Challenges to innovate in complex systems industries

Nicolette Lakemond, Associate Professor

nicolette.lakemond@liu.se

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LINKÖPING UNIVERSITY

CoPS – Complex Products and Systems:

- High cost
- Engineering-intensive
- Customized components
- High degree of new knowledge
- Several knowledge bases
- Usually involving many firms
- Product cycles last for decades

Hobday, 1998

Innovation and complexity in CoPS

Collaborative projects as a central coordination mechanism

to communicate design and architectural knwoledge and to combine distinctive resources, know-how and skills of many partners.

Role of user/customer is central

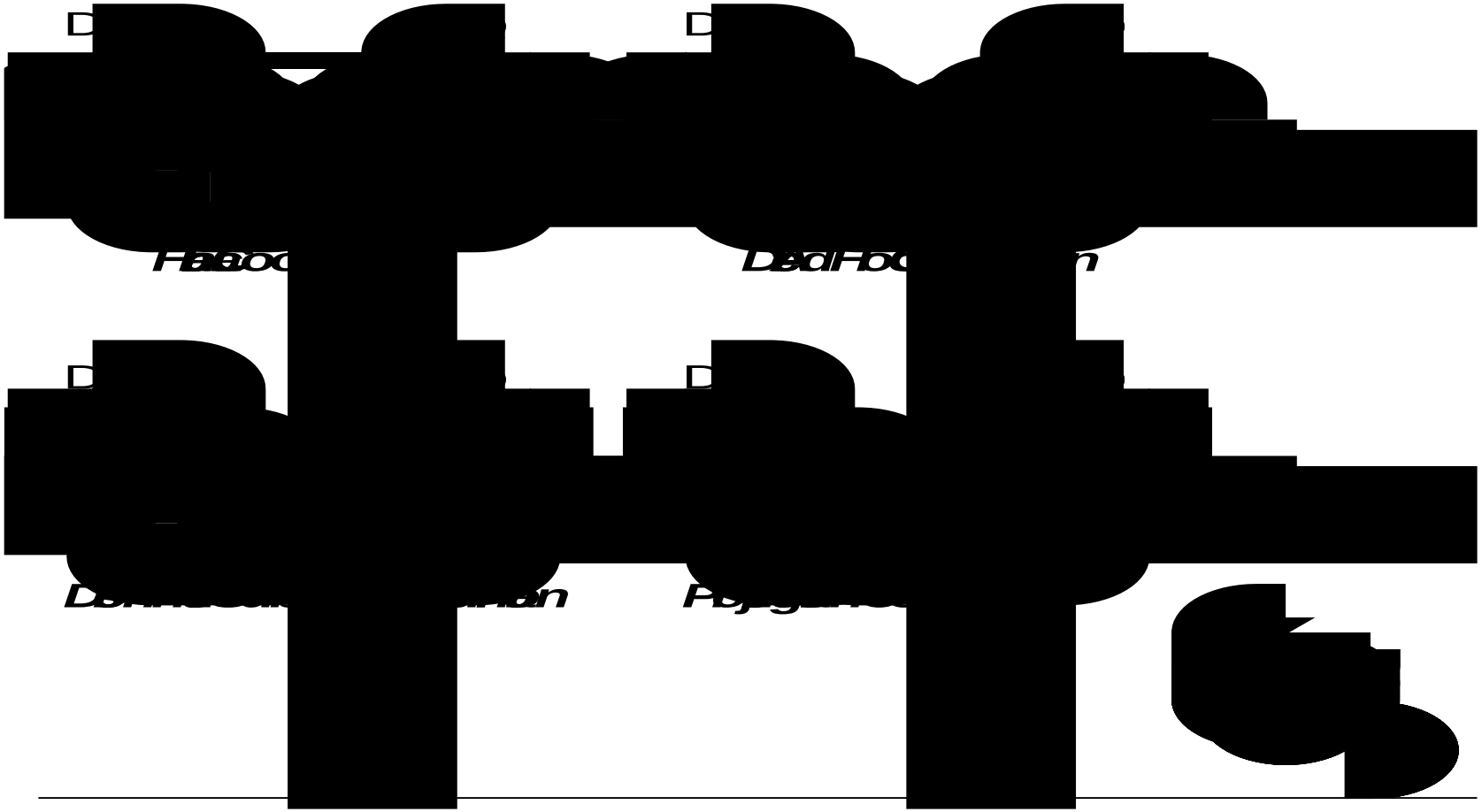
Depth of user involvement and its influnece at the various stages of te innovation process is one of the critical dimensions of CoPS

Example ABB

”We need to integrate our technical solutions with our customer. In that way we can reduce the product’s footprint, decrease weight, increase energy efficiency, and reduce money. In order to do this we need to create a partnership and work integrated with our customer in engineering and understand their problems”

CTO - ABB

Managing collaborative projects



Lakemond et al., 2006

The importance of knowledge integration

Knowledge integration refers to the process of combining specialized, differentiated, but complementary knowledge bases and creating new knowledge through synthesis.

Berggren et al., 2011

Coordination and Cooperation challenges

- **Cooperation problems** – conflicts of interests among the partners
  - Monitoring, discretion restrictions, socialization, and incentive systems

- **Coordination problems** – when partners are ignorant of each other's choices and fail to match up their actions
  - Integration practices

Postrel, 2009; Johansson et al., 2011)

Mechanisms for knowledge integration in collaborative innovation

- **Project management across organizational borders –** pm techniques, performance assessment, incentive systems to minimize agent and cooperation problems

- **Knowledge matching –** access to partner's technical resources, complementarity of knowledge bases and synergy created by combining knowledge allow implicit and informal coordination

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