UNIVERSITÀ DEGLI STUDI DI TRIESTE

Deams

Dipartimento di
Scienze Economiche, Aziendali,
Matematiche e Statistiche "Bruno de Finetti"

UNIVERSITY OF TRIESTE – DEAMS DEPARTMENT
BACHELOR COURSE IN BUSINESS & MANAGEMENT

A.Y. 2024 – 2025

BLOCK 6

Management of Innovation

INSTRUCTOR
Guido Bortoluzzi (Ph.D)

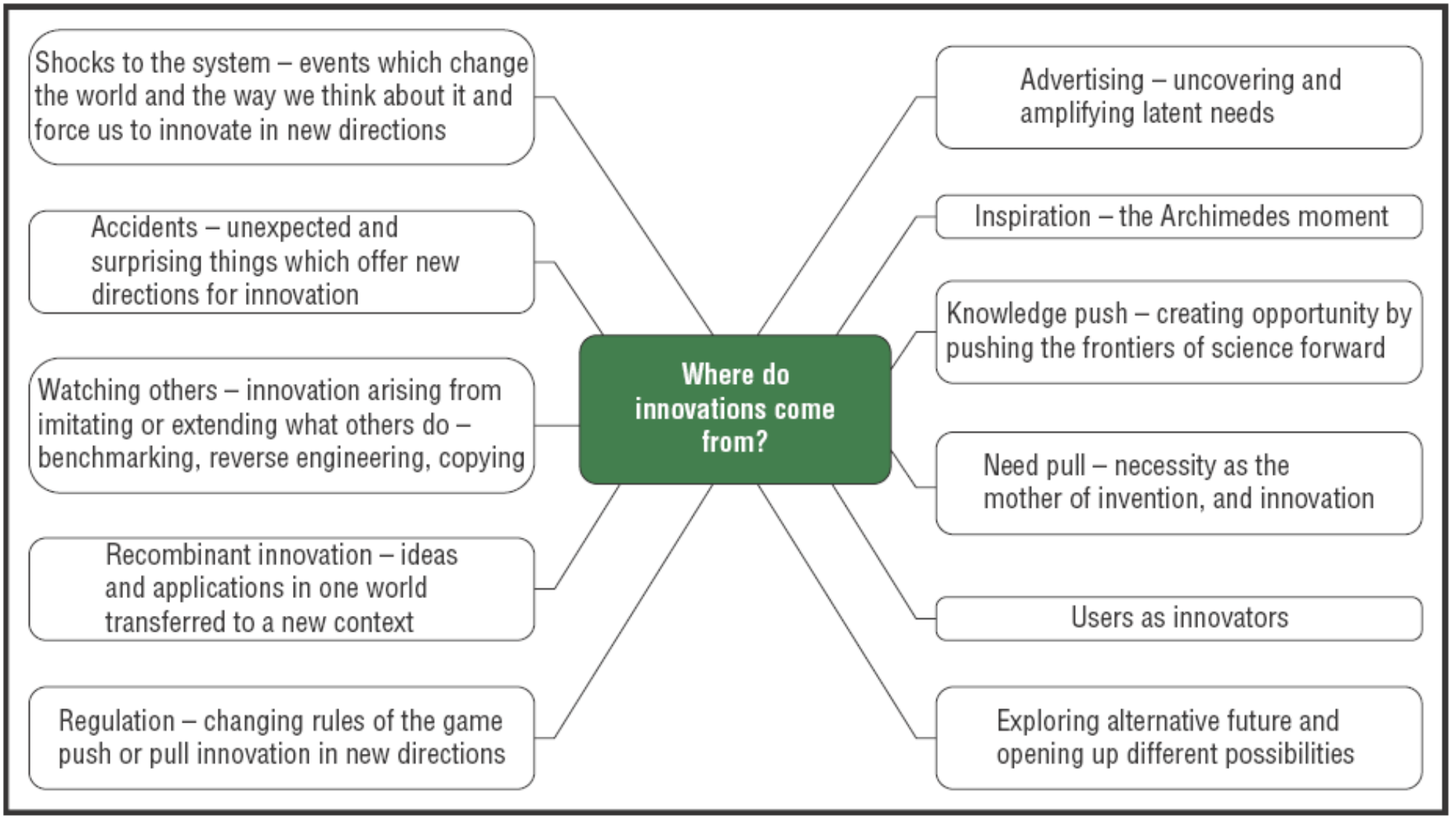
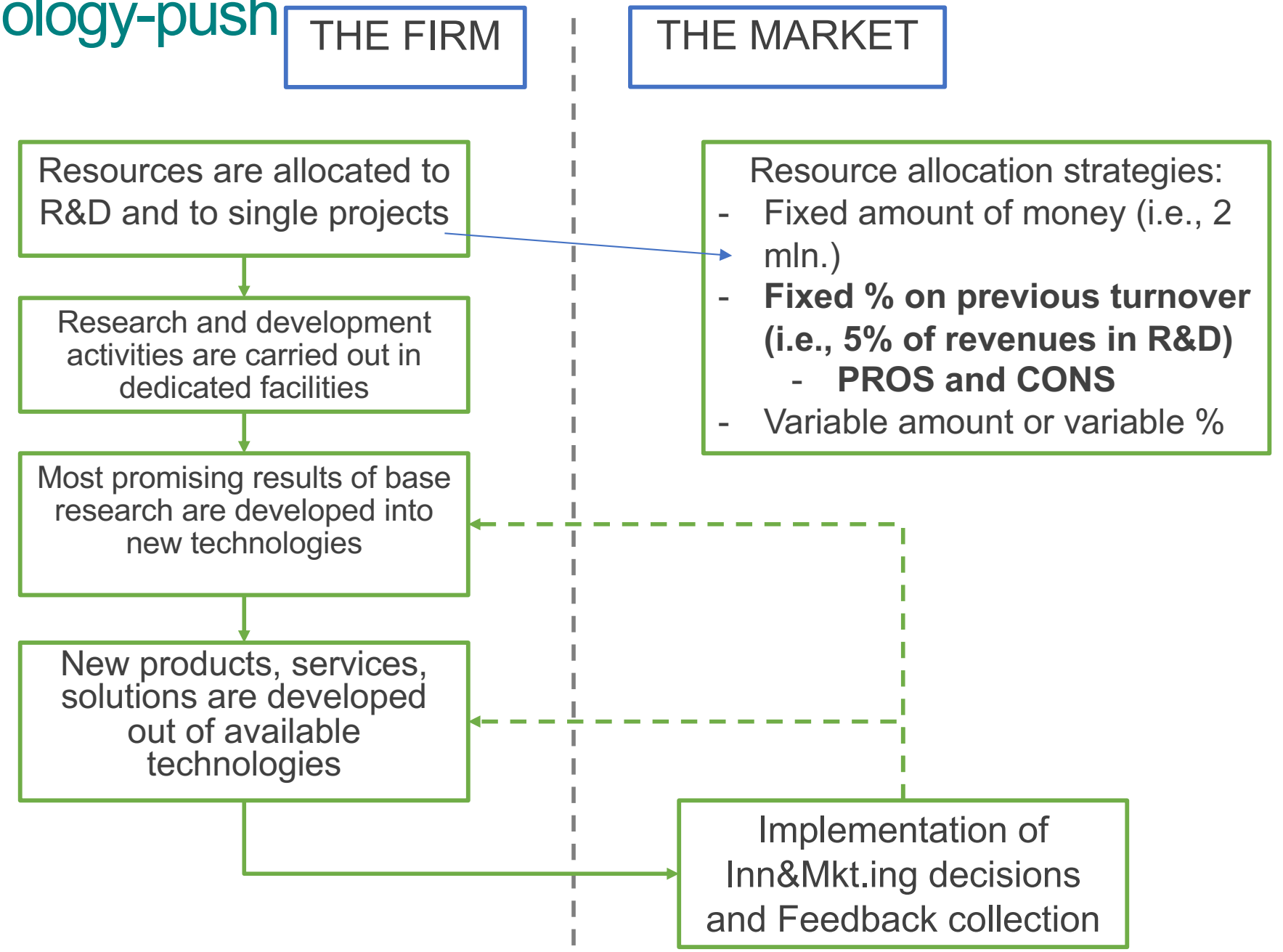


