POST-EVENT WEBINAR
March 2018

MOBILE WORLD CONGRESS 2018
KEY FINDINGS AND IMPLICATIONS

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Roberto Kompany, Caroline Chappell,
Justin van der Lande and Michelle Mackenzie**

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Webinar overview

MWC key themes and takeaways
Larry Goldman, Head of Telecoms Software and Networks

Mobile networks are key to evolving to the converged, sliced future services
Caroline Gabriel, Senior Contributor

5G will be driven by many different issues
Roberto Kompany, Senior Analyst

Automation, cloud-native NFV, multi-domain SDN, distributed cloud and end-to-end orchestration
Caroline Chappell, Research Director

AI is set to grow and mature as new use cases drive innovation for CSPs and vendors
Justin van der Lande, Principal Analyst

Operators face challenges to generate revenue from IoT beyond connectivity
Michele Mackenzie, Principal Analyst

Q&A

?

- 15 minutes after presentations

- Enter your questions in the 'Ask a question' tab on the left during webinar

MWC18 perspective – 5G is part of a bigger, more-complex set of investment trade-offs

INVESTMENT TRADE-OFFS
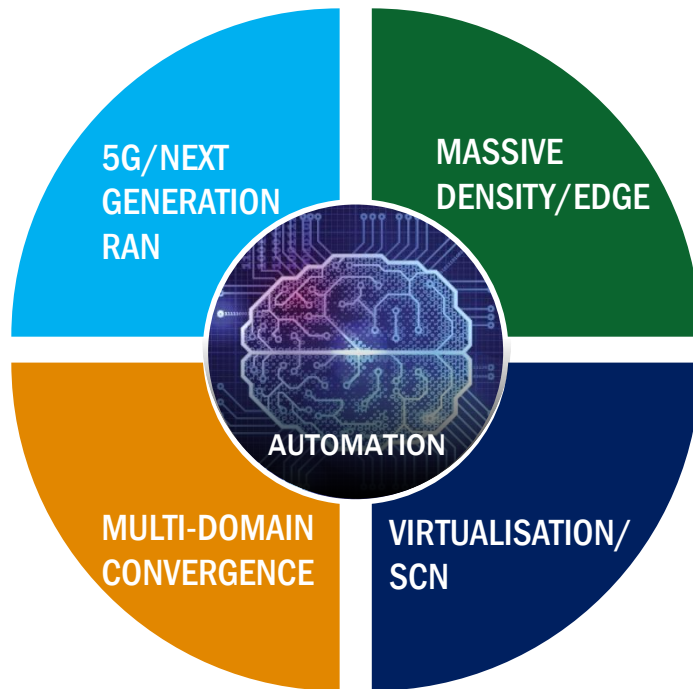
Dominate by raising barriers to entry

