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Supply-side

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Outline

- Meso-theories of innovation and the firm
- Innovation strategies of the firm

- Serious Game (Allard van Mossel)

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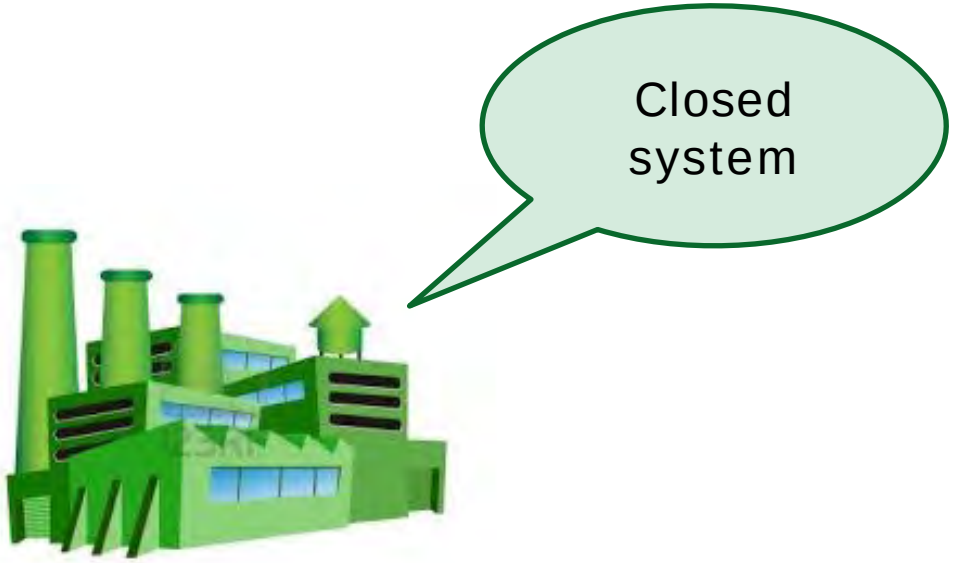
Meso-theories of innovation and the firm

Outline Meso-theories of innovation and the firm

- Neo-institutional theory
  - Background and concepts
  - Assumptions
  - Institutional complexity
- Institutions, innovation, and dynamics
- Population Ecology
  - Background and concepts
  - Assumptions

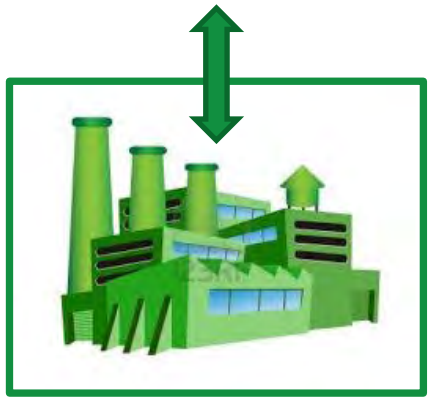

Closed
system

Open system

Organizational environment

" The set of forces surrounding an organization that have the potential to affect the way it operates and its access to scarce resources" (Jones, 2004: 81)

Organizational environment



Institutional environment: "set of values and norms that govern the behavior of a populations of organizations" (Jones, 2004:337)

Institutions:

"are more-or-less taken-for-granted repetitive social behaviour that is underpinned by normative systems and cognitive understandings that give meaning to social exchange and thus enable self-reproducing social order" (Greenwood, 2008:5)

Institutions:

"are comprised of regulative, normative and cultural-cognitive elements that, together with associated activities and resources, provide stability and meaning to social life" (Scott, 2008:48)

Three pillars (Scott, 2008):

1. Regulative
2. Normative
3. Cultural-cognitive

Basic concepts

Institutionalization: involves the processes by which social processes, obligations, or actualities come to take on a rule-like status in social thought and action

Basic concepts

Organizational field: those organizations that, in the aggregate, constitute a recognized area of institutional life (DiMaggio and Powell, 1983 :148)

Neo-institutional theory

Why do organizations become so similar?