FIGURE 5.1: Where do innovations come from?

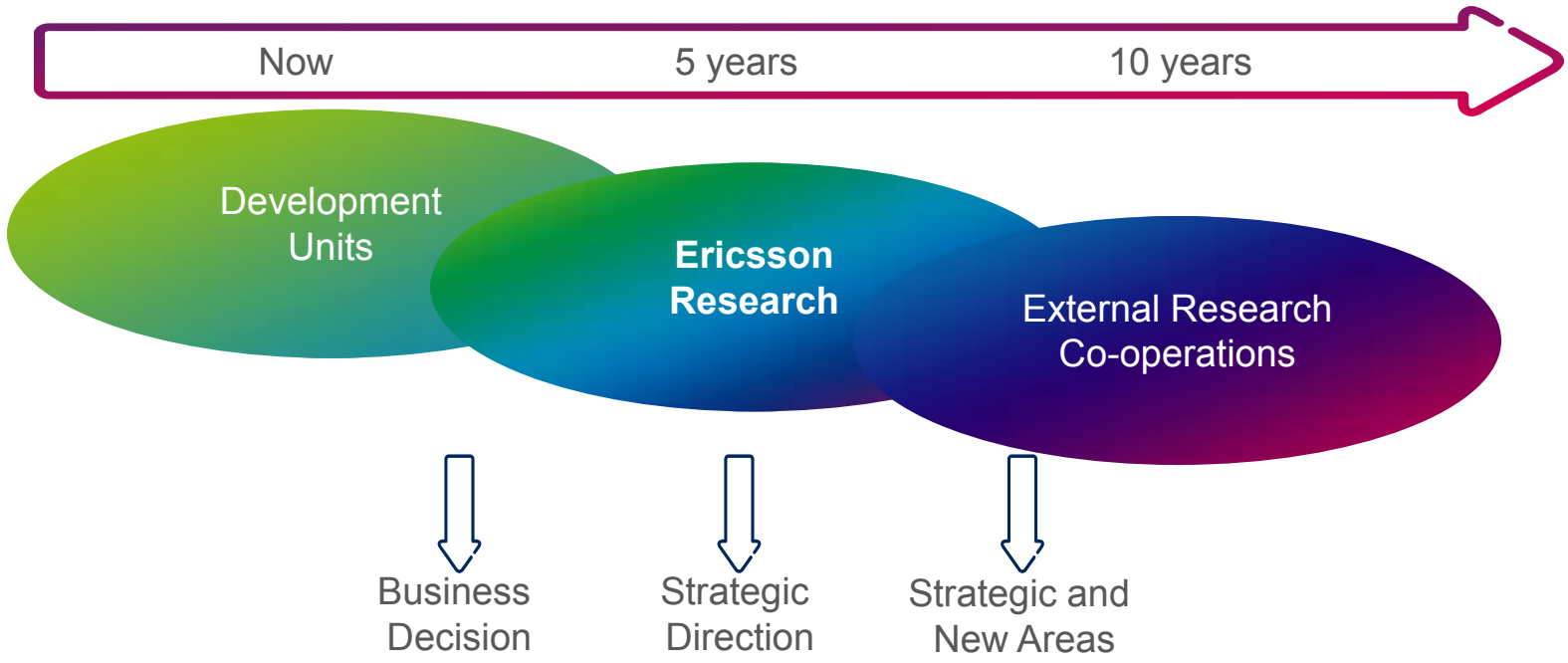
Technology-push



Ideas coming from “inside”: methods

- Internal Idea contests and hackathons
- Patent mining
- Brainstorming activities
- “Lateral thinking” techniques
- Design thinking techniques
- Many others

