Industrial Symbiosis Practitioner Training



Part 3: Development determinants







by Murat Mirata

Environmental Technology & Management

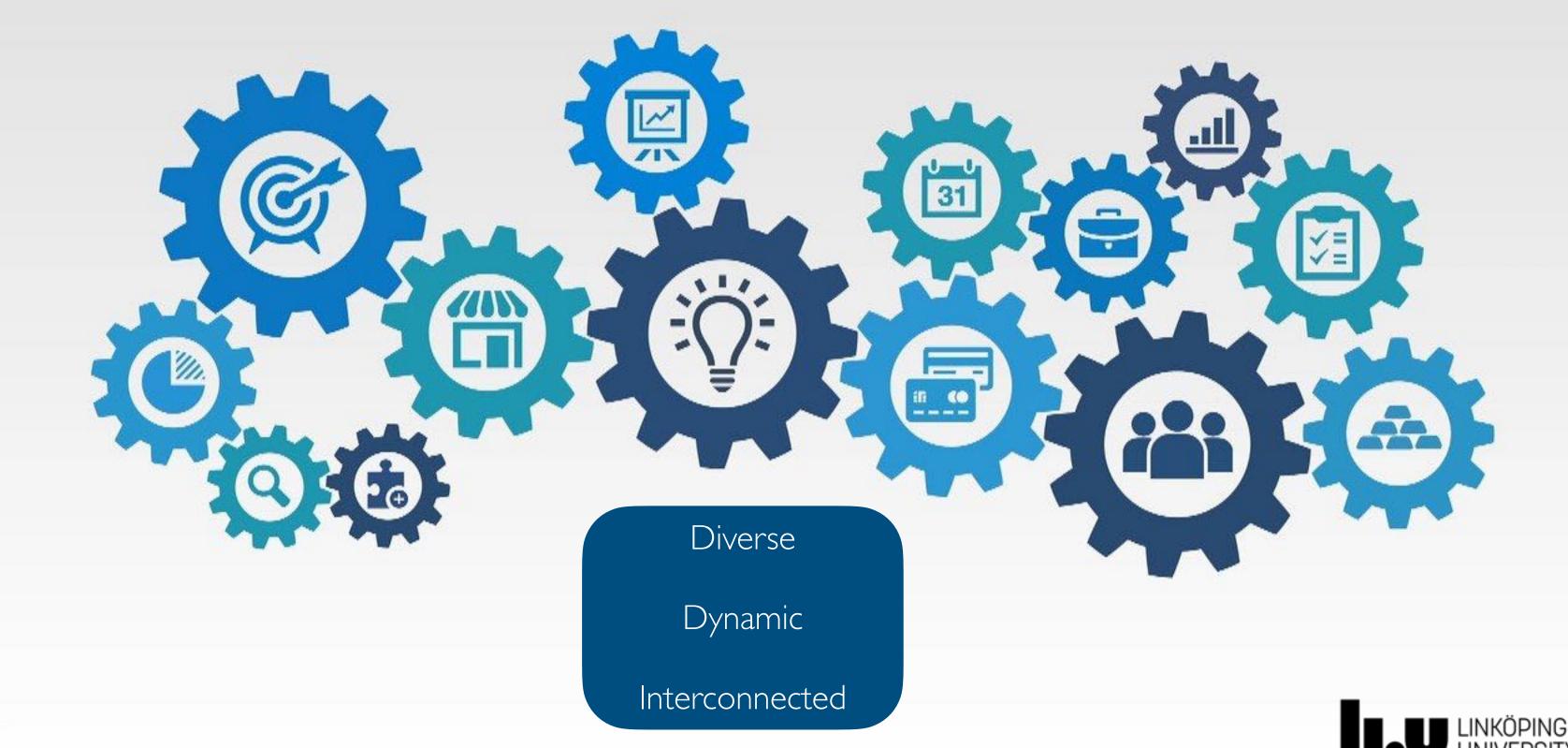




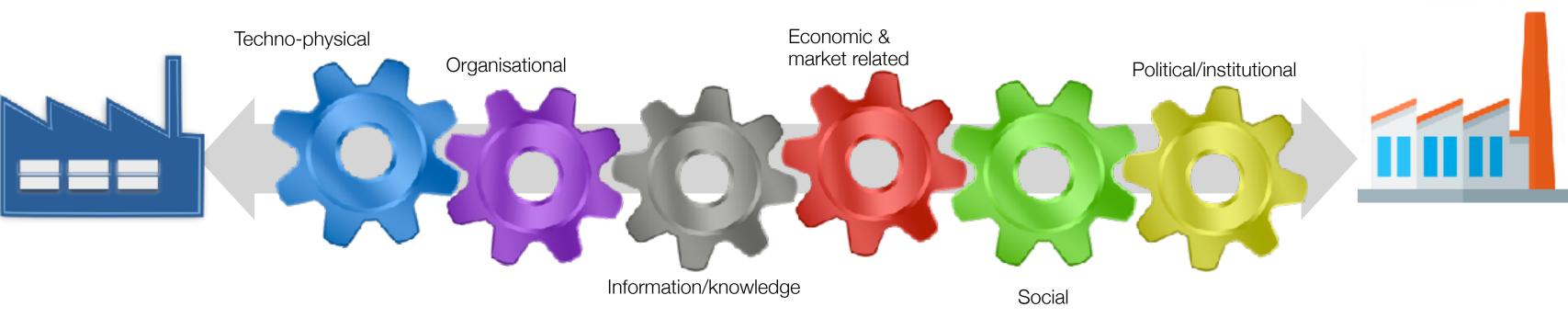
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Complex processes with multiple interlinked determinants



Determinants of industrial symbiosis processes







Local resource availability

Resource characteristics

Supply-demand (mis)match

- Quantity
- Quality
- Stability

Physical anchors

Activity mix

Processing needs

Technology specs & maturity

Process impacts

- Capture at source
- Integration at user

Product impacts

Location & proximity

Infrastructure availability/ access

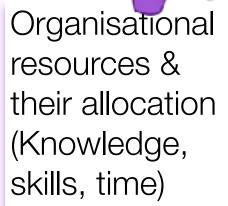
Land availability





S

Strategic recognition



Organisational

Resistance to change

Organisational championing & anchoring

Value & risk assessments

