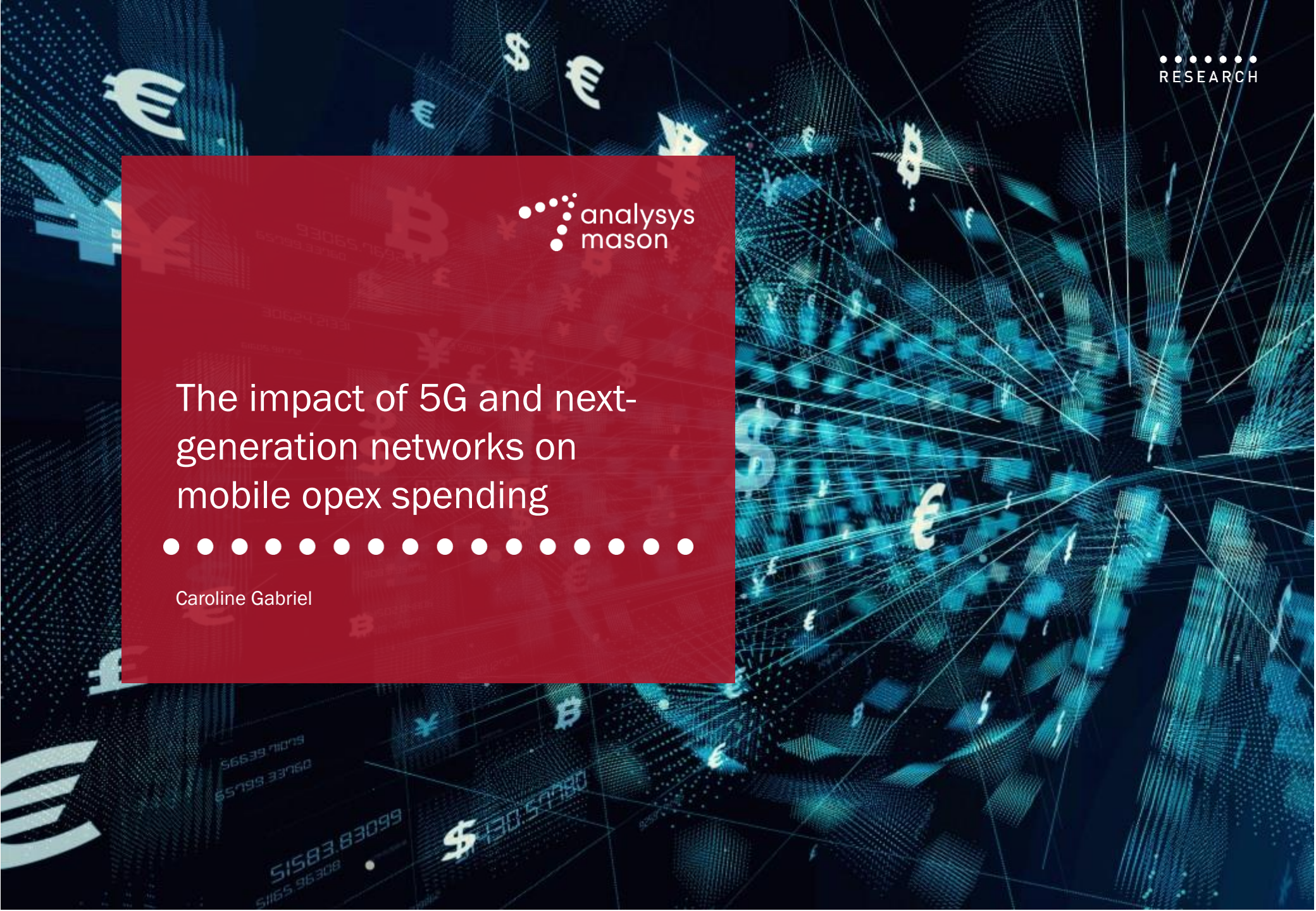

RESEARCH

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The impact of 5G and next-generation networks on mobile opex spending

Caroline Gabriel

About this report

This report describes the most important ways in which mobile operators can address one of their biggest challenges: the reduction of the operating expenditure (opex) related to their next-generation networks, including 5G. We will present a detailed analysis of the options available to MNOs according to their business models and priorities. This report also provides recommendations for senior management within mobile operators, including CFOs, CEOs and CTOs.

