

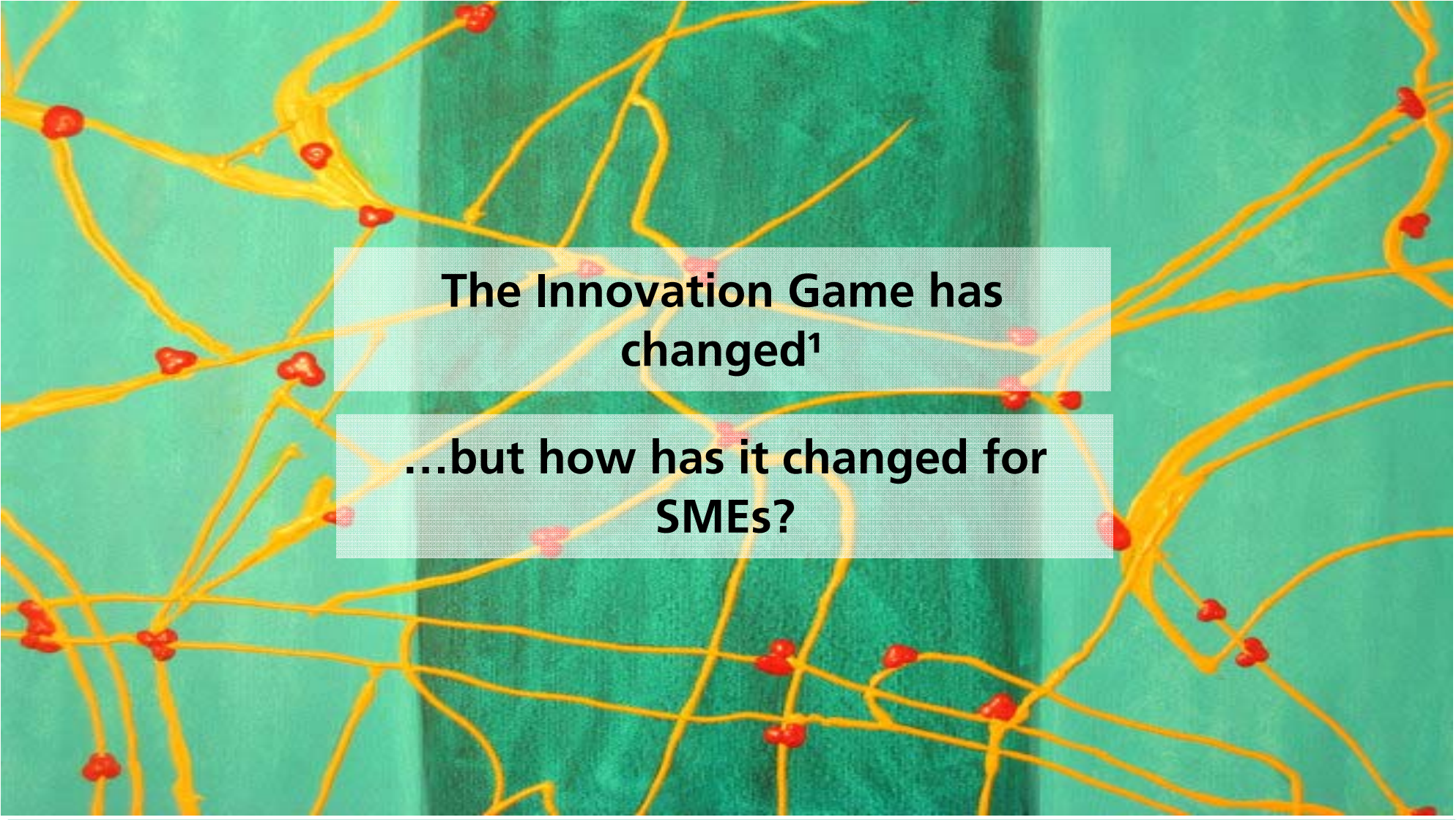


The networked SME – Taking a closer look into open and collaborative innovation in European SMEs

**Open Innovation Speakers Series –
Haas School of Business, UC Berkeley**

Sabine Brunswicker, Fraunhofer-Gesellschaft

October 19, 2009



**The Innovation Game has
changed¹**

**...but how has it changed for
SMEs?**

Source: 1) Chesbrough (2003)

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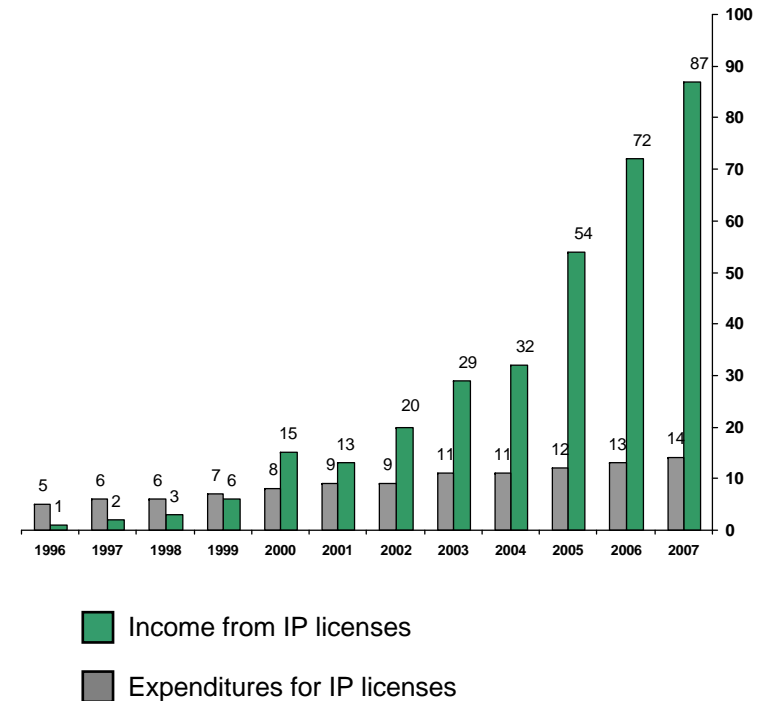
Fraunhofer-Gesellschaft – A brief introduction

Fraunhofer-Gesellschaft is one of the largest applied research organization in Europe



- Largest European applied research organization
- 13 000 Employees
- More than 80 research labs; 56 are independent profit centers
- Fraunhofer International (Europe, USA; Asia, Far East)
- Yearly research budget: € 1.32 Bil. (2007)
- € 1.16 Bil. contracted research (2007)
- Non-profit organisation

IP Licenses income and expenses of the Fraunhofer-Gesellschaft in Mio €

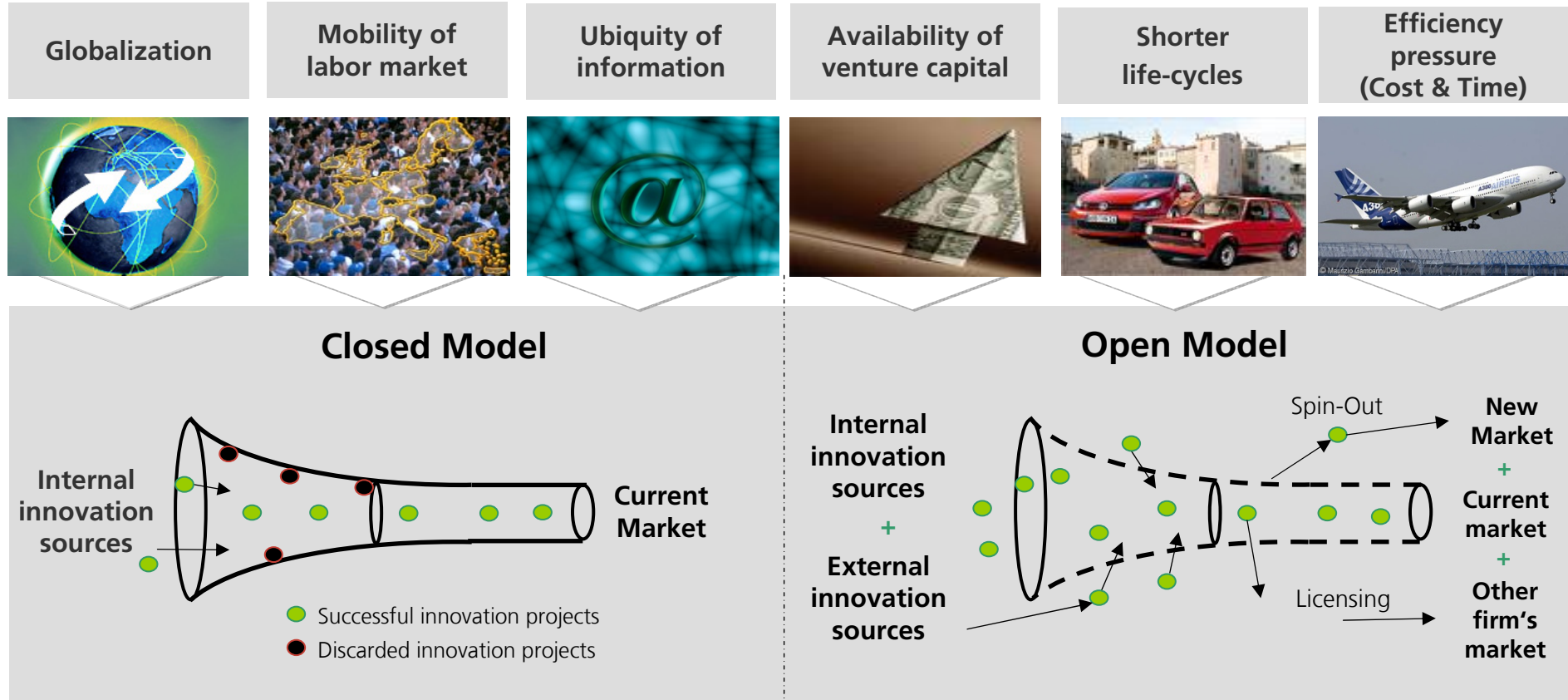


Topics of today's session

- Motivation - Open Innovation and SMEs
- Innovation and innovation management in European SMEs
- The impact of openness on innovation performance of European SMEs
 - Research questions and research framework
 - Data and methodology
 - Results and discussion
- Open innovation practices in SMEs – Challenges and opportunities
 - Openness and commercialization
 - IP exploitation
 - SMEs and value networks: Managing open platforms and ecosystems

Motivation – Open innovation and SMEs

In the beginning, open innovation challenged the traditional R&D driven innovation model of large enterprises



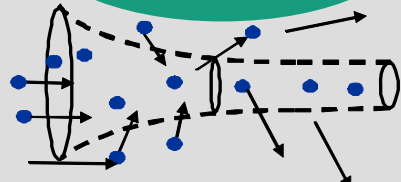
Open Innovation is not „Open Source“, Mass customization or Open Science

Source: Chesbrough (2003)

Motivation – Open innovation and SMEs

The discourse on openness and innovation hardly addresses SMEs and the relevance of systematic innovation management practices

Claim for benefits of openness and collaboration



- Prominent case examples
- First empirical proof of impact on performance

What is the impact of different types of openness and “interconnectedness” at various stages of the innovation value chain?

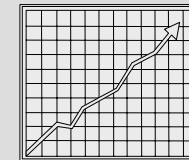
SMEs, networks and partnerships



- Networks and business relations are crucial for SME and firm growth
- Entrepreneurial firms rely on partnerships

How relevant are systematic open innovation practices in SME?

Systematic innovation management routines



- Large enterprises rely on systematic innovation management routines
- Systematic innovation management is also crucial for SMEs

What is the role of systematic innovation management to exploit openness?

Innovation and innovation management in European SMEs

Innovation and innovation management in European SME

There is no standard definition of a SME; “smallness” is a key characteristic

Europe

Definition of the European Commission

A standardized definition

- 1 **Micro enterprises**
< 10 employees
< € 2 million turnover per year
- 2 **Small enterprises**
< 50 employees
< € 10 million turnover per year
- 3 **Medium-sized enterprises**
< 250 employees
< € 50 million turnover per year

Adaption of classification in individual countries to cater for structural and sectoral differences

Definition of small and medium-sized enterprises

US

Small business administration (SBA)

Examples

- 1 **Manufacturing and mining**
< 500 employees
- 2 **Wholesales and trade**
< 100 employees
- 3 **Construction and mining**
< \$33.5 million of annual receipts

