

## **Digital Transformation, Multi-organizational System-of-Systems, and Web-based Ecosystems**

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The globalization of technology and the present Digital Transformation process have interested all the Society and economic sectors, including Earth and Space Sciences. Anything and any activity has been transformed in data and new value-chain software ecosystems have been generated to connect the deluge of available data and information in order to generate intelligence and either support decision makers or ingest “smart” autonomous systems. The development of (learning-based) Artificial Intelligence models and platform virtualization technologies has greatly contributed to that. The Web, traditionally used as a network, is now largely utilized as a development platform, where users (actually consumers) can find any digital service or product.

This digital revolution must be effectively used to face important challenges for Humanity –such as Global Change and the need for a Sustainable Development of our Society. In a globally connected Society, a valuable example is the development of “smart” multi-organizational and multi-disciplinary platforms to help decision makers. These kind of systems are called to interconnect the many existing (and next coming) autonomous and largely distributed enterprise systems (either private or public) that are collecting (or generating) data and information on significant natural or social phenomena. This development requires to divert from the traditional multi-functional system approach in order to adopt the more flexible collaborative approach that is at the core of System-of-Systems. Due to their complex nature, System-of-Systems must be controlled by a cybernetic mechanism to face changes and enforce a defined policy and economic model of sharing.

A System-of-Systems may be seen as the enabling software platform for realizing a business Ecosystem that lives around the core concepts of the domain of discourse and the engaged stakeholders. Ecosystem approach (with its focus on emerging properties) beautifully fits in the development of value-chain models, linking producers of resources and services with consumers that can generate specific applications and services on top of them. Three service layers can be recognized: Supplier, Platform, and Consumer service layers.