5G, full-fibre upgrades

High risk,
service optimist

Hardware-oriented
investment

Upgrade connectivity

New retail and
platform models

Extend service
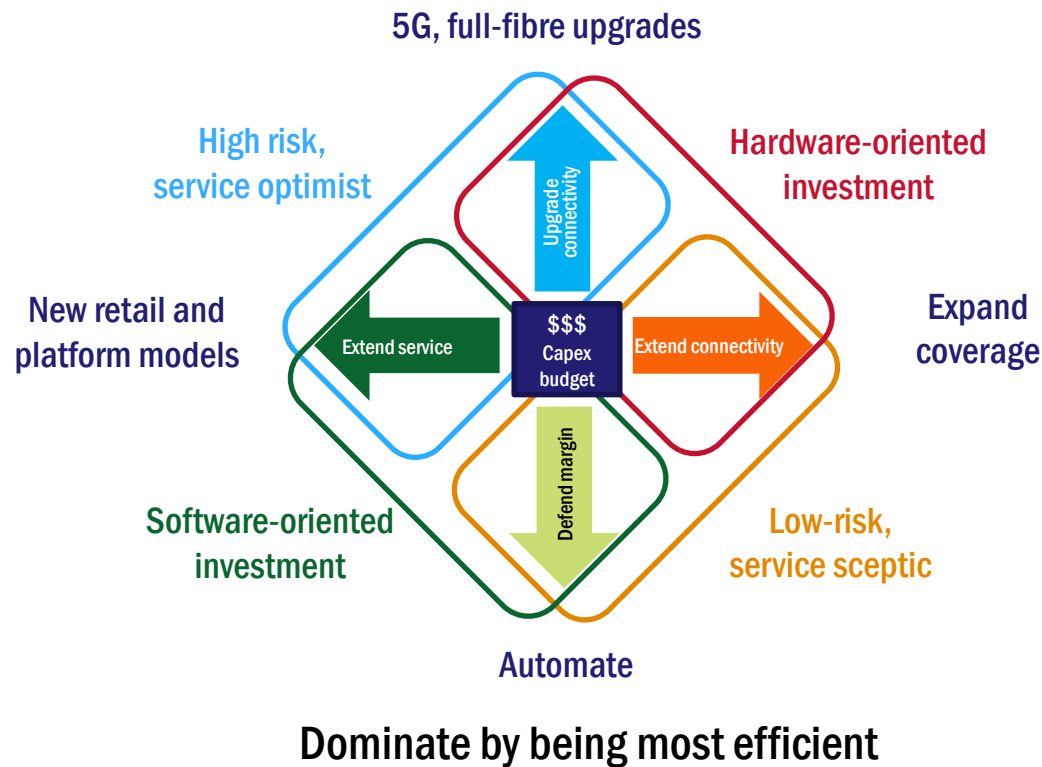
$$$
Capex
budget

Extend connectivity

Expand
coverage

Software-oriented
investment

Defend margin

Low-risk,
service sceptic

Automate

Dominate by being most efficient

Key findings

- Operators have to choose a balance. In a normal competitive environment, they can rarely afford it all.

- Enhancement (upgrade): more advanced network capabilities to establish an advantage, weaken competitors. How much do they emphasize 5G? What about FTTP?

- Geographical extension: physical network or virtual service reach to boost the top line – for many, this is extending the reach of existing LTE networks.

- Service extension: new high-growth adjacent areas, including IoT and B2B services.

- Transformation: investment in efficiency to boost the bottom line.

Mobile networks are no longer a silo, but are key to evolving to the converged, sliced future

5G/NEXT GENERATION RAN

MASSIVE DENSITY/EDGE

AUTOMATION

MULTI-DOMAIN CONVERGENCE

VIRTUALISATION/ SCN

$$$$$

PHASE 1	PHASE 2	PHASE 3
OPERATOR AUTOMATED SLICE CREATION AND APPLICATION ALLOCATION	THIRD-PARTY AUTOMATED SLICE CREATION AND APPLICATION ALLOCATION	APPLICATION-NEGOTIATED SLICE SELECTION/ INSTANTIATION/ CONSUMPTION

SERVICE-SPECIFIC NETWORK SLICES

CAPACITY-BASED VIRTUAL NETWORK SLICES

PHYSICAL NETWORK INFRASTRUCTURE SLICES

Mobile decisions are taken in the context of a fully integrated, automated network

Result: connectivity platform and business reinvented around slicing

Key findings

- 5G is not just a radio network. To be justified as an investment, it has to be part of a broader platform that supports radical cost efficiency and new revenue.

- At MWC 2018, there was less direct discussion (or hype) about the 5G radio than in 2017, despite plenty of demos based on the new standards.

- There was far greater emphasis, by vendors and operators, on changes to enhance the impact of 5G. In our view, the critical ones are multi-domain convergence, virtualisation/orchestration, and massive density of cells and devices.

- The significance of 5G is less in high speeds and low latency (Huawei demonstrated both using LTE), but its ability to support and enhance these changes in a standards-based way.

- Operators are still searching for a business case. We believe this will be found in network slicing, which will create virtual optimised slices of network resources for a host of applications and eventually allow those services to become self-navigating. Notable slicing demos came from smaller companies like Argela, to major vendors like ZTE. This reflects the broader ecosystem that the new network will support.

Further research

TYPE	TITLE	AUTHOR(S)	LINK
Strategy report	Network slicing: the future of connectivity in a 5G and fibre era	Caroline Gabriel and Caroline Chappell	www.analysysmason.com/Research/Content/Reports/network-slicing-connectivity-RMA16-RMA18/
Comment	Towercos can capitalise on new opportunities in the dense 5G HetNet	Caroline Gabriel	www.analysysmason.com/Research/Content/Comments/5G-towerco-opportunities-RMA18/
Strategy report	Small cells: to realise the benefits of 5G, the mobile value chain must alter its approach to densification	Caroline Gabriel	www.analysysmason.com/Research/Content/Reports/Small-cells-densification-Feb2017-RMA18/
Strategy report	5G migration: SON solutions must become the brains of the network	Caroline Gabriel	www.analysysmason.com/Research/Content/Reports/5G-SON-brains-Jan2017-RMA18/
Strategy report	Planning for cloud-RAN now to ease 5G later: how vendors can lower the barriers to CSP adoption	Caroline Gabriel	www.analysysmason.com/Research/Content/Reports/Cloud-RAN-5G-Oct2016-RMA18/
Forecast	Mobile operator capex spending: worldwide trends and forecasts 2016–2025	Caroline Gabriel	www.analysysmason.com/Research/Content/Reports/mobile-capex-forecast-RDNS0/