LONG- AND SHORT-TERM FOCUS



ERICSSON RESEARCH

ERICSSON

9 countries

3 continents

~50% PhDs

INNOVATION
FROM IDEA TO REALITY

ERICSSON

Long term Horizon

Medium term Horizon

Short term Horizon

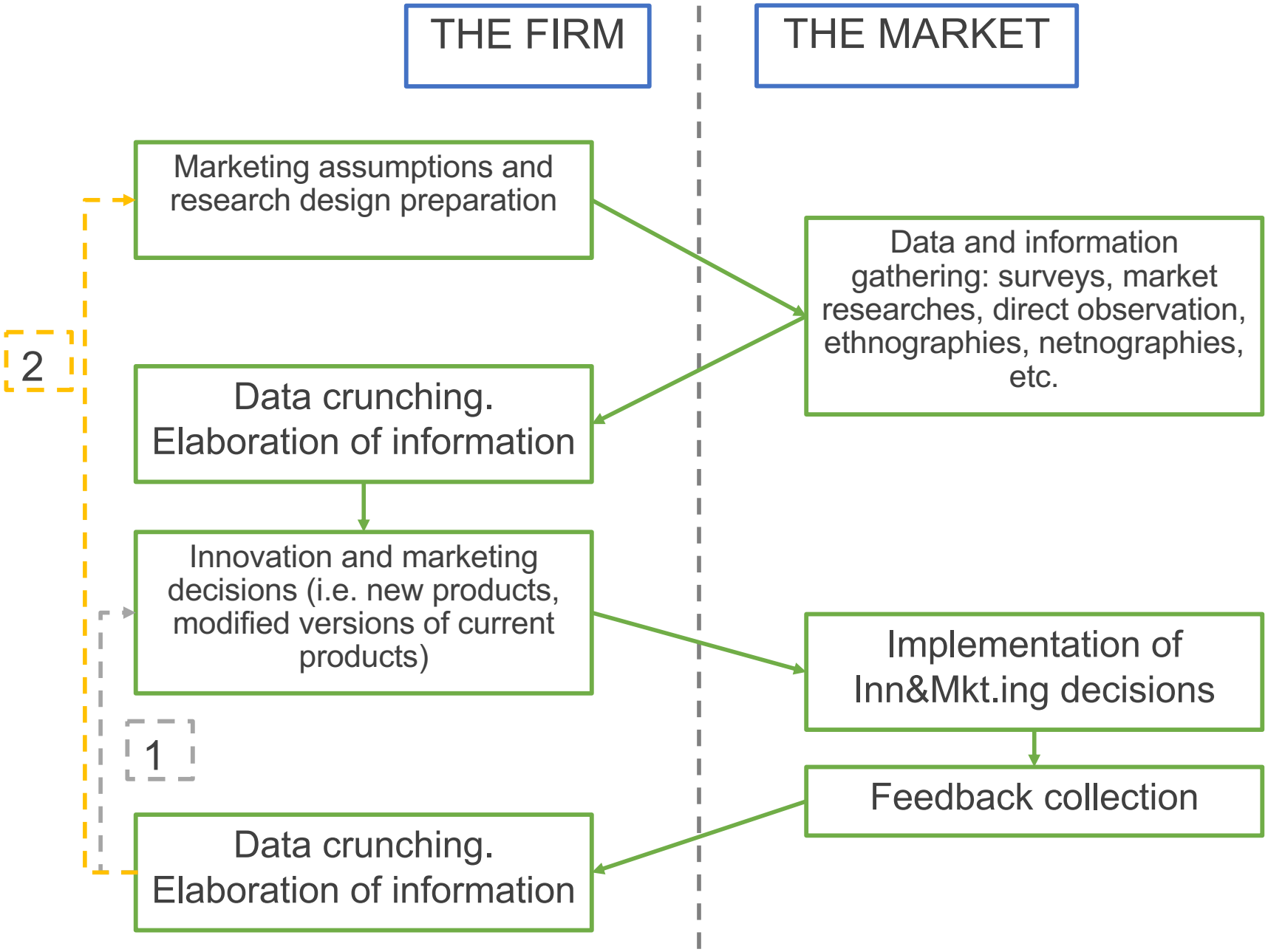
Ericsson Innovation Day: when technology meets the (potential) market

Click!

NEED PULL

1. OBSERVATION
   - users (clients, consumers), competitors
2. ELABORATION
   - back to the needs: from consumers' behaviors and successful products to needs
3. DIFFERENTIATION
   - typically, new products for existing markets

Market-pull


THE FIRM
THE MARKET
Marketing assumptions and research design preparation
Data and information gathering: surveys, market researches, direct observation, ethnographies, netnographies, etc.
2
Data crunching. Elaboration of information
Innovation and marketing decisions (i.e. new products, modified versions of current products)
Implementation of Inn&Mkt.ing decisions
1
Feedback collection
Data crunching. Elaboration of information

INTERACT with users and from them

Barilla

snaidero

INTERACT with users and from them

- Lead and extreme users:
  - ahead the market;
  - users in the toughest environments have needs "at the edge"
  - any solution which meets their needs can have possible applications back into the mass market
- "Everyday" users
  - learn from unmet needs and frustrations

LEARNING FROM USERS

- Communities of users

David Robertson
LEGO Case
2011 – FT, 20-25min

About LEGO

- In March 2004 they select an adult fan team leader, who set up a secure forum where users could share their designs. "In the space of a few short weeks, the level of fan activity was tremendous" said vice-president Søren Lund
- A fan involved the team was in the business of high-tech sensors. LEGO decided, for the first time, to partner with an external vendor and introduce 12 advanced sensors "which greatly expanded its capabilities over prior models"
- After some months, CEO of the firm, Jørgen Vig Knudstorp, declared: “We think innovation will come from a dialogue with the community”
- Adult fans helped Lego identify new product lines, including one new line featuring models of architecturally significant buildings. Chicago architect and Lego enthusiast Adam Reed Tucker was involved with great success (White House, Empire State Building, etc.)
- The architectural kits are now sold around the world in outlets such as museums, souvenir shops and bookstores


