

Public consultation on the Draft RSPG Opinion on 5G implementation challenges (RSPG 3rd opinion on 5G)

Comment

G rard Pogorel, Professor Emeritus

Telecom ParisTech

Graduate School of Engineering

CNRS Interdisciplinary Innovation Institute

Paris, France

gerard.pogorel@telecom-paristech.fr

5G for Vertical Industries 4.0

What competencies, What actors

Outline of an analytical framework

- How specific are the industry requirements?
- How distinctive, “core”, are the competencies needed to comprehensively operate the industry platforms?
- Is the competence so highly “core” that it cannot be outsourced
- Does the platform allow for a viable business model per se
- Are there significant economies of scale and scope in providing “sliced” services across companies and across industries
- What solutions allow the efficient use of spectrum
- Which Industry 4.0 services structure is more conducive to innovation and competition.

5G mobile communications services are considered an essential component of economic development and of the establishment of a Digital Single Market in Europe. The path towards this objective however has proved difficult, as numerous obstacles have been found along the way at both policy and industry levels. 5G, however, offers renewed opportunities for the high-level managerial technological, innovative, and entrepreneurial competencies in Europe to flourish and fully play the role digital innovation is expected to assume in a very close future.

5G, given its technological flexibility and versatility, opens the possibility of a range of new, services, customised for each industrial sector, often referred to as « verticals ». The most commonly considered are the automotive, aerospace, energy, health industries. The question we address here is: what are the specific 4.0 digital requirements of the verticals expected from exploiting the 5G potentialities and how to best satisfy them?

In the industry 4.0 perspective, requirements of each industry for production, R&D, logistics, and marketing purposes will be defined in terms of latency, reliability, versatility, scalability, and data confidentiality, with possible requirements regarding establishing local area networks.

The corresponding promise of 5G is the possibility of offering customised services in the form of network slicing, i.e., virtually operated subsets of the general network, offering the functionalities of a special network for a particular industry. The hotly debated issue here is who will provide this kind of service, who will operate the “sliced” network, the specific platforms required by the “vertical” industry or a company. Broadly speaking, three possibilities are currently being envisaged: Operation by an MNO, by the vertical itself, or by a third party. The implications are wide-ranging, touching upon who will reap the major benefits of 5G, whether 5G will allow MNOs to escape the curse of commoditisation, whether new digital specialised actors will emerge, and incidentally but not to be neglected, whether access to the necessary radio spectrum should take the form of licenses, or be accommodated within existing licenses. We do not intend here to provide a definite answer but just to outline the variables at play in designing this important evolution of the digital industry structure.

The determining factors will be the following:

- How specific are the industry requirements?
- How distinctive, “core”, in the strategy jargon, are the competencies needed to comprehensively operate the industry platforms?
- Is the competence so highly “core” that it cannot be outsourced, and the corollary:
- Does the platform allow for a viable business model per se
- Are there significant economies of scale and scope in providing “sliced” services across companies and across industries
- What solutions allow the efficient use of spectrum
- Which Industry 4.0 services structure is more conducive to innovation and competition.

To make it short, if the needed competencies are more on the side of network operations, MNOs will prevail. If Industry knowledge and operation is the core competence, and the network just a digital reinforcement, each vertical will claim the leadership in its domain. If sliced network operation is a definitely distinctive competence, and if there are big economies of scale in providing a plurality of platforms, new actors might emerge.

The issue of radio spectrum access in the industry 4.0 perspective is being addressed by all agencies in charge of spectrum management in Europe. No definite, harmonised, answer has been provided yet. Some NRAs have ruled out allocating frequencies to specific industries (with the exception, of existing PMSE). Other NRAs have taken the opposite view. The jury is still out in other countries. In all cases, access of vertical industries to the necessary spectrum is warranted. Possibilities are:

- Allocated frequencies
- Leasing agreements by industries
- Sharing agreements
- Wholesale access by MVNOs.

Some vertical industries (and related non-MNO players) want to exploit 5G with their own spectrum. Such parties are interested in including, as soon as possible, 5G as a key element for the digital transformation. Some others are either still not ready to apply for spectrum of their own, or justifiably confronting objections in regulatory bodies outlining the risks of spectrum fragmentation

A question is whether commercial contracts under competitive ex post supervision, might be enough, or if ex ante regulation is warranted.

What will come out of the Industry 4.0 development process will shape the 5.0 landscape: will MNOs take advantage of 5G to escape the curse of commoditisation, will vertical industries transform themselves into digital industries, or in positive interactions with MNOs ? Will new actors emerge?

In the background, and this is a problem Europe is currently wrestling with, will the 5G backhaul network, fiber, Fixed Wireless, be up to the challenges. What fixed-mobile network structure will be more conducive to 5G enabled innovation: competitive networks, one wholesale network, and in this case, how to fend off the risks of a renewed monopoly. Much will depend upon how much the spectrum fees paid at auctions will mean in terms of investments plans by operators, and possibly how much of the fees will be recycled in the development of the 5G network, and will the achieved coverage correspond to the industry 4.0 needs?