidents per month

Citizen-centric

- XLAs, user experience index – based on analytics data
- Citizen satisfaction score
- Net Promoter Score (NPS)
- % reduction in time to service an end-user issue
- % increase in citizen engagement

Source: Everest Group (2021)

Certainly, investments in digital connectivity will take time, up-front capital infusion, restructuring, and re-adapting, but there is a cost to inaction.

Organisations need to prudently assess the relevance and viability of their digital connectivity initiatives as a long-term ROI rather than a short-term cost. Also, the return should not only be measured in terms of cost saved, but also by the value created for employees, citizens, and businesses.

The potential negative impacts of public sector organisations not investing in digital connectivity in the near term include:

Compromised citizen experience and reduced trust Inability to leverage benefits of other digital technologies and initiatives

- Operational inefficiencies and performance issues

- 5-15% lower customer satisfaction scores

- 30-40% lower service delivery timelines / productivity

- 35-45% increase in network maintenance, integration, and support cost

- 55-65% increase in the risk of security breaches

- 30-40% increase in total cost of ownership

Source: Based on the analysis of 50+ digital connectivity-related deployments / case studies across enterprises

Digital connectivity case studies

Organisation	Business challenge	Solution	Impact
Norfolk County Council, UK	The county was facing challenges with its connectivity infrastructure, that were directly impacting citizen experience and delivery of digital services.	The SI partner was responsible for implementing a digital connectivity solution and IoT network for citizens.	• Optimised citizen safety spend through IoT sensor implementation • Attracted new private businesses to the county
Highland Council, Scotland	The community was facing connectivity issues due to the pandemic and was struggling with legacy network infrastructure.	The SI partner equipped the community with secure network infrastructure and enabled digital transformation.	• 700-800% increase in the number of people working from home • Digital classrooms enabled for 30,000-50,000 students

Source: Everest Group (2021)

Public sector organisations should use these statements to inspire their thinking around their need for digital connectivity

01 Our **current networks** will not suffice to run digital applications in the next three to four years

02 **Real-time data processing** and **data delivery** requirements are important for our applications

03 Our core **operational applications** require extremely low levels of latency

04 High **network** reliability is critical for our applications

05 Different elements of our work have different network requirements such as varied levels of **speed and latency** requirement

06 We foresee an increase in the use of **connected devices** and the data generated thereby in the near future

07 We have near-term **investment plans** in areas such as smart cities and smart citizen services

If you agreed to **three or more statements**, you should consider investing in digital connectivity immediately, leveraging the steps in the digital connectivity roadmap.

To learn more about how Capita
can help you and your business,
please visit our website at
capita.com

Capita