

From System to Ecosystem

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Abstract

OEM vendors sell products that they see as their System-of-Interest. Many capabilities require interaction of multiple products and humans or organizations; we enter here the Systems of Systems (SoS). These SoSs with their associated social entities form even more complex ecosystems.

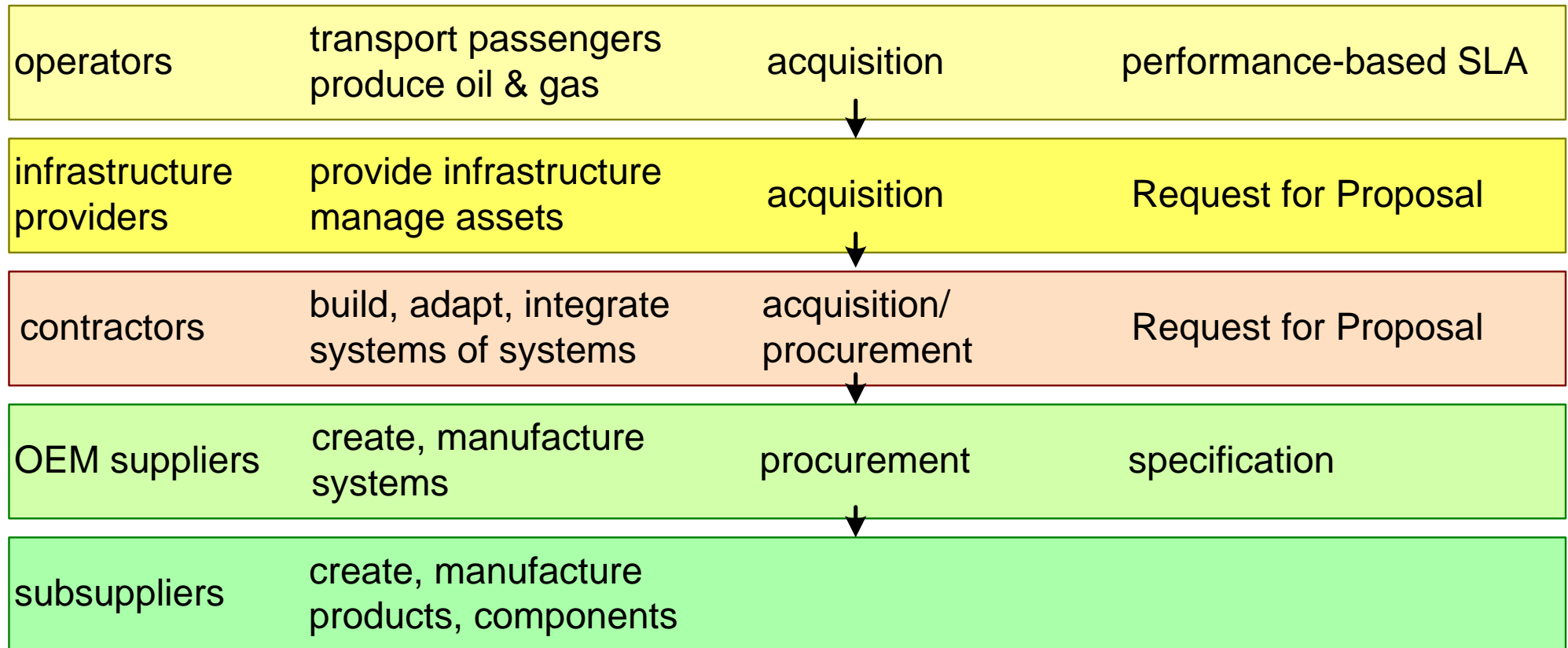
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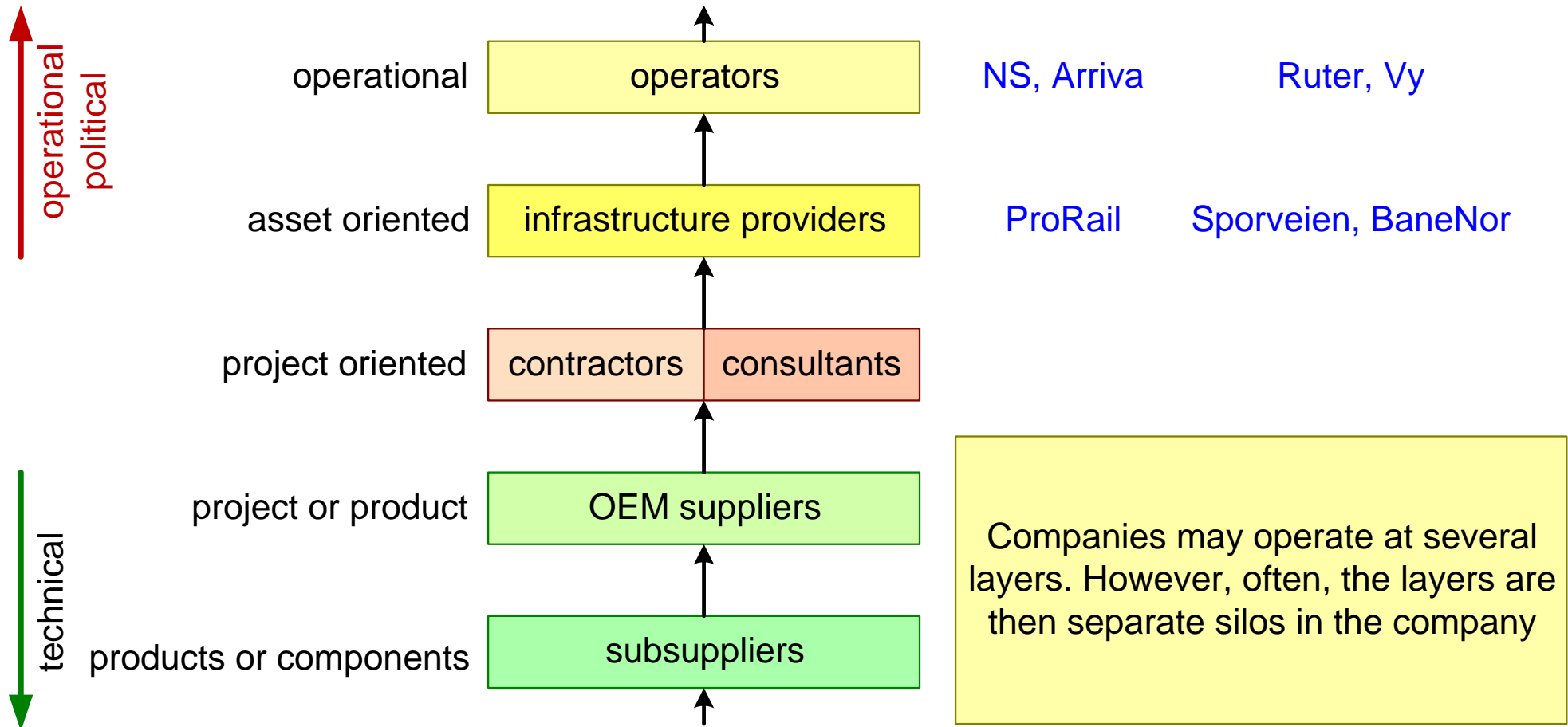
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logo
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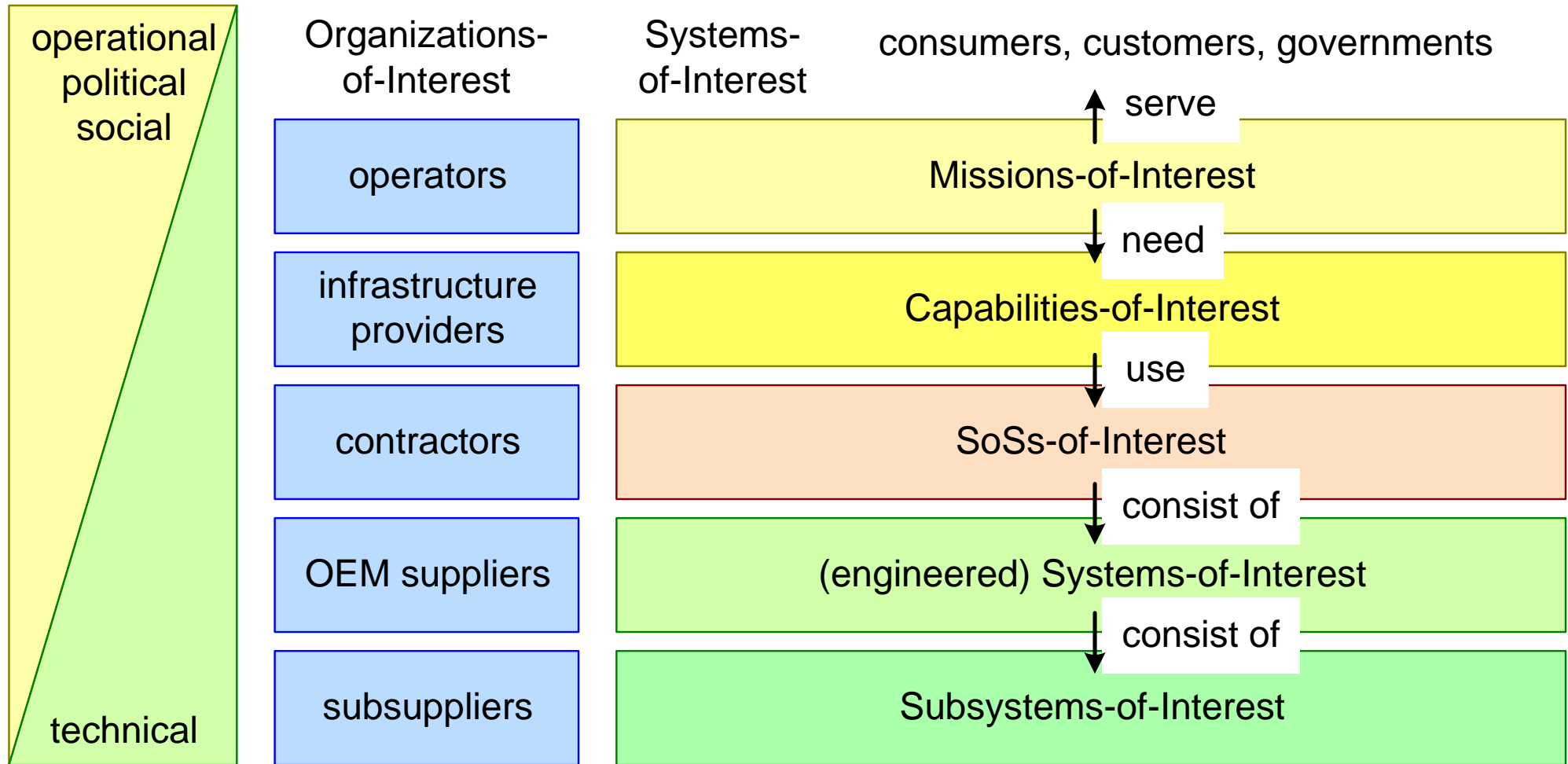
Characterization of Domain Layers



