

Eco-design principles in a business network: A case study on the work of designers in developing a large-made-to- order product

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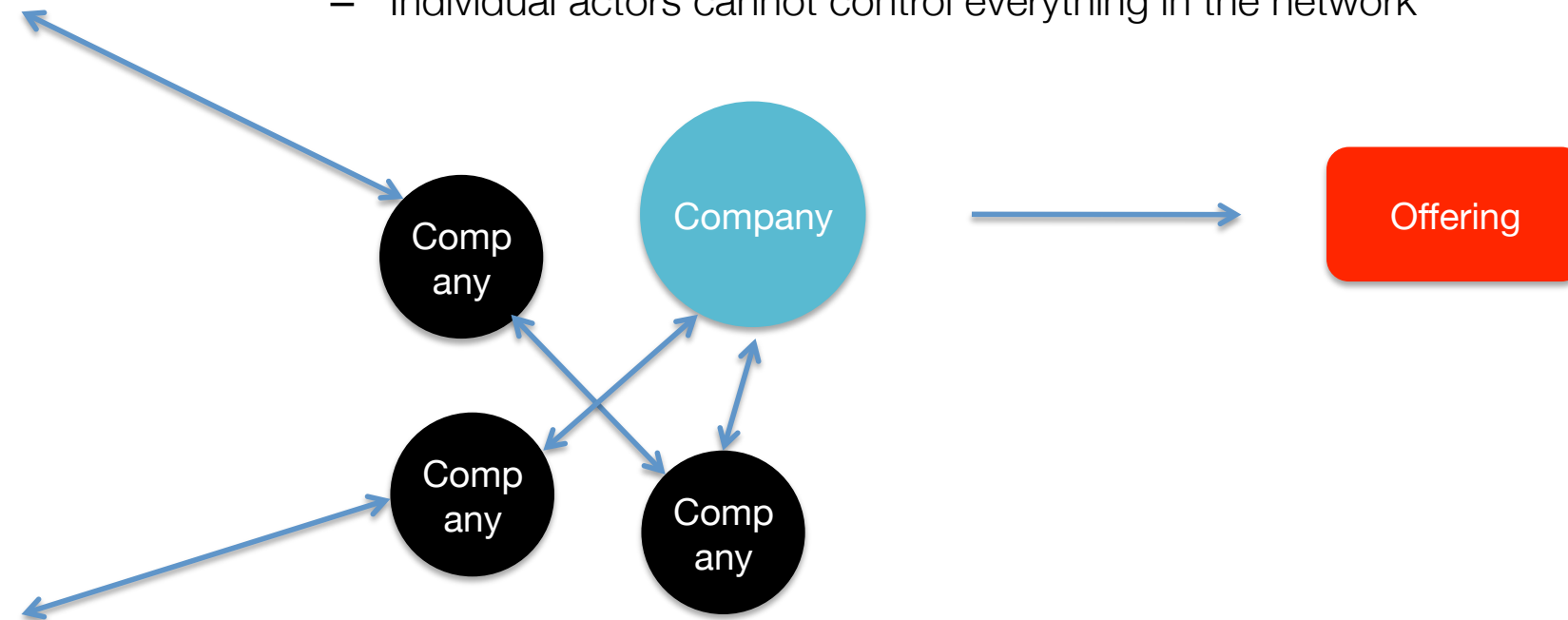
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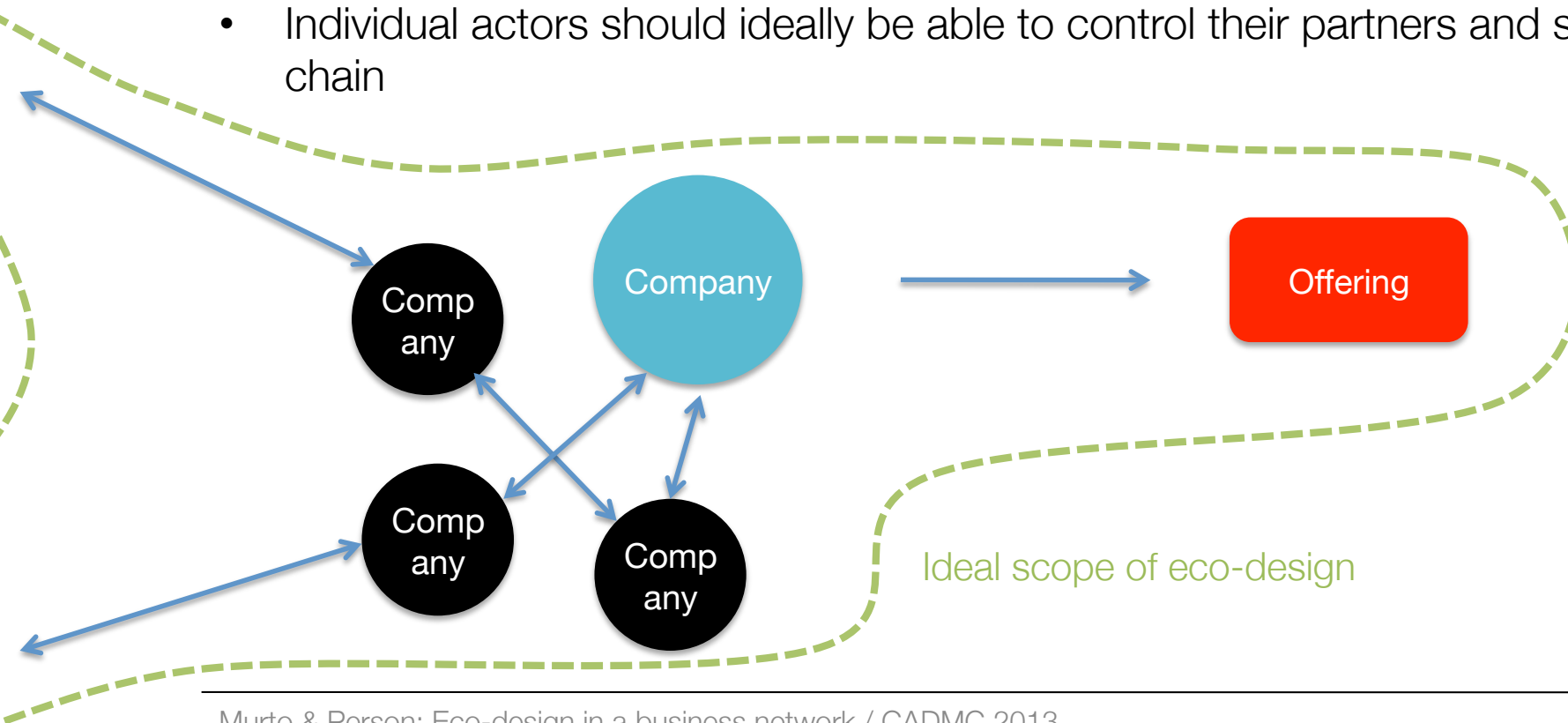
Introduction: business networks

