



UBIQUITOUS NETWORK OF SYSTEMS

Timo Seppälä is Post-Doctoral Researcher at Aalto University and Senior Research Associate at the Research Institute of the Finnish Economy

Juri Mattila is a Researcher at the Research Institute of the Finnish Economy

This is the first manuscript in a series of two that discuss a ubiquitous network of systems, and is released as part of the 'Digital Platforms' project funded by the Prime Minister's Office, Finland.

Forthcoming in Esko Kilpi (February, 2016), Perspectives to New Work, Sitra Studies

Interoperability and a Network of Systems

In the Europe 2020 strategy, the European Commission has defined *interoperability and standards* as one of the seven key pillars of its digital agenda. In doing so, the Commission has rightfully recognized that in order for a single digital market to be attainable, devices and services must be able to interact seamlessly anywhere — just like the internet.

As an idea, it sounds simple enough, but in practice, things get complicated. The current company and industry systems have been built disconnected from one another, piece by piece, layer after layer. They have emerged like individual pockets of lifeforms, slowly evolving into separate species that are no longer able to interconnect.

To fuse such individual systems into *systems of systems*, and eventually into one ubiquitous *network of systems*, a shared method of free communication is required which all systems can effectively understand. So essentially, to build a network of systems, we first need to build a *platform* for it.

The Need for a Platform Mediator and Platform Control

Platforms, such as Uber, AirBnB and Facebook, base their businesses on serving as generic foundations upon which other firms can build complementary products, services or technologies. In doing so, platforms base their value creation logic on encouraging network effects and complementarities, rather than discouraging them, as is all too often the case with traditional business models.

Digital platforms are disrupting the existing organizations and institutions of economic activity in every field of society. They are resetting the contemporary industry boundaries and architectures, changing the logic of value creation and value capture, reconfiguring labor and repositioning competitive advantage in the global value networks. But mostly, it is all happening within individual *systems*, or within *systems of systems*, at best.

When it comes to developing a platform to combine different *systems of systems* into one big *network of systems*, no one seems to be taking initiative. So far, no party has considered it their responsibility to take up the role of a platform mediator at such a high level of integration. Over time, this may become a problem because without a suitable platform for a *network of systems*, we are severely under-utilizing our assets as a society.

Standards or Market-driven Platforms?

There are three different ways that a platform for a *network of systems* could come about.

Firstly, it could be that some market-driven company eventually steps up to the plate and assumes the role of a platform mediator. There are plenty of cases where system platforms have formed on such a *de facto* basis, for example Linux and Android.

The second option would be that the government takes a position as an enabling force and by regulating and/or deregulating the field it encourages market-driven operators to take the helm on platform development. One prior example of such *ex ante* platform development would be the deregulation of telecommunication networks in Europe in the 90's.

The third possibility is that the government itself takes up the role of a platform mediator. Such has been the case in the past with building a railroad network, for example. This option can be extremely useful in situations where the financial cost and the payback time of constructing a platform simply pose too big of a risk to market-driven companies.

Implications to Work

From the standpoint of job creation, it is not irrelevant which of the three options comes true. By taking more initiative and control over platform creation for a *network of systems*, the government can ensure that a larger portion of platform-related jobs are born within its domain. Conversely, if platform creation is left to the devices of the market economy, the resulting jobs will appear wherever the platform companies happen to emerge, either domestically or abroad.

Creating a platform requires a unique set of expertise and knowledge which government organisations and companies may not currently possess. Therefore, it is important to acknowledge that in the future, job security may be more closely linked to platform know-how, on a nation-wide level.

As platforms are unbundling conventional vertical value chains, they are also creating new kinds of horizontal cross-industry structures for lateral value creation. In doing so, platforms are also radically reshaping the skill sets required of employees in different industries, as job descriptions are gravitating towards higher and higher degrees of cross-industry overlap.

References:

Ailisto, H., Mäntylä, M. & Seppälä, T., (2015), Finland – the Silicon Valley of Industrial Internet, Government's Analysis, Assessment and Research Activity, 2015/10

<https://ec.europa.eu/digital-agenda/en>

Kenney, M. & Zysman, J. (2015), Choosing a Future in the Platform Economy: The Implications and Consequences of Digital Platforms". Discussion Paper. Prepared for the New Entrepreneurial Growth Conference, Kauffman Foundation

Mattila, J. & Seppälä, T., (2015), Blockchains as a Path to a Network of Systems – An Emerging New Trend of the Digital Platforms in Industry and Society, ETLA Reports No. 45