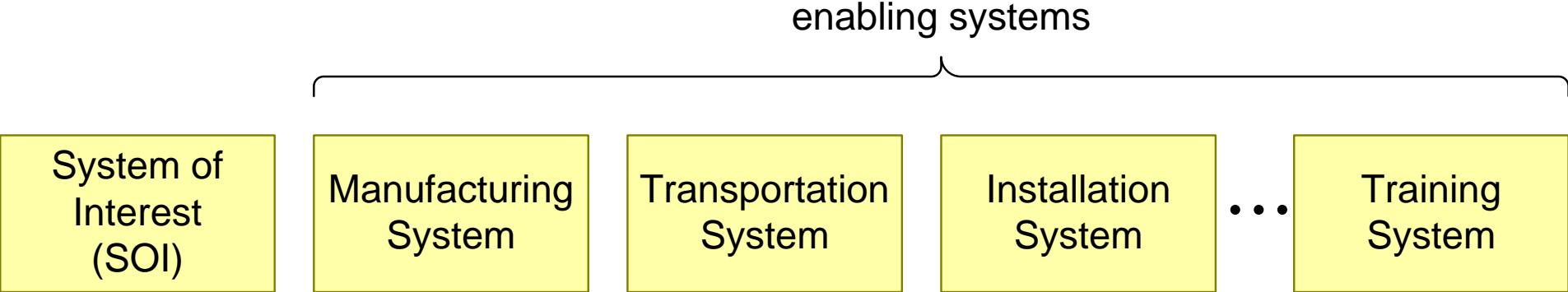
Positions in the Value Network Differ in Nature



