

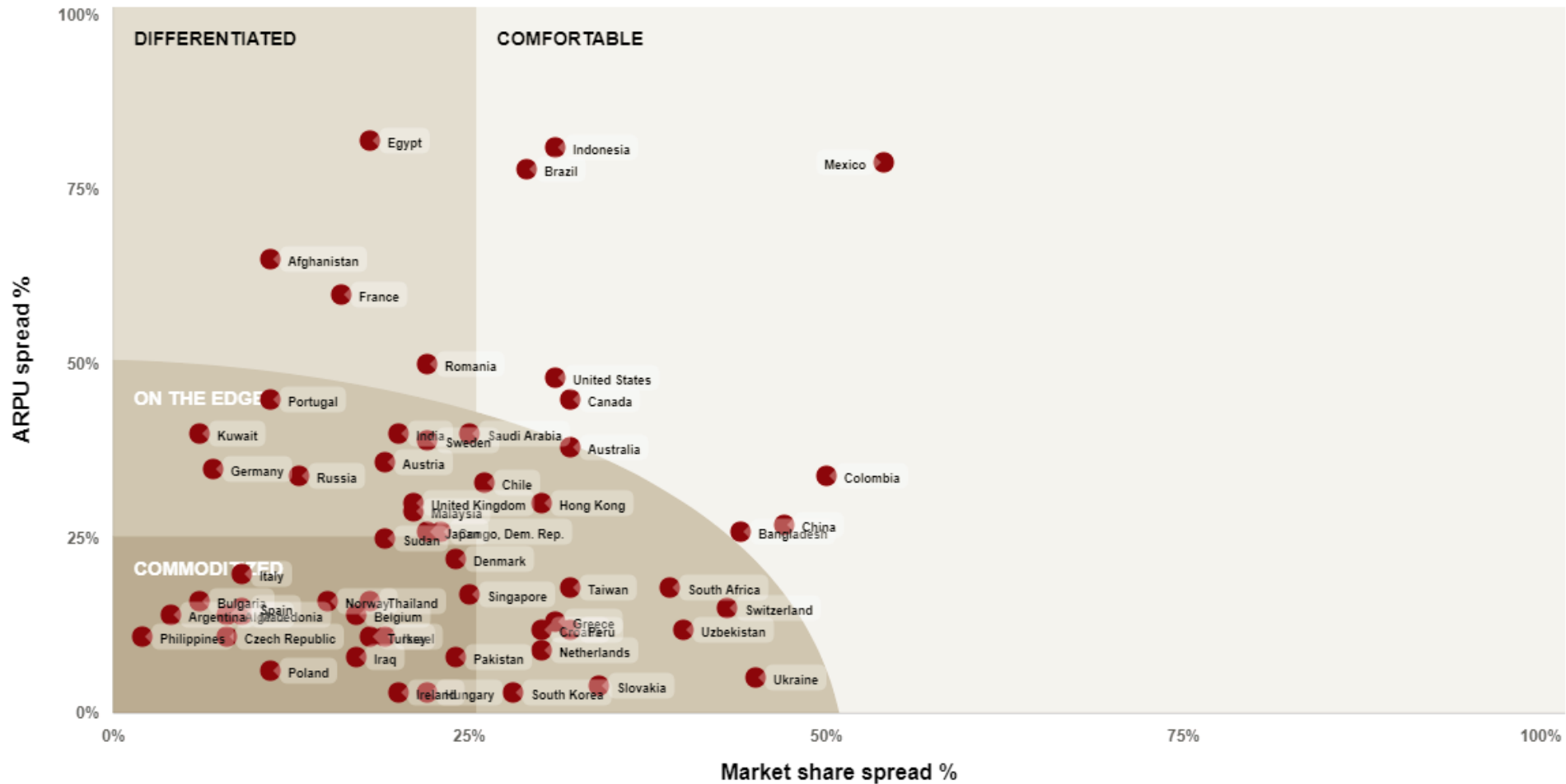
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Monetizing 5G – the disruption of traditional telco business models