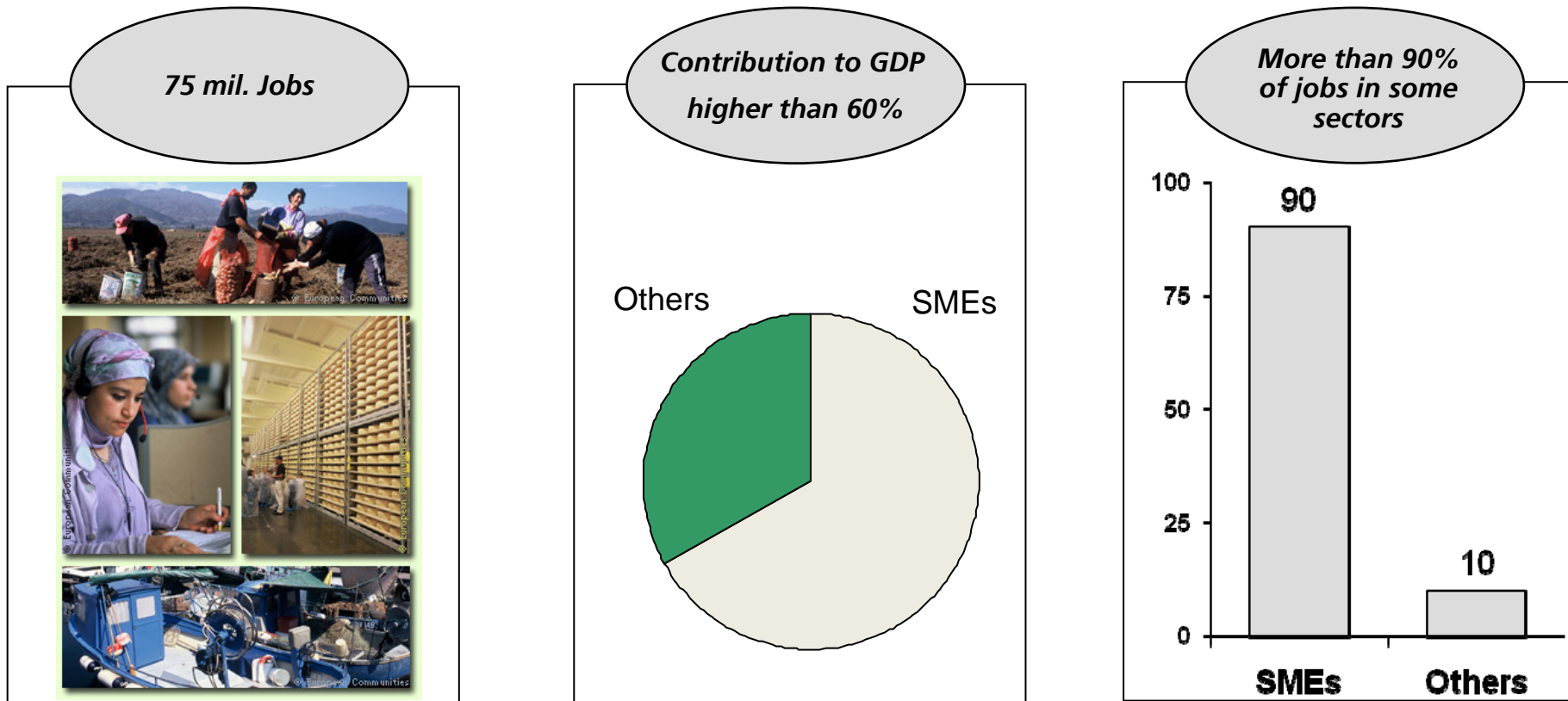
Size standards is adapted for each individual NAICs

Innovation and innovation management in European SMEs

SMEs are the backbone of Europe

Contribution of small and medium-sized enterprises (SMEs):

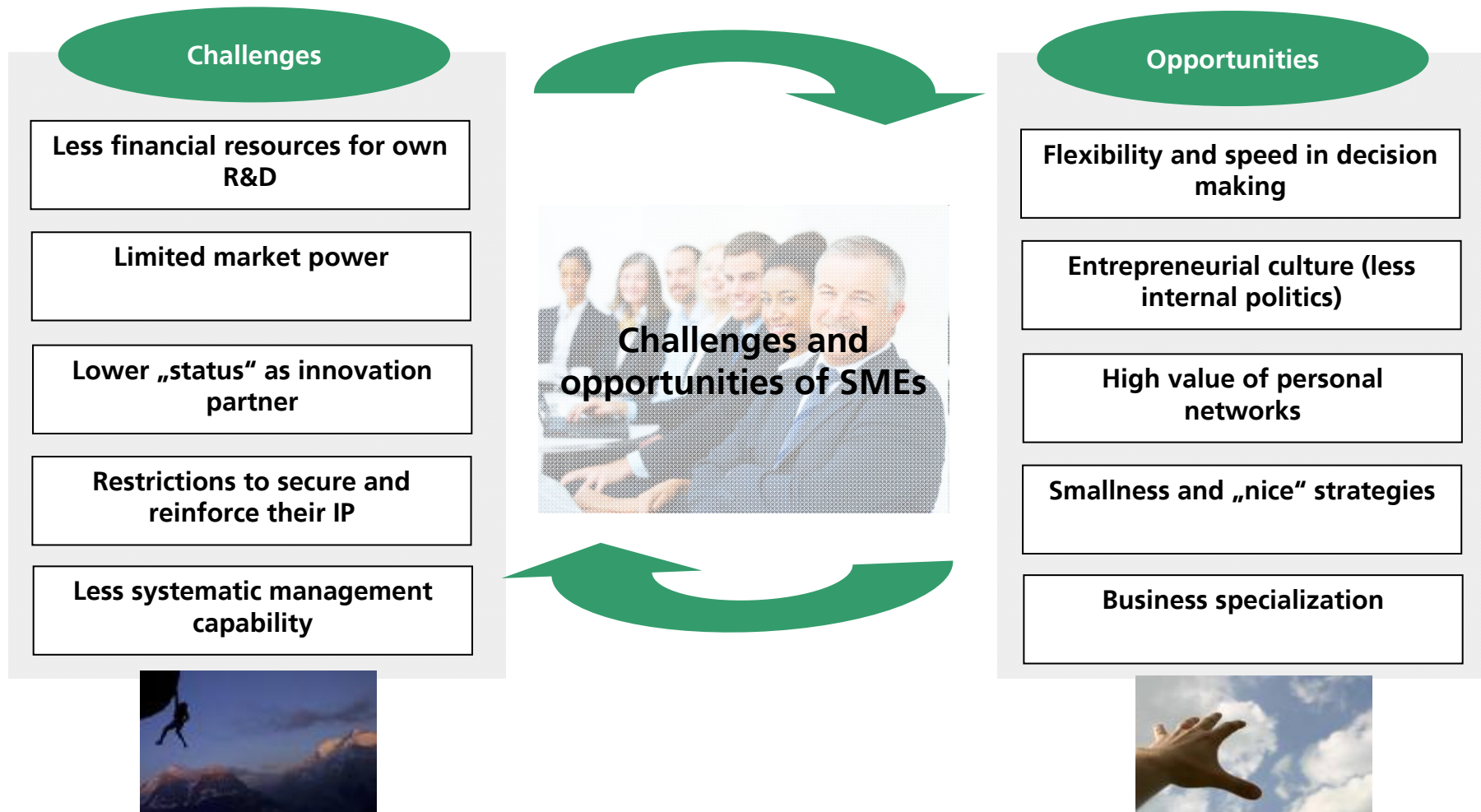
- Illustrative Europa -



Source: IMP³rove, 2007; www.improve-innovation.eu

Innovation and innovation management in European SMEs

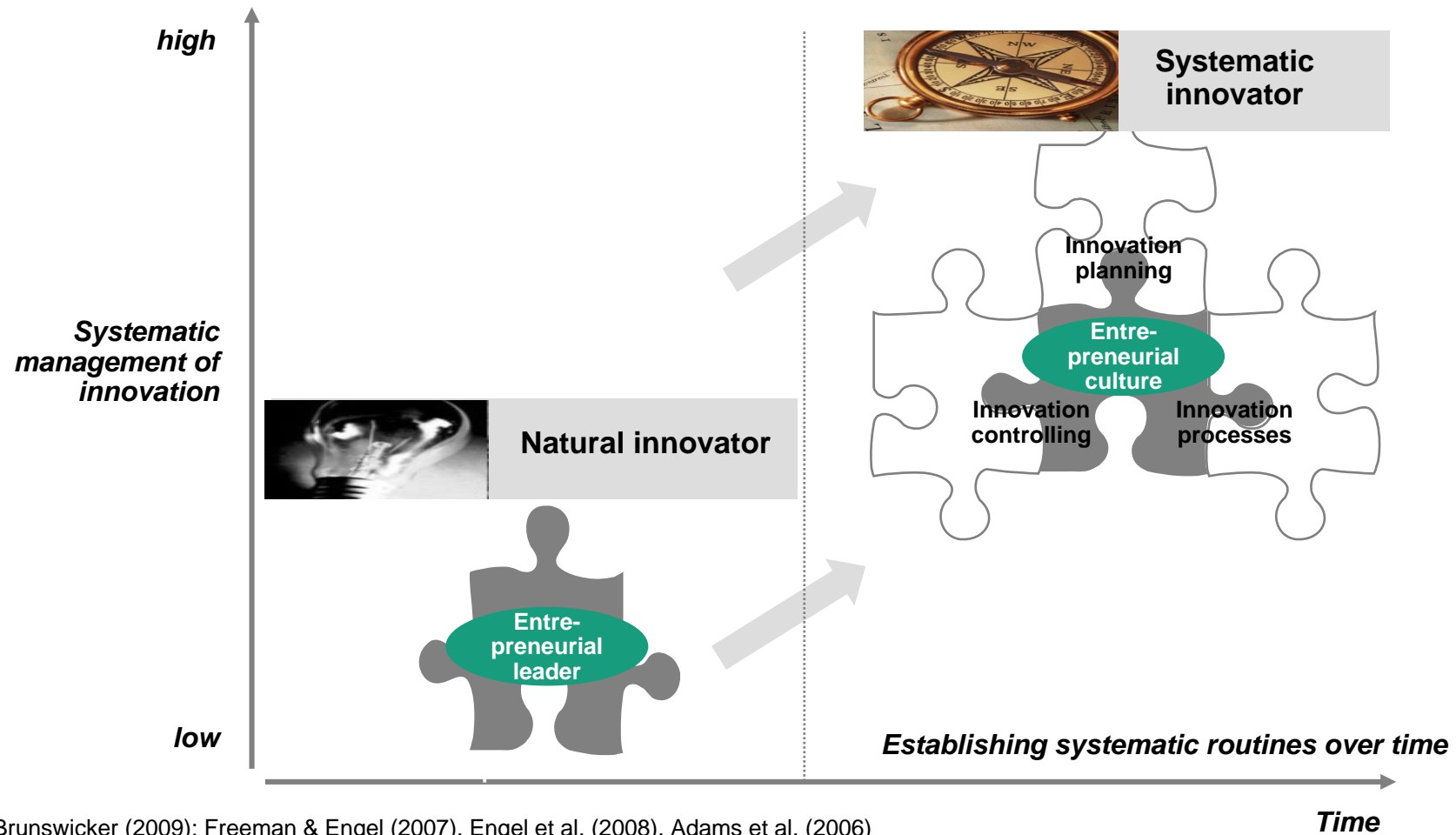
There are challenges and opportunities for SMEs with regards to innovation



Source: see also Van der Vrande, Vanhaverbeke (2009)

Innovation and innovation management in European SMEs

“Systematic innovation management” complements the discussion on entrepreneurial capabilities

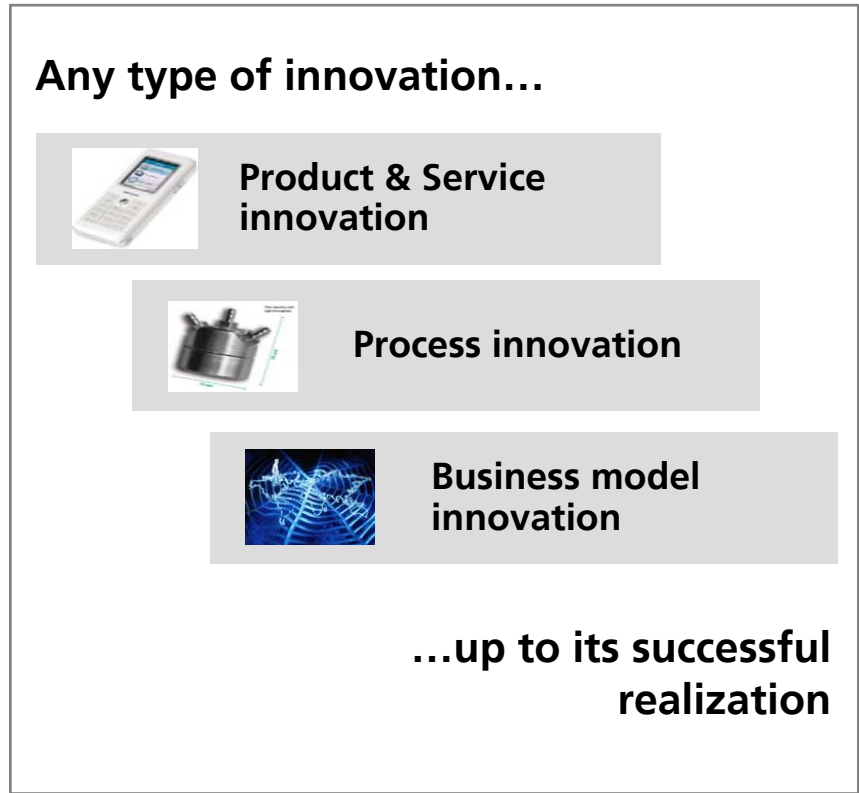


Source: Brunswicker (2009); Freeman & Engel (2007), Engel et al. (2008), Adams et al. (2006)

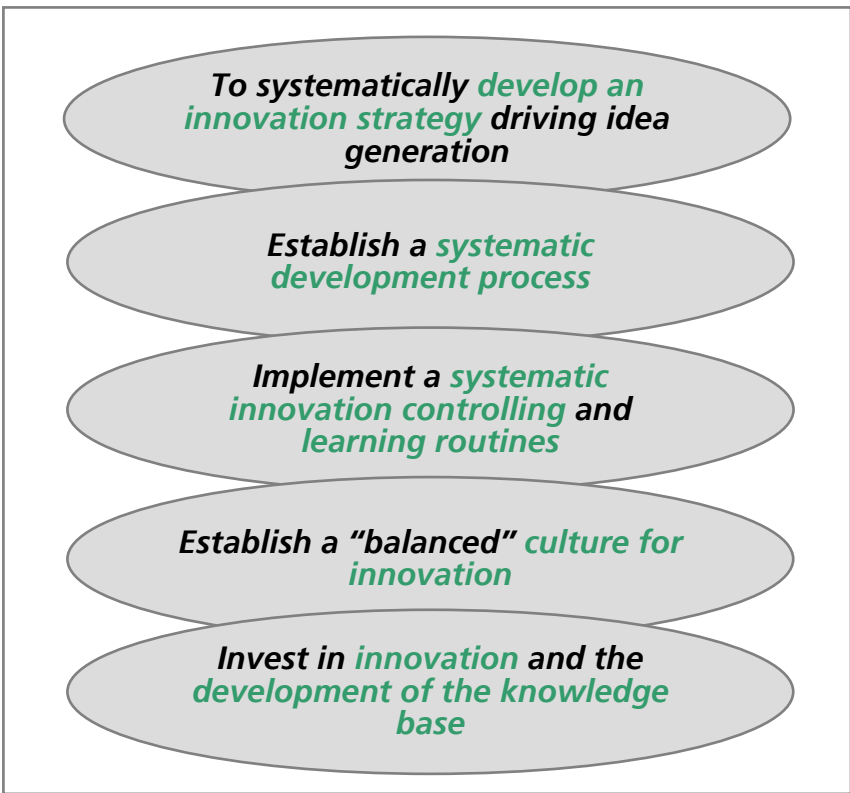
Innovation and innovation management in European SMEs