5G will be driven by many different issues giving more players a role in how CSPs develop their networks

Figure: The mobile ecosystem is changing to include IT/cloud and small cells as well as new entrants
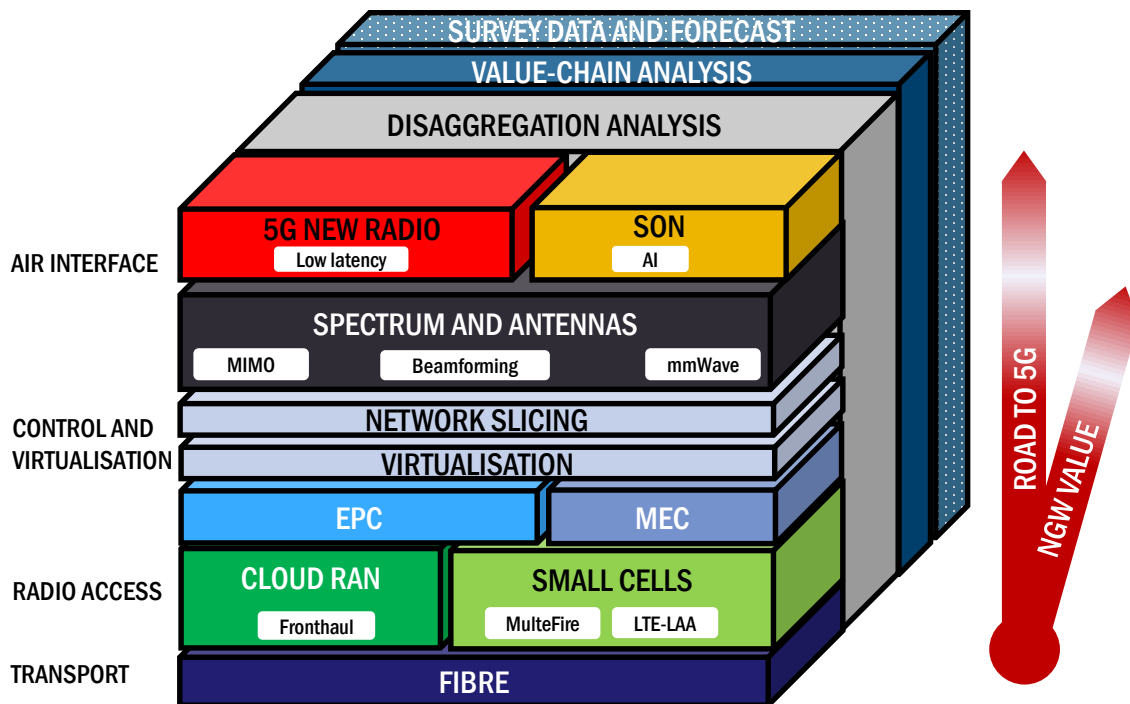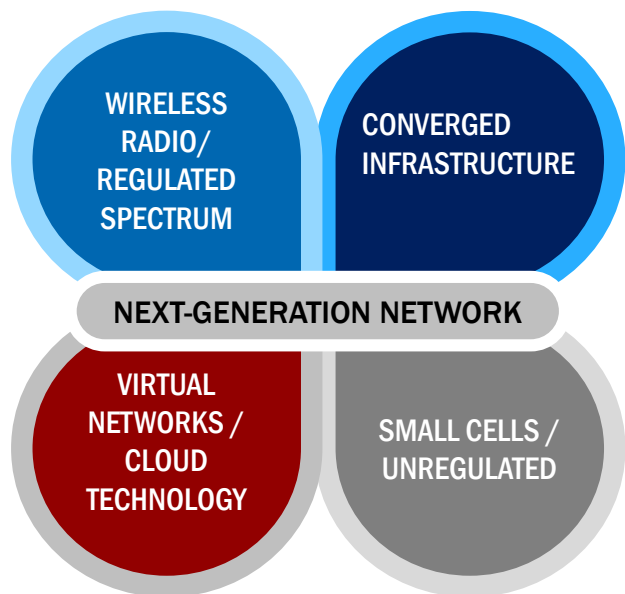
Key findings

- 2018 will be the year of 5G according to several high-profile operators, such as AT&T and Verizon.

- 5G network must drive down the cost per bit delivered by at least an order of magnitude. This will be achieved by creating innovative radio solutions.

- Disaggregating the RAN in to its components and virtualisation creates efficiencies where resources can be allocated on a dynamic basis, reducing capex and opex. Initiatives such as xRAN, CRAN, now OpenRAN will accelerate this.

- 5G introduce a number of new technologies such as millimetre-wave spectrum, massive-MIMO antennas and beamforming to deliver spectrum efficiency and reuse. Many new players are developing sophisticated technologies.