This report is based on several sources: interviews with about 40 MNOs, Analysys Mason internal research and public financial statements from operators.

GEOGRAPHICAL COVERAGE	CASE STUDIES
▪ Global	▪ Reliance Jio ▪ AT&T

KEY QUESTIONS ANSWERED IN THIS REPORT

- How can 5G, including its broader architecture, affect operating expenditure for operators?
- What are the technology choices that will have the greatest impact?
- When do we expect these technology and architecture changes to affect opex levels, and what will the regional patterns be?
- What factors may prevent operators from achieving their opex reduction targets?
- What is the most realistic timing to achieve an efficient operating cost base? Will slower movers benefit more than early adopters in certain scenarios?

WHO SHOULD READ THIS REPORT

- Key decision makers (CTOs, CMOs and CEOs) in business and platform sectors who are formulating strategies for future product and service models and need to understand the implications of the new connectivity.

Executive summary

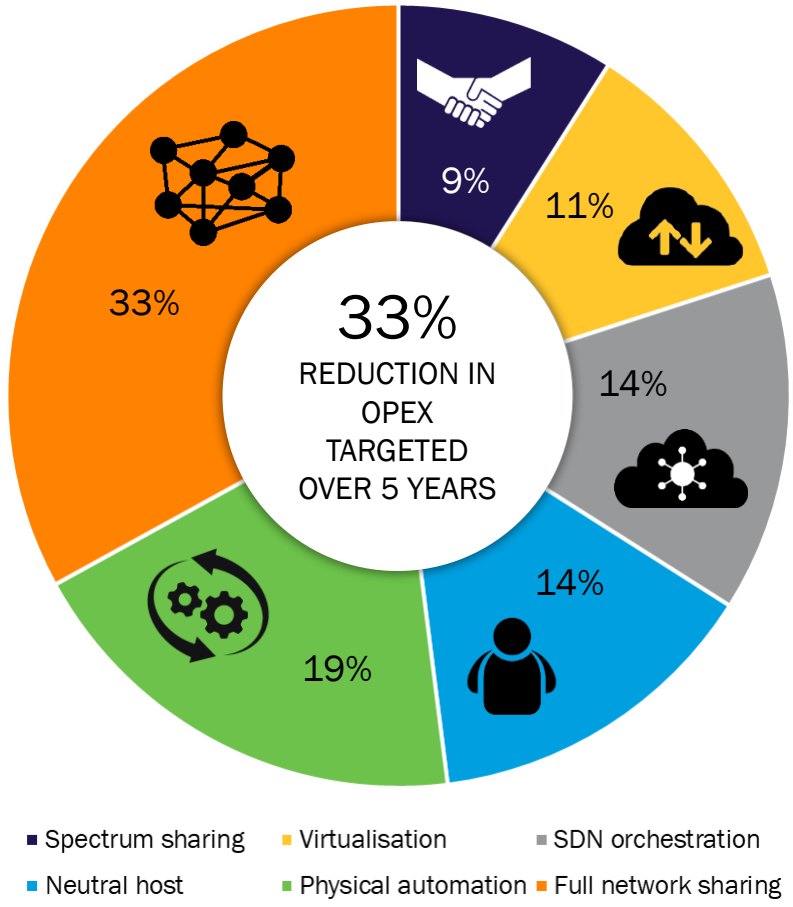
A dramatic reduction in operating expenditure (opex) is essential to the 5G business case for most MNOs, but neither 5G, nor associated virtualisation, will deliver this alone. MNOs need to plan a multi-faceted approach to cost reduction now, including new approaches to asset sharing and co-investment.

For many operators, one of the key promises of 5G was to reduce opex significantly, by introducing higher levels of virtualisation, automation and software-defined networking (SDN). However, even before 5G is commercially deployed, it has become clear that these approaches will not quickly deliver savings of the magnitude targeted by MNOs. Operators will need to adopt other tactics. Some of these, such as increased sharing of networks and spectrum, are already being demonstrated by a new breed of disruptive, opex-light operators.