- Products developed increasingly in business networks (Ford et al. 2011; Möller et al. 2004; Jarillo 1993)
- Optimal combination between vertical integration and outsourcing
 - Focus on core competence & collaborate to produce complete offerings
 - Individual actors cannot control everything in the network



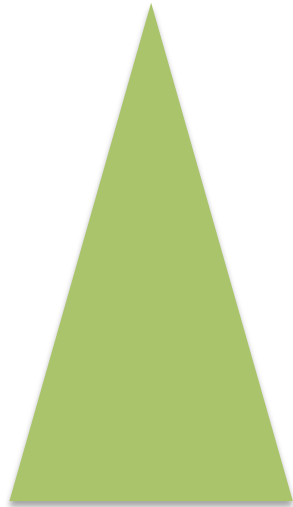
Introduction: eco-design

- Eco-design often suggested to require wide and early application already in concept design (e.g. ISO 2011; Lewis et al. 2001; Blizzard & Klotz 2012)
 - Similar to consistency and strategic use of design as in design management (Cooper and Press 1995; Stevens and Moultrie 2011)
- Individual actors should ideally be able to control their partners and supply chain

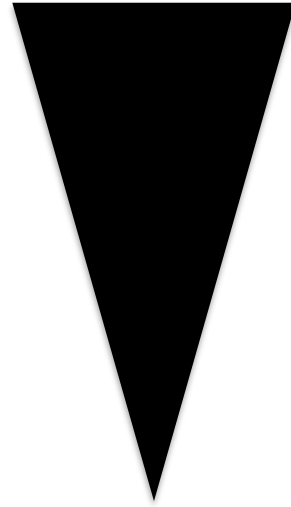


Eco-design in business networks?