- 5G will require new spectrum in the sub-6GHz and millimetre-wave bands where auctions will be held. Several operators are calling on regulators to avoid high prices.

- 5G will be a heterogenous network with the need for scaling and automation to deliver the use cases such as network slicing, and massive IoT deployment.
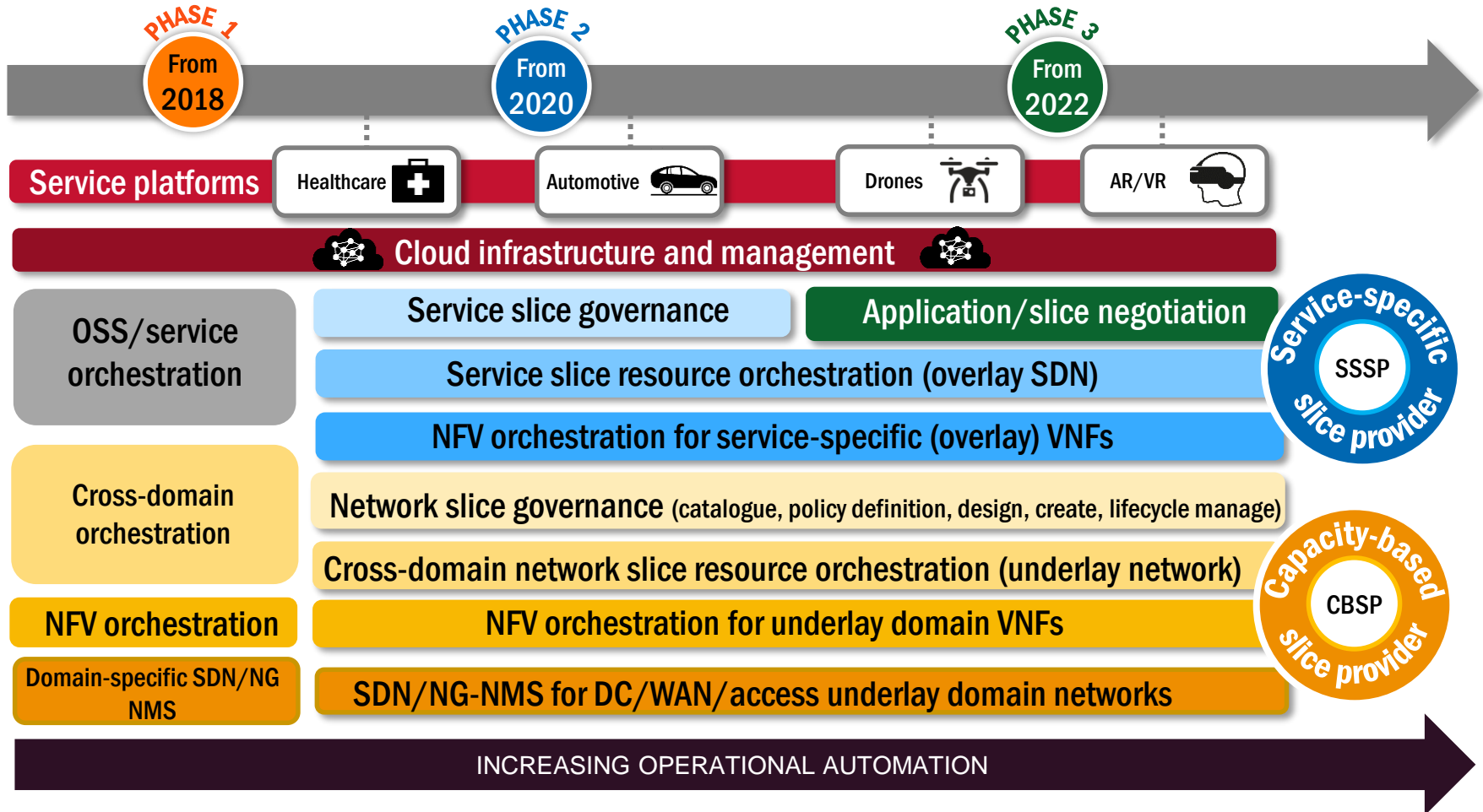
Further research