KEY RECOMMENDATIONS

1. Operators should maximise the cost efficiencies of a virtualised, automated network, but should also focus on the other benefits of this new architecture.
2. Operators should rethink the efficiencies of the physical network as well as those of the virtualised one, and should be open to significant levels of asset sharing and 'brutal' automation.
3. Operators should learn from disruptors' opex-light models and encourage regulators to create the right environment.

Figure 1: Breakdown of targeted 5G opex savings



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Challenge: no one approach to cost reduction will decrease opex enough to make 5G profitable

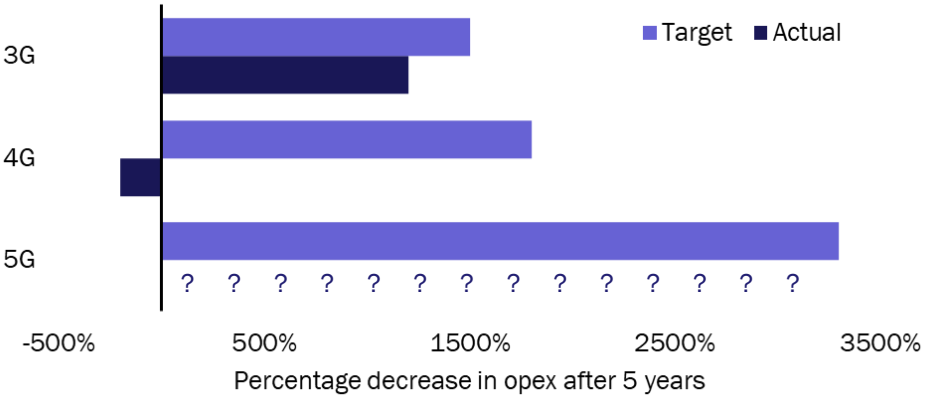
As mainstream revenue growth declines, radical opex reduction is essential. The efficiencies of the 5G platform will not be enough, on their own, to reach targets as high as a 40% opex reduction over 5 years, along with a 25% increase in capacity.

Mobile operators' opex has been growing more quickly than their revenue since 2008 and they have consistently missed targets to reduce it (Figure 2). They have reduced the cost per site, but the number of sites has increased significantly with each mobile generation (Figure 3). It is therefore essential to adopt a radically different approach to planning and running the new next-generation networks, in order to slash not just the cost per site, subscriber or kilometre, but the absolute opex levels.

One of the drivers for MNOs' migration to 5G is the promise of far-lower operating costs, achieved partly through a platform that will be heavily virtualised and automated. However, the amount of opex efficiency provided by the software-driven approach is unproven, and the chief justification for virtualisation therefore comes from other benefits such as service agility.

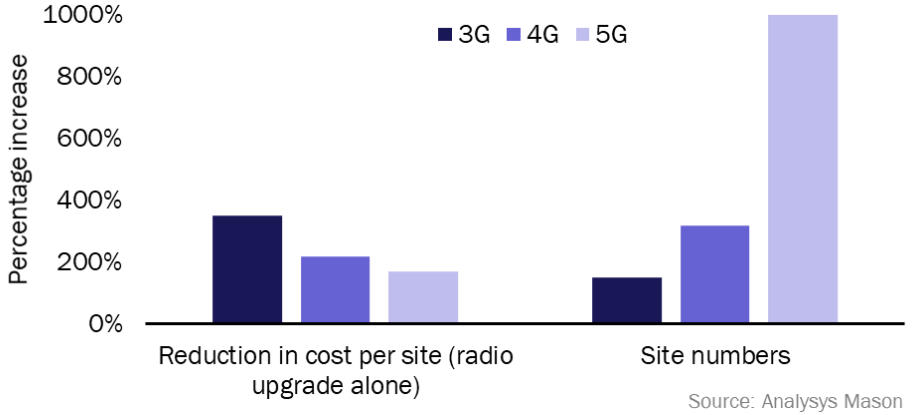
On the opex front, MNOs will need to derive as much efficiency as they can from a more open, software-based network, but there is typically a maximum opex reduction of 25%. There remains a significant challenge to reduce the cost of running the elements of the network that are not susceptible to 'software-isation'.