- Meyer and Rowan (1977) focused on the spread and elaboration of formal structure
- The myth of the institutional environment versus the (efficiency) demands of the work activities

Neo-institutional theory

Isomorphism: "a constraining process that forces one unit in the population to resemble others units that face the same set of environmental conditions" (DiMaggio and Powell, 1983: 149)

Neo-institutional theory

Three processes that explain why organizations become similar are:

- Coercive isomorphism
- Mimetic isomorphism
- Normative isomorphism

But what about change and innovation?

- Isomorphism
  - → inertia
  - → low incentives to innovate

- Prevailing institutions are likely to resist change in existing practices

- Stability

But what about change and innovation?

Existing institutions within IS might hinder development new technologies

Example: innovative alternatives for animal studies in drug development

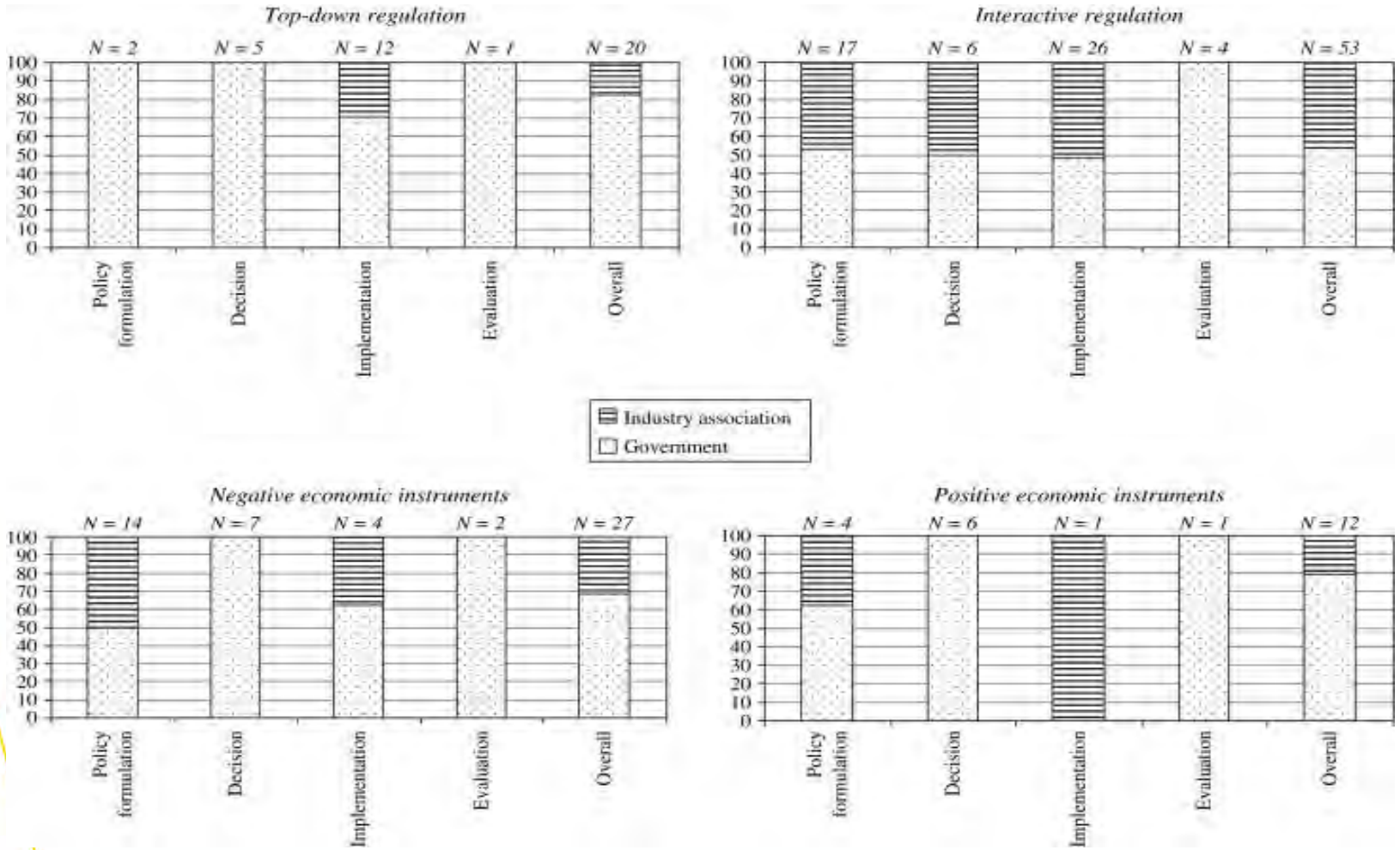
Marloes Kooijmans

But what about change and innovation?

