

A Comparison of two Books on Systems of Systems

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The objective of this text is to carry out a comparative analysis of the general features regarding System of Systems (SoS) in the books *System of Systems Engineering: Innovations for the Twenty-First Century* (Jamshidi, 2009) and *Systems of Systems* (Luzeaux & Ruault, 2010).

Comparison of the books *System of Systems Engineering: Innovations for the Twenty-First Century* and *Systems of Systems*

Both books are rather similar regarding fundamental concerns that are specific to SoS, namely concepts and practical examples such as engineering, architecting, modeling, simulation, net-centricity, emergence, technical evaluation and management of SoS. Both of them define the potential and real technology applications where SoS can or will be important as defence, services, commercial airlines, transportation systems, health care, space exploration and electric power systems. Methods and tools for engineering, simulation, maintaining and managing SoS are described in the same way by both Luzeaux & Ruault (2010) and Jamshidi (2009). What Luzeaux & Ruault (2010) do, but not Jamshidi (2009), is to describe in a clear way the Human Factor, including organisation issues due to human involvement linked to SoS, to which a full chapter by Ruault is dedicated (2010). One further difference is a chapter by Luzeaux et al (2010, pp. 291-318) dealing with globalisation issues concerning SoS.

The main objective of the book by Jamshidi (2009) is to create an overview of engineering and the engineering tools of SoS whereas Luzeaux & Ruault (2010, p. XIX) want to “offer an extensive review of the field”.

A number of examples in practice are pointed out by Luzeaux & Ruault (2010), such as network centric organisations, Space Communication and Observation SoS, Intelligent Transport Systems, Systems of Systems in Healthcare Field and Critical Infrastructure Protection, and are mentioned as being SoS or having the potential to be SoS. This set of properties of SoS is not new and can be also be seen in Jamshidi (2009).

The book analyses specific examples of technology systems claiming to be SoS, like for instance the Boeing 787 airline as an air traffic system (Wilber 2009, pp. 232-256). Both books deal with the Engineering discipline devoted to Systems of Systems; Systems of Systems Engineering (SoSE) with modeling, simulation. Systems of

Systems are stated to be a new discipline due to increased technology complexity. According to both Jamshidi (2009) and Luzeaux & Ruault (2010) a new discipline of SoS must therefore be defined.

Jamshidi's (2009) book raises different fundamental issues and gives examples of applications. Common international development is discussed by Luzeaux & Ruault (2010) but not by Jamshidi (2009). The former also addresses social matters and culture in connection with Human intensive systems in an international globalisation context ■

References

- Luzeaux Dominique & Ruault Jean-René [ed] (2010) *Systems of Systems*, London, ISTE Ltd.
- Luzeaux Dominique, Ruault Jean-René & Kam Lui (2010) "Globalization and Systemic Impacts", in Luzeaux Dominique & Ruault Jean-René [eds] *Systems of Systems*, London (UK), ISTE Ltd, pp. 291-319.
- Ruault Jean-René (2010) "The Human Factor within the Context of Systems of Systems", in Luzeaux Dominique & Ruault Jean-René [eds] *Systems of Systems*, London, ISTE Ltd, pp. 149-206.
- Jamshidi Mohammad [ed] (2009) *System of System Engineering: Innovations for the 21st Century*, Hoboken (NJ), John Wiley.
- Wilber George F. (2009) "Boeing's SoSE Approach to e-Enabling commercial Airlines", in Jamshidi Mohammad [ed] *System of System Engineering: Innovations for the 21st Century*, Hoboken (NJ), John Wiley, pp. 232-256.