Figure 2: The gap between opex targets and reality[1]



Source: Analysys Mason

Figure 3: Changes in cost per site and site numbers, by generation[1]



Source: Analysys Mason

[1] Source for consensus 5G targets: Analysys Mason survey 52 MNOs + public operator statements. Source for other figures: operator statements.

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Solution: a multi-faceted strategy is complex, but can transform an MNO's cost model

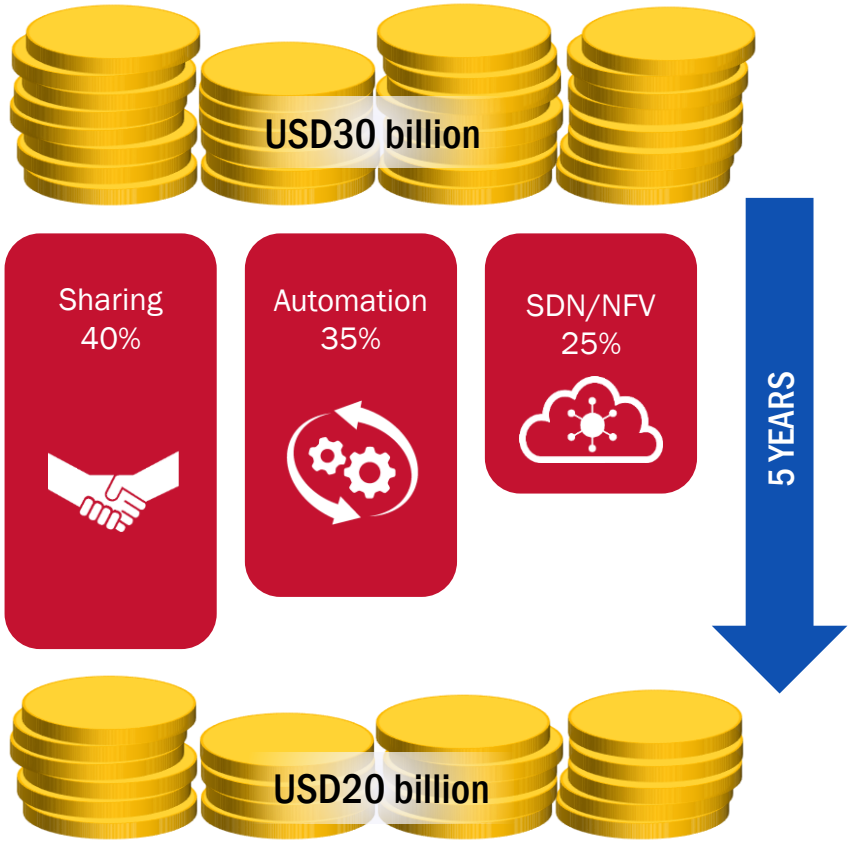
Several characteristics of next-generation platforms support radical opex reduction, but only if harnessed in parallel and with a co-ordinated plan on how to transform the cost model.

There are three approaches to opex reduction for MNOs.

- Make an early start with the implementation of the virtualisation and software-defined networking (SDN) strategy. The opex savings will not be immediate and they will often be forward-looking; only if approaches such as slicing are successful at generating new customers or services will the overall cost per customer come down.
- Apply automation to every process, not just those affected by SDN. Activities such as site maintenance, spectrum utilisation, network optimisation and customer service can all be heavily automated, and eventually, some can be AI-enabled. This can affect 35% of a typical opex budget.
- Be open to much more equipment, spectrum and asset sharing. Partners may be other MNOs or new stakeholders such as industrial or web-scale companies. This will shift the capex/opex ratio towards the latter, but can also reduce the absolute opex if the overall total cost of ownership (TCO) is reduced enough.

Together, these approaches can deliver a reduction in absolute opex of at least one third over a 5-year period.[1]

Figure 4: The contribution of different factors to a 33% reduction in opex



Source: operator statements and survey

[1]This conclusion is based on calculations by over 50 MNOs surveyed by Analysys Mason, and case studies of disruptive, opex-light MNOs such as Reliance Jio. The results of these studies are detailed in the report.