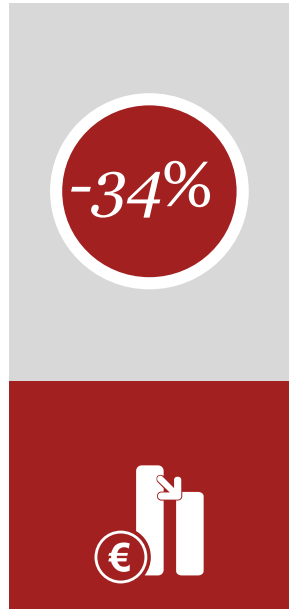
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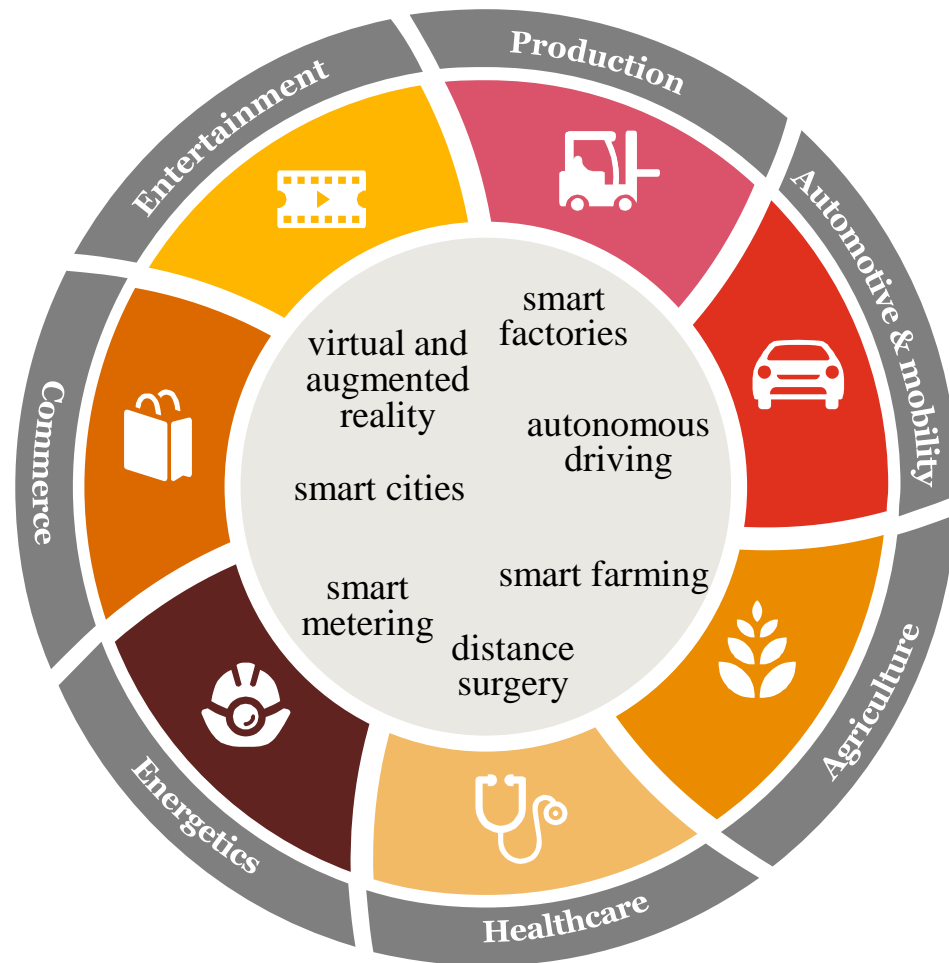
Service providers are facing a saturated market and declining margins due to the commoditizing of connectivity services



Past 10 years cumulative change in average ARPU weighted with globalised population