From a capability perspective, innovation management embodies formal and embedded routines and capabilities

An organizational wide capability to manage innovation



Formal and embedded innovation management capabilities and practices

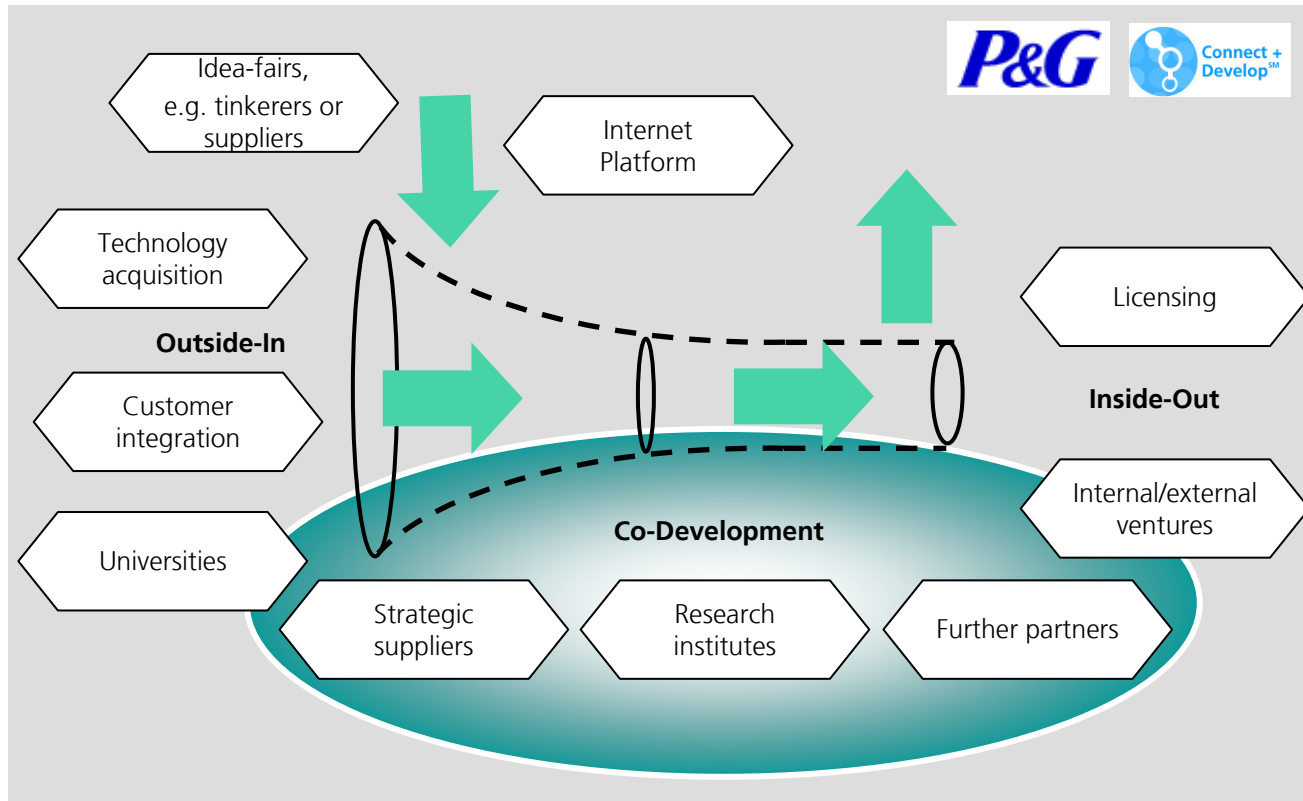


Source: Brunswicker (2009), Pavitt (2006), Teece (2006), Adams and Phelps (2006); Chiesa (1996)

The impact of openness on innovation performance of European SMEs

The impact of openness on innovation performance of European SMEs

Prominent case studies of large incumbents on „open innovation“ demonstrate the impact of the paradigm shift on innovation performance

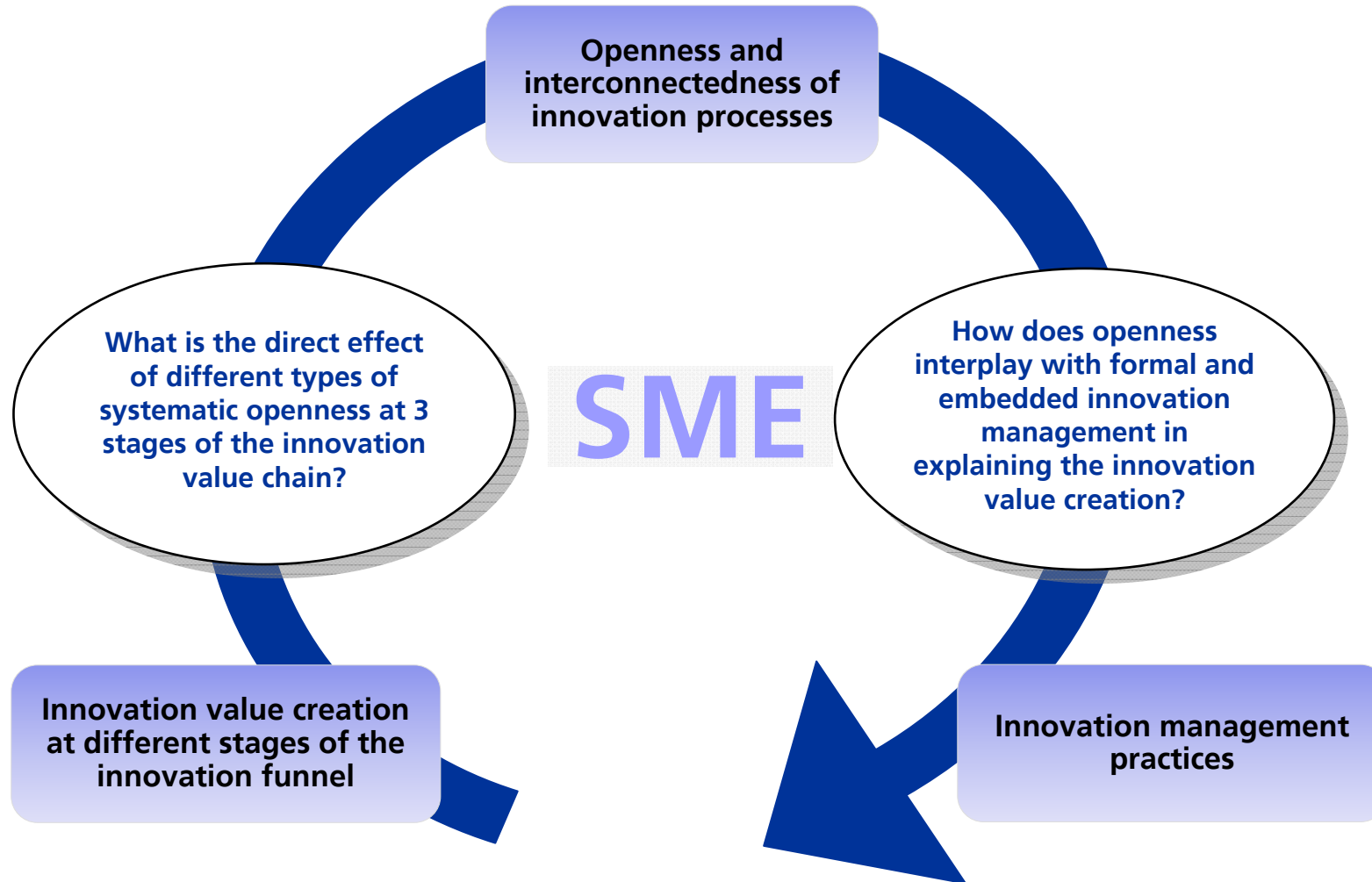


- **45 % of P&G's** product developments come from external sources
- **R&D productivity** has been improved by 60%
- P&G has doubled its R&D productivity, reduction of R&D investments from **5,8% to 3,4% of revenues**
- In 2 years P&G has marketed more than **100 new products**

Source: Enkel, Gassmann (2009)

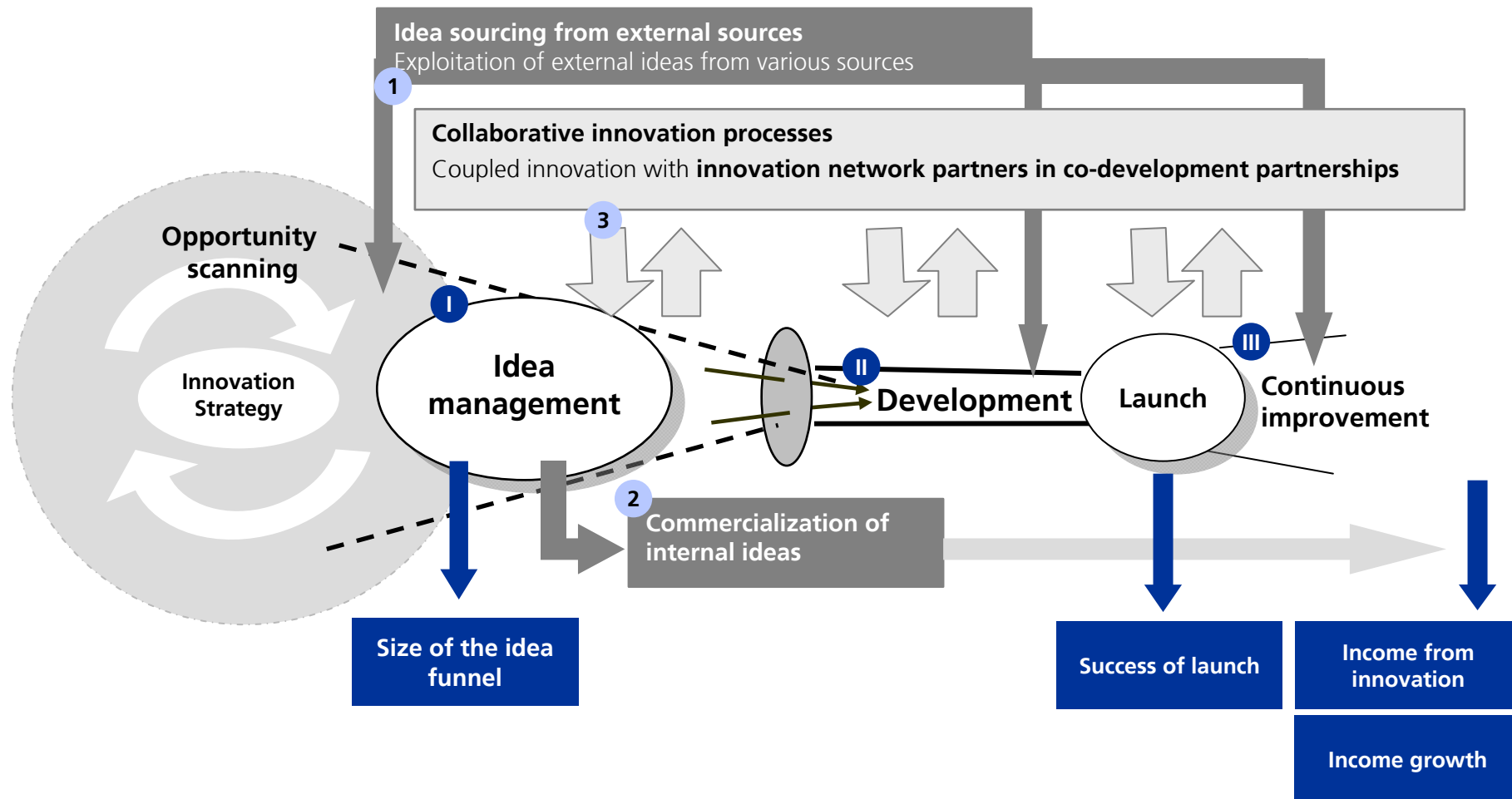
The impact of openness on innovation performance of European SMEs

The aim of the research is to investigate the interplay between openness, innovation management practices and performance