Recommendations

1

Operators should maximise the cost efficiencies of a virtualised, automated network, but should also focus on the other benefits of this new architecture.

A 5G network that is built on a software-driven, orchestrated architecture will reduce the opex per site or per kilometre because of a more flexible allocation of resources (including physical resources). However, this will be offset by the increase in the number of sites and in the backhaul/fronthaul capacity for 5G. Therefore it is essential to combine new software architecture with other tactics that can reduce the absolute opex spending.

2

Operators should rethink the efficiencies of the physical network as well as those of the virtualised one, and should be open to significant levels of asset sharing and 'brutal' automation.

MNOs must reduce the operating costs of physical infrastructure by using automated processes such as predictive maintenance and SON. They also need to reduce the number of physical assets that they run themselves, and should share active equipment and spectrum or rely on emerging neutral host providers. This will shift the balance of spending from capex to opex, but can also reduce both elements of TCO.

3

Operators should learn from disruptors' opex-light models and encourage regulators to create the right environment.

Greenfield and neutral host operators will show the way to an infrastructure-light, opex-light model which will not just increase the operational efficiency but also reduce the absolute opex spend. Other operators must emulate some of these tactics or risk being outpaced in terms of price flexibility or service agility. This means being open to sharing network assets not just with fellow MNOs, but with industrial or web-scale partners, with the potential to follow a co-investment model. MNOs should encourage regulators to enable such approaches.

Contents

About the author

Caroline Gabriel (Senior Contributor, Research) is part of Analysys Mason's *Next-Generation Wireless Networks* research programme. She contributes to Analysys Mason's published and custom research content and works directly with our research clients to advise them on wireless network trends and market developments. Caroline has been engaged in technology analysis, research and consulting for 30 years, and has focused entirely on mobile and wireless since 2002. As co-founder and research director of Rethink Technology Research, Caroline has developed a research base and forecast methodology based around deep contacts with mobile and converged operators worldwide.

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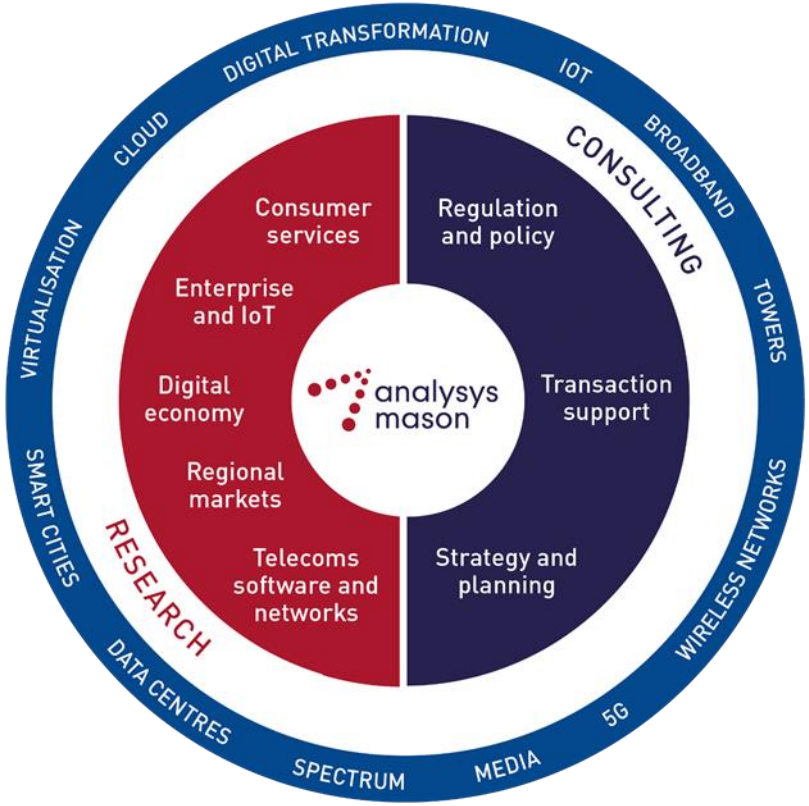

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Bush House • North West Wing • Aldwych • London • WC2B 4PJ • UK

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