Perspective Changes from Layer to Layer

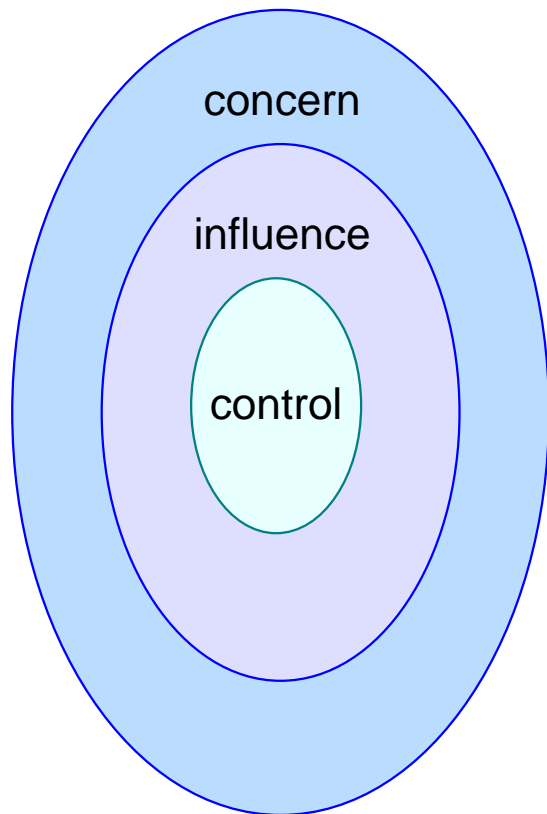


Development Has to Develop the Sol and the Enabling Systems

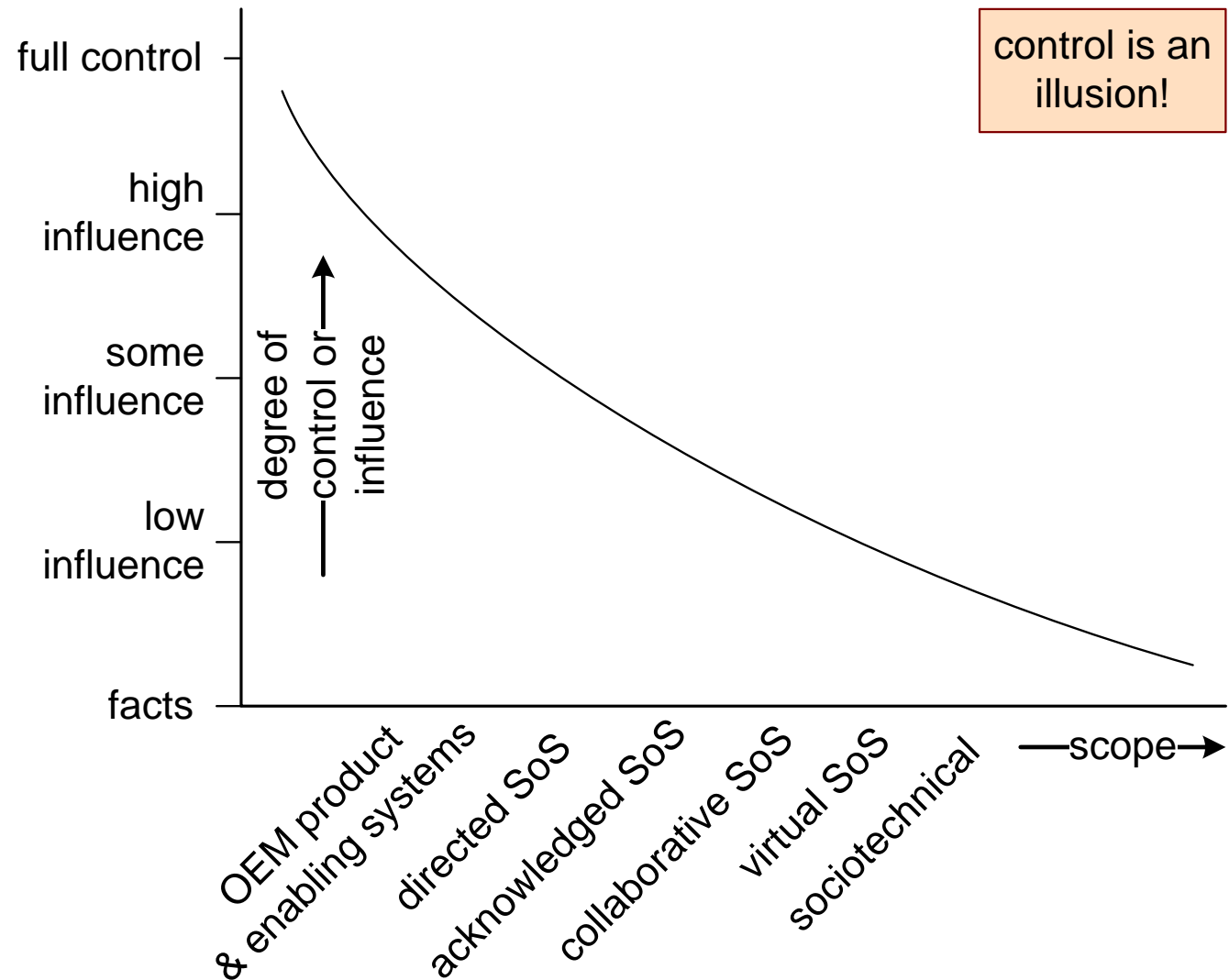


Development and Engineering must develop the System of Interest and all Enabling Systems

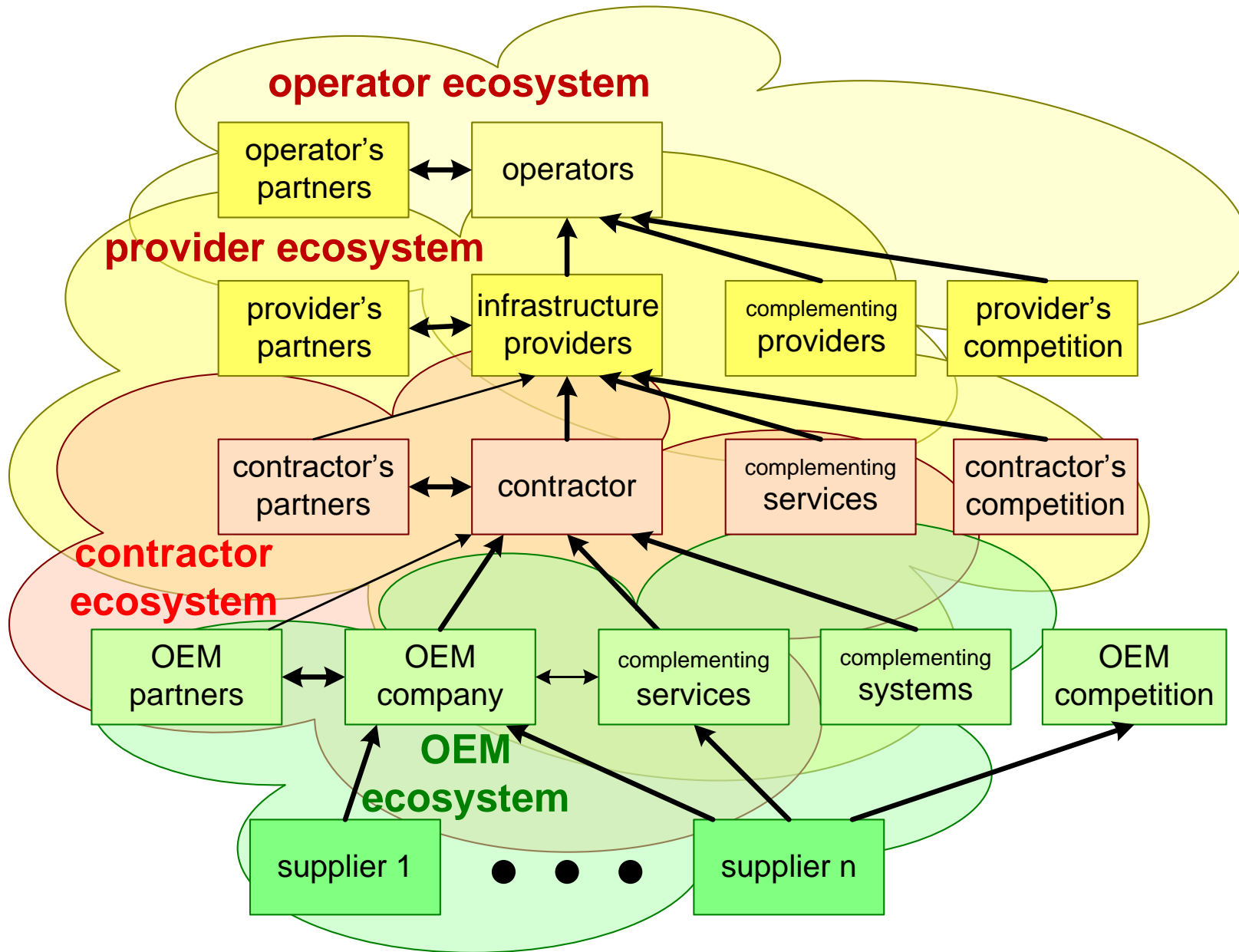
The Level of Influence Decreases with Scope