The impact of openness on innovation performance of European SMEs

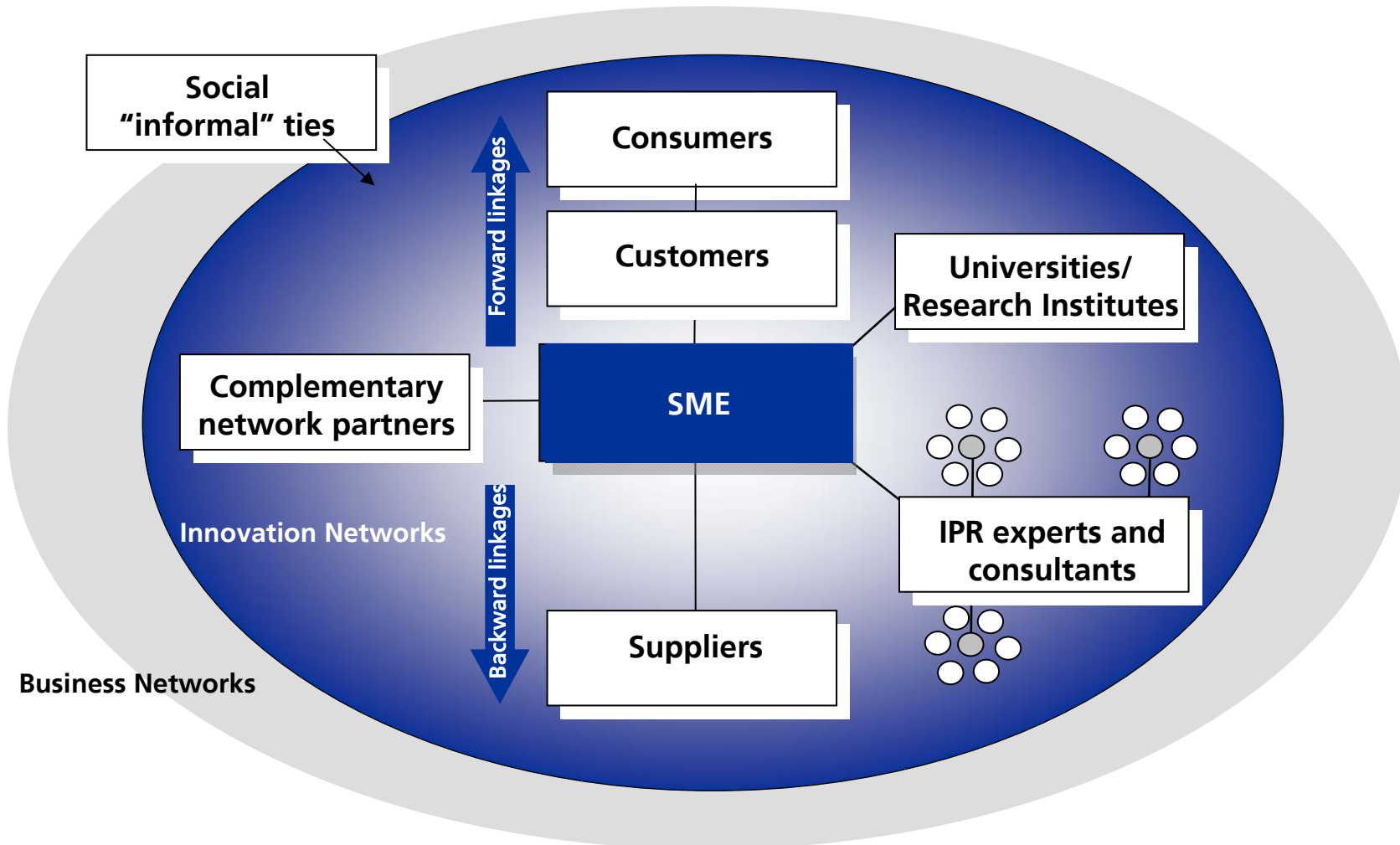
I am interested in the impact of external idea sourcing and collaborative innovation on innovation performance of SMEs



Source: Brunswicker et al. (2009); Gassmann and Enkel (2004), Roper et al. (2008), Nelson et al. (1982), Hansen & Birkeinshaw (2007)

The impact of openness on innovation performance of European SMEs

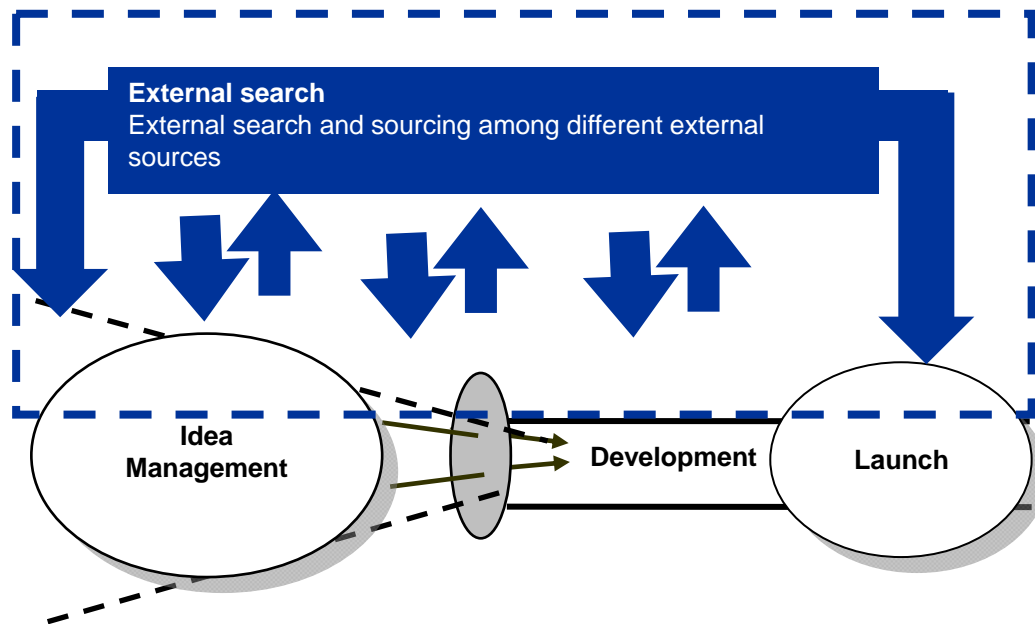
Linkages can be established with different actors in the innovation network



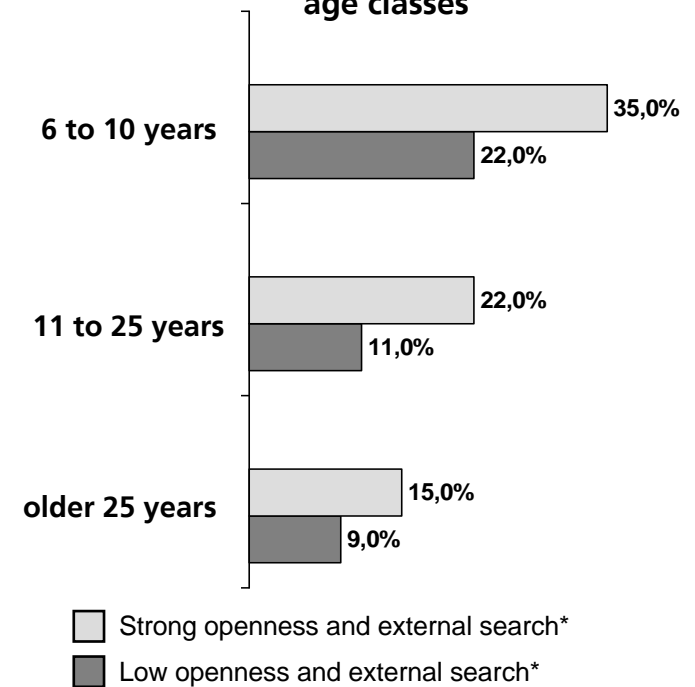
Source: See also Laurson and Salter (2006), Gassmann (2006), Vanhaverbeeke (2006), Brown and Hagel (2006), Cohen and Levinthal (1990)

The impact of openness on innovation performance of European SMEs

SMEs with a high search breadth and depth show a higher innovation performance



Income of new product/ services not older than 3 years (as % of total revenue; median) across different age classes

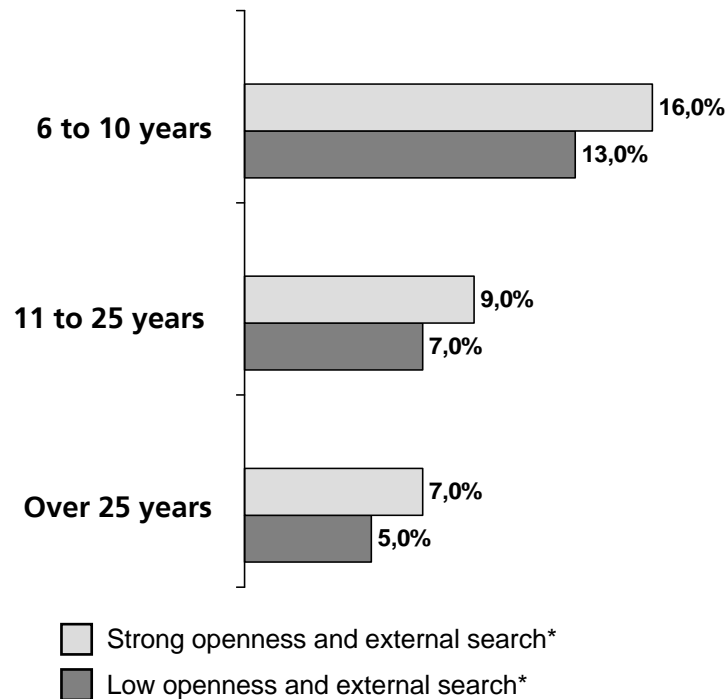


*Sourcing of external ideas outside of the firm's boundaries among customers, consumers, suppliers, universities, network partners and IPR experts: Average > 4 on a Likert Scale 1 to 7.

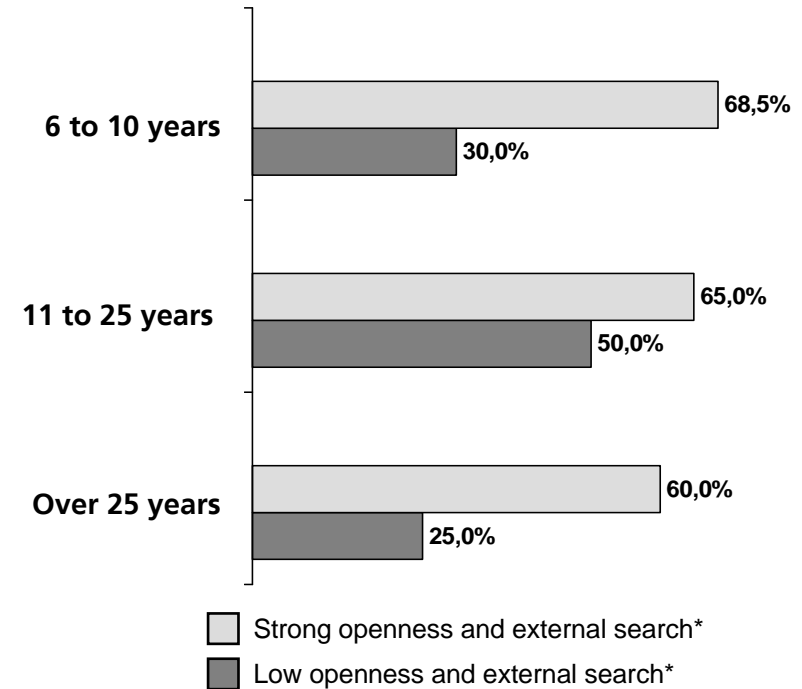
Source: IMP³rove, July 2009; www.improve-innovation.eu

The impact of openness on innovation performance of European SMEs ...and also a higher income growth and higher success of launch

Income growth – Comparison of different age classes (Average growth rates; Average of the last 4 years)



Success of launch – Comparison of different age classes (Percentage of projects, where targets were achieved; median)

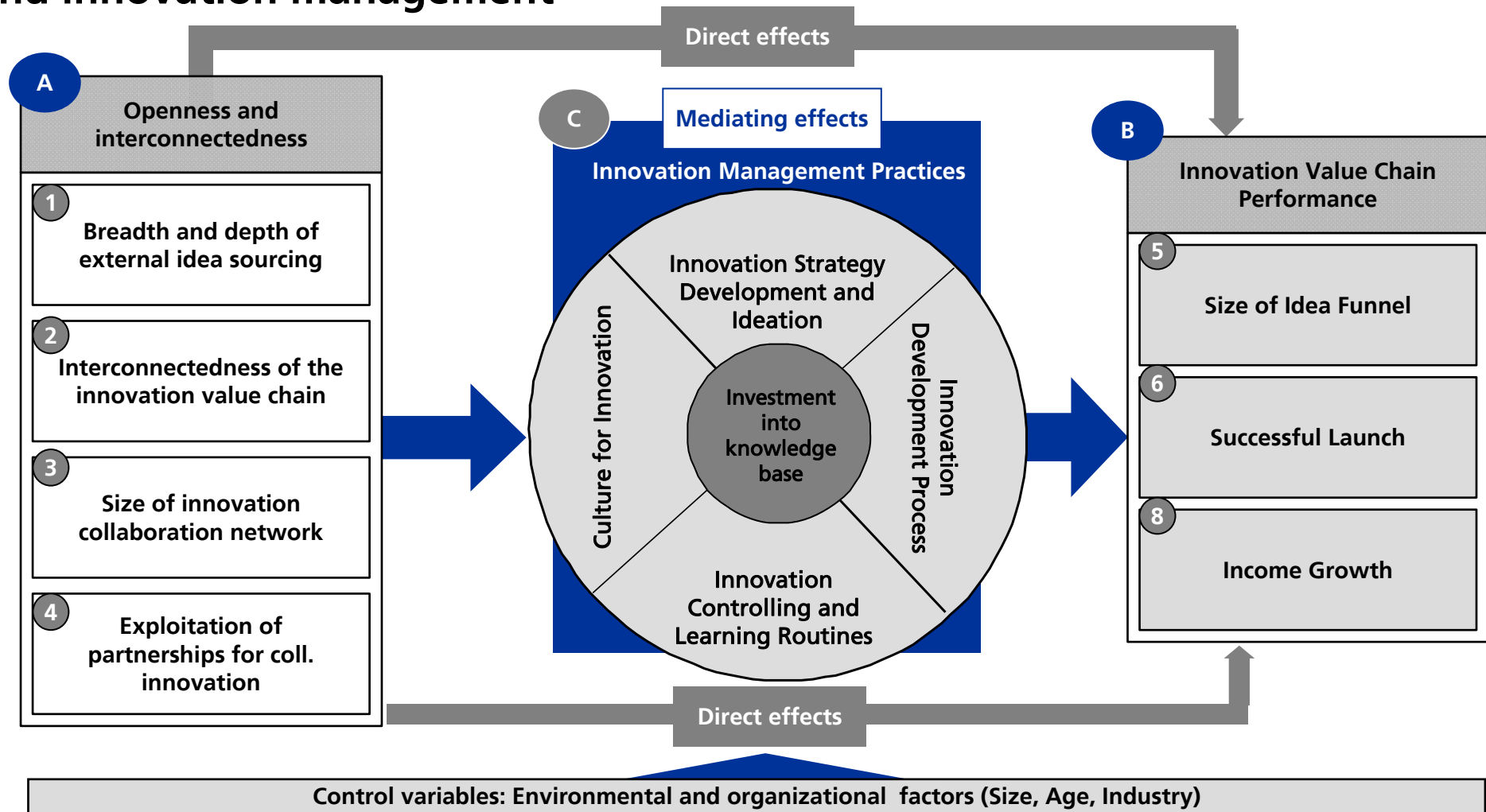


*Sourcing of external ideas outside of the firm's boundaries among customers, consumers, suppliers, universities, network partners and IPR experts: Average > 4 on a Likert Scale 1 to 7.