Disruptive technologies will arise enabled by 5G revolutionizing complete vertical industries

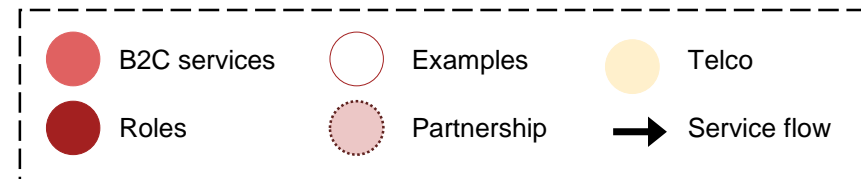
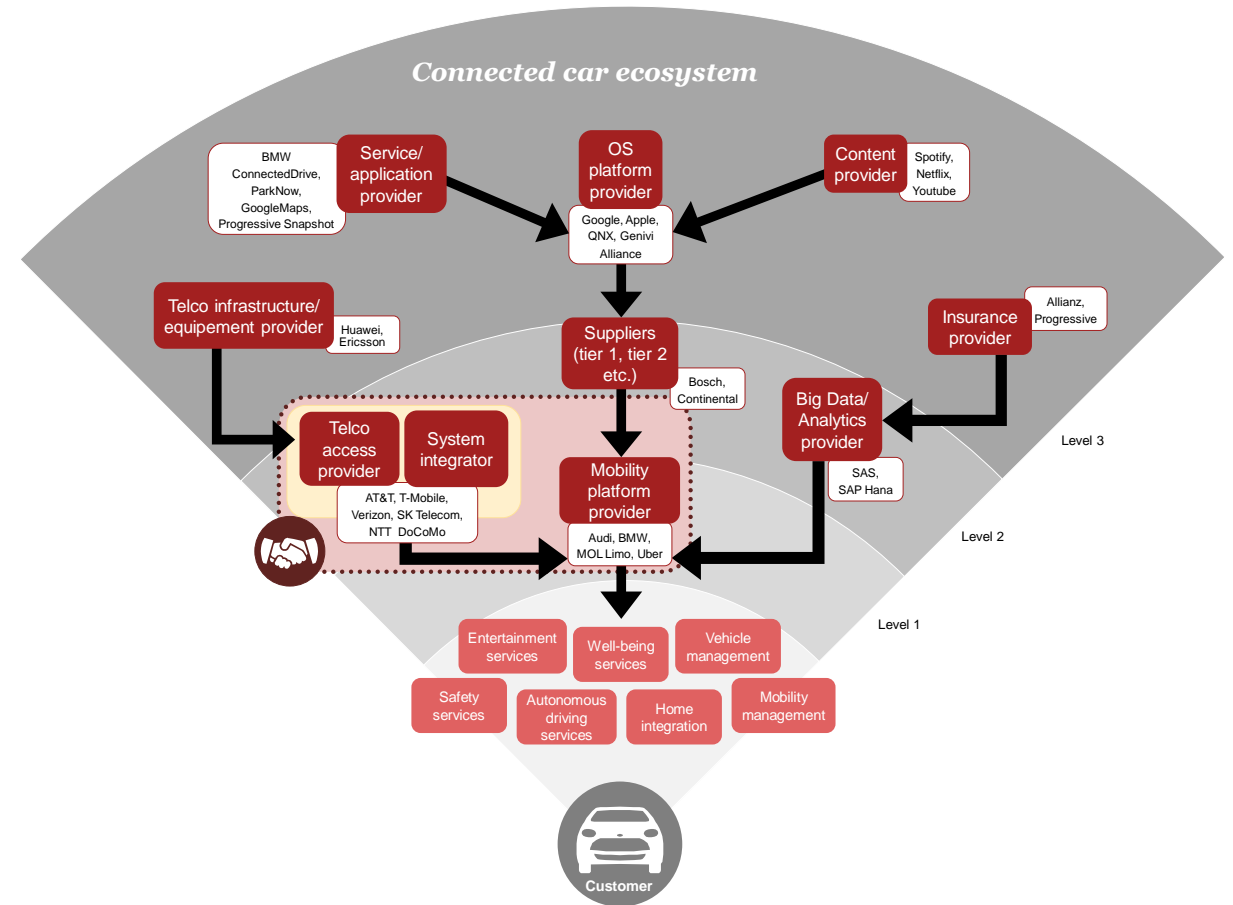


