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Summary policy paper for Cisco

AI for connectivity: how policy makers can help digitalisation

Ian Adkins, Andrew Daly, Adaora Okeleke, Dalya Glickman, Simon Saunders

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Executive summary

Artificial intelligence (AI) systems have significant potential to improve the operations of communications networks, including those offered by communications service providers (CSPs) and also end-user organisations (including enterprise and governments).

Although the adoption of AI in networks has begun, the communications industry has significant progress to make in order to fully realise the potential of AI. Policy makers, including governments and regulators, have a role to play in facilitating this adoption, and maximising the benefits of AI in communications networks. This paper sets out recommendations for how policy makers can help network operators to overcome challenges to embrace the capabilities of AI, which will drive a range of benefits in support of countries' wider digitalisation goals.

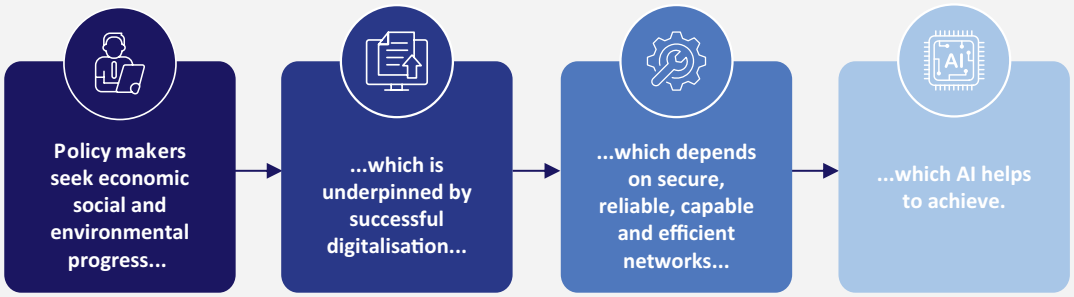
1.1 Improvements in communications networks operations will support digitalisation

Most national and regional governments have identified the benefits of digitalisation to the societies and economies that they govern. The goals of digitalisation include economic growth, increasing productivity and skills, improved delivery of public services, production of intellectual property, improving competitiveness with other economies, social inclusion and sustainable living. Any improvements in the operation and performance of digital communications networks will further support these goals. AI has the potential to provide improvements to networks across four key areas:

- improved resilience, including security and reliability, which is critical to underpinning the success of the digital economy
- improved operational efficiency, which lowers costs and therefore can allow greater coverage and capacity, and/or lower prices
- improved technical performance and customer experience, leading to increased satisfaction with services on the networks
- savings in energy consumption, which mitigate the carbon impact of networks.

Overall, AI supports the operation of networks, which in turn helps to unlock the benefits of digitalisation. These interdependencies are summarised in Figure 1.1.

Figure 1.1: Interdependencies between digitalisation, networks and AI [Source: Analysys Mason, 2025]



1.2 AI applications in communications networks combine to deliver digitalisation benefits

As communications networks continue to increase in size and complexity, with much of the potential functionality operating at 'machine scale', more control of that functionality will need to be handled by machines. AI has wide potential to be implemented in networks in both 'customer-facing' and 'network-facing' functions. While customer-facing functions are relevant to the digitalisation goals of policy makers, we have focused on the use of AI in network-facing functions, as these most directly support the aims of resilient, efficient, capable and sustainable networks.

We have chosen to focus on the benefits provided by a selection of the most promising use cases for the implementation of AI in communications networks. Our chosen applications are applicable to a wide range of interpretations of digital communications networks:

- networks operated by CSPs, such as mobile (e.g. 5G) and fixed (e.g. fibre) networks; and
- networks operated by public and private organisations (enterprise and government networks), which may run as an 'overlay' on the CSP networks.

This paper highlights the following applications in relation to AI in communications:

Anomaly detection, root cause analysis and issue prioritisation	AI-powered anomaly detection, root cause analysis and issue prioritisation allows rapid recovery from security and reliability issues, and fewer issues in the future. These features reduce network costs and minimise downtime for end users, reducing the wider economic and societal impact of security and reliability incidents, while boosting confidence in communications networks.
Configuration fidelity	AI-supported network configuration fidelity helps to reduce the likelihood of human error-driven network outages, by ensuring that all network equipment receives the correct parameters during both set-up and maintenance.
Predictive maintenance	AI-powered predictive maintenance systems 'listen' to a wide range of data inputs from the network, and by analysing the circumstances of previous failures can plan and target maintenance activities to avoid breakdowns before they occur.

Capacity management and planning	AI can analyse current and historical traffic data and form predictions based on previous patterns, to enable more accurate forecasting of when new investments should be made. This benefits both end-user experience (i.e. during busy periods) and operator cost management.
Capex optimisation	AI-enabled capex optimisation uses the data from the network to guide effective upgrades of the existing network to improve the experience of current customers, and help increase network coverage into new areas.
Optimisation of wireless networks	AI has the potential to improve the capabilities of wireless networks, which are typically constrained by the coverage and capacity dynamics of the spectrum they use. AI can make the best use of the spectrum resources available through dynamic allocation of spectrum, advanced beamforming and interference mitigation.
Energy consumption optimisation	The data analysis and advanced computation capabilities of AI can provide energy consumption (and cost reduction) benefits. These include dynamically putting idle network assets to sleep, and also potentially replacing conventional processing functions with a more energy-efficient alternative.