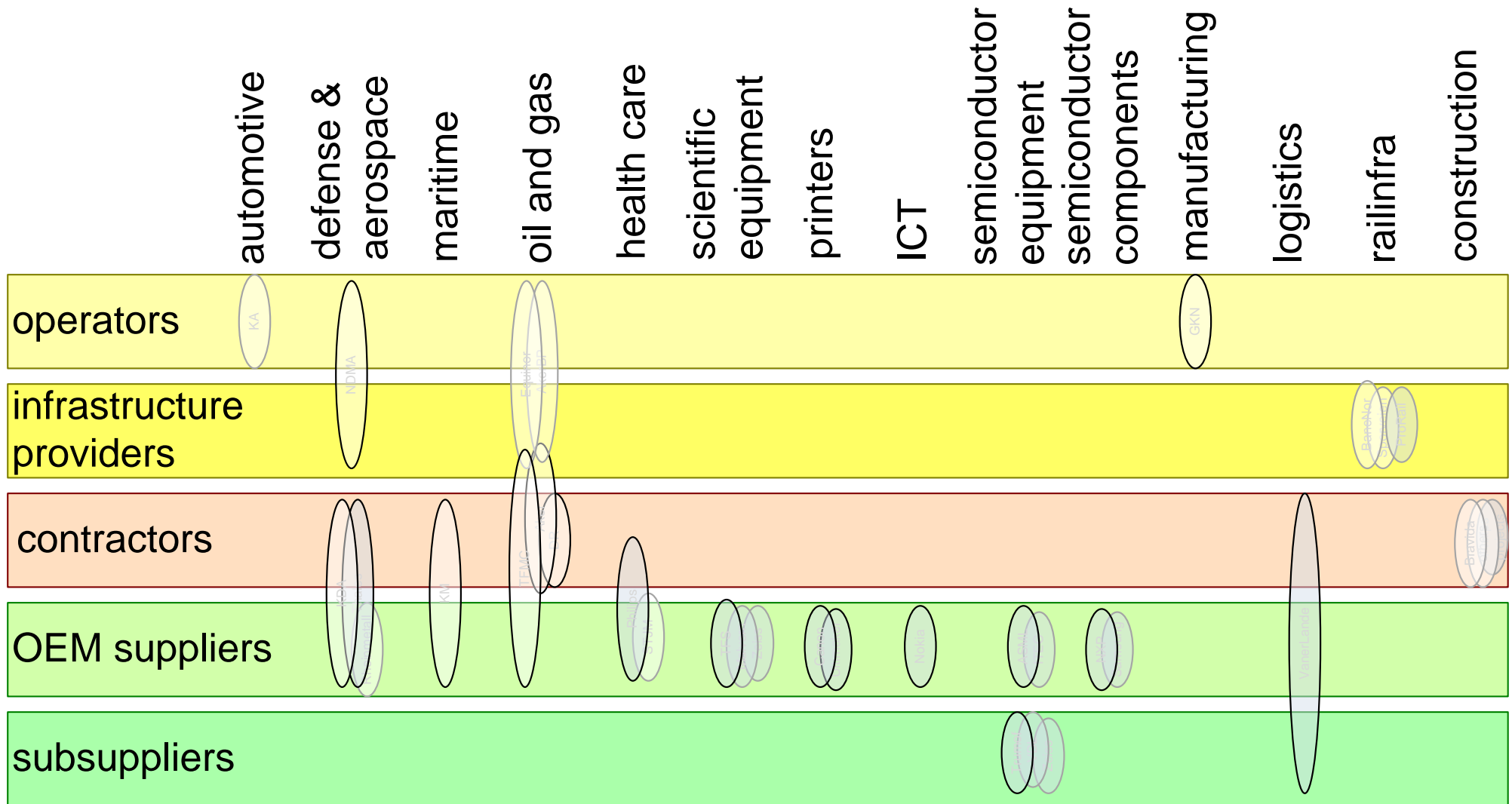
framework after
"The 7 Habits of Highly Effective People.",
Stephen Covey