- But institutions might change over time
- Organizations are often confronted with new institutional requirements

- But organizations can also be involved

Roles of government and industry association in the policy process



(Chappin et al., 2008)

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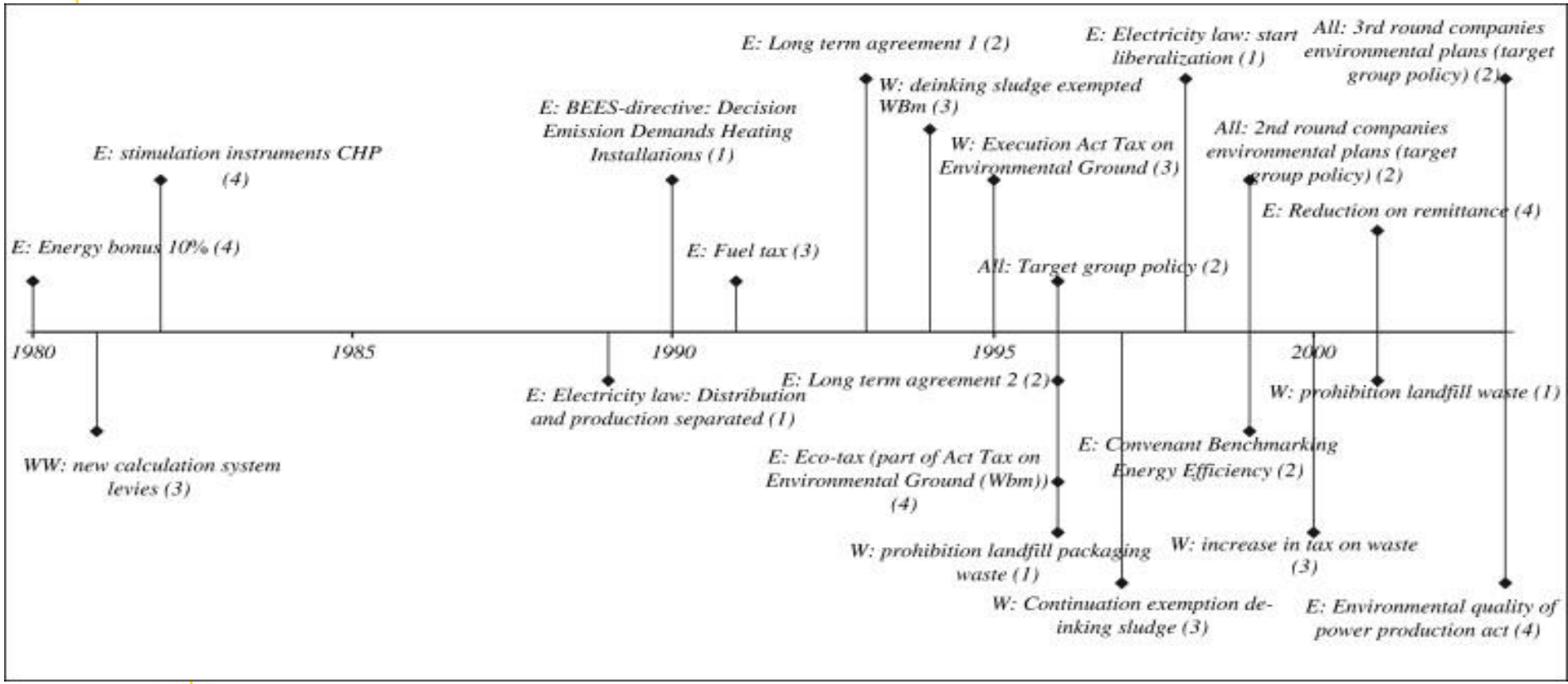
An overview of the policy instruments in Dutch paper and board industry (1980–2003)