Eco-design
focus/ideal
scope



Individual
business
focus/control

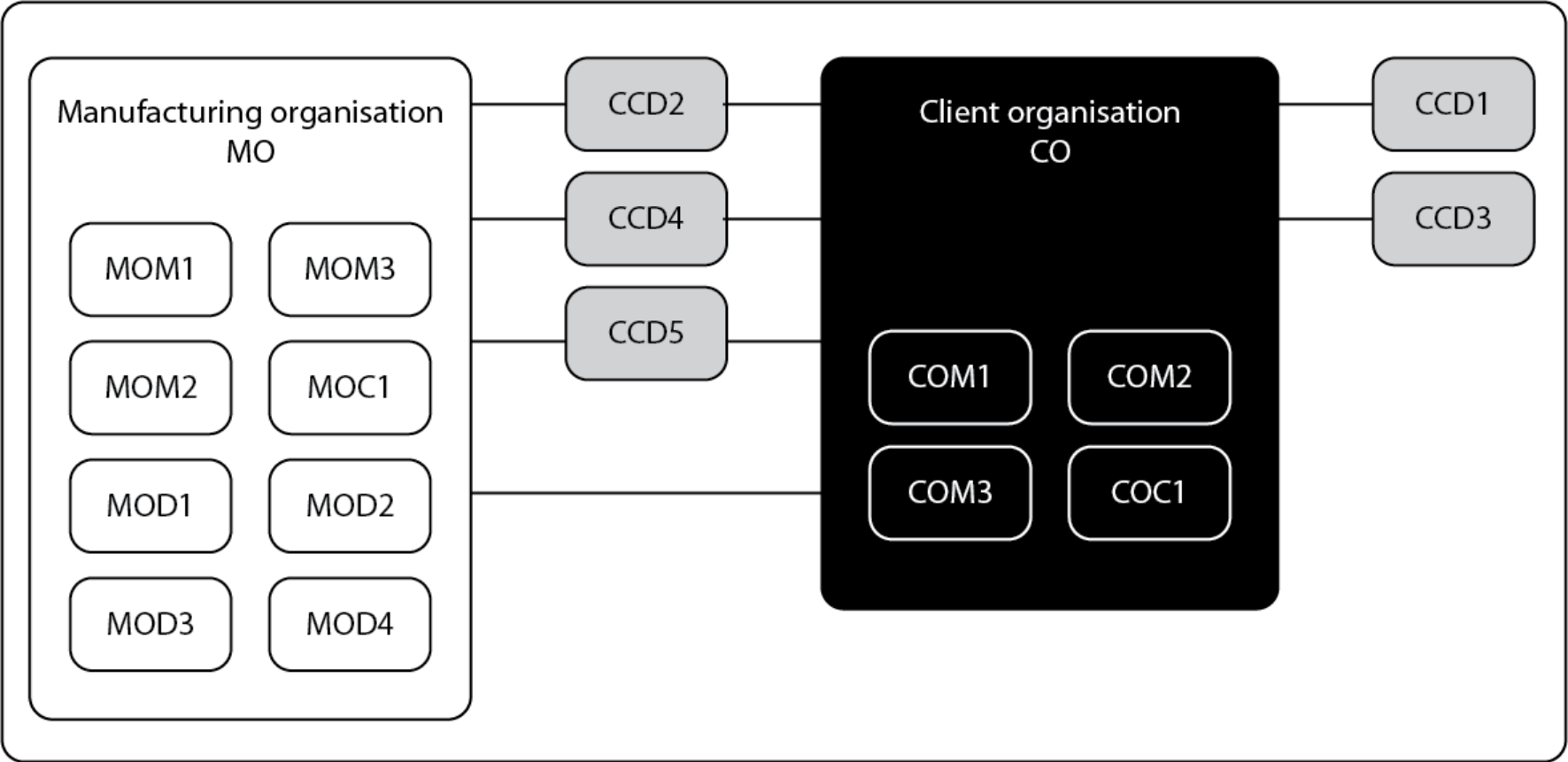


1. How do eco-design principles stand out in business networks?
2. What is the role of designers in realising eco-design in business networks?

Method

- Case study (work in progress)
 - 17 interviews with product developers working in a project
 - 10 designers, 5 managers, 2 coordinators
 - Process documents and public documents used as supportive material
