



5G INDUSTRIAL TRANSFORMATION WEBINAR

Responses to questions from the STL Partners webinar on 22/10/2019.

Questions and Answers

- Q1) Since telcos have very low investments in R&D (R&D costs as % of revenue is extremely low) - how telecoms will pull this off? Who are threats to take away this opportunity from them (and leave them with connectivity part of value)?

STL Partners: I think part of our argument is that telcos need to make a shift to investing more in (non-network) service innovation and delivery. In terms of competition, it does depend on the industry. In manufacturing, for example, there are industry specific system integration and IT players who may take on the application enablement and solutions areas. Some large manufacturing companies (particularly in Germany) are even looking to challenge in the connectivity space by building their own private networks.

- Q2) Given that HD virtual consultation will be performed mostly when both the patient and the doctor are stationary and indoors, usually at home I guess, why use 5G for that service and not a fixed broadband, e.g. fiber or xDSL connection?

STL Partners: There may be circumstances where a fibre connection is more appropriate – particularly if the patient has travelled to their primary care facility to have a referral appointment with a specialist doctor. However, fixed broadband connections at home can provide variable quality – and it is not possible for the quality of the video call to be guaranteed before the call happens. In comparison, 5G will be able to reliably deliver the latency and bandwidth required for HD video calling. On top of this, using 5G connectivity means that patients will be able to have flexibility to have video consultations while at work/on holiday etc. We are also seeing the use of home routers with mobile connectivity back-up in many markets and BT recently announced that this router has now become the default option for customers in the UK.

- Q3) What appetite do you think Investors, eg stock market/PE have for their telco holdings to spend money on verticals and applications rather than capturing market share in connected devices?

STL Partners: I think most investors ultimately care about the top and bottom lines. It's true that market share is important but investors also understand the pressures on the existing business model. If a telco demonstrates success at moving beyond communications and connectivity (rather than just talk about it), they are likely to be rewarded for it. It's true investors don't want telcos to risk the company on something new (ie fall far behind their competitors) but there is scope to do things differently as Free (France), Play (Poland), Jio (India) as new entrants have demonstrated.

- Q4) The presented capabilities of 5G are also being addressed by WiFi 6. How would you position WiFi 6 (not WiFi 5) against 5G?

STL Partners: We know that Wi-Fi 6 will be able to provide some of the benefits that 5G will bring (e.g. increased security) but other elements, such as flexibility and mobility, less so. We also know that, whatever functionalities it will bring, those within industries, particularly

manufacturing, *perceive* Wi-Fi as unreliable and insecure. Wi-Fi 6 will have to overcome this negative perception in gain widespread adoption. A big concern with Wi-Fi is perception that interference between access points is an issue and that coverage in big facilities is challenging with many manufacturers citing 'white spots' which 5G should be able to eradicate.

Q5) Why does country income impact the potential output increase of precision monitoring?

STL Partners: We have used the World Bank's country income levels as a proxy for the speed at which we envisage 5G being rolled out. Higher income countries are more likely to invest in additional infrastructure while their consumers are more likely to upgrade to 5G handsets. We take your though point that there will be examples where manufacturing plants, perhaps owned by multinational companies, in less economically developed countries will implement 5G solutions relatively fast as a campus network.

Q6) Are the \$1.4Tn benefits estimates cumulative or annual?

STL Partners: These are annual benefits.

Q7) What is the current spend by telcos in these verticals?

STL Partners: In terms of providing specific vertical solutions (as opposed to generic horizontal ICT solutions) it's very low. Some telcos, such as BT, Deutsche Telekom, and AT&T have bought and built ICT solution companies that have some vertical capabilities but it has not yet really happened in mobile.

Q8) Do you think it's necessary or a-must to make alliance with other providers or third parties for advancing from NaaS to Application Provider? Particularly, in the case of European telcos...

STL Partners: It is very likely that telcos will need to partner or acquire companies in order to begin to play in the application enablement and solutions space. In the case of TELUS in healthcare their first play was to acquire an insurance company called Emergis. They then built developed additional capabilities internally.

Q9) Could you please repeat your views on the split of the revenue opportunities for telcos in each of the three layers

STL Partners: estimates are NaaS = 5-10%, Application enablement = 15-20%, Apps and solutions = 70+% but competition is fierce in both new areas. Big tech in applications enablement and fragmented collection of specialists in apps and solutions.

Q10) Why do Telcos go into Media?

STL Partners: 1. Relevance and engagement with consumers (acquire customers, reduce churn) 2. Media drives network usage so provides pull-through for connectivity

- Q11) In manufacturing how/when will we be able to apply 5G in a meaningful way given that most factories have a 20-25 year lifespan. So new factories don't happen very often so any changes would need to overlay onto existing plant and infrastructure.

STL Partners: As 5G will be built from the bottom up on virtualised infrastructure there will be minimal need to install hardware on site. We do not envision factories having to reach the end of their lifecycle before 5G solutions can be implemented. In fact, a use case like precision monitoring may be able to be achieved with legacy machinery, where many IoT sensors are added to existing machinery.

- Q12) What are the main technological / uptake concerns of 5G (eg reliability, infrastructure costs, etc)?

STL Partners: Clearly telcos will need to invest in new infrastructure to roll out 5G. We are arguing that the cost of doing this should be seen as an investment that, if telcos are ambitious, will unlock new revenue opportunities within enterprise. In terms of the industries themselves, there are barriers including more general lack of digitalisation and the need for cultural shifts before some industries will adopt scaled 5G use cases. Within healthcare, for example, the vastly different levels of digitalisation between localities makes scaling a 5G solution difficult. This goes along with the need for shifts in working behaviours and education of healthcare professionals before they will feel comfortable diagnosing or treating a patient remotely, for example.

- Q13) Is high carrier costs & thus pricing of 5G in IoT likely to arrest the widespread adoption by enterprise - compared to LPWA networks (NB-IOT, Lora, Sigfox)?

STL Partners: It could do – if operators don't accept they will need to change their pricing models when it comes to 5G.

- Q14) Do you see the route for verticals growth for operators through building skills internally or partnerships?

STL Partners: We think operators will need to do both to be successful. For many the route into a new vertical will also come through some form of M&A – in the case of TELUS they bought Emergis as their first real move into the healthcare market.

- Q15) Which market players are likely to build capabilities and take this opportunity from telcos? (like tech firms harvested value from telco with 4G deployment)

STL Partners: In apps and solutions, it will be existing vertical specialists plus, for consumer-oriented solutions it might include internet players that have strong consumer brands – e.g for wellness, home security, etc. In enablement it will be hyperscale cloud and big tech firms I think.

- Q16) What relationship do you think Telco's will have to the state? I.e. many Telco's are state-owned today.

STL Partners: Some telcos are state owned in some markets and regions and even those that have been sold on retain a close relationship with their national government. Recent conversations have focused on regulation and on telco pricing being managed. 5G should change the nature of conversation and shift it more towards what telcos (and regulators) can do to create more value for society. We cover lots of this in the report we recently published called *5G Regulation: Ensuring successful industrial transformation*.

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