(Chappin et al., 2008)

Institutional complexity

- Moreover, organizations embedded in many institutional environments (Scott, 2001; Kraatz & Block 2008)
- Multiple institutional logics can be conflicting
- Organizations face institutional complexity (Greenwood et al., 2011)

→ Strategic responses of organizations

Timing of adoption

Different motives early versus later adopters:

- Early adopters more triggered by technical gains; late adopters more motivated by social gains (legitimacy)

  (c.f. Tolbert & Zucker 1983; Westphal et al., 1997).

- Motives can coexist (Kennedy and Fiss, 2009).

Timing of adoption

In study with Cambré & Vermeulen on internalization of sustainable forestry management we found two patterns for high internalization of wood trade firms:

1. *early* adopters have a high level of *environmental concern*

2. *Late* adopters experience a high level of *institutional pressures*

Organizational birth

- Founding of an organization
- Occurs when entrepreneurs take advantage of opportunities to use their skills and competences to create value
- A dangerous life cycle stage associated with the greatest chance of failure

- *Why are there so many kinds of organizations?* *(Hannan and Freeman, 1977:936)*

Population Ecology

Aim:

- Focuses on the processes and rates of organizations founding, failure and change at population level
- To strive for explanations for organizational diversity at population level

Population: a set of organizations engaged in similar activities and with similar patterns of resource utilization

Population Ecology

Main assumptions:

- Organizations are “unable” to adapt

- Selection is major driver of transformation and change in organizational forms

Population Ecology

Organizations can use different strategies to gain access to resources and enhance their chances of survival in the environment:

- Specialists: organizations that concentrate their skills to pursue a narrow range of resources in a single niche
- Generalists: organizations that spread their skills thin to compete for a broad range of resources in many niches

Population Ecology

Founding and failure:

- Density dependence
- Liability of newness
- Liability of smallness

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Meso-theories of innovation and the firm…in sum