The White House
Empire State Building

The Opicina Tram

LOCAL MOTORS™

the SPORTSCAR platform

Designed by

Vedran Martinek
Professional Automotive Designer

Combining AI, 3D printing, IoT and crowdsourcing

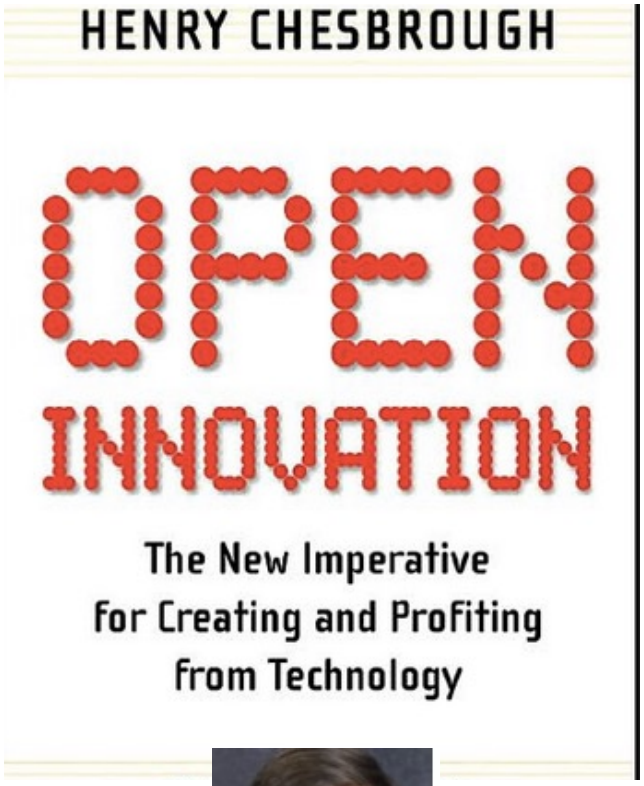
Using and benefiting from crowdsourcing platforms

Click!

Crowdfunding platform-types

- Equity
- Reward
- Donation
- Lending

Closed and open innovation



In 2003 Henry Chesbrough (MIT) highlights the co-existence of two different models of innovation:

- One more centred on internal resources and ideas
- Another relying on knowledge flows from and to the company to sustain and accelerate better innovations

2003

OPEN INNOVATION COMMUNITY
THE LATEST NEWS, RESEARCH, DISCUSSIONS & APPLICATIONS OF OPEN INNOVATION

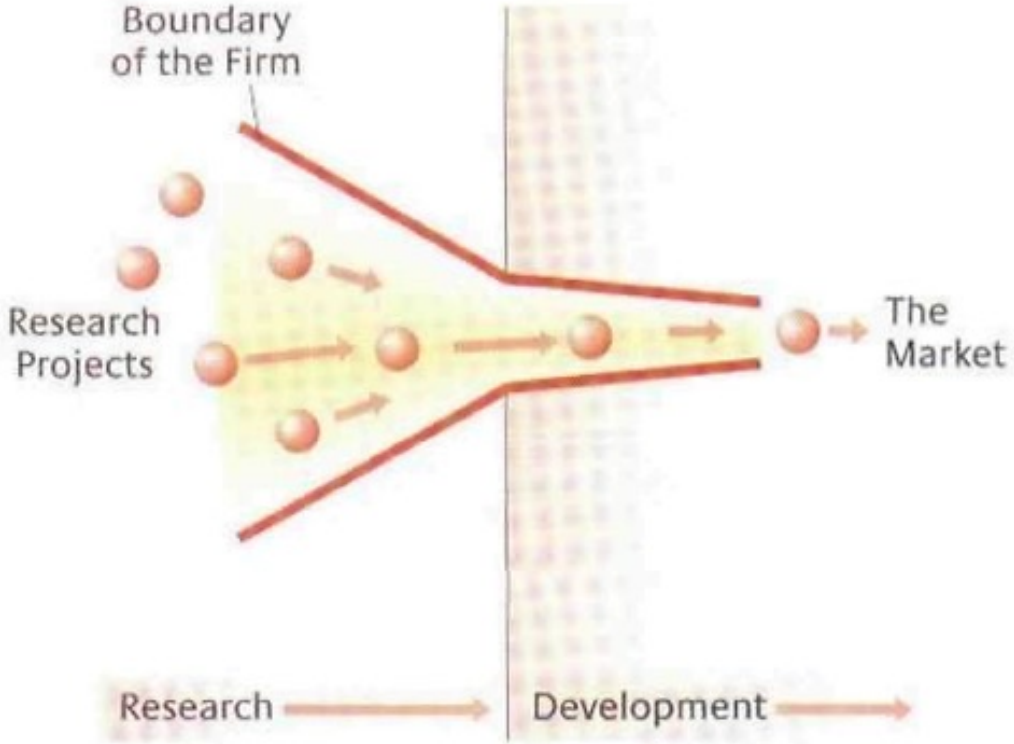
The closed innovation model

Successful innovation requires control

- Companies must generate their own ideas
- Development, manufacturing, market distribution is under the control of the company
- Self-reliance