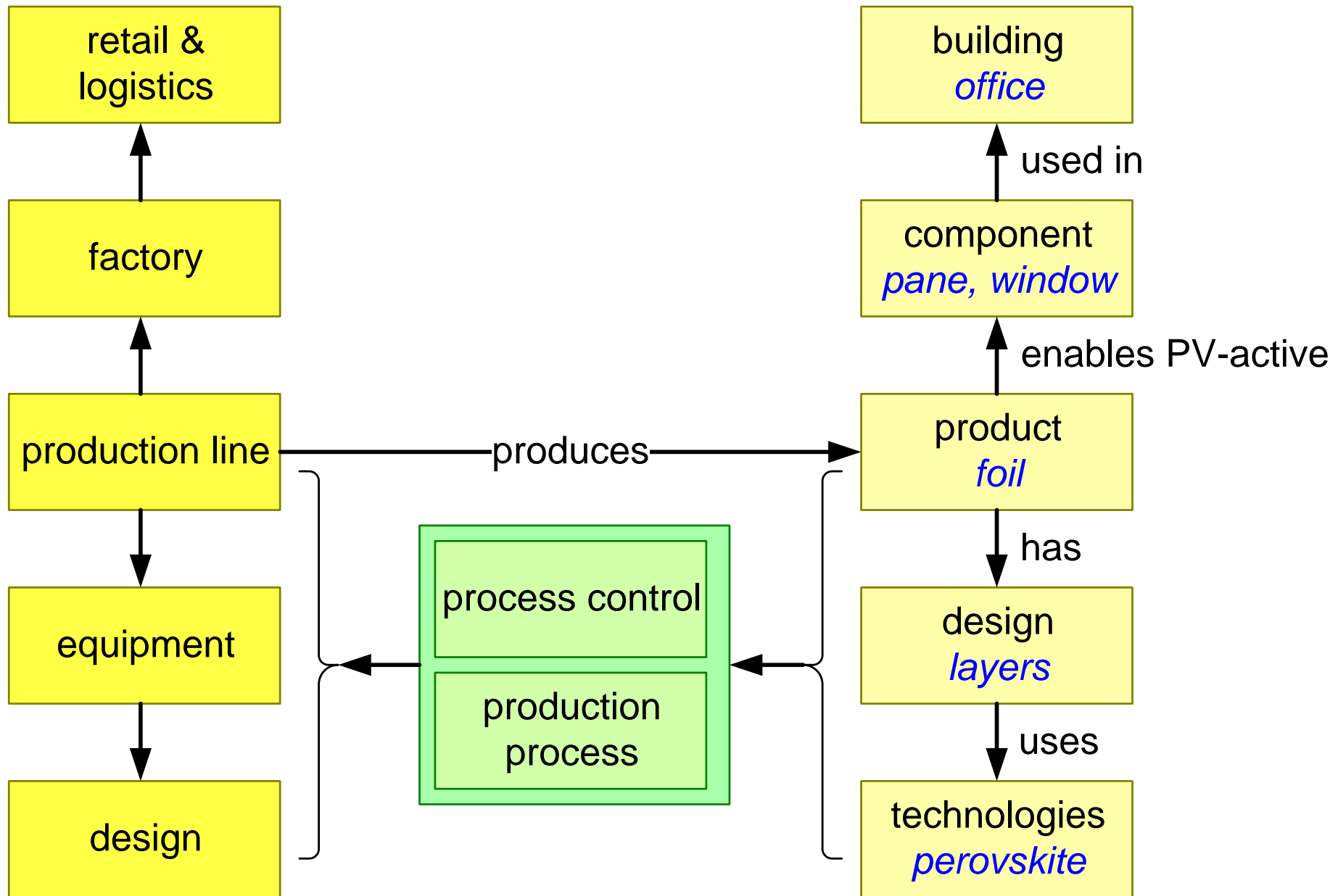
Each System is Part of its Ecosystem



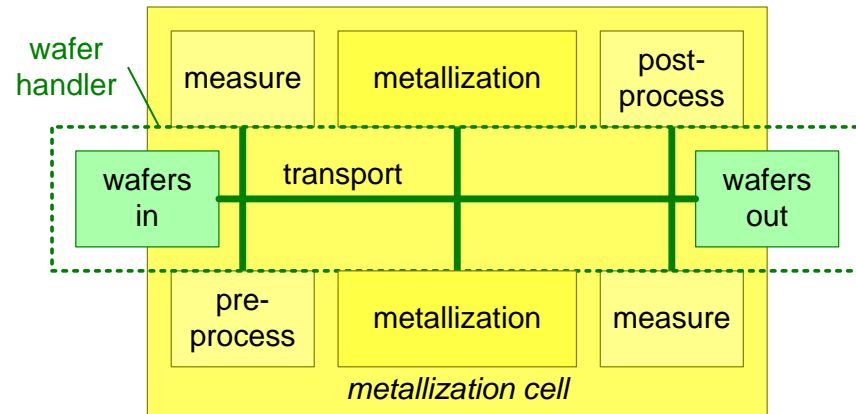
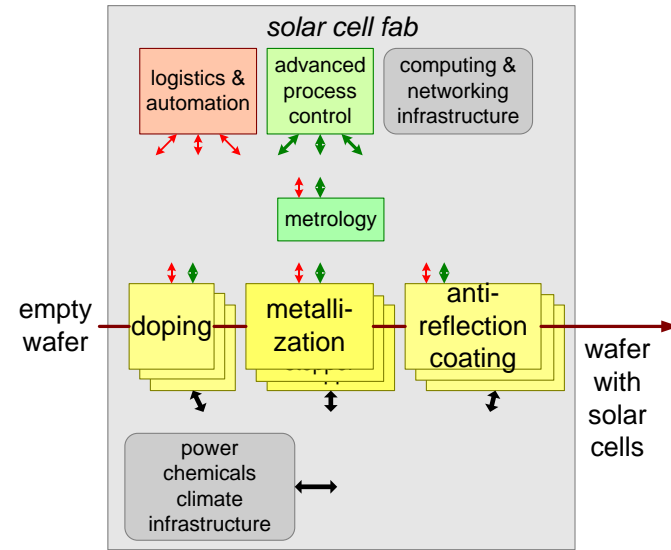
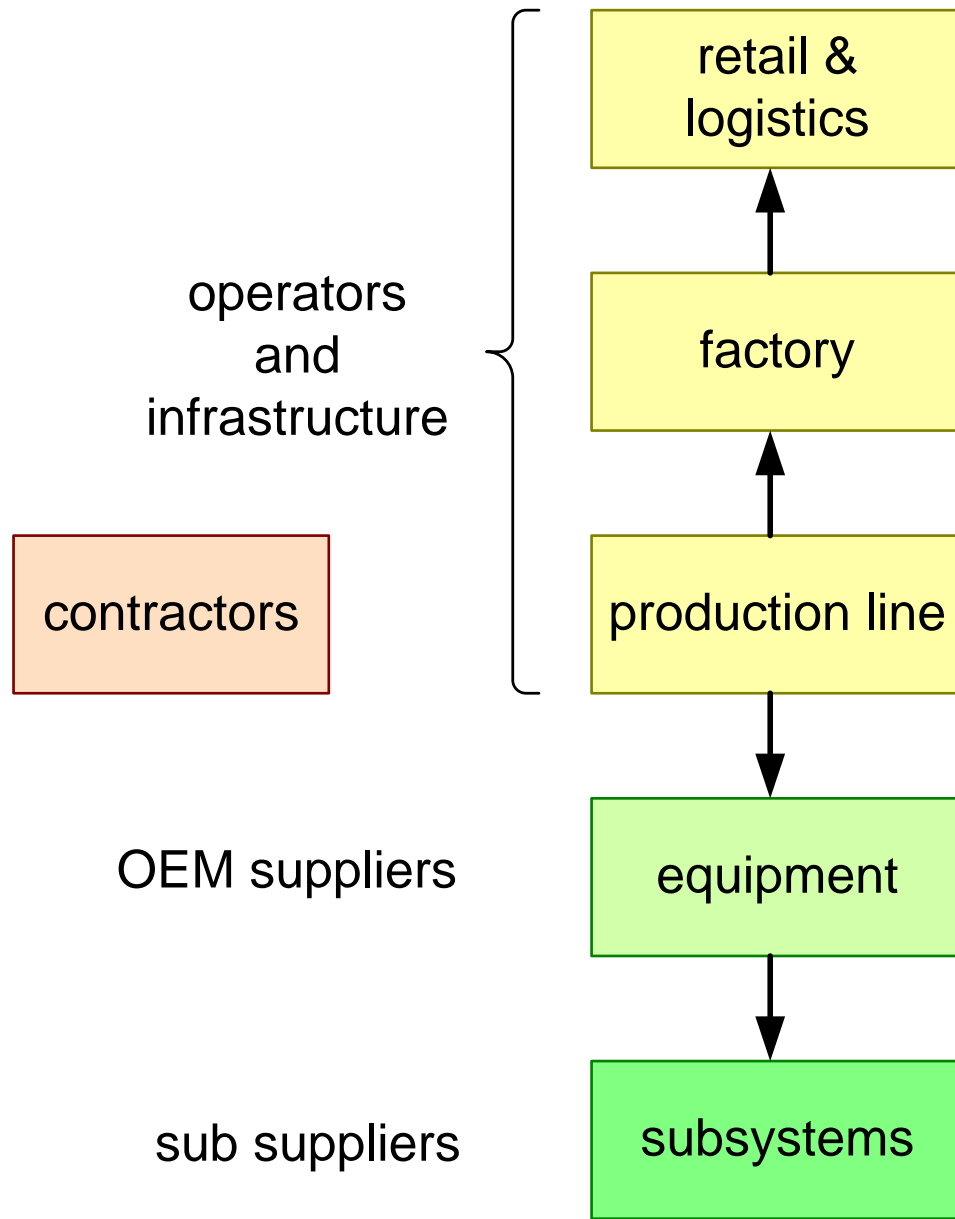
USN-SE and TNO-ESI Experience of the past 24 Years