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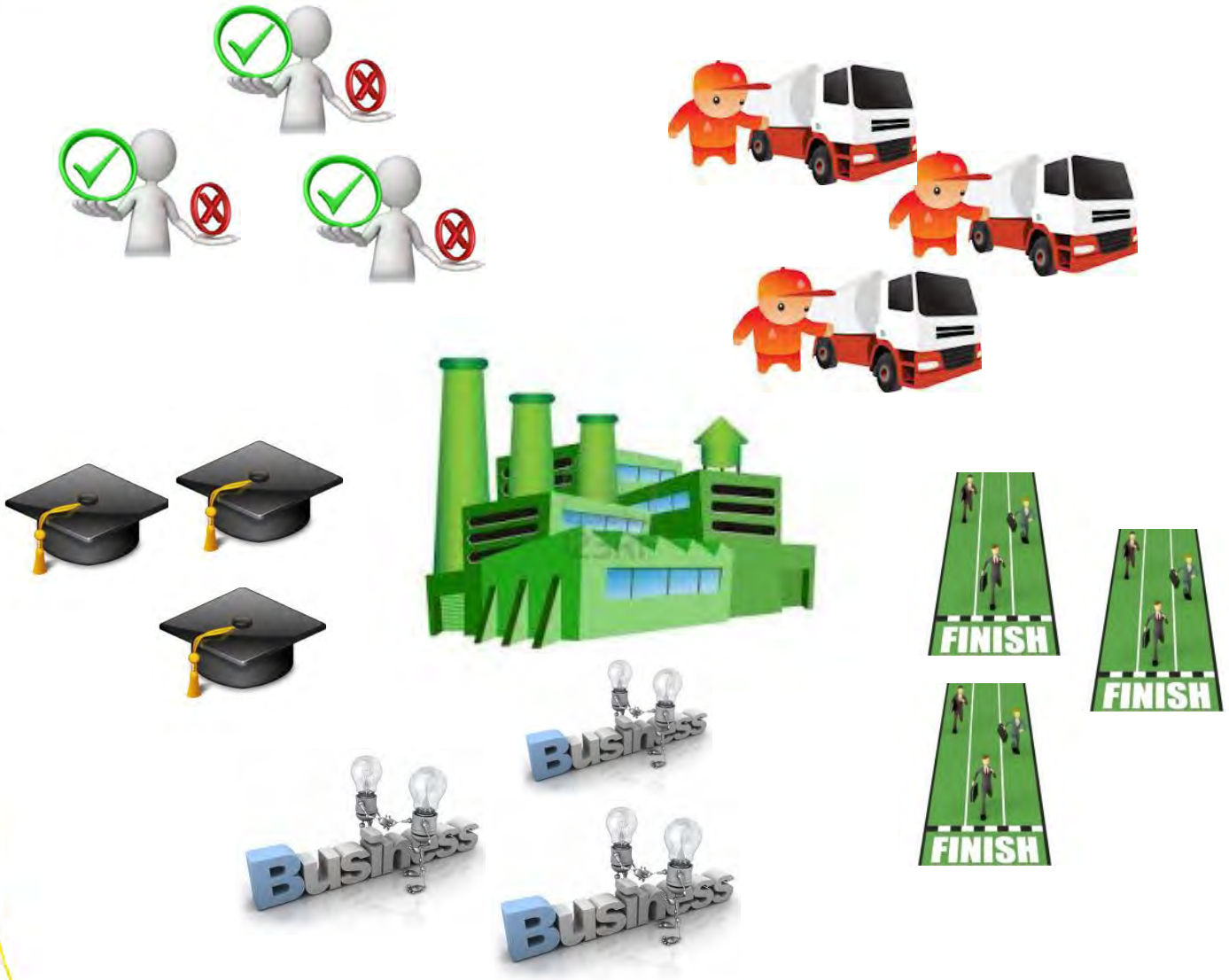
Innovation strategies strategies of the firm

Outline innovation strategies

- Open innovation
  - What
  - Why
  - How

- Strategies relevant for game


FINISH
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Open innovation

"the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and to expand the markets for external use of innovation respectively"
(Chesbrough et al 2006, p.1).

Joy's law: No matter who you are, most of the smartest people work for someone else

Different concepts

Open innovation

Open source innovation

User innovation

Crowdsourcing

Open?

- Outcome
- Process

Innovation Process:	Innovation Outcome:	
	Closed	Open
Closed	1. Closed innovation	3. Public Innovation
Open	2. Private Open Innovation	4. Open Source Innovation

(Huizingh, 2011: 3)

Why?

Review open innovation

West, Joel and Bogers, Marcel, "Leveraging External Sources of Innovation: A Review of Research on Open Innovation," forthcoming in the *Journal of Product Innovation Management*, January 2, 2013, http://ssrn.com/abstract=2195675

→ Focus on outside-in and coupled

Approach

25 top journals

- SSCI: open innovation
- SSCI: cite Chesbrough 2003
- Google scholar: open innovation (title) and 100+ citations