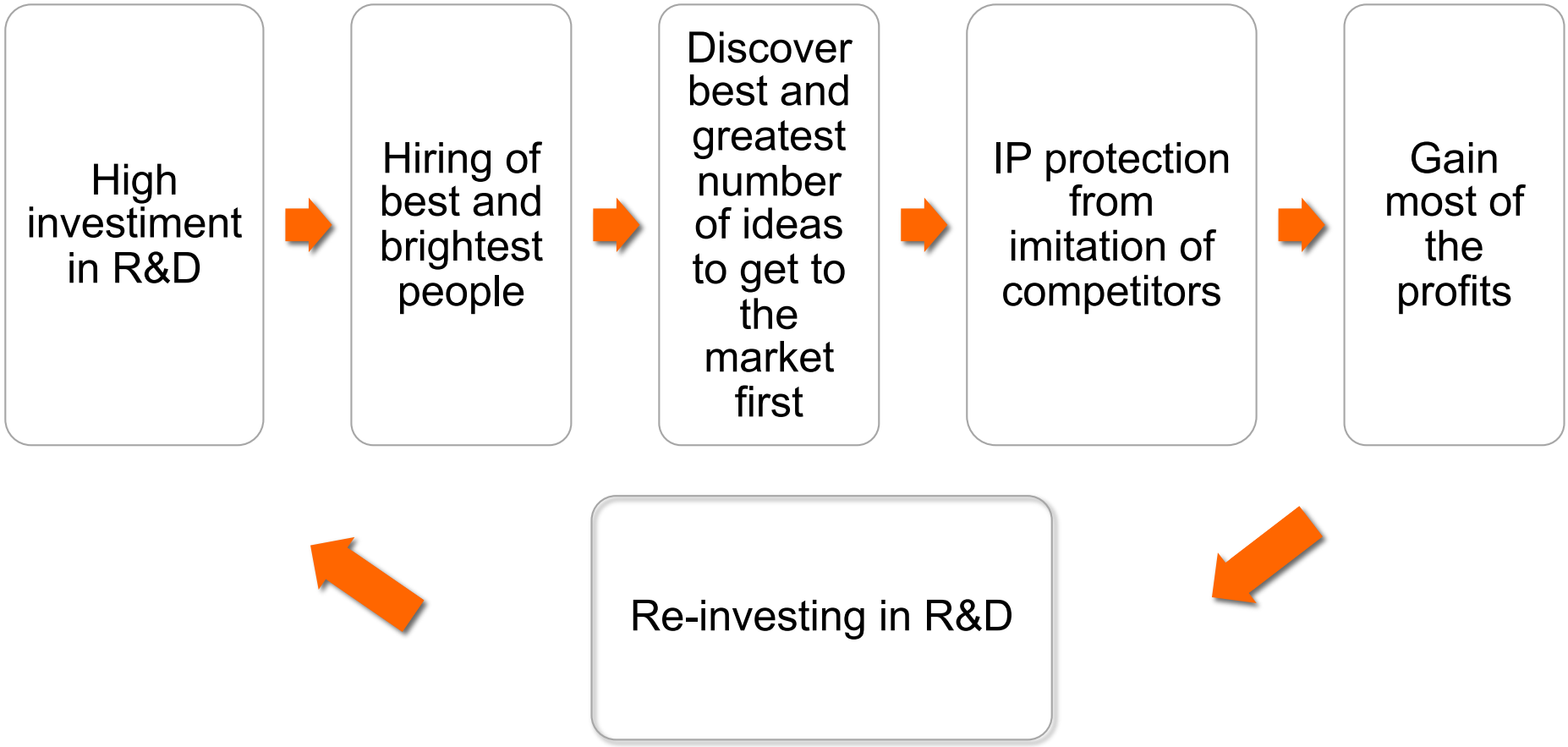
"If you want something done right, you've got to do it yourself"