Decision power

Dependence, Flexibility, Power

Mindset/

culture/

attitude

Interorganisational alignment Learning & innovation

Timing

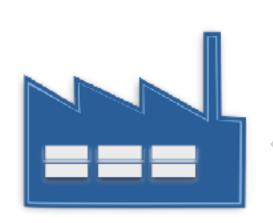
Agreements & contracts

Organisational trust

Coordination needs & transaction costs.

Supporting and mobilising actors (Coordinators and regenerative entrepreneurs)





Info & knowledge





Generic knowledge about concept, benefits, challenges Needs & haves of actors

Possible applications

Performance expectations

- Technical
- Business
- Socio-economic
- Environmental

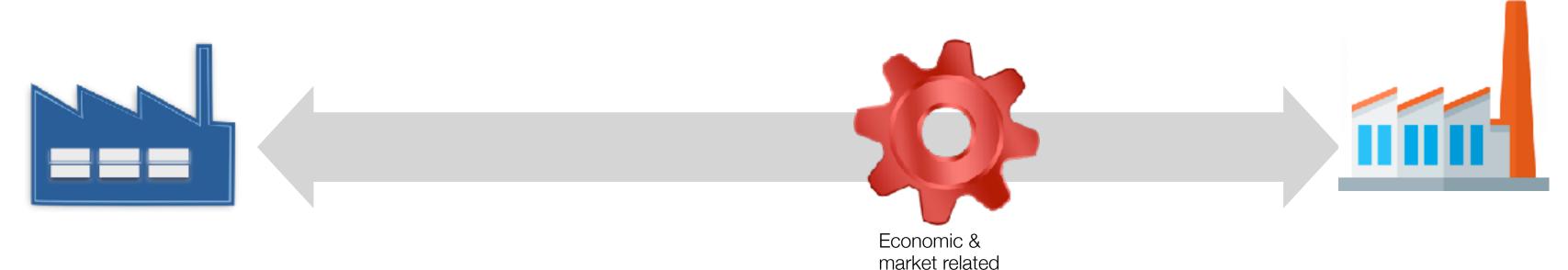
R&D capacity (e.g. testbeds)

Confidentiality

Information/data availability and accessibility

Information and knowledge brokers





Costs/
returns of
alternatives

High investments, lower returns

Market conditions:

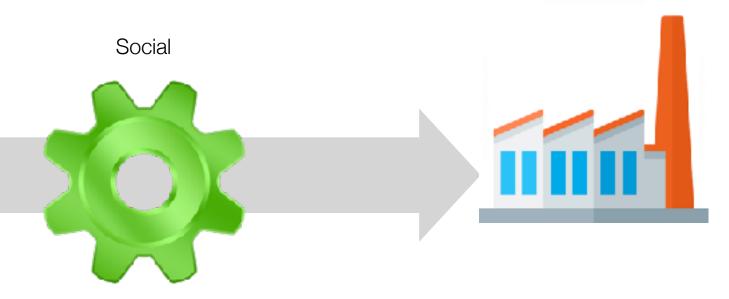
- Existence
- Competitiveness
- Accessibility
- Certainty