- Transformation in roles
- New ecosystem
- New business models

An example for the complexity of a 5G vertical ecosystem – connected cars

THE 5G ECOSYSTEM

- 1 ...is not limited to an industry
- 2 ...establishes **collaboration** between market players
- 3 ...create close **partnership** between **mobility platform providers** and **telcos**
- 4 ...makes it possible for **telco** providers to play a **vital role** in creation of the new ecosystem



5G will create new opportunities for operators - new revenue streams as well as potential cost advantages

OPPORTUNITIES

New Revenue in Enterprise and Consumer IoT

1

- Enterprise IoT market may scale first, and Consumer to follow
- Early uptake likely to be use cases related to Manufacturing, Transport, Health and AR/ VR

Cost-effective Backfill, Backhaul or Fixed Wireless Access

2

- Backfill for NBN in remote areas where the business case for fixed line is not appealing
- Relatively cheap backhaul option for operators and service providers
- 5G can be used as a cost effective last mile option (several trials on-gong)

Substitute for Fixed Broadband

3

- 5G can be a substitute to FBB for certain segments: for example, cohorts of youth that prefer to be mobile-only may tolerate higher spend on 5G for the convenience of remaining mobile-only

Slicing and Latency-Enabled Services

4

- 5G network slicing capability may enable graded, differentiated pricing for connectivity
- There will be relatively few use cases which justify low latency slicing services, but the superior 5G characteristics can't be efficiently offered without proper slicing capabilities

Network Operations Cost Efficiency

5

- 5G could be utilized in "hot spots" to reduce the cost of data transmission, relative to 4G networks today
- 5G could lower the cost per MB due to its higher spectral efficiency and lower energy consumption

5G comes with several challenges when trying to understand the nature of demand, willingness to pay and generation of returns

5G CHALLENGES

1 Challenges to Adoption of Integrated Machine to Machine Communications

- Consumers still view IoT or 5G-enabled services as **complex and their cost high or unknown**
- Enterprises are concerned about **data control and system integration**
- Most enterprises are yet to believe the business case for IoT and haven't started thinking about 5G

2 Significant New Capability and Cost Requirements

- 5G plays will require capabilities that many telcos and technology companies **alone** do not possess (e.g. **software solutions selling, device selling, device lifecycle management**)
- **5G CapEx** will present new burdens, as well as spectrum cost

3 Competition is Increasing

- Multiple players will compete in the IoT market ranging from **start-ups, large tech players, device players, etc.**
- Because of seed funding, **it may take a few years before the market shakes out**

4 Value Extraction is Low Due to Partnership-Driven Offerings

- Players typically will need to strike **partnerships with other value chain players** to create an offering (device, platform, applications etc.)
- **Value extraction thus will remain low** unless wider plays are considered