The Closed Innovation Model



Source: Cheesbrough, 2003

The strategy of successful company in the CIM

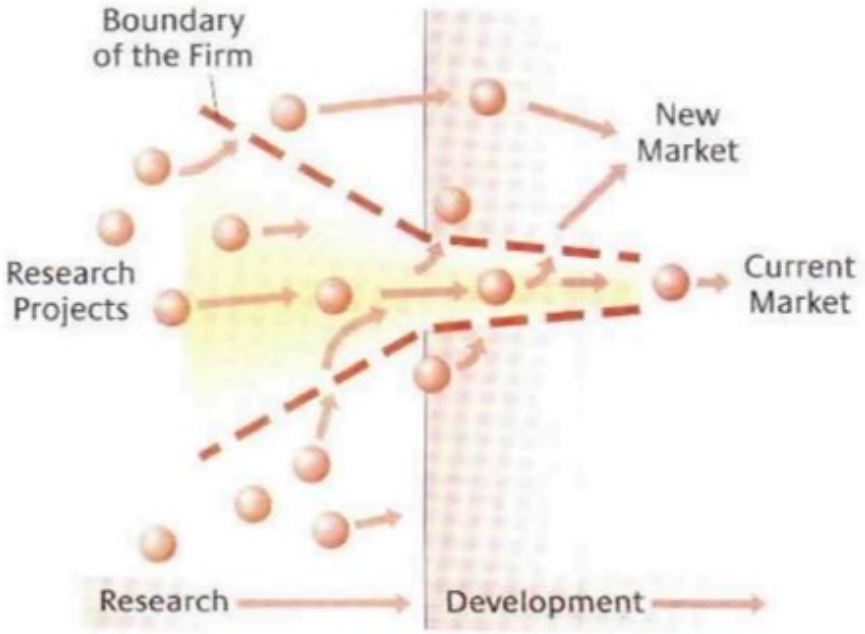


Open innovation

- Firms commercialize **external** (as well as internal) ideas by deploying **outside** (as well as in-house) **pathways** to the market
- Companies can commercialize **internal** ideas through **channels outside** of their current businesses in order to generate value for the organization. Typically:
  - startup companies (which might be financed and staffed with some of the company's own personnel)
  - licensing agreements
- Ideas can also **originate outside** the firm's own labs and be brought inside for commercialization

The Open Innovation Model

Licensing
Spin-off



Technology insourcing
- In-licensing
- Acquisition
- Venture investing

Source: Cheesbrough, 2003

The main principles

Closed Innovation Principles	Open Innovation Principles
The **smart** people in our field work **for us**.	Not all of the smart people work for us, so we must find and **tap into the knowledge** and expertise of bright individuals **outside** our company.
To **profit** from **R&D**, we must discover, develop and ship it **ourselves**.	**External** R&D can create significant **value**; internal R&D is needed to claim some portion of that value.
If we discover it ourselves, we will get it to market first.	We don't have to originate the research in order to profit from it.
If we are the **first** to commercialize an innovation, we will **win**.	Building a better **business model** is better than getting to market first.
If **we** create the **most and best** ideas in the industry, we will **win**.	If we make the best use of **internal *and* external** ideas, we will win.
We should **control** our **intellectual property** (IP) so that our competitors don't profit from our ideas.	We should **profit from others' use of our IP**, and we should buy others' IP whenever it advances our own business model.

Cheesbrough, 2003

Two directions of OI

Outside-in ("inbound OI")

- Companies exploit knowledge and resources acquired outside
  - Technological collaborations
  - User innovations
  - Crowdsourcing

Inside-out ("outbound OI")

- Companies reveal some ideas or new technologies, often without fully controlling the spillovers
  - Licensing
  - Spin-off
  - Open source

→ Choose between control of spillovers or generating spillover in order to stimulate collaboration and co-creation through more open business models

Open Innovation and Syndromes

- Not Invented Here (NIH) Syndrome:
  - Dismissive attitude toward ideas or improvements suggested or implemented by others because, if they were worthwhile, "we" would have already thought of them (source: businessdictionary.com)
- Not Sold Here (NSH) Syndrome:
  - Dismissive attitude toward selling ideas or to implement them in partnerships with other firms, because if they were profitable, "we" (and we only) should exploit them

Procter&Gamble

- Leading american multinational in consumer goods, mainly cleaning and personal care (until 2012 also food, with Pringles)
- 70bn $ and 100.000 employees (2019)
- Annual R&D budget around $3 bn
- About 7000 scientists and engineers working worldwilde in R&D
- Switch from Reasearch&Develop → to Connect&Develop