- Large-made-to-order (LMTO) metal product
 - E.g. power plants, offshore equipment, ships (see Stoyell et al. 2001)
 - Collaboration and networked development with multiple different specialists
 - Major sustainability improvements targeted and achieved in the project (mostly energy-related)
- "Dyad-network perspective" (as in Halinen & Törnroos 1998)
 - Focus on manufacturer and client

Case boundary



Legend:

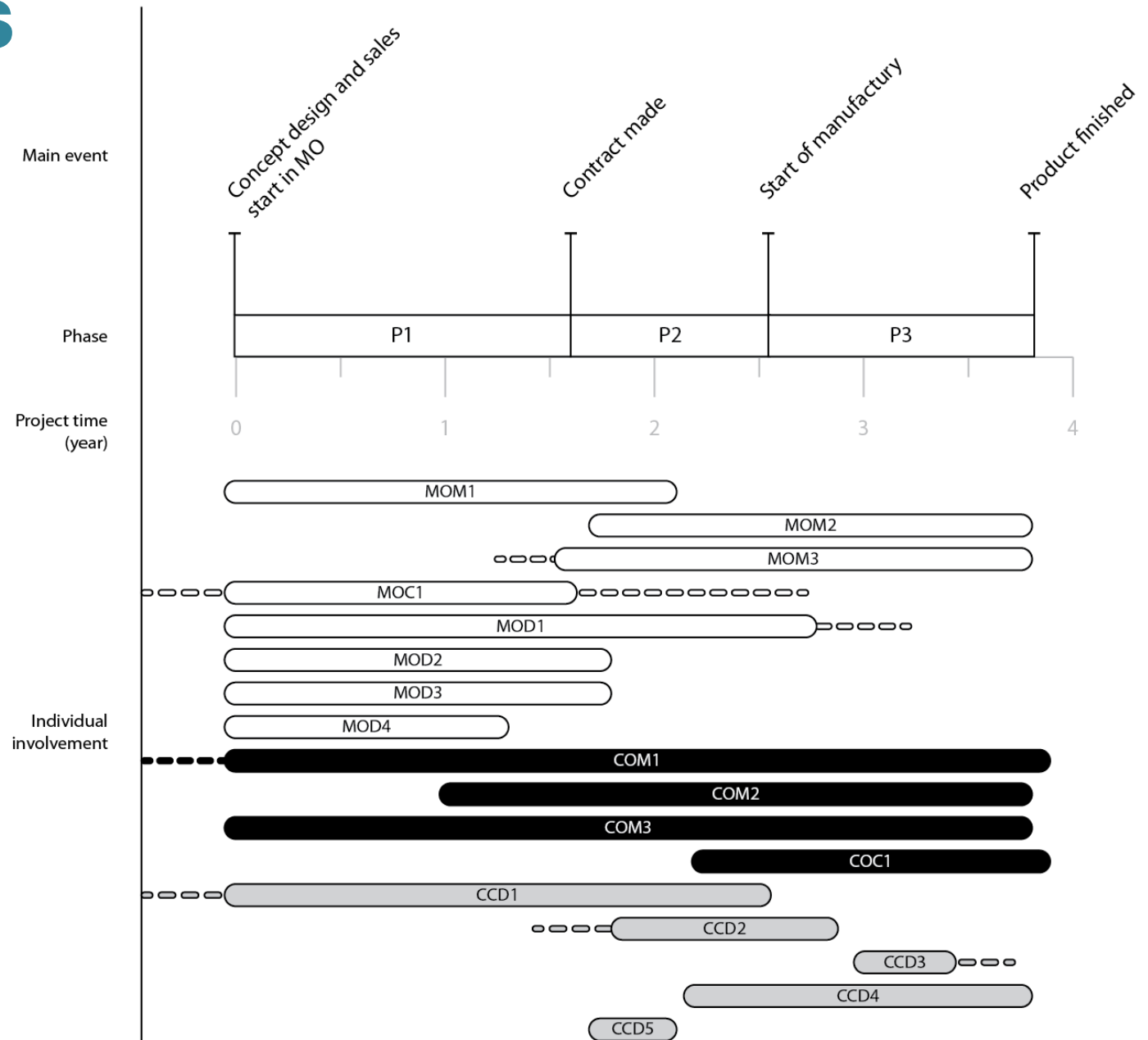
MOD1= Manufacturing Organisation Designer 1

