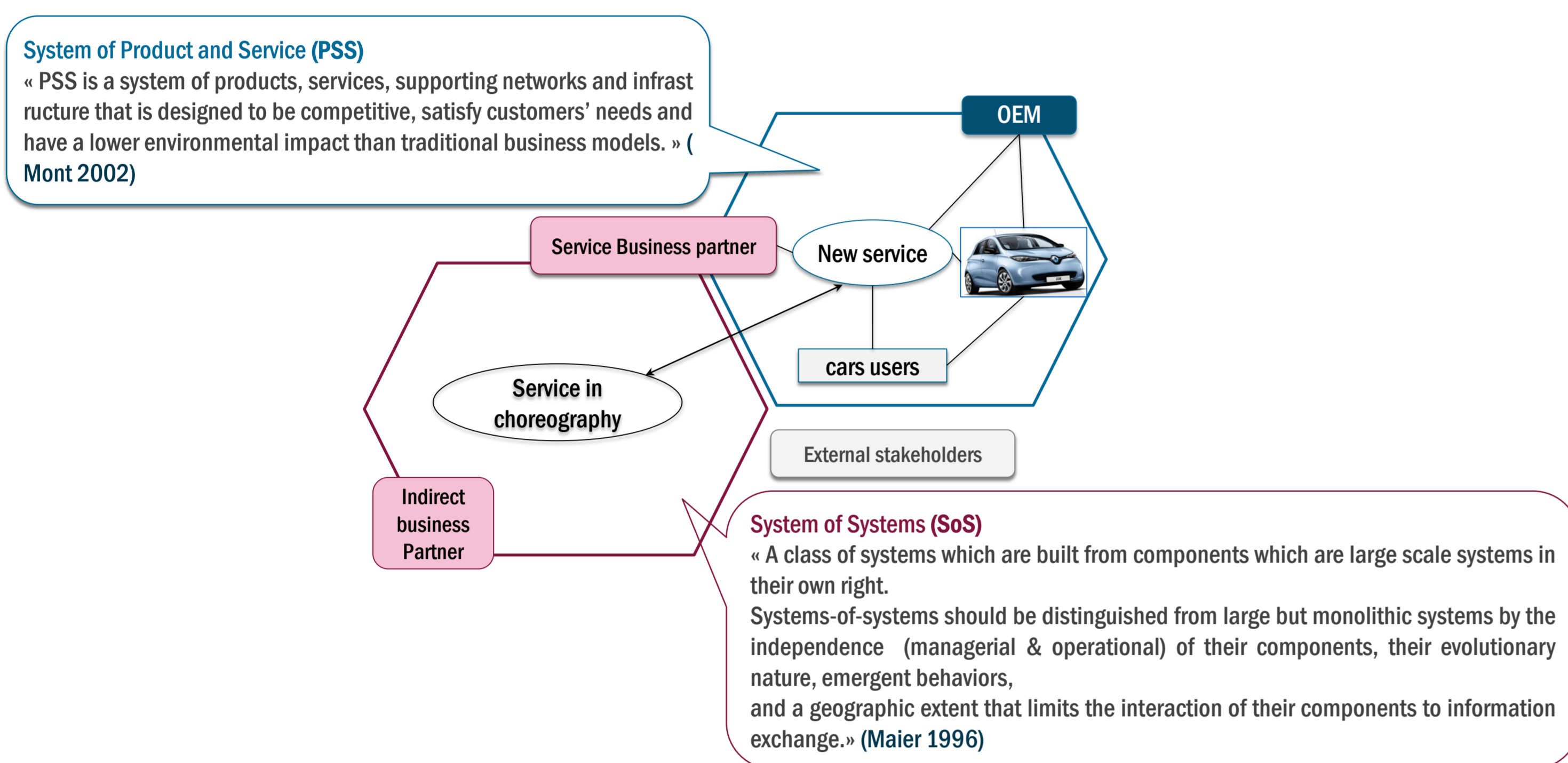


Proposition of a Product and Service SoS design methodology in the context of new mobilities for an OEM

In view of new ways of production and consumption, the manufacturing industry needs to diversify its sources of value and develop new business strategies in order to enhance its competitiveness. This shift in manufacturing industry materializes in the development of Product Service Systems (PSSs) in a context of Systems of Systems (SoS).