Finance availability & terms

Investment risk







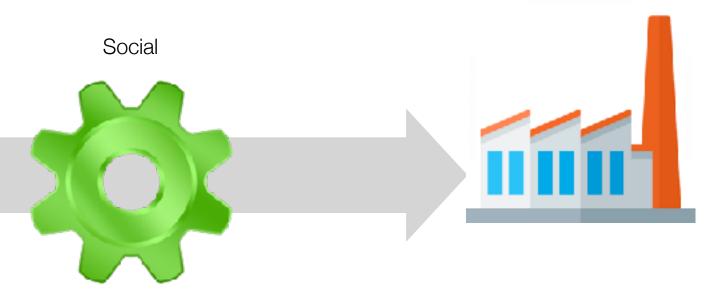
Motto from Kalundborg

Systems make it POSSIBLE...

... people make it HAPPEN.







Relationships

Communication & familiarity

Trust & openness

Local embeddedness Social proximity & common norms

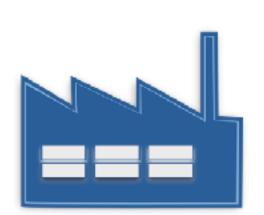
Institutional capacity to collaborate

Networks & their characteristics

- Diversity
- Density
- Centrality

Champions,
(relationship) brokers,
coordinators,
institutional anchors





Laws & Regulations Permits and permit processes

Economic/ financial support and penalty schemes

Policies:

- EU
- National
- Regional
- Local



- Infrastructure plans
- Energy policies

Political

- Waste/resource policies
- Public procurement
- Business support



Determinants of Industrial

- Flow quantities & qualities
- Applicable solutions
- Relevant partners
- Multiple impacts
- Multiple challenges
- Confidentiality

- Cost of alternatives
- Investment size
- Finance availability
- Operational costs
- Market maturity, certainty & access

Political/institutional

- Trust
- Communication
- Familiarity
- Intermediation
- Social network structure
- Institutional capacity



Information/knowledge

Economic & market related

Social



- Supply/demand conditions
- Resource properties
- Processing & logistics needs;
- Technology readiness
- Process & product impacts
- Distance
- Land
- Infrastructure

Organisational

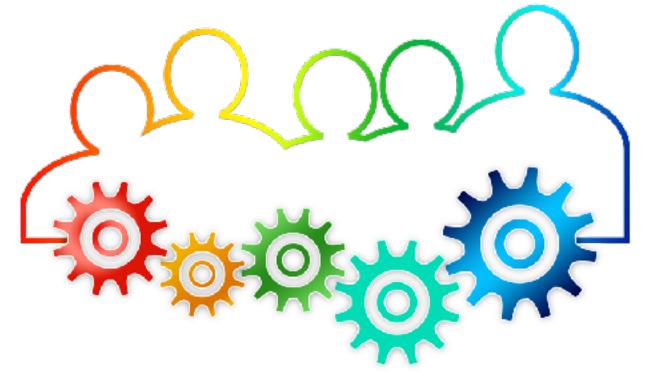
- Mindset/attitude
- Strategic interest
- Organisational resources
- Value/risk perception
- Dependency/power
- Power imbalances
- Business models
- Transaction costs

- Laws
- Regulations
- Permits & procedures
- EU policies
- National policies
- Local/regional policies

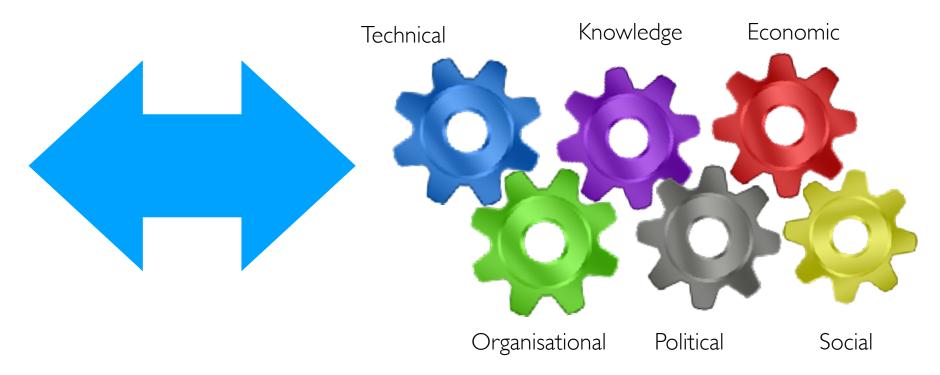


Facilitation

Focused actions to create supportive conditions



Determinants
(Barriers & enablers)







QUESTIONS & INQUIRIES

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EUROPEAN UNION

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