Network location/organisation	Role/profession	Individual identifier number
MO = Manufacturing Organisation	D= Designer	
CO = Client Organisation	M= Manager	
CC = Client Consultant	C = Coordinator	

Method

- Interviews fully transcribed, analysed and coded:
 - When did the designers/developers work in the project?
 - What tasks and roles they performed?
 - How the environmental targets influenced their work?

Results



Results

Roles and tasks in different stages compared

- Phase 1 focus on sales and a wide range of concepts
 - Style, function, service, technology, sustainability...
 - Generic focus on sustainability, i.e. "suggestions"
- Phases 2 and 3 more focused on realisation

"...we try to lure the client with good ideas and pictures right from the start"

"...it's a long journey and there's many processes in between. But if you're lucky and make a good suggestion or idea [...] it can go all the way to the end."

Results

- However, no linear sequence between Phases 1,2 and 3
 - Designers coming in at later phases start again with their own concepts (with cost level determined and feasibility expected)
 - Contractual reasons and work ownership

"I go through them [concepts from P1] and I met the designer also [...] but we didn't go about realising them in any way, it was not feasible"

*"One consultant made this kind of a proposal and we started negotiating from that [...] about what it should then **actually** be like, so that we can manufacture it"*

Results

Influence of environmental targets to design

- Designers aware and interested in sustainability issues of the product but detached from eco-design and sustainability improvements
 - Focus on core design competences, i.e. appearance and function (as in e.g. Ulrich and Eppinger, 2000)
 - Safety constrains as a barrier to more sustainable material selection
- In comparison engineers heavily influenced by the targets

“so the reality is quite, it's like there's so many safety issues before that [sustainability] you have to think about”.

“ [the sustainability focus of the project] did not really, in terms of the environment, bring anything to the design, so that we would have somehow emphasized environmental friendliness in it”

Conclusions

- Principles of wide and early eco-design application difficult in business networks
 - Early design concepts not decisive in the studied case (translatability more relevant)
 - No linear progression from P1 to P2 to P3 (instead multiple different concept design phases)
- In the studied case, designers did not play a key role in eco-design
 - Focus on core competence in business networks
 - Design work mostly untouched by energy-related issues
- Yet, significant environmental improvements achieved
 - The collaborative nature of business networks as a key success factor in sustainability improvements?
 - Client problems become manufacturer problems

Implications

- Design managers must develop sensibility towards who specifically to manage in eco-design and when?
 - Translation of ideas to practice a key moment, not the earliest possible concepts
 - Some product developes more influential in eco-design
- Focused environmental improvements that can survive from idea to execution should be targeted
 - Design managers should aid to bridge the gap between early vision concepts and production concepts

Limitations

- LMTO-products are unique
 - Different industries and product types developed in business networks need to be studied to draw wider conclusions
- Interviews as reflections on events rather than factual accounts of events (Silverman 2011)
 - Ethnographic studies may reveal deeper insights
 - Interviewees in different project stages during the time of interview due to long lead time

Thank you!