Source: IMP³rove, July 2009; www.improve-innovation.eu

The impact of openness on innovation performance of European SMEs

My empirical research investigates the interplay of openness, performance and innovation management

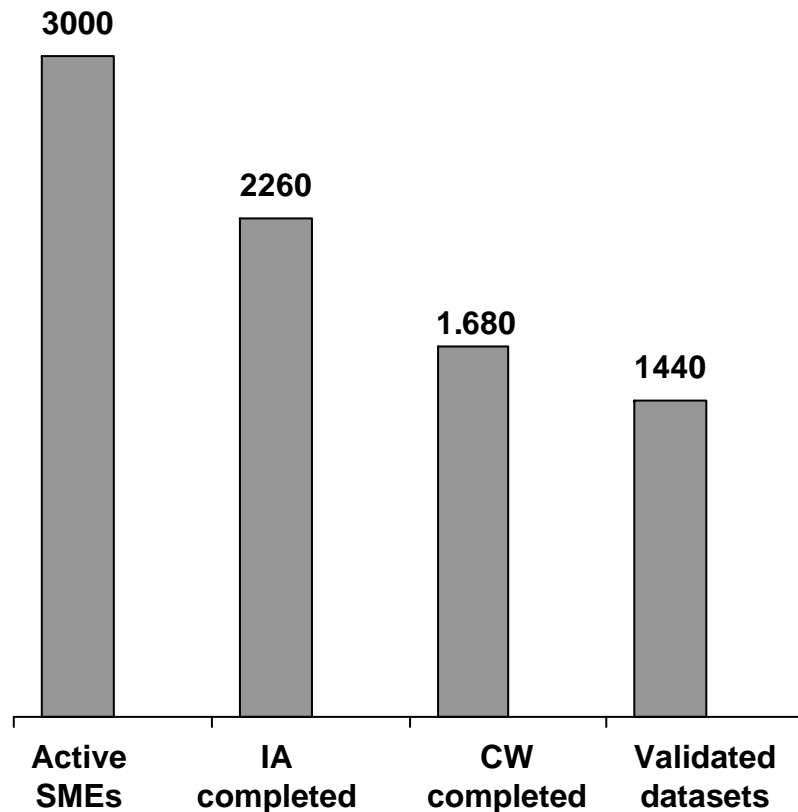


Source: Brunswicker et al. (2009)

The impact of openness on innovation performance of European SMEs

1440 firm-level data of one benchmarking database provides the basis for the empirical research; it was collected between May 2007 and February 2009

Sample size



Data collection in context of the European benchmarking project IMP³rove



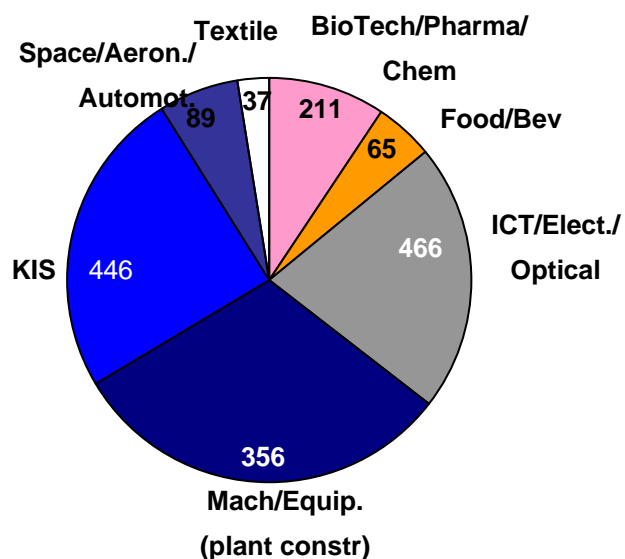
SME = Small and medium sized enterprise; IA = IMP³rove Assessment; CW' = Consulting workshop
 Source: IMP³rove Core Team, 2009

The impact of openness on innovation performance of European SMEs

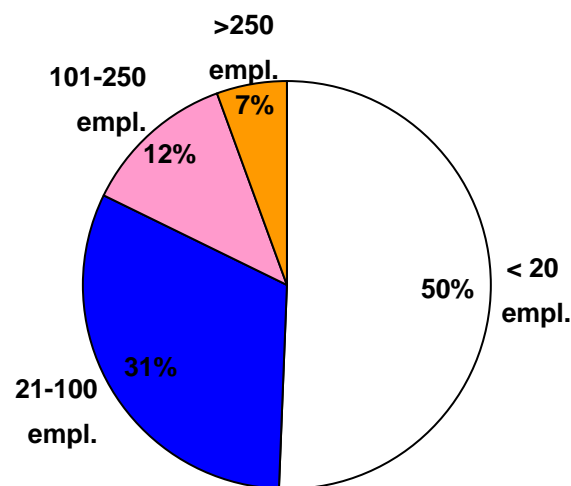
The sample covers SME from European countries from 7 major industry groups

Distribution of data by sector, size and age

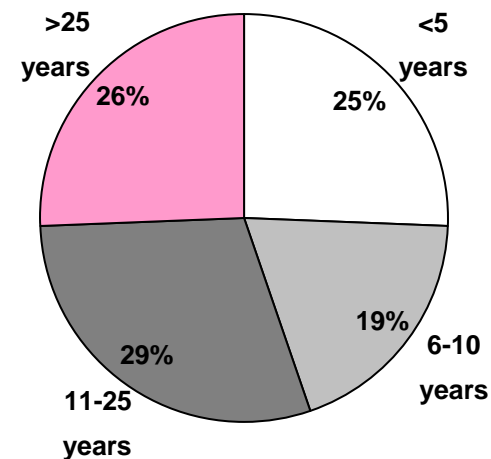
Distribution by sector



Distribution by size class in percentage



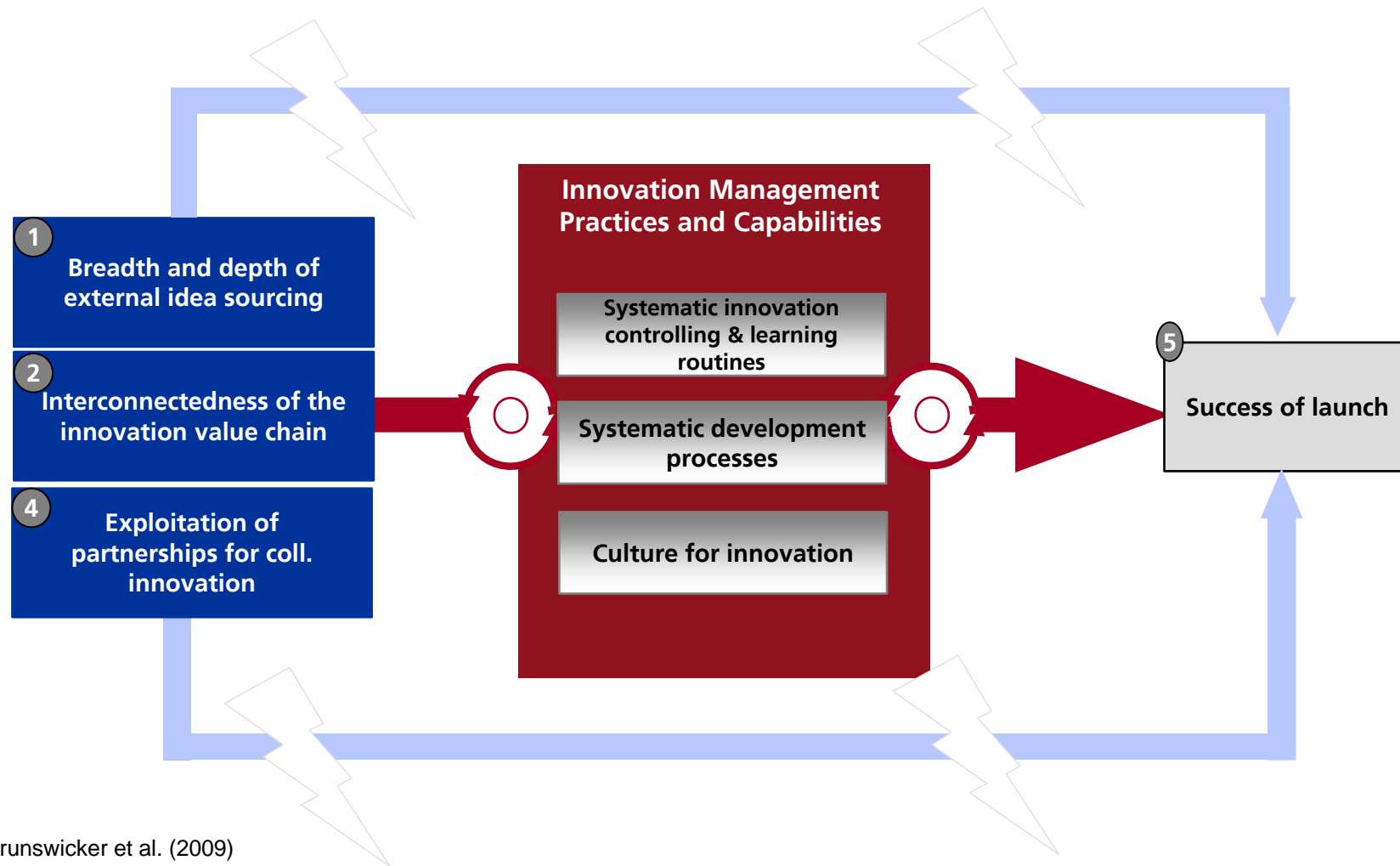
Distribution by age class in percentage



Source: IMP³rove, 2009 Figures as of February 2009 KIS = Knowledge Intensive Services; www.improve-innovation.eu

The impact of openness on innovation performance of European SMEs

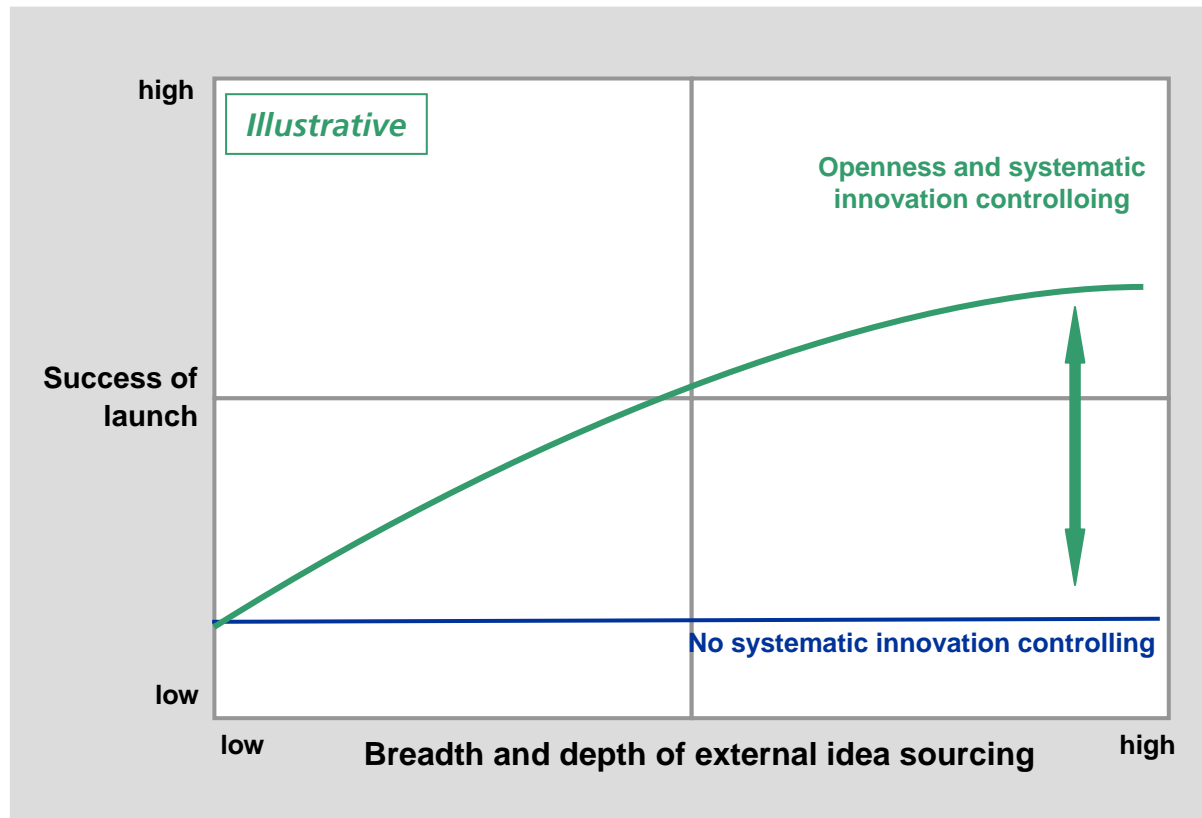
Indeed, systematic innovation controlling and learning routines seem to be the most important pre-requisite to leverage openness for successful launch