TYPE	TITLE	AUTHOR(S)	LINK
Strategy report	Next-generation wireless network investment: LTE will fill the 5G gap for operators and vendors	Roberto Kompany	www.analysysmason.com/Research/Content/Reports/5G-gap-LTE-RMA18/
Strategy Report	Millimetre-wave spectrum and 5G: opportunities for operators and vendors	Roberto Kompany	www.analysysmason.com/Research/Content/Short-reports/mmWave-spectrum-5G-Mar2017-RMA18/#31March2017
Comment	5G gives Samsung a long-awaited opportunity to break into radio access networks	Roberto Kompany	www.analysysmason.com/Research/Content/Comments/Samsung-Arqiva-FWA-RMA18/
Strategy Report	MulteFire: vendors have an opportunity to accelerate small-cell deployment in unlicensed spectrum	Roberto Kompany	www.analysysmason.com/Research/Content/Short-reports/MulteFire-small-cells-RMA18/
Strategy Report	eCPRI: MNOs require open fronthaul standards and multi-vendor solutions to reduce deployment costs	Roberto Kompany	http://www.analysysmason.com/Research/Content/Short-reports/eCPRI-standards-MNOs-RMA18/
Comment	Mobile operators must de-risk their MIMO antenna upgrades as traffic demand grows	Roberto Kompany	www.analysysmason.com/Research/Content/Comments/RAN-World-MIMO-RMA18/
Strategy report	Multi-access edge computing: content moves to the edge of the network	Roberto Kompany	www.analysysmason.com/Research/Content/Short-reports/Multi-access-edge-computing-RMA18/

Automation, distributed, cloud-native NFV, multi-domain SDN and end-to-end orchestration are needed for 5G

Figure: Orchestration is a key opportunity with vendors potentially able to sell to many new customers as the slicing value chain diversifies

PHASE 1 From 2018

PHASE 2 From 2020

PHASE 3 From 2022

Service platforms — Healthcare | Automotive | Drones | AR/VR

Cloud infrastructure and management

OSS/service orchestration
- Service slice governance
- Application/slice negotiation
- Service slice resource orchestration (overlay SDN)
- NFV orchestration for service-specific (overlay) VNFs

Service-specific slice provider — SSSP

Cross-domain orchestration
- Network slice governance (catalogue, policy definition, design, create, lifecycle manage)
- Cross-domain network slice resource orchestration (underlay network)

NFV orchestration
- NFV orchestration for underlay domain VNFs

Domain-specific SDN/NG NMS
- SDN/NG-NMS for DC/WAN/access underlay domain networks

Capacity-based slice provider — CBSP

INCREASING OPERATIONAL AUTOMATION

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Key findings

- Telefónica's CTIO: virtualisation is a prerequisite for 5G – and it's the big challenge: the industry knows how to do antennae.

- Virtualisation requires simplification of network architecture and an end to silos: simplification across network domains was a big message.

- Cloud-native virtualisation can't be achieved without automation – and neither can network slicing across both physical and virtual networks.

- No orchestration product answers to end-to-end slicing yet, although we think there will be a broad market for this capability (illustrated on slide).

- Automation is a long road, operators are at the beginning, Google et al took years to achieve the extreme automation they have today.