5 Inventory/ Investment Risks for Device-led Plays

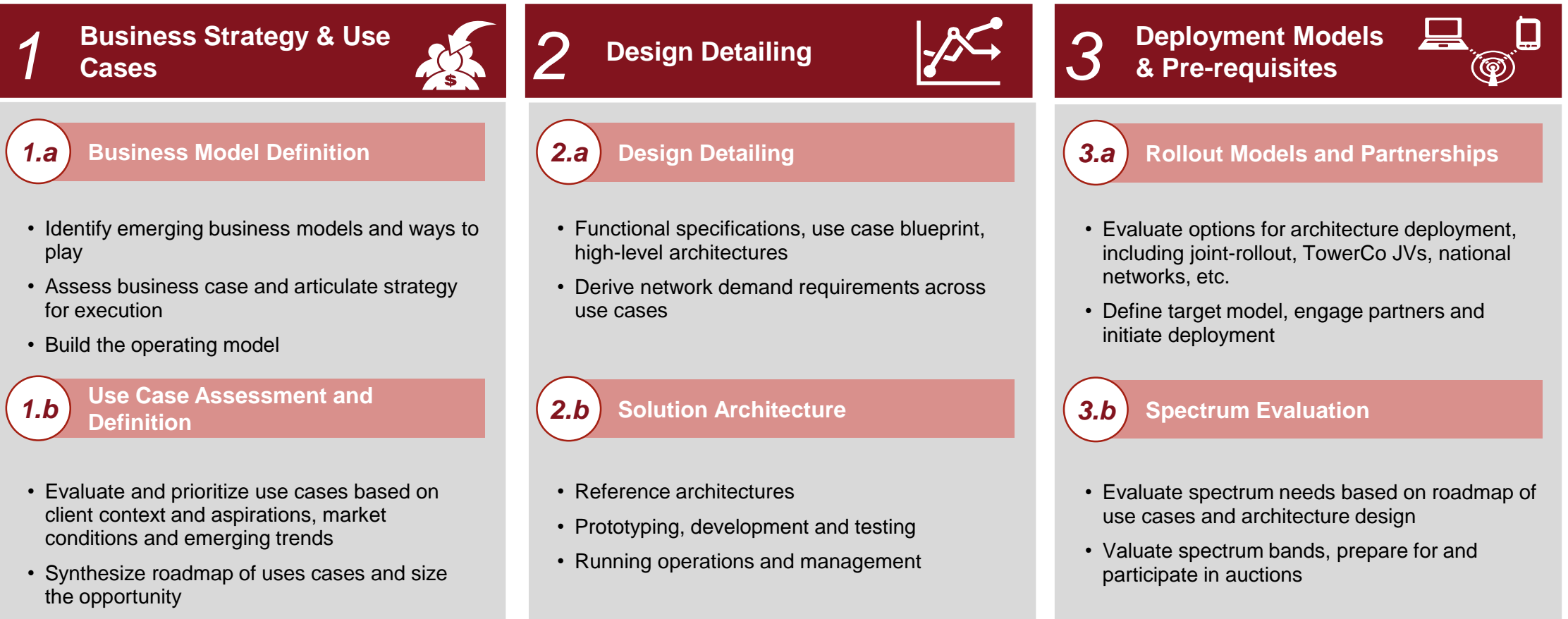
- Devices will likely claim a larger share of the consumer spend on 5G than 3G/4 G (due to possible elevated 5G device cost)
- However, **device plays are characterized by inventory risks**

6 Alternate Monetization Models not Mature

- Alternate monetization options are **yet to be proven** (digital advertising, big data driven solutions, and advanced bundling driven packages)

The preparation for 5G rollout includes three main tasks ranging from finding the business value specific for an operator to possible rollout partnerships

THREE MAIN AREAS



Take-away for telcos / regulators and government

Telecommunication companies:

- Connectivity is not enough to sustain margins, operators should aim for higher value add
- New skills should be developed especially in B2B solution selling
- Facilitators can help establish trust between telcos and vertical industry players
- Consider the benefits of rollout partnerships, tower asset companies

Regulators:

- Network management roles might be shifting towards new players requiring regulatory attention
- The business case will most likely not support 3-4 independent countrywide networks, which has an impact on spectrum auctions

Government:

- In order to exploit the innovation potential of 5G enabled services an increased emphasis should be placed on supporting R&D activities + pilots via state and EU funds
- Industry development strategies should involve telecommunication as a key enabler
- Rural and not developed areas might lag behind without state support in coverage

Thank you for you attention!



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