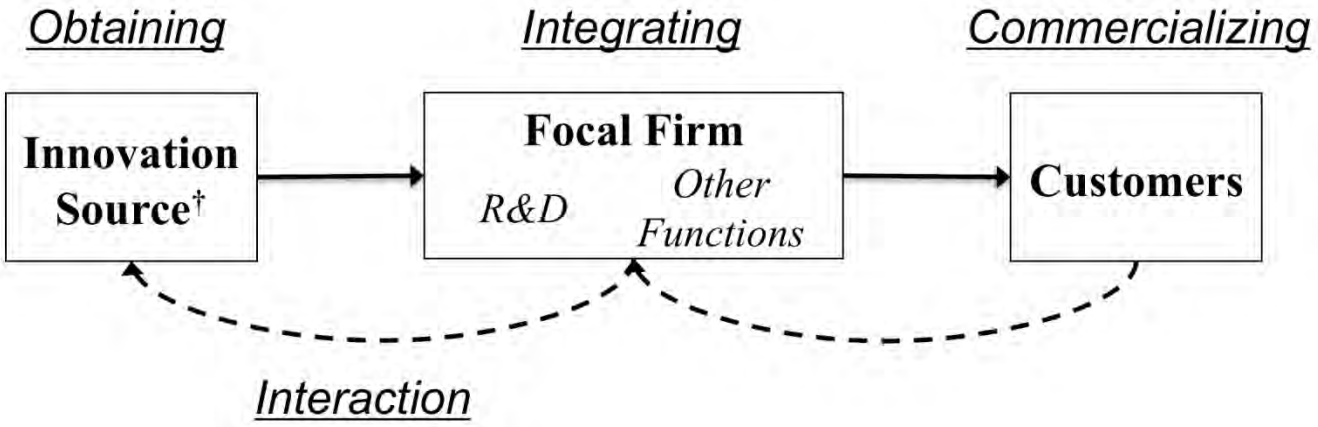
→291 publications

→165 publications

→151 publications

Their model (West and Bogers, 2013)

A four-phase process model for profiting from external sources of innovation



† Sources may include suppliers, rivals, complementors and customers.

Obtaining innovations

- Best covered phase
- Searching, Enabling/Filtering, Acquiring

- Focus on sources of innovation
- Focus on external knowledge and less on external innovation

Integrating innovations

- In order to profit, innovations need to be integrated into firm's R&D activity
- Role of absorptive capacity in relation to collaboration and performance
- Role of organizational culture
- New competences?

Commercializing innovations

- Value creation and value capture

Interaction mechanism

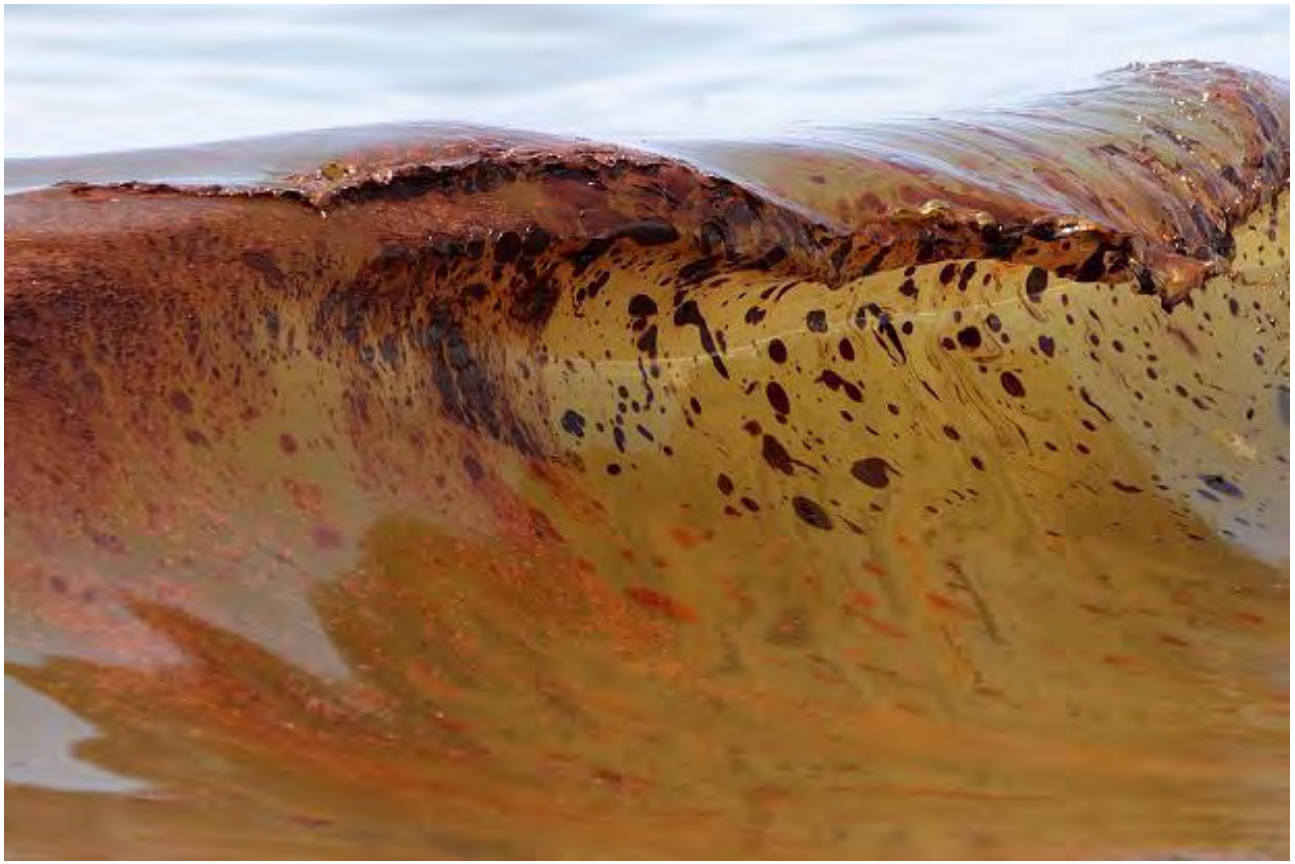
- Beyond linear model
- Feedback mechanisms
- Reciprocal innovation process