- Messages we heard from operators and vendors endorsed our DNOP vision – may not like terminology but consensus on simplified, virtualised network architecture with closed-loop operations close to network elements.
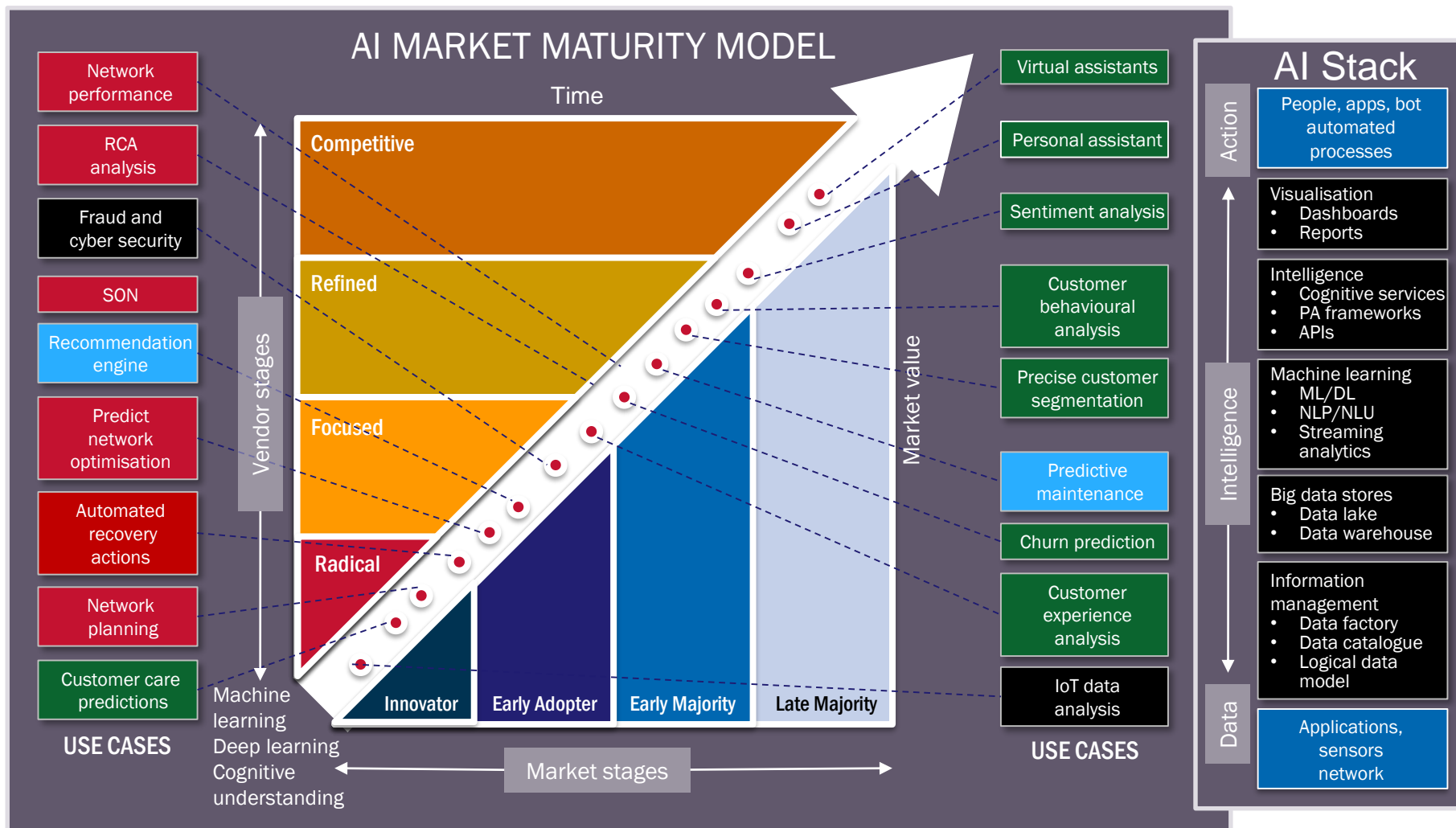
Further research

TYPE	TITLE	AUTHOR(S)	LINK
Strategy report	Network slicing: the future of connectivity in a 5G and fibre era	Caroline Chappell and Caroline Gabriel	www.analysysmason.com/Research/Content/Reports/network-slicing-connectivity-RMA16-RMA18
Short strategy report	Defining the digital network and operations platform for 5G and future networks	Caroline Chappell	www.analysysmason.com/Research/Content/Short-reports/Defining-DNOP-5G-RMA16-RMA07-RMA18-RMA01-RMA02-RMA04
Strategy report	Software-defined networking (SDN) in the WAN: solution options and vendor opportunities	Caroline Chappell and Dana Cooperson	www.analysysmason.com/Research/Content/Reports/SDN-WAN-strategy-Mar2017-RMA07/
Short strategy report	Cloud native opportunities for telcos: definitions, challenges and opportunities	Caroline Chappell and John Abraham	www.analysysmason.com/Research/Content/Reports/Cloud-native-computing-CSPs-RMA16/
Short strategy report	NFV deployment models: 'virtual boxes' predominate as orchestrated deployments are slow to take off	Caroline Chappell, Don Alusha, Gorkem Yigit	www.analysysmason.com/Research/Content/Short-reports/NFV-deployment-models-RMA16/
Report	Telefonica's UNICA architecture strategy for virtualisation	Dana Cooperson and Caroline Chappell	www.analysysmason.com/Research/Content/Reports/telefonica-UNICA-architecture-strategy-for-network-virtualisation-white-paper/

AI is set for growth fuelling digital transformations by creating dynamic insights from big data

AI MARKET MATURITY MODEL

Time

USE CASES (left column, top to bottom):
- Network performance
- RCA analysis
- Fraud and cyber security
- SON
- Recommendation engine
- Predict network optimisation
- Automated recovery actions
- Network planning
- Customer care predictions

Vendor stages

Market value

Market stages

Competitive
Refined
Focused
Radical

Innovator | Early Adopter | Early Majority | Late Majority

Machine learning
Deep learning
Cognitive understanding

USE CASES (right column, top to bottom):
- Virtual assistants
- Personal assistant
- Sentiment analysis
- Customer behavioural analysis
- Precise customer segmentation
- Predictive maintenance
- Churn prediction
- Customer experience analysis
- IoT data analysis

AI Stack

Action

- People, apps, bot automated processes

Intelligence

- Visualisation
  - Dashboards
  - Reports
- Intelligence
  - Cognitive services
  - PA frameworks
  - APIs
- Machine learning
  - ML/DL
  - NLP/NLU
  - Streaming analytics
- Big data stores
  - Data lake
  - Data warehouse
- Information management
  - Data factory
  - Data catalogue
  - Logical data model

Data

- Applications, sensors network

Key findings

- The AI revolution has started, but has a long way to go.