Source: Brunswicker et al. (2009)

The impact of openness on innovation performance of European SMEs

Internal structures and processes need to be established first



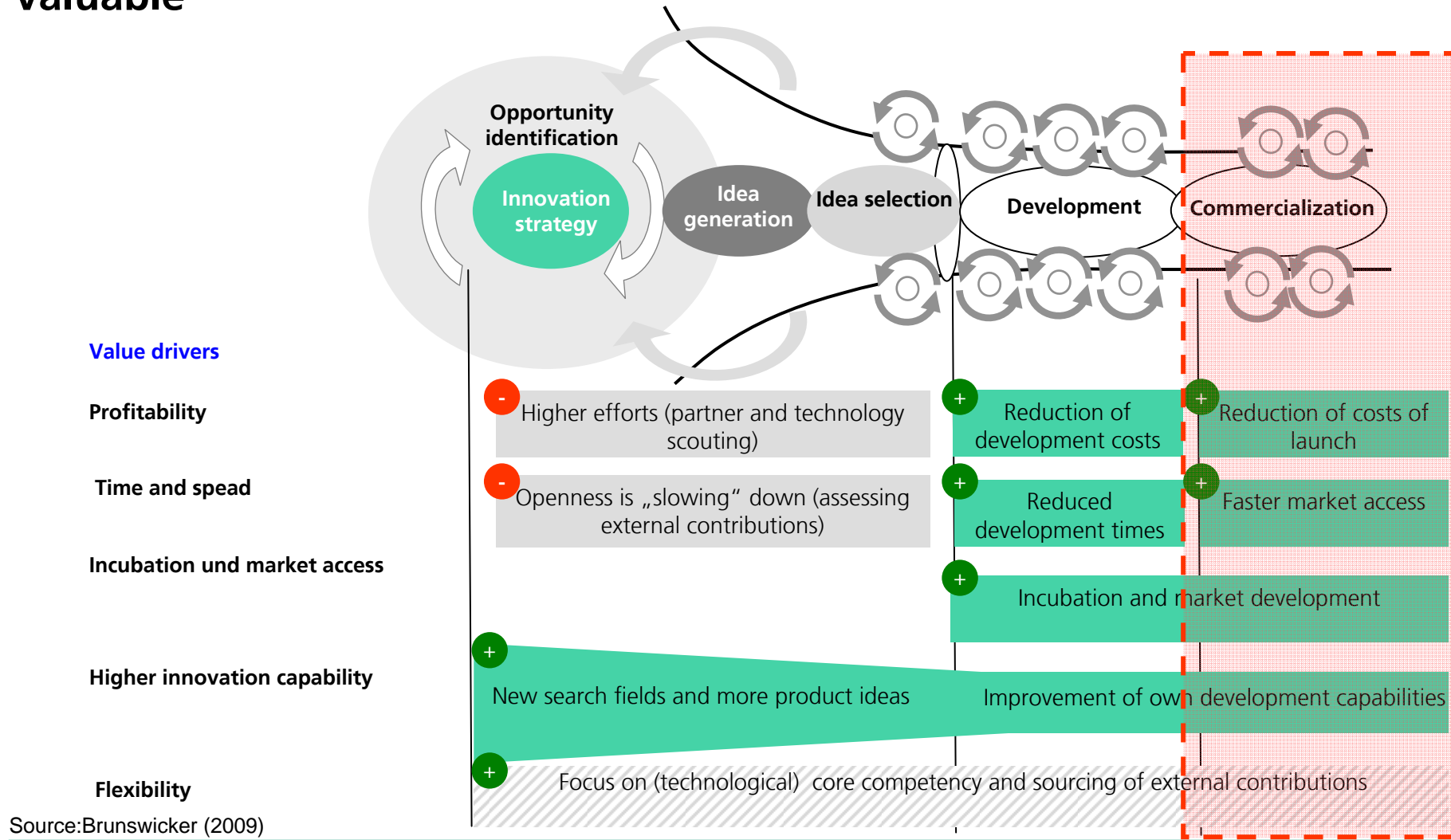
„Open innovation“ processes need to be systematically aligned with internal structures and processes

Source: Brunswicker et al. (2009)

Open innovation practices in SMEs – Challenges and opportunities

Open innovation practices in SMEs – Challenges and opportunities

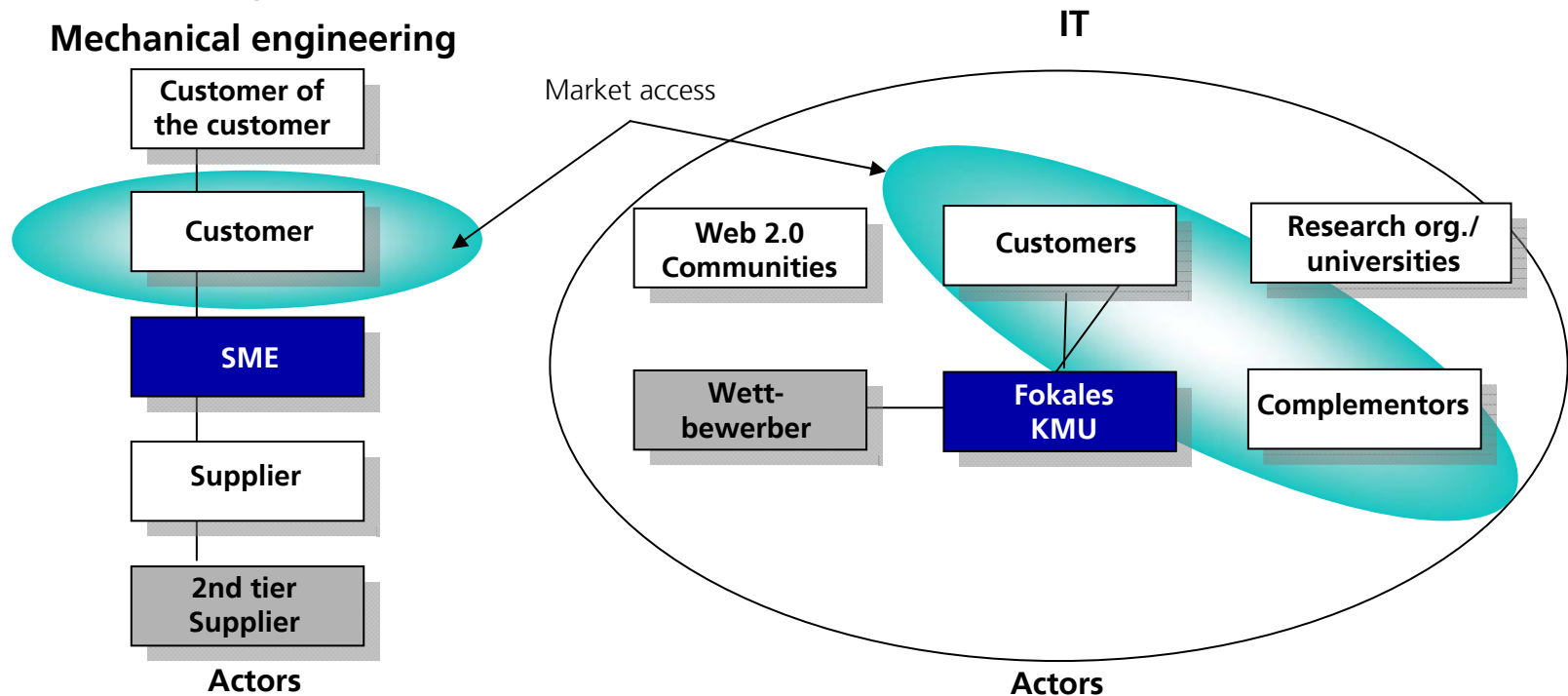
Innovative SMEs consider openness in the exploitation phase extremely valuable



Source: Brunswicker (2009)

Open innovation practices in SMEs – Challenges and opportunities

SMEs from traditional industries (e.g. mechanical engineering) don't see the value of complementary partners

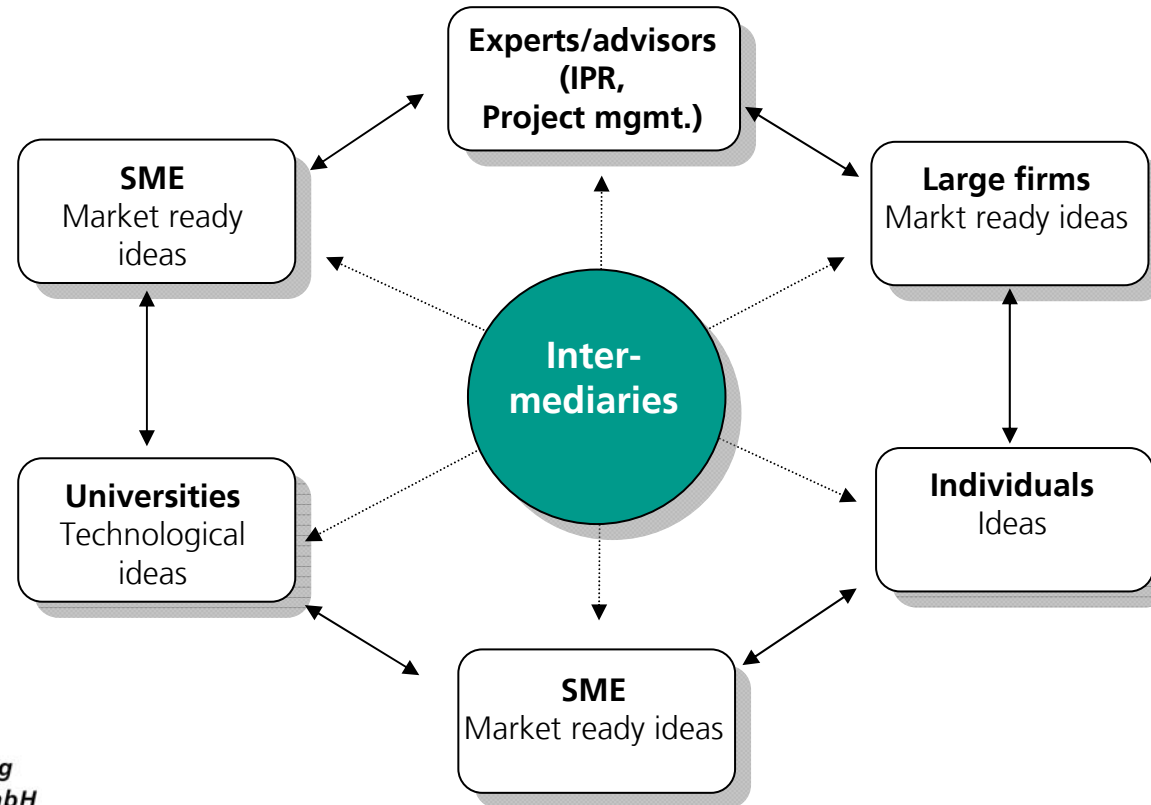


High importance	Customers, Suppliers, Consumers	Customers, Complementors, Universities, Communities (social networks)
Medium importance	2nd tier suppliers	Competitors
No importance	Complementors, competitors, Intermediaries	Intermediaries, Suppliers, Customers of the customers, 2nd tier supplier

Source: Brunswicker and Ehrenmann (2009)

Open innovation practices in SMEs – Challenges and opportunities

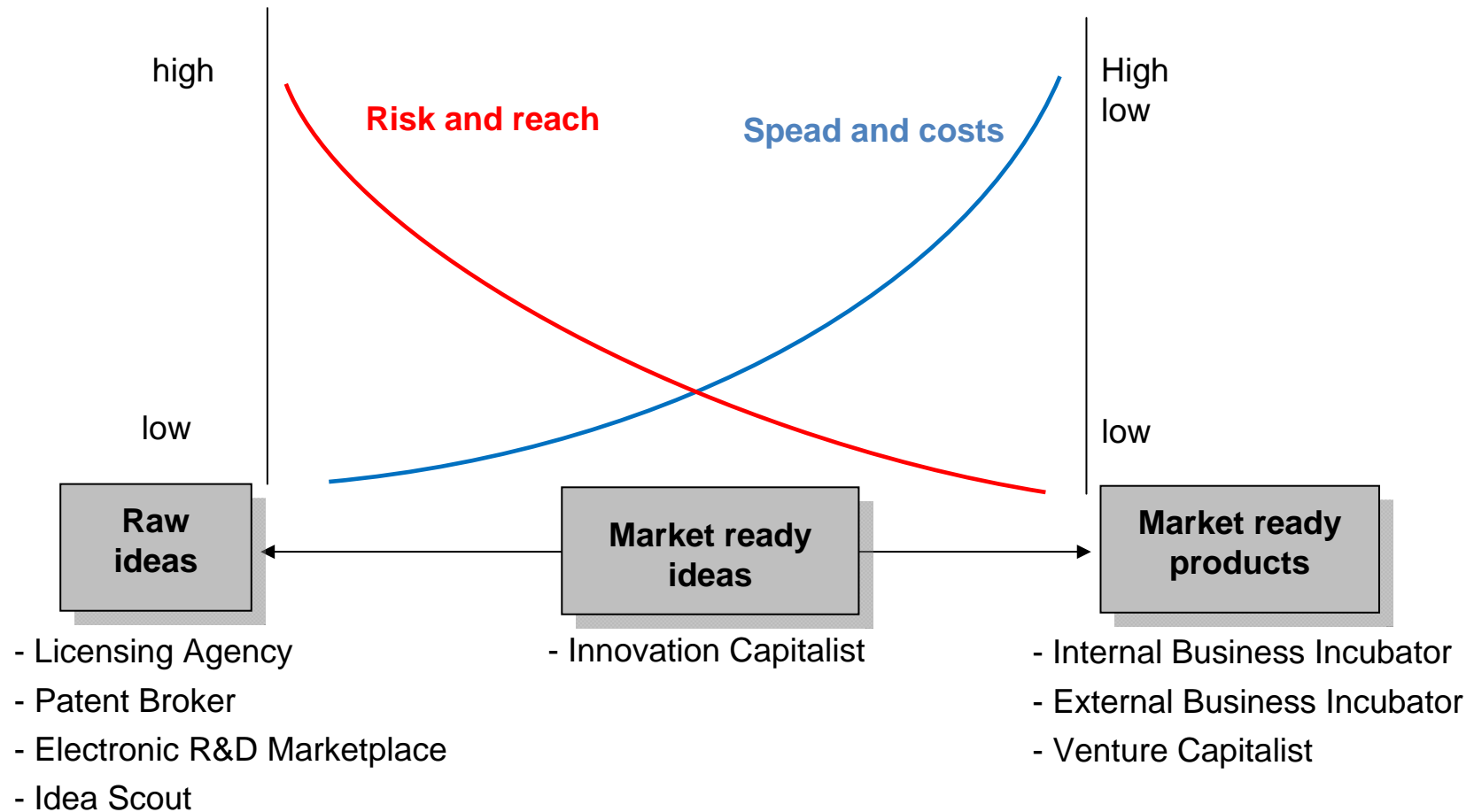
New types of intermediaries are currently emerging



