Governance and leadership challenges in the era of the global knowledge economy

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IEEE's mission is to advance technology for humanity. To achieve this audacious goal in the era of the Global Knowledge Economy, it is very important to understand first what exactly is at stake and at which level. It may then emerge that there are critical challenges that in spite all good will and intentions cannot be solved by technology alone or where technology may even be part of the problem.

In particular, there is an urgent need to rethink our perception of and our relation to nature, whereas for certain fields we may need to re-examine the way we use the potential of our collective intelligence. Latter is producing knowledge, which is then transformed in information, whenever it is communicated. These processes are becoming increasingly important, as many people believe that we live now in an era where control over codified knowledge and information related to it is the most important strategic asset.

The very nature and availability of this resource is changing and we speak of the "knowledge paradox": "If the rules around access, management, production and ownership of knowledge are not chosen properly, more information could even equal less knowledge - and less innovation." Thus, it is important to understand the structure and dynamics of the contemporary chain of production and utilization of technical knowledge, in particular:

- who is producing it, how and where?
- what are the mechanisms of its appropriation, institutional and factual, and who shapes the rules ?
- how is the appropriated knowledge controlled and diffused (or not)?
- what is the impact of ubiquitous globalization on the global knowledge economy ?

The analysis shows that if inclusiveness is a goal, then it must start already in the way knowledge (and innovation) is generated, intervening downstream may be too late already. This is important as new strategies are needed to enable humanity to advance towards more inclusive technological capacities. Truly, new actors are entering the knowledge arena and they could change the current equilibriums, but it is not sure that this will necessarily happen in a win-win mode and without major convulsions and conflicts.

Further, we need to better understand what we mean when we refer to 'technological innovation'. An innovation taxonomy will therefore be presented, together with the related consequences for emerging leadership patterns and governance gaps. To complete the picture, an additional, intertwined perspective will be offered, based on underlying tectonic shifts at societal, ethical and geopolitical level. This will allow us to tackle *i.a.* following questions and issues:

- what are the key characteristics of the Global Knowledge Economy?
- why is there a critical governance problem therein and which are promising leadership strategies?
- what are the challenges but also opportunities posed by the rise of the Global Innovation Networks for current incumbents and new comers?

- what are the contemporary taxonomies of innovation and how can they be used to advance in different technological and socio-cultural landscapes?
- which are currently the major global challenges and risks, and how are they linked to technology and its specific cultural context?
- how strong are possible solution trajectories linked to rapid generation and diffusion of codified knowledge and technology?
- how can radical innovation become possible in hierarchical systems, trimmed for stability?
- what unintended consequences may emerge out of good intentions of the technoscientific community?
- what types of collaborative platforms are emerging in parallel to the existing exclusive intellectual property rights system?

This analysis includes leadership examples and also some suggestions about what knowledge-based institutions with a universal scope and mandate, such as IEEE, could do to assume leadership in this context and to develop and implement appropriate courses of action.