- AI tools solve the thorny issue of creating deep insights from big data, but without needing continual intervention with expensive data scientist resources.

- This enables insights to be generated more often, with more data and more precision.

- AI has started with customer-facing use cases – typically with virtual assistants or with NBAs. Customer-facing domains are typically complex and expensive to service so are ripe for a more-automated approach using AI.

- Use cases focused on network and operations are less mature generally.

- Fraud and security are heavy users of AI. They are able to scale, develop new algorithms and look for unusual activity to spot problems.

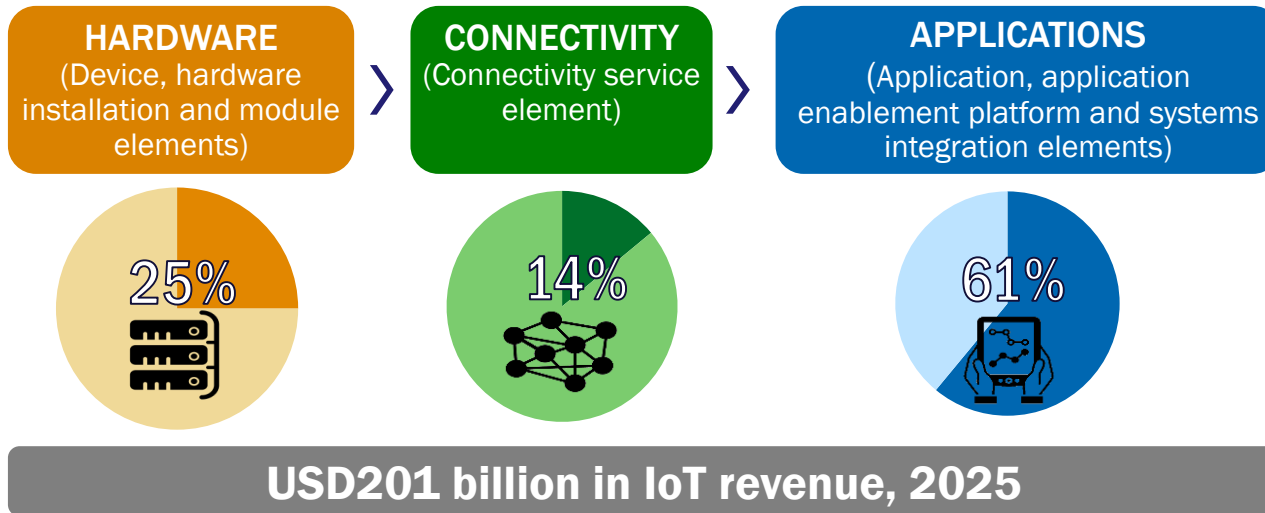- Automations and digital transformation needs AI to work – most CSPs have recognised this.

Further research

TYPE	TITLE	AUTHOR(S)	LINK
Strategy report	The rise of AI: why it is different this time	Justin van der Lande	http://www.analysysmason.com/Research/Content/Short-reports/AI-telecoms-different-RMA14/
Strategy report	Collaborative AI platforms: accelerating the adoption of AI in telecoms	Justin van der Lande	http://www.analysysmason.com/Research/Content/Short-reports/collaborative-ai-platforms-rma14/
Comment	GDPR conformity may hinder AI uses cases and data monetisation unless incentive schemes are in place	Justin van der Lande	http://www.analysysmason.com/Research/Content/Comments/AI-GDPR-conformity-RMA14/
Strategy report	Data centres: network function virtualisation data infrastructure can help CSPs to create new services	Justin van der Lande	http://www.analysysmason.com/Research/Content/Short-reports/data-centres-NFV-RMA14/
Strategy Report	Analytics systems: worldwide forecast 2017–2021	Justin van der Lande	http://www.analysysmason.com/Research/Content/Reports/Analytics-systems-forecast-2017-RMA14/
Comment	Machine learning still needs data scientists to optimise results	Justin van der Lande	http://www.analysysmason.com/Research/Content/Comments/machine-learning-scientists-RMA14/

5G does not resolve the immediate challenges of building an IoT business

HARDWARE
(Device, hardware installation and module elements)

CONNECTIVITY
(Connectivity service element)

APPLICATIONS
(Application, application enablement platform and systems integration elements)

25%

14%

61%

USD201 billion in IoT revenue, 2025

Automotive	Agriculture	Manufacturing	Healthcare
Fleet	Smart cities	Retail	Smart building

Application enablement and analytics

Connectivity management, device management

Connectivity: LPWA, NB-IoT, LTE-M, 2G, 3G, 4G, fixed, satellite

Ecosystem

Awareness

Key findings

- Most presentations about 5G mention IoT as a use case, few IoT presentations mention 5G. IoT developers are developing solutions for today's networks and not waiting for 5G.