TABLE 4
Key categories for research on profiting from external sources of innovation

Phase	Category	Open Innovation Topic	Representative Articles
1. Obtaining	Searching	• Sourcing • Technology scouts • Limits	Dodgson et al. (2006); Laursen and Salter (2006)
	Enabling/ Filtering	• Brokerage • Contests • Intermediaries • Toolkits • Platforms • Gatekeepers	Jeppesen and Lakhani (2010); Piller and Walcher (2006); Whelan et al. (2010)
	Acquiring	• Incentives to share • Contracting • Nature of the innovation	Ceccagnoli et al. (2010); Dushnitsky and Shaver (2009)
2. Integrating		• Absorptive capacity • Culture and "Not Invented Here" • Incentives to cooperate • Competencies	du Chatenier et al. (2010); Emden et al. (2006); Herzog and Leker (2010)
3. Commercializing		• Commercialization process • Value creation • Value capture	Belderbos et al. (2010); Lau et al. (2010); Rothaermel and Alexandre (2009)
4. Interaction	Feedback	• R&D feedback • Customer/market feedback	Berkhout et al. (2006); Hughes and Wareham (2010)
	Reciprocal	• Co-creation • Communities • Value networks	Dittrich and Duysters (2007); Faems et al. (2010)

Lego

Deepwater horizon



Crowdsourcing

- 'crowdsourcing represents the act of a company or institution taking a *function* once performed by employees and *outsourcing* it to an *undefined* (and generally large) *network of people* in the form of an *open call*' (Howe, 2006, p.4 italics added).

Different crowdsourcing types

- *problem solving*
- *creative input*
- *opinion poll*
- *outsourcing tasks*
- *money raising*

Different crowdsourcing types

- *problem solving*
- *creative input*
- *opinion poll*
- *outsourcing tasks*
- *money raising*

Focus on innovation

Example: Study with Smeets & Kaashoek

Aim: researching the effects of **process** characteristics of crowdsourcing on the output of crowdsourcing:

- Feedback to participants
- Interaction among participants

Output of crowdsourcing

- Quantity
- Variety

Results quantity

Type of crowdsourcing important factor:

- crowdsourcing complex tasks require high level of knowledge → crowd relatively small → low quantity
- crowdsourcing creative tasks require lower level of knowledge → crowd relatively large → high quantity

- Duration positive effect

Results quantity

Feedback reciprocal effect

Feedback seems positive because appreciation is a motivation

But it becomes infeasible to give feedback for a high number of contributions and so no feedback is given

Results variety

Negative effect of interaction (combined with creative crowdsourcing practices):

- Interaction leads to copying behavior
- Risk of groupthink

Crowdsourcing complex tasks result in variety

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Strategies relevant for game