SME = Small and Medium Sized Enterprise

Open innovation practices in SMEs – Challenges and opportunities

Indeed, intermediaries offer SMEs new opportunities both for idea sourcing and idea exploitation

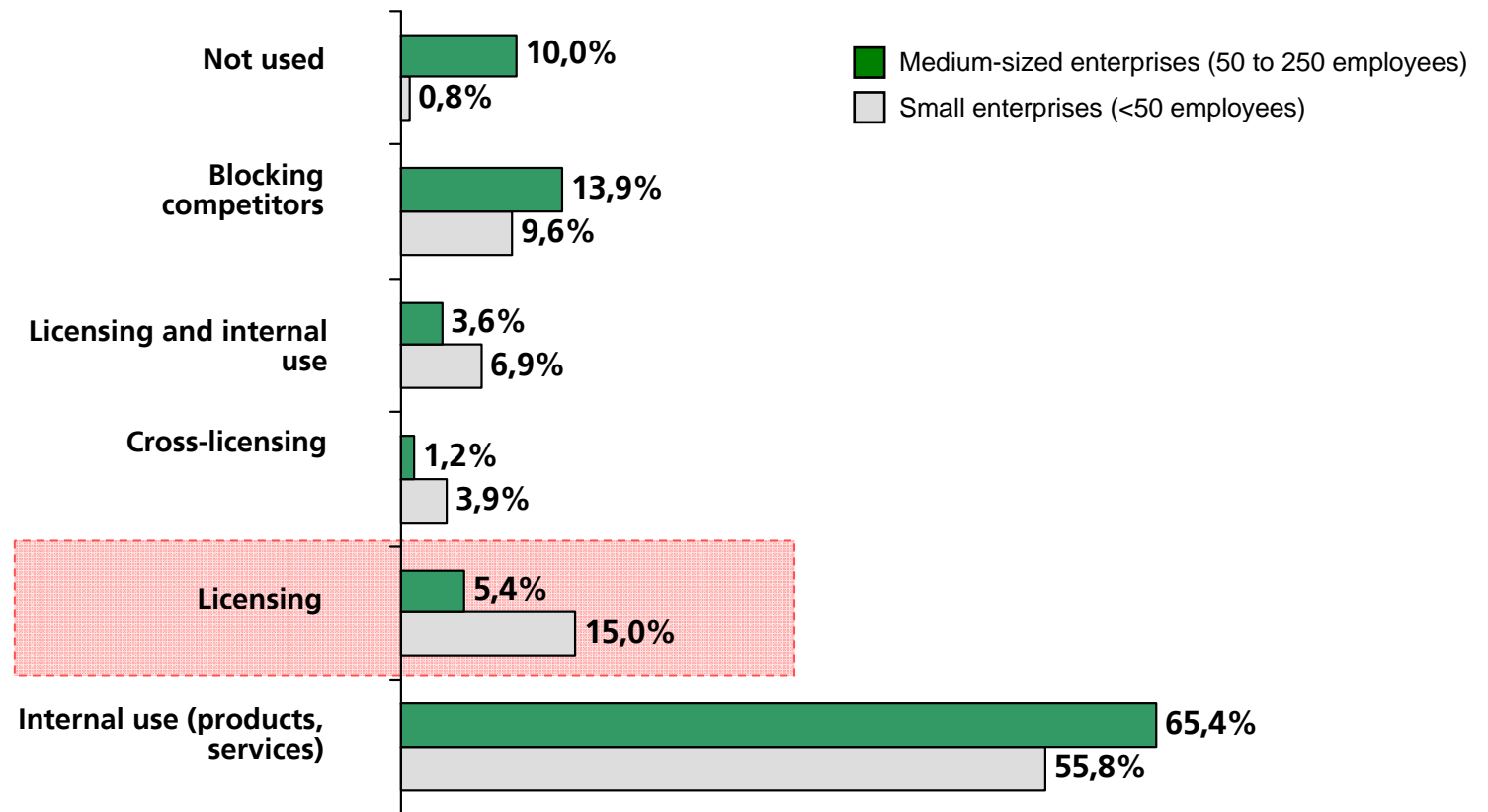


Source: Nambisan and Sawhney (2006)

Open innovation practices in SMEs – Challenges and opportunities

In Europe SMEs are hardly utilizing IP outward licensing to exploit their technological knowledge

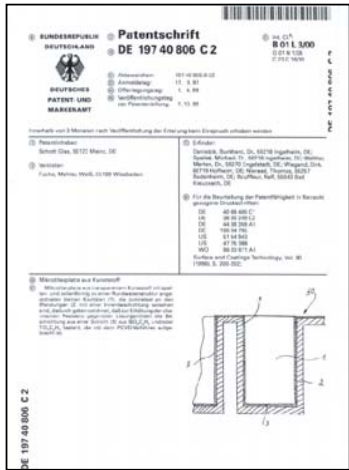
Distribution of different exploitation types of patents among European SMEs (N=7556)



Source: ProInno Report; 2007 – Removing Barriers for a better use of IPRs by SMEs

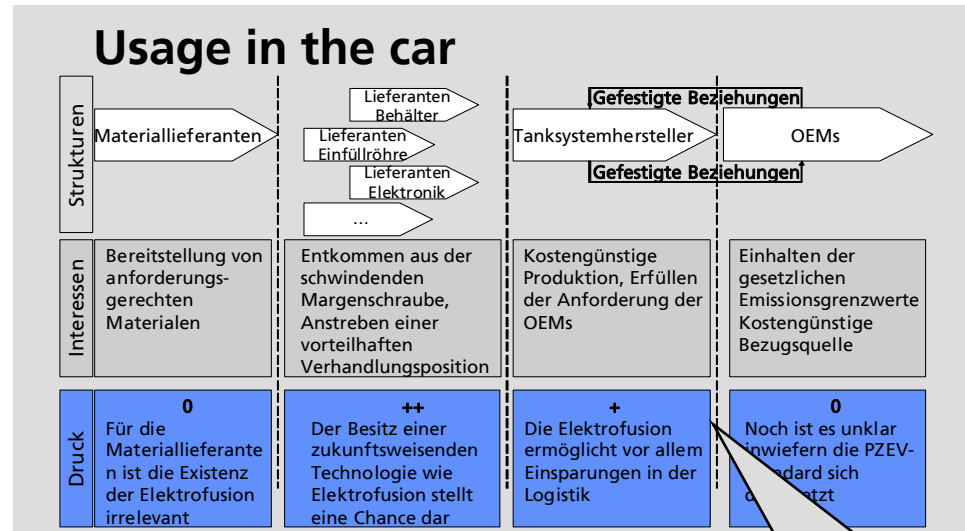
Open innovation practices in SMEs – Challenges and opportunities

There is a large potential for SMEs to exploit their IP; however, they lack the capability to investigate alternative application areas



Alternative exploitation of the technology

Usage of substituting technologies



Ship building



Construction

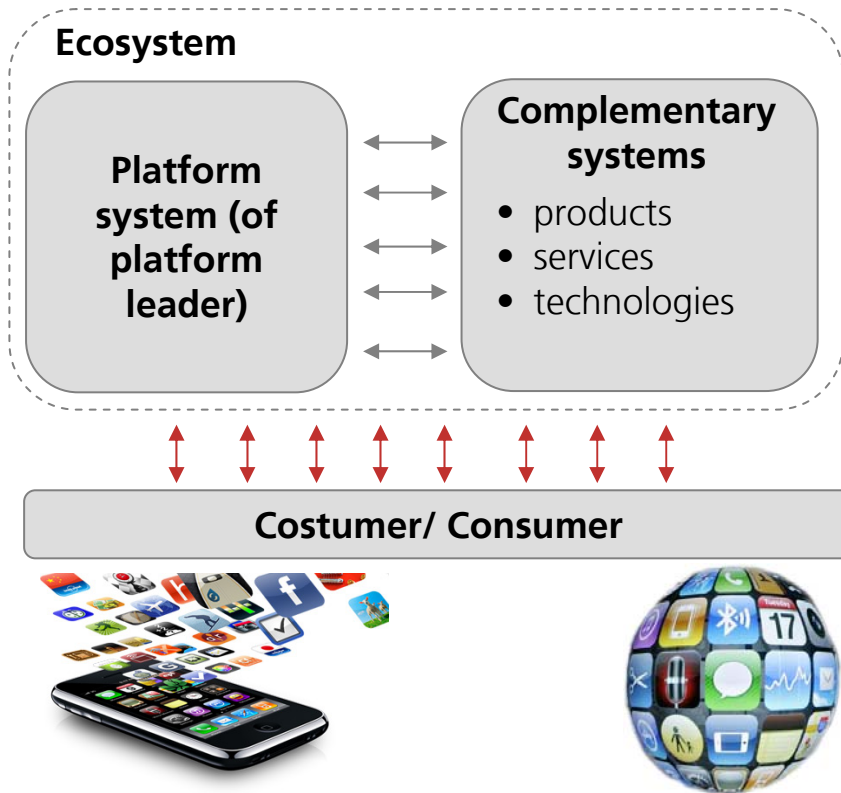


Analysis of value creation processes to identify new potential licensees

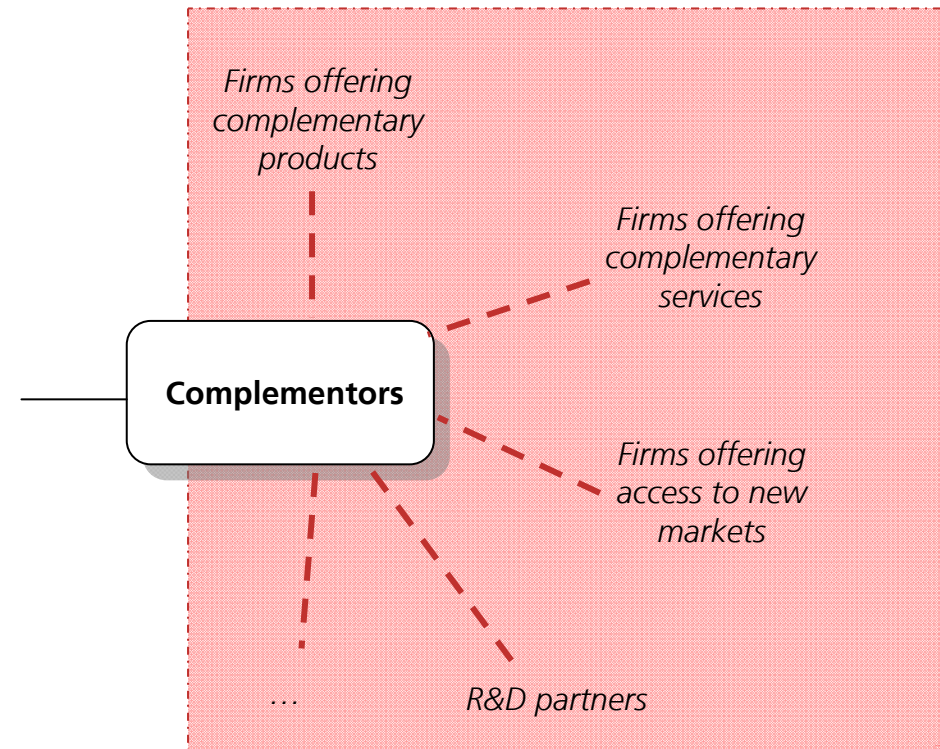
Open innovation practices in SMEs – Challenges and opportunities

Prominent examples of large firms depict the relevance of innovation networks, eco-systems and “open” platforms