Example Solar Domain

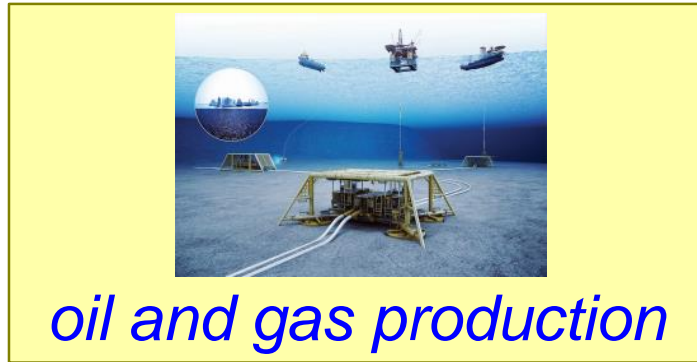


Layers in Solar example



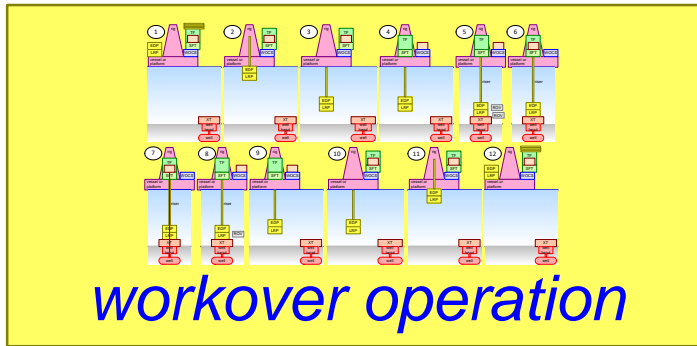
<https://www.gaudisite.nl/SolarCaseSESlides.pdf>

Example in Oil and Gas Offshore



operational

Equinor, Shell



asset oriented

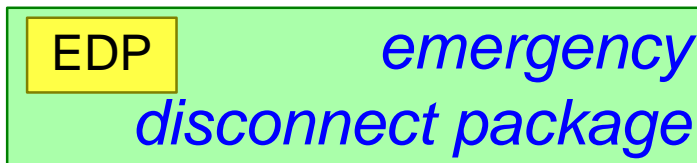
Equinor, Shell

TechnipFMC



project or product

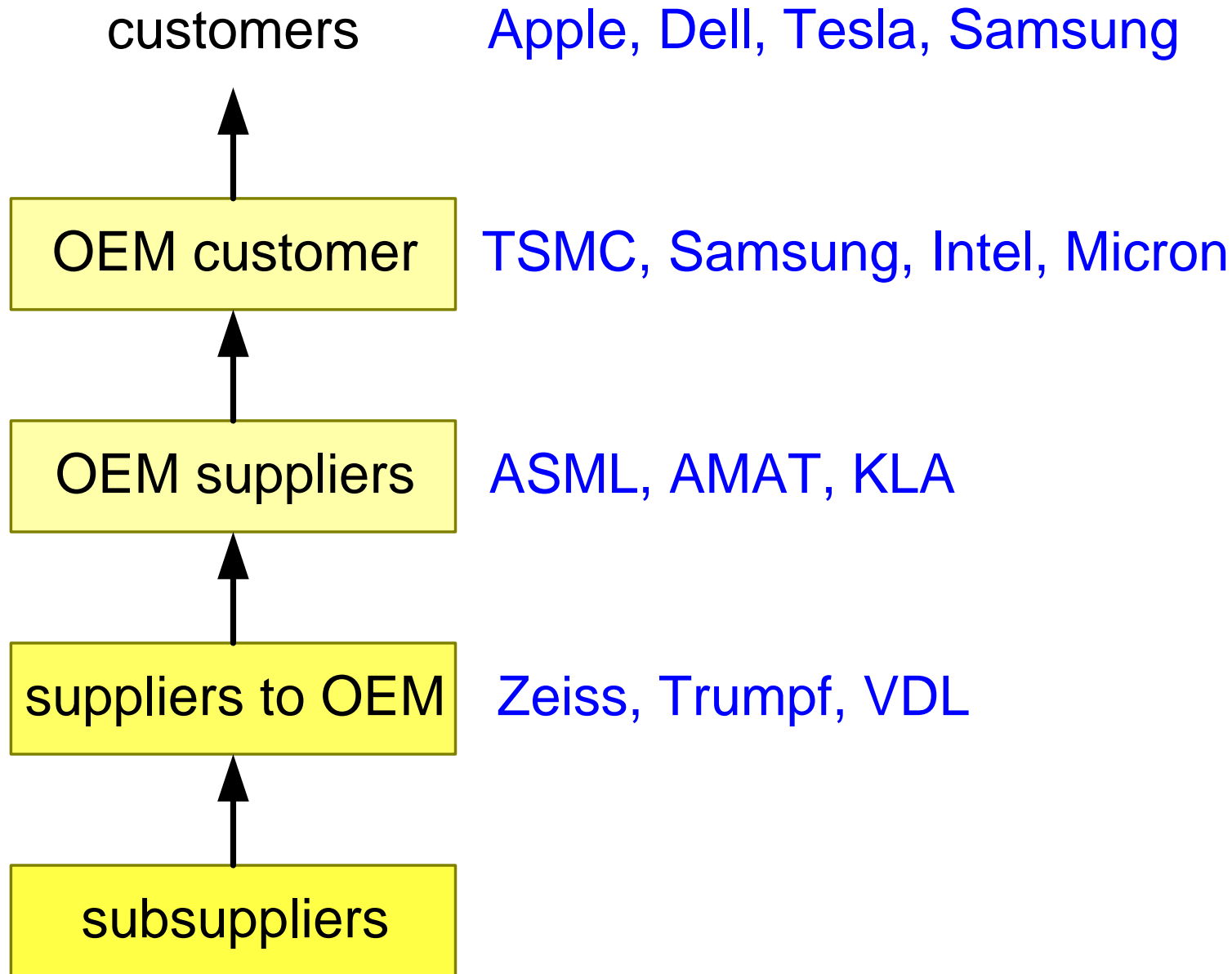
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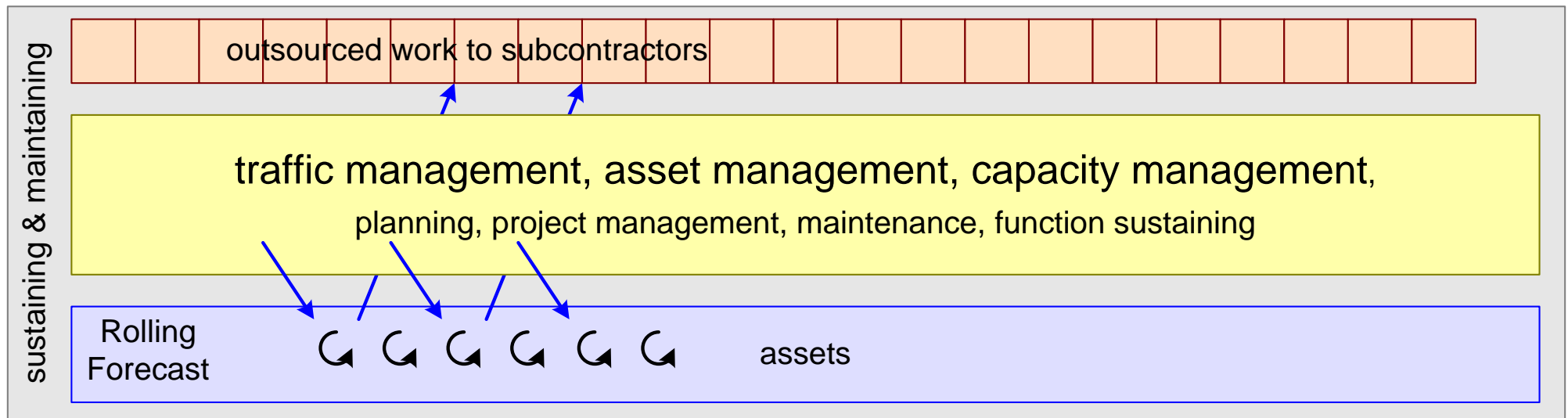
product