INDUSTRIAL CONTEXT



[Mr. Yann Chazal]

« A PSS-SoS is a set of products, services, infrastructures, and networks where its constituent elements exhibit operational and managerial independence. » (Hein et al. 2018)

INDUSTRIAL CHALLENGES

Developing Product Service Systems (PSS) in the context of Systems of Systems (SoS) implies:

- Cooperating to fix service definition and operating conditions (interfaces)
- Incorporating new capabilities in vehicle
- Involving users so that they bring their contribution
- Respecting users' needs for mobility
- Adapting partnership framework, business model and technical behavior to local operation context

The main challenges for PSS development in the context of SoS are:

- PSS family design
- PSS Lifecycle Issues (Lifecycle offsets, obsolescence issues...)
- Services typology (Software intensive PSS, Connected service...)
- Quality attributes for PSS
- New collaboration context

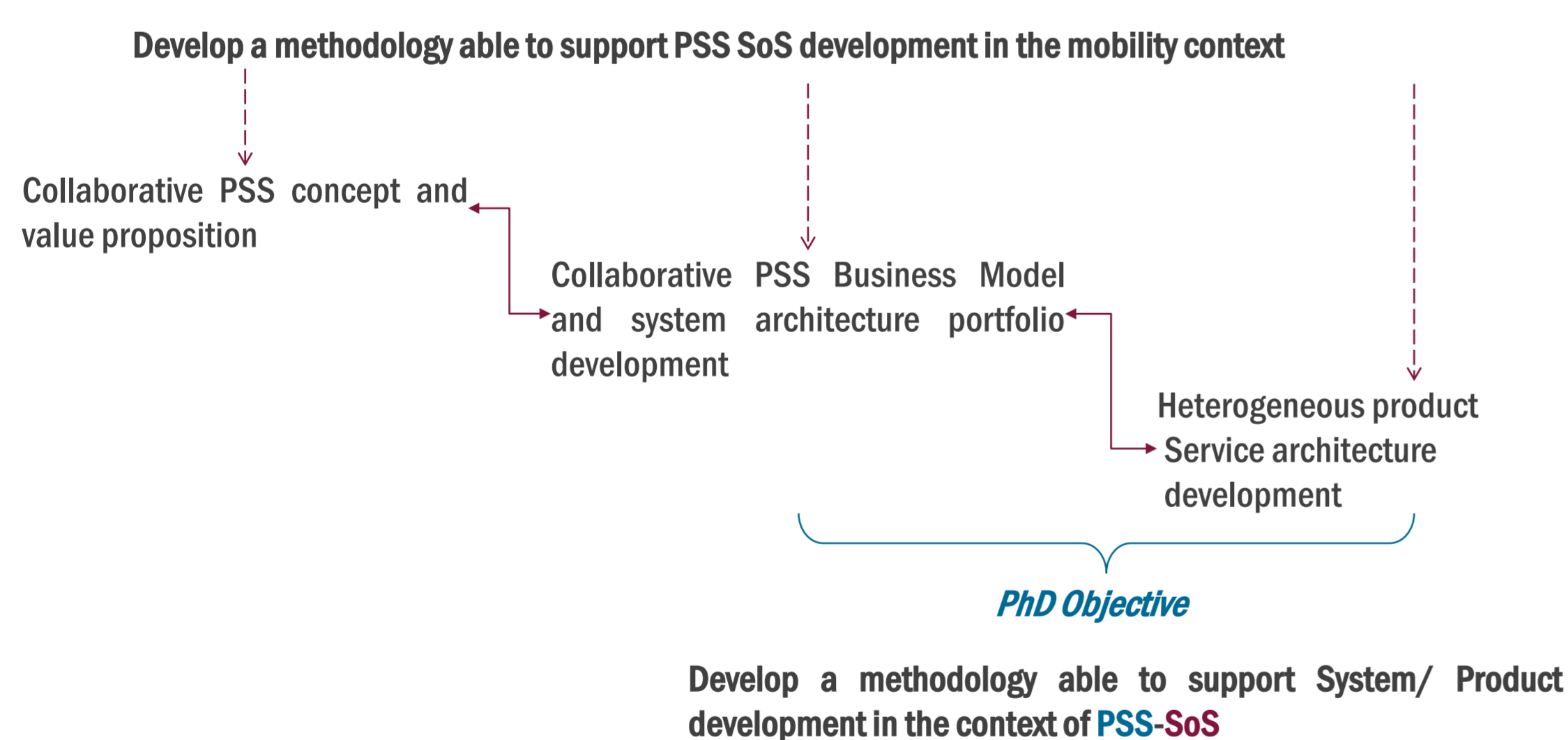


(Hein et al. 2018)

« Manufacturing companies still adopt approaches based on a traditional engineering perspective to design and develop their integrated solutions. They engineer the "tangible" part and then adopt intuitive processes and methods to develop the "intangible" elements. The value obtained is therefore not optimized because it is an un-structured combination of "something methodologically and systematically approached" and "something rudimentally developed" »