Functional perspective



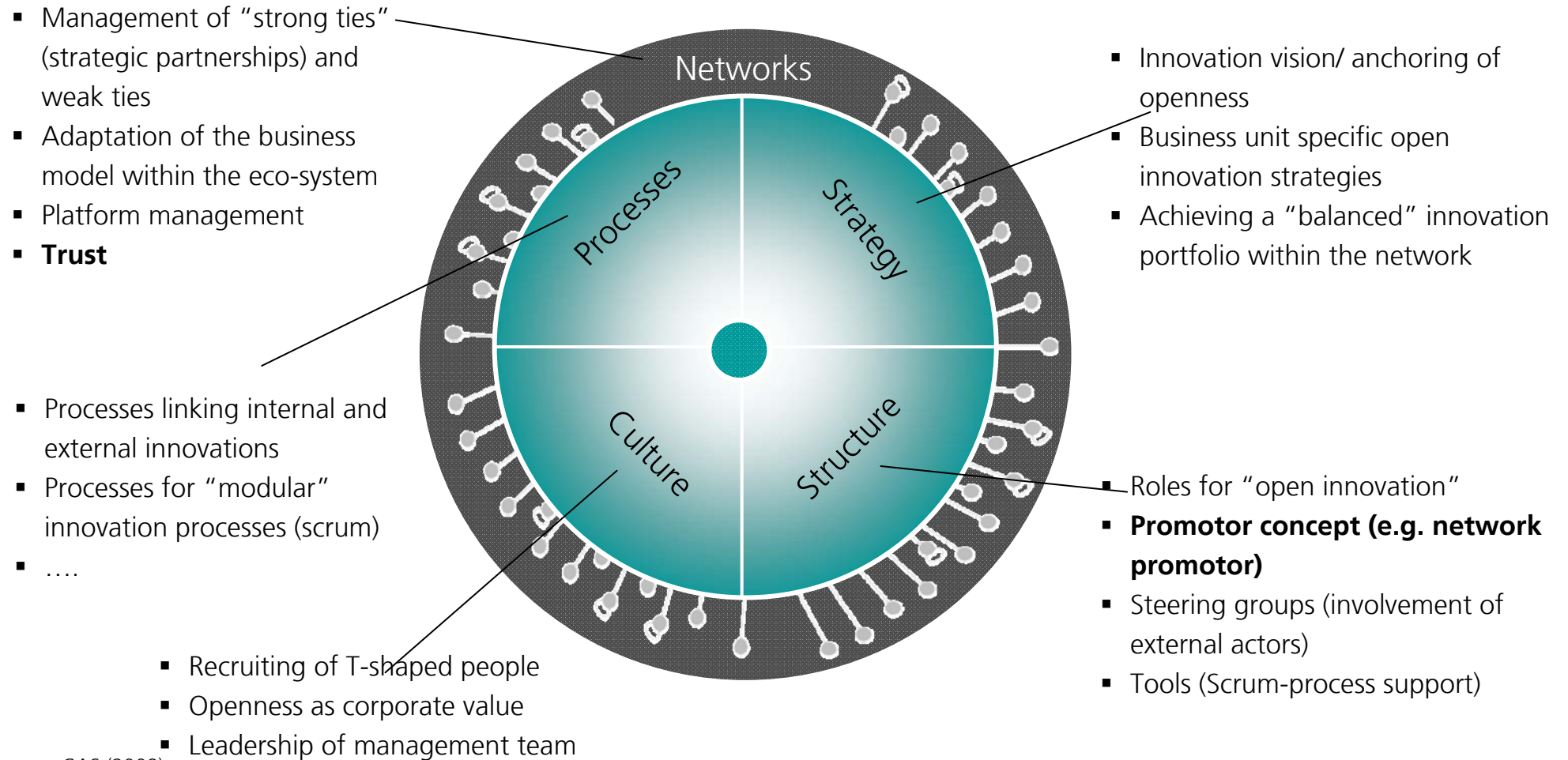
Value network perspective



Sources: Gawer and Cusumano 2000, Gawer and Henderson 2000

Open innovation practices in SMEs – Challenges and opportunities

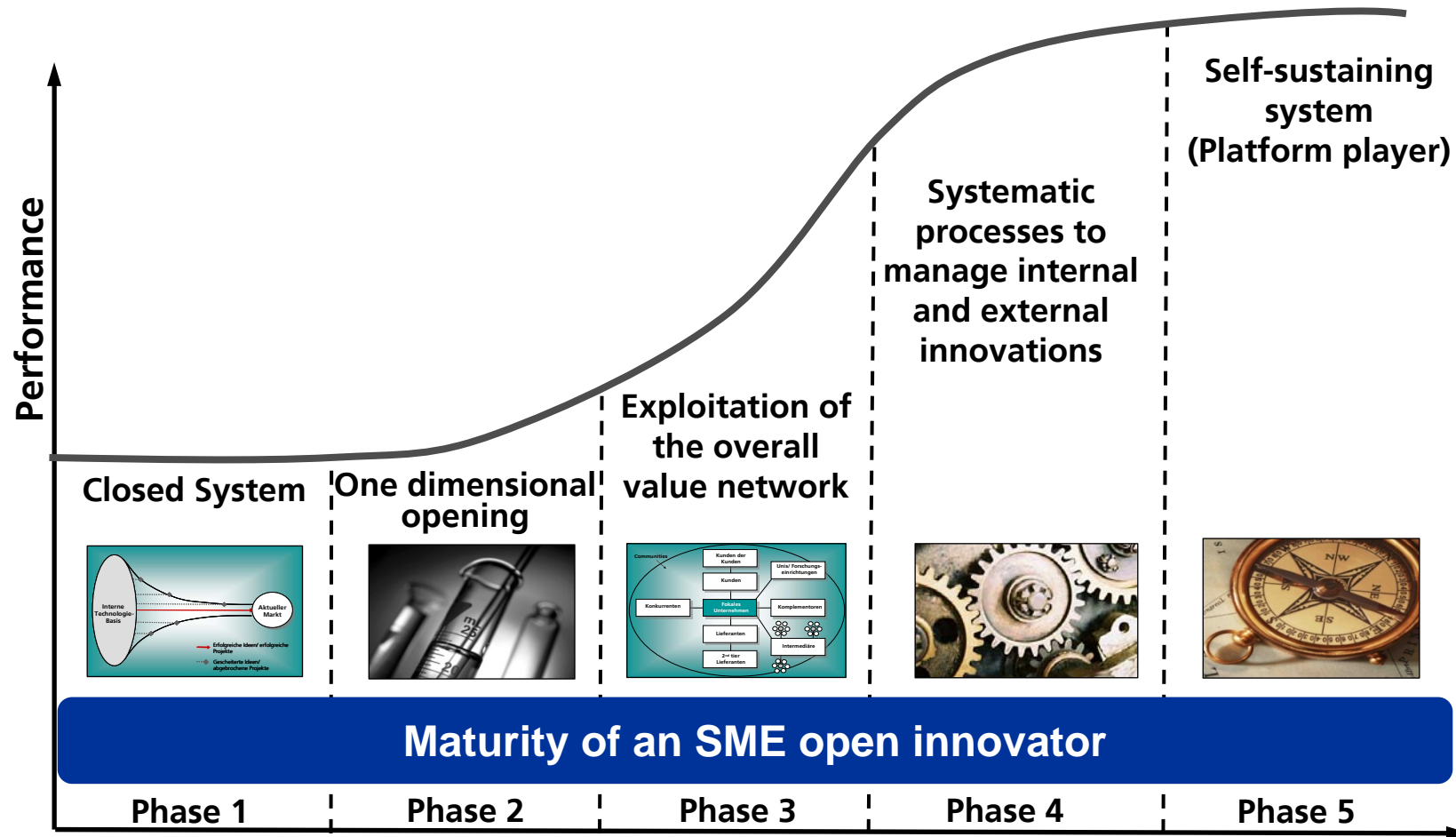
Openness needs to be holistically implemented



Source: CAS (2009)

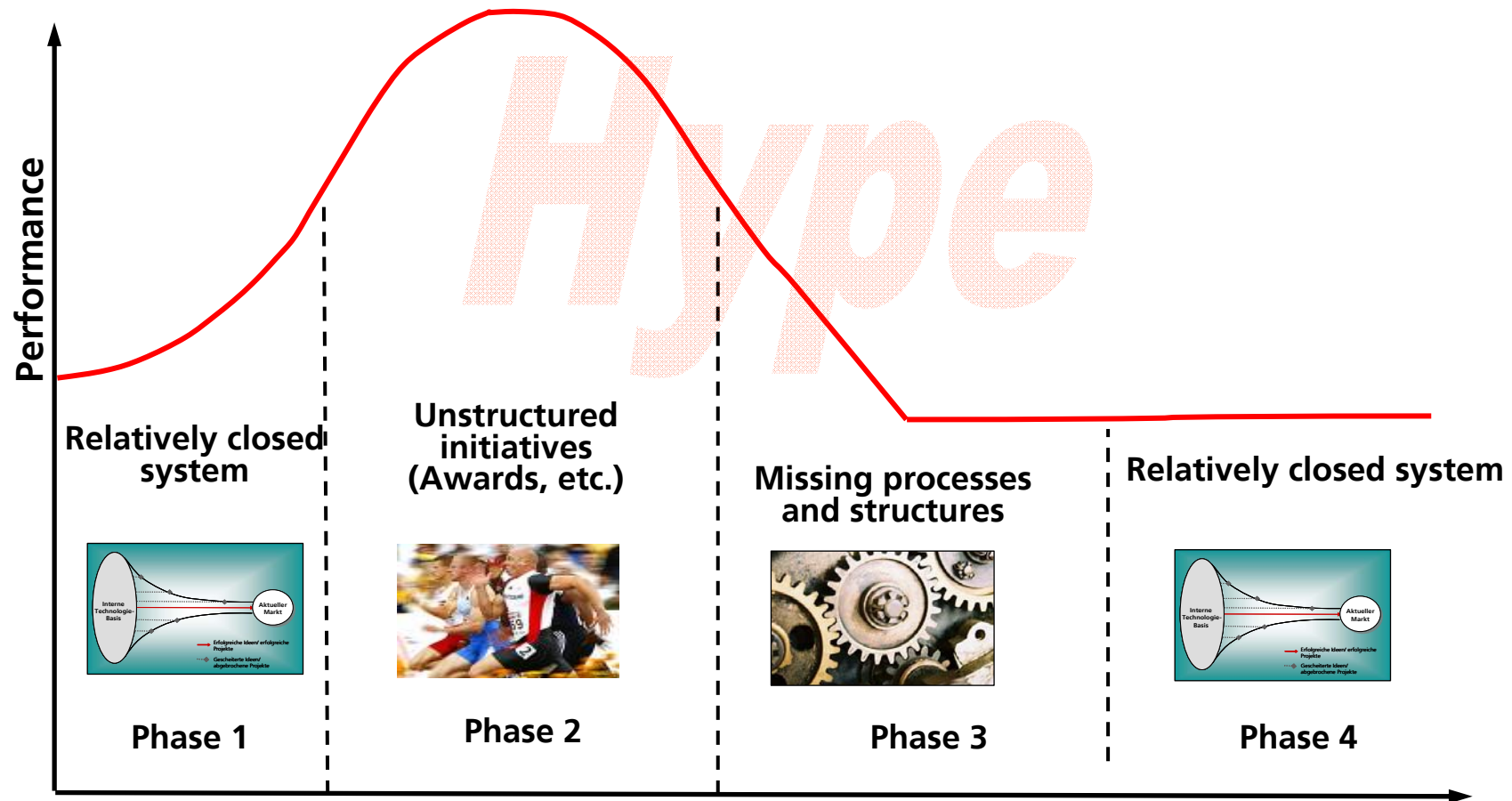
Conclusion

There are various maturity levels of open innovation



Conclusion

If openness is not systematically implemented, there will be only memories of a "hype"




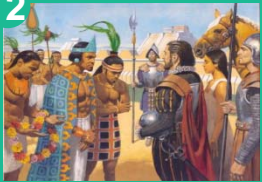
Vorne ist immer Platz!





**Michael Schumacher,
Formel 1 – Pilot**

I am looking forward to your thoughts

-  **Empirical quantitative research**

Empirical research on SME – e.g. impact of direction of search and differences between high-tech and low-tech
-  **Case study and action research**

Open innovation, eco-systems and two-sided markets, Open innovation and innovation strategy, open innovation and intermediaries (with atizo)
-  **Discussions**

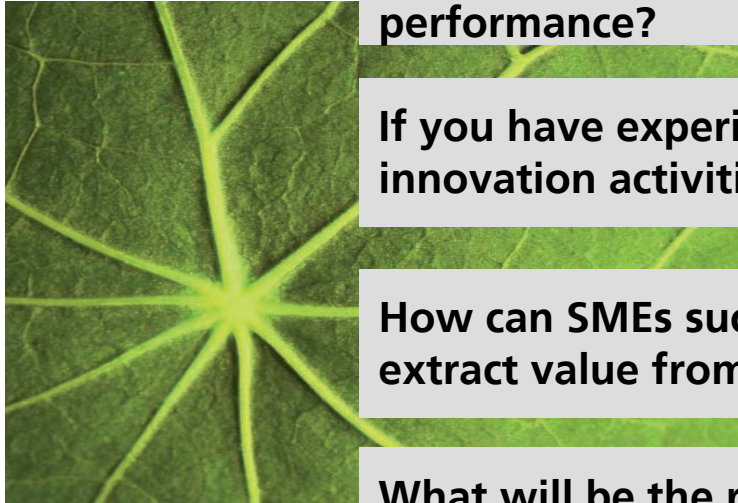
Follow our blog twitter, face-book etc. and participate in the discussion
-  **Theoretical investigation**

Open innovation and absorptive capacity; open innovation and innovation routines, openness and ambidextrous organizations

Contact: sabine.brunswicker@iao.fraunhofer.de; + 49 711 970 2035

Blog: <http://blog.iao.fraunhofer.de/>

Topics for discussions



How is the direction of search interplaying with environmental context (technological opportunity) in explaining innovation performance?

If you have experience with US SMEs, how do their open innovation activities differ from the ones of European SMEs?

How can SMEs successfully adapt their business models to extract value from innovation ecosystems?

What will be the role of “public” advisors and intermediaries in establishing linkages between SMEs and large incumbents?