- Most conversations with IoT business units at MWC 2018 revolved around the broader IoT opportunity and specifically NB-IoT and LTE-M, technologies also designed to support massive IoT.

- Challenges to address include how to differentiate and monetise the IoT, module cost and functionality, LPWA roaming and global IoT connectivity.

- With so much uncertainty around the 5G business case and the role of IoT, it is perhaps reassuring that operators are prioritising and addressing the challenges that they face in building a scalable IoT business, capable of addressing multiple sectors based on their recent IoT network investments in NB-IoT and LTE-M.

- 5G will materialise but initial use cases are unlikely to be based on IoT.

Further research

TYPE	TITLE	AUTHOR(S)	LINK
Strategy report	Preparing for LPWA: how operators are maximising their chances of success	Michele Mackenzie	Preparing for LPWA: how operators are maximising their chances of success
Video/ podcast	Autonomous vehicles: entertainment may generate demand for telecoms operators	Tom Rebbeck	Autonomous vehicles: entertainment may generate demand for telecoms operators
Strategy report	IoT security: opportunities for communications service providers	Michele Mackenzie	IoT security: opportunities for communications service providers
Strategy report	Strengthening application enablement platforms in a highly competitive market	Ahmed Ali	Strengthening application enablement platforms in a highly competitive market
Comment	LPWA: challenger operators could benefit from using a different technology to that of the market leader	Michele Mackenzie Tom Rebbeck	LPWA: challenger operators could benefit from using a different technology to that of the market leader
Comment	LPWA technologies: NB-IoT and LoRa were the leaders in 2017	Tom Rebbeck	LPWA technologies: NB-IoT and LoRa were the leaders in 2017
Forecast report	IoT value chain revenue: worldwide trends and forecasts 2016–2025	Michele Mackenzie Andrew Cheung	IoT value chain revenue: worldwide trends and forecasts 2016–2025

Thank you

- You can download the webinar recording is available on our website: http://www.analysysmason.com/About-Us/News/Webinars/mobile-world-congress-2018-key-findings-and-implications/

- Contact our presenters for more information on the topics covered today.

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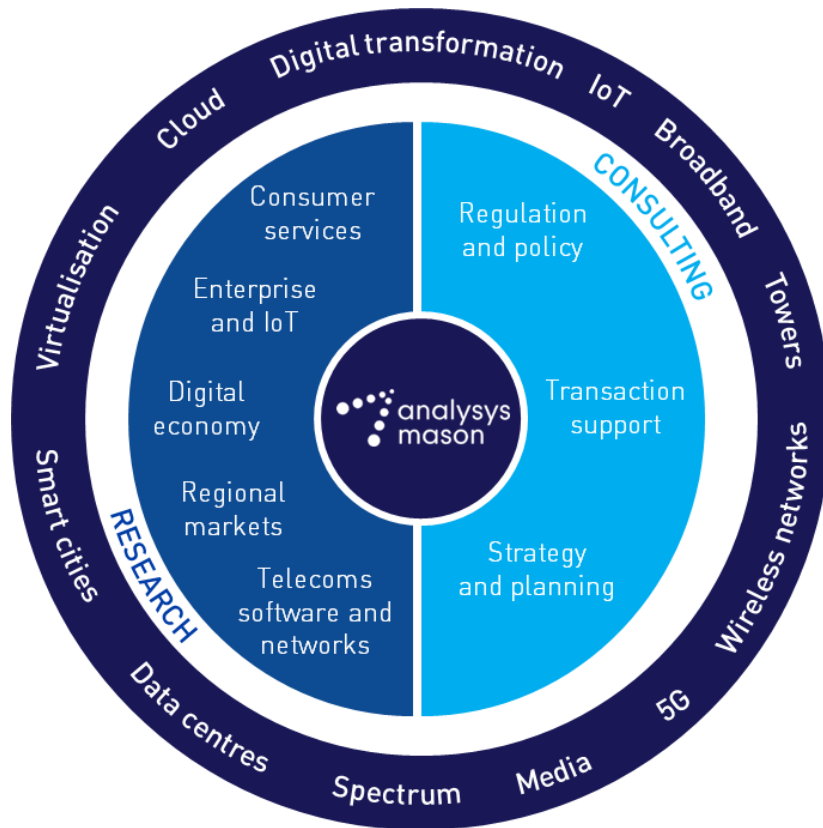Senior Contributor
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