1.3 Overcoming implementation barriers will support adoption of AI in communications

Despite the potential benefits of AI applications in communications networks, implementation is being held back by a range of barriers:

- Data: while communications networks are rich sources of data, this data is often 'siloed' within the network operator (i.e. for different network- or customer-facing functions), requiring significant resources to access and prepare data, even before it can be used by AI.
- Trust: including concerns over both network configuration integrity and network security. Within the 'critical infrastructure' mindset of connectivity providers, network teams can be reluctant to allow AI to influence the operation of their systems (e.g. by recommending network parameters, or other network-related decisions). Network teams may also have security concerns related to the use of third-party AI models from external environments being allowed to work on internal data.
- Skills: communications network providers tend to be staffed by network experts, not data scientists and code debuggers. Their networks are generating data at an increasing rate, but they may not have enough of the right sort of skills to capitalise on the opportunity. Furthermore, existing governance teams will need to consider new types of issues, including whether any deployment of AI is done in a secure and responsible manner.
- Budget: deployment of any new technology by an organisation requires investment, and must be shown to provide a positive return. Some communications network providers are struggling to demonstrate a positive return on investment for AI deployments, due to the large up-front costs and uncertainties over the impact of AI on their operations.
- Regulation: existing regulation may be creating barriers both explicit (e.g. by imposing a significant reporting and governance burden on the use of AI) and implicit (e.g. because it is not clear how or whether the regulations can be met). These issues may be compounded where AI regulation overlaps with other areas of regulation, such as those related to data localisation and data transfer, or cloud, cyber security, telecoms, energy).

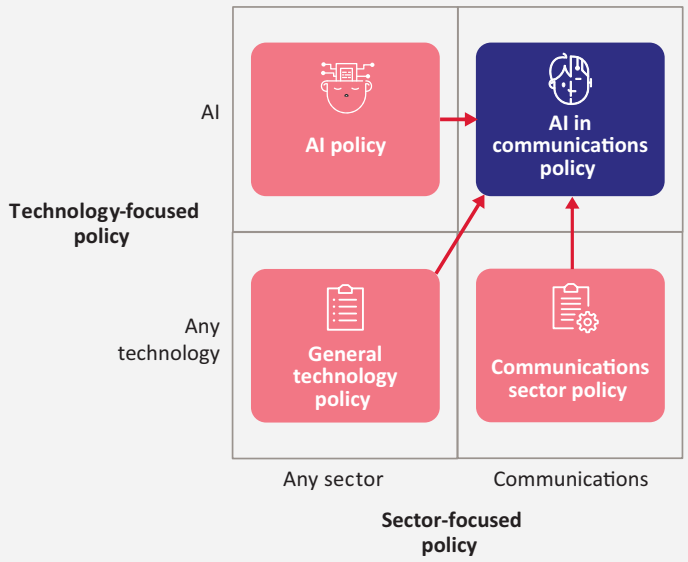
1.4 Policy makers have tools to maximise the potential of AI in communications networks

Some jurisdictions (whether national or regional) already have some form of AI-related and/or communications-related policies. There is an opportunity for policy makers to bring these elements together, to create a supportive environment for AI in communications, for the following reasons:

- communications networks are a critical foundation of all digital transformation goals; and
- the high-tech nature of communications makes it a natural first step for more sector-specific AI policy actions, which can lead the way for implementation in other sectors.

Existing policy can be tailored to focus on AI in communications, as shown in Figure 1.2.

Figure 1.2: Illustration of how existing policy can be targeted at AI in communications
[Source: Analysys Mason, 2025]



We present recommendations overleaf for policy makers under four high-level themes: engage, facilitate, implement and intervene.

Policy makers have a range of tools to maximise the potential of AI in communications networks

Engage	**Continual assessment of industry status**	Current and future trends	Multiple intelligence sources	Wide stakeholder engagement	Regulator reporting outputs
	Convene industry stakeholders	Share lessons and successes	Sub-groups with specific focus	Regular meetings	Inception report and regular updates
Facilitate	**Guidance on best practice**	Frameworks, with guiding principles based on industry success	Standards, used sparingly to enable interoperability		
	Ensure AI skills are available	Map what skills are needed and where	Government-supported training programmes	AI modules in university courses	Publish budgets
Implement	**Targeted R&D programmes**	Define specific goals for funding	Define project award criteria	Infrastructure partnerships techniques	Publish budgets
	Use of AI in government networks	Deploy AI in government networks	Build on initiatives and engagements above	Share results with trusted stakeholders	
Intervene	**Incentives to invest**	Tax incentives	Government-supported finance	Links to R&D programmes	Links to specific applications
	Shape outcomes	Regulation should be outcomes based	Collaborate and harmonise	Issue guidance on how to meet	Consult and iterate on changes

Communications networks are a natural fit for the capabilities of AI. AI-enabled communications networks are more resilient, capable, efficient and sustainable than conventional networks While there are implementation barriers to overcome, policy makers can take a leadership role in addressing these, and help to deliver wider digitalisation goals

The full report is available to download at www.analysysmason.com

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Analysys Mason Limited
North West Wing, Bush House
Aldwych
London WC2B 4PJ
UK
Tel: +44 (0)20 7395 9000
enquiries@analysysmason.com
www.analysysmason.com
Registered in England and Wales
No. 5177472

Get in touch

enquiries@analysysmason.com

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