Strategies relevant for game

- Decision making
- Innovation strategies
- Competitive strategies

Decision making

- Organizational decision making: the process of responding to a problem by searching for and selecting a solution or course of action that will create value for organizational stakeholders

Rational model

Identify problem → Generate alternatives → Select the best solution

Underlying assumptions rational model

- Decision makers have all the information they need
- Decision makers can make the best decision
- Decision makers agree about what needs to be done

Criticisms rational model

- Information and uncertainty: the assumption that managers are aware of *all* alternative courses of action and their consequences is unrealistic
- Managerial abilities: managers have only a limited ability to process the information required to make decisions
- Preferences and values: assumes managers agree about what are the most important goals for the organization

A new set of assumptions

- Satisficing: limited information searches to identify problems and alternative solutions
- Bounded rationality: a limited capacity to process information
- Organizational coalitions: solution chosen is a result of compromise, bargaining, and accommodation between coalitions

Innovation strategies

Offensive

The few firms which follow an *offensive* strategy attempt to make radical innovations, sometimes but not always based on fundamental research.

Innovation strategies

Defensive

A larger number of firms follow *defensive* strategies, responding fairly quickly to the innovative efforts of others with new products and processes of their own.

Innovation strategies

Imitative

Much larger numbers of firms follow a simpler *imitative* strategy, sometimes on the basis of licensing, franchising or subcontracting from more innovative firms.

Competitive strategies

Strategies to gain access to resources and enhance chances of survival:

- *Specialists*: organizations that concentrate their skills to pursue a narrow range of resources in a single niche
- *Generalists*: organizations that spread their skills thin to compete for a broad range of resources in many niches

Competitive strategies

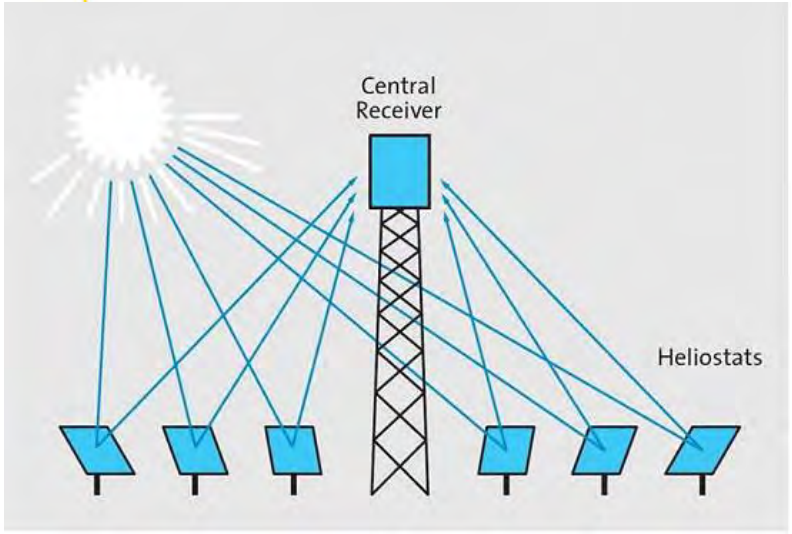
Focus on cost or quality of product?

Competitive strategies

Competitive Scope	Competitive Advantage: lower cost	Competitive Advantage: uniqueness
broad	Cost leadership (Korean firms) Wide range & low price	Differentiation (Japanese firms) Wide range & premium price
narrow	Cost Focus (Chinese firms) Simple, standard & Lowest price	Focused Differentiation (Scandinavian firms) Specialised & Premium price

Solar energy

- PV (or solar cells)
- Solar thermal heat
- Concentrated solar power (CSP)



Different types of PV cells

- Polycrystalline Silicon – typical blue panels, mass production, 14-20% efficiency
- Monocrystalline ~27%
- Multi-junction, better performance than traditional silicon solar cells, 33-42%
- Thin films – very expensive materials, higher efficiency up to 12-20%
- Organic cells - novel technology, cheap material and process, but only 8-11% efficiency

Innovation strategies of the firm…in sum

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