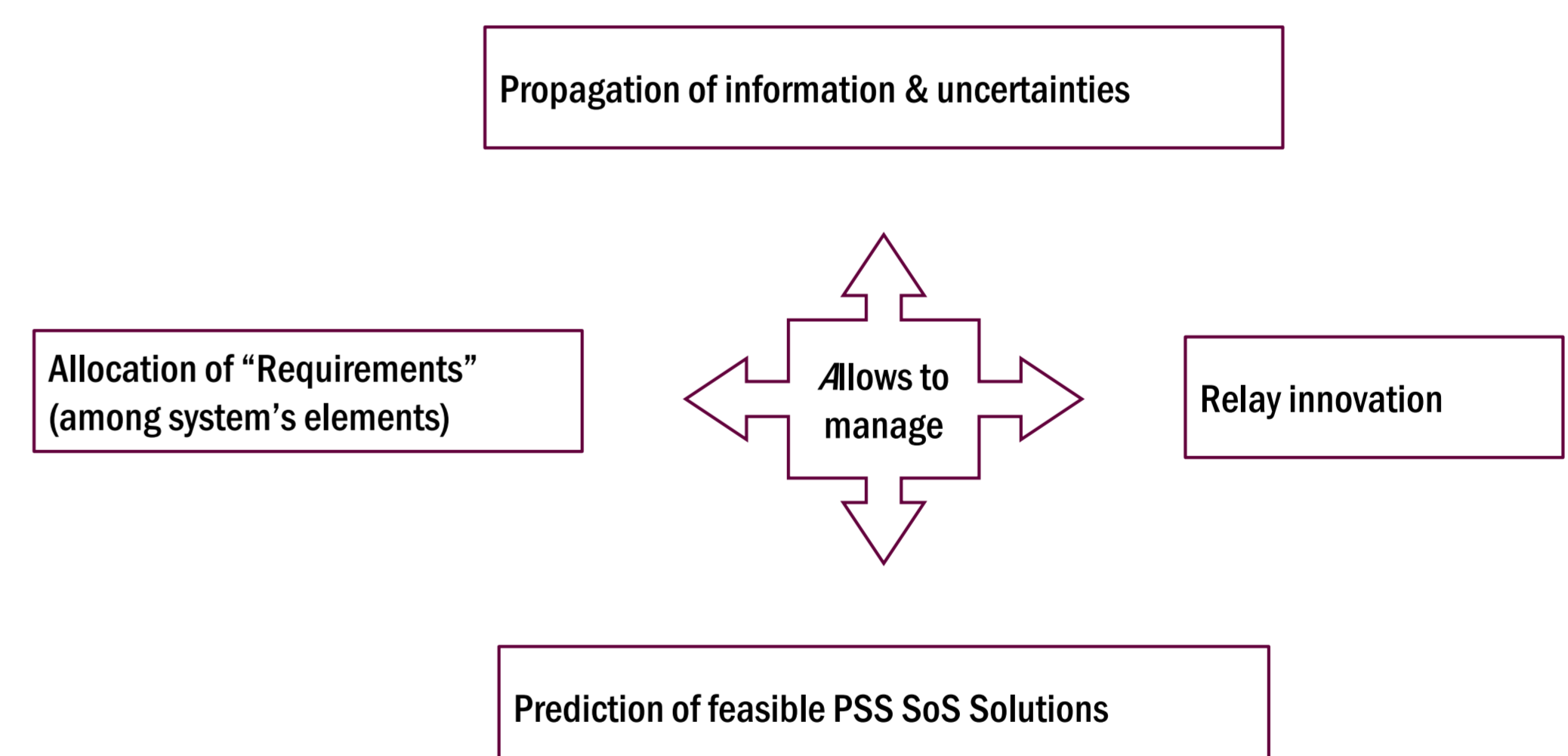
(Pezzotta, Cavalieri, and Gaiardelli 2012)

GLOBAL OBJECTIVES



RESEARCH OBJECTIVES

Suggest a methodology able to support a systematic exploration of the design space of feasible Product/ Systems architectures within a PSS SoS context



RESEARCH CHALLENGES

1st Challenge: Build a holistic and interdisciplinary approach to study PSS SoS

Need to gather necessary information to comprehend the system under consideration

- Systems Characterizations (P, S, PSS & SoS)
- Systems Taxonomies & Typologies (Result oriented, Collaborative ...)
- Systems lifecycles (P, S, PSS & SoS)
- Systems external impacts and/or Interactions (Collaboration and Co-creation)
- Systems combinations

2nd Challenge: Identify methods and tools able to support PSS SoS description, design and development

Need to identify Frameworks, models and tools able to support the "harmonization" of heterogeneous systems

- Systems Architecture
- Systems Development Processes
- Systems Development Activities
- Systems development strategies (Modularity, configuration ...)

3rd Challenge: Identify Systems Analysis Models and Decision Support Models

Need to analyse feasible PSS SoS design solution and Support Architecture optimization

- Systems descriptive parameters decomposition
- Systems Architecture Choices identification
- Systems Architecture performance Assessment
- Quality attributes Analysis

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