TechnipFMC

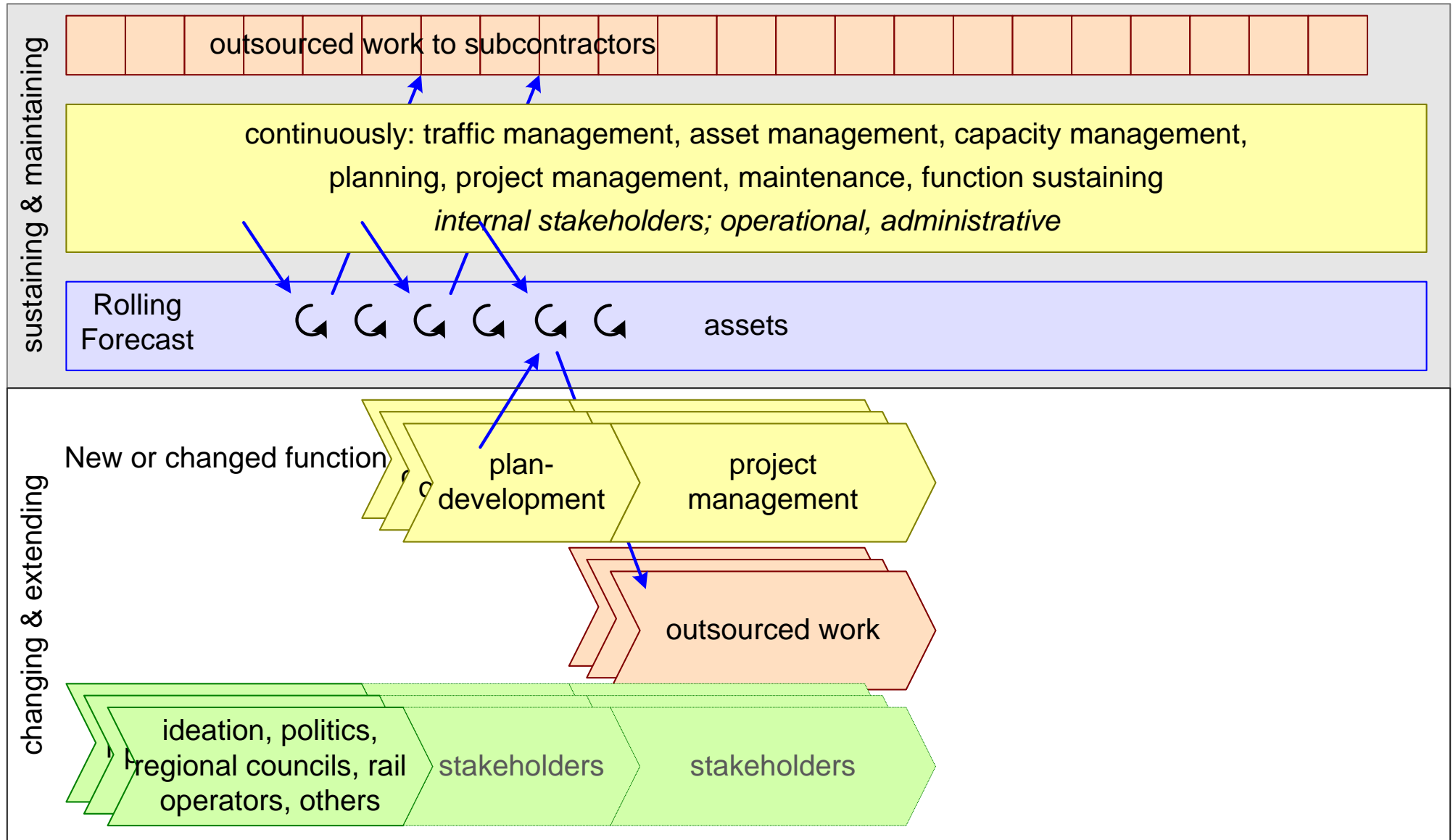
Example in Semiconductor Industry



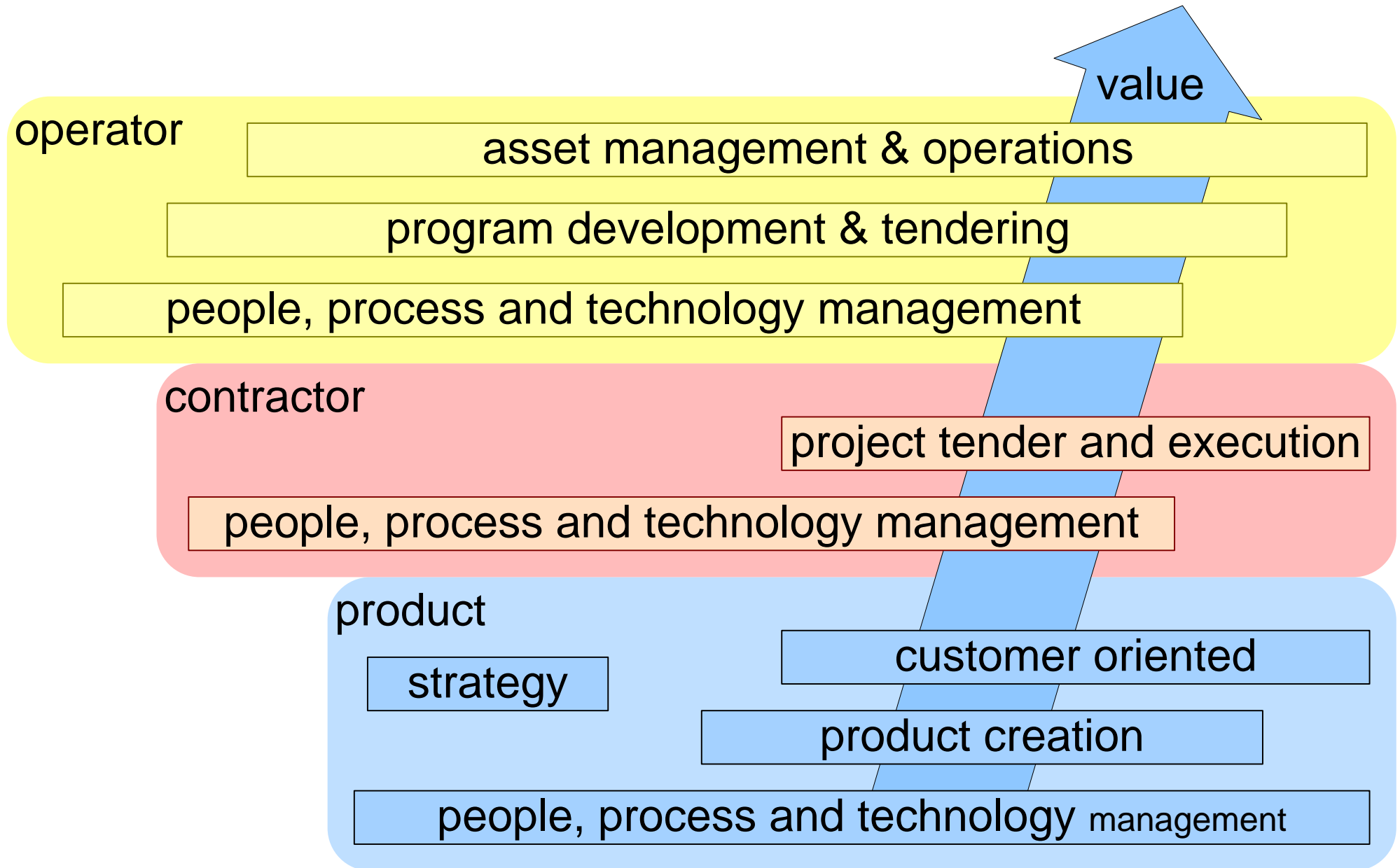
Railways Provider: Focus on Assets and Traffic

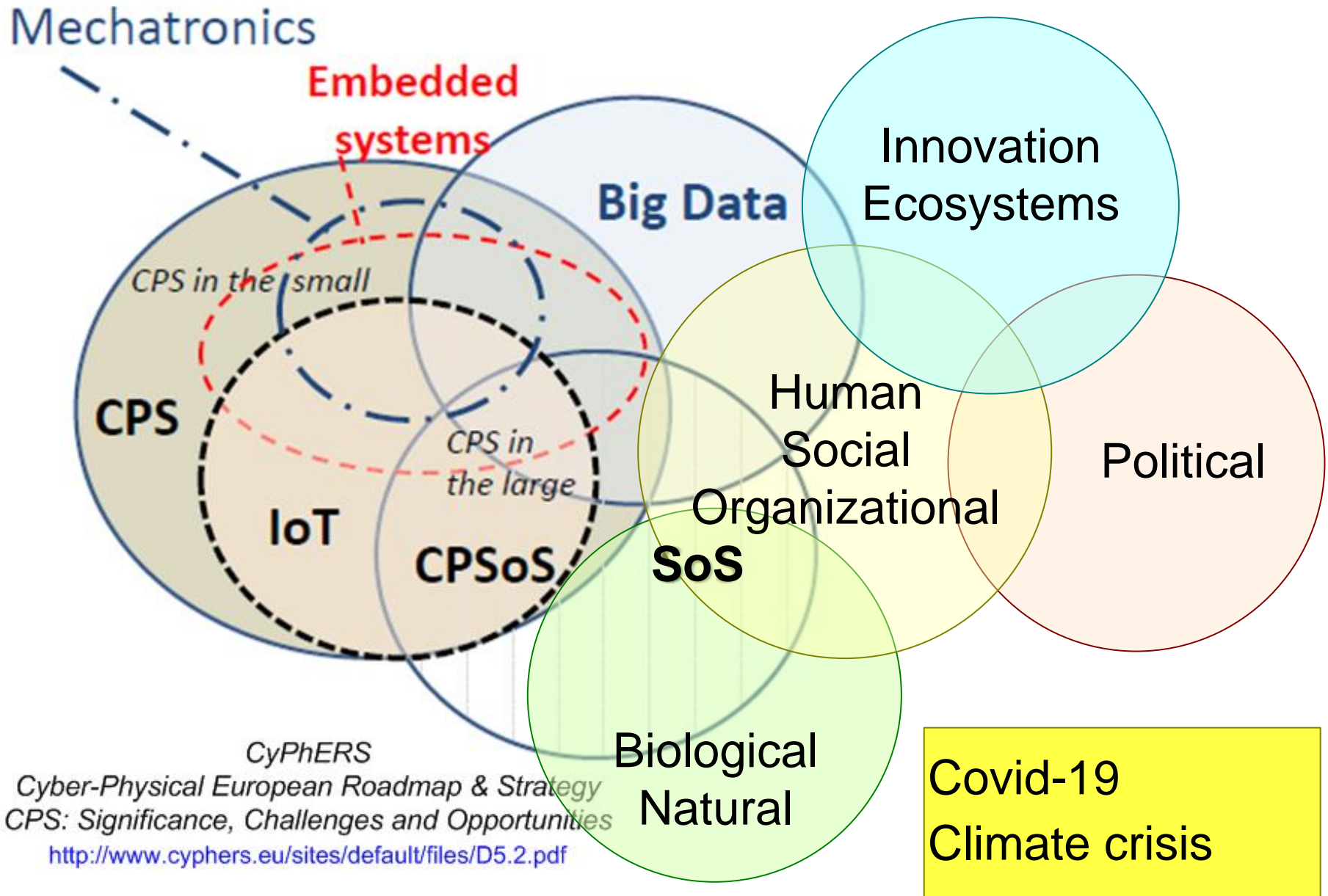


Railways Provider: Program Development



The Value Chain across the Layers





CyPhERS
 Cyber-Physical European Roadmap & Strategy
 CPS: Significance, Challenges and Opportunities
<http://www.cyphers.eu/sites/default/files/D5.2.pdf>