The need for a change

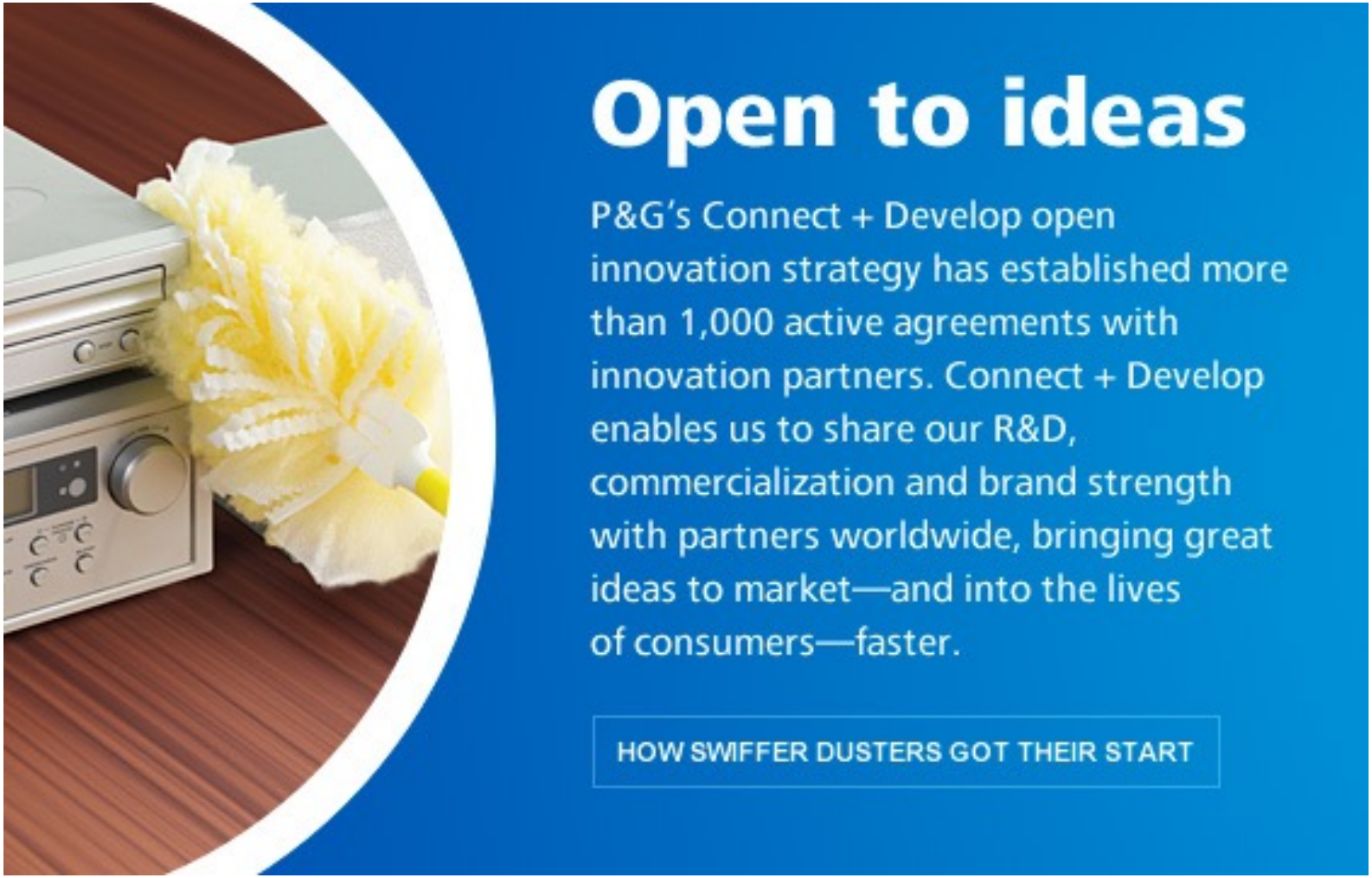
“By 2000, it was clear to us that our invent-it-ourselves model was not capable of sustaining high levels of top-line growth. […] We discovered that important innovation was increasingly being done at small and midsize entrepreneurial companies. Even individuals were eager to license and sell their intellectual property. University and government labs had become more interested in forming industry partnerships, and they were hungry for ways to monetize their research. […] In 2000, realizing that P&G couldn’t meet its growth objectives by spending more and more on R&D for less and less payoff, our newly appointed CEO, A.G. Lafley, challenged us to reinvent the company’s innovation business model” (Huston&Sakkab, P&G, 2006).

P&G Connect&Develop

- New role: Director of External Innovation
- Objective: sourcing 50% of innovations from outside the business (achieved) (15% in 2000, 35% in 2006, 45% in 2008)
- R&D productivity increased by nearly 60%, innovation success rate doubled, cost of innovation fallen

Even inside-out direction: any internal idea offered to external firms if not developed within three years → stimulate exploitation of innovation

P&G's Connect + Develop



Click!

P&G AND OPEN INNOVATION

Breakthrough Blend of Winning Ingredients

“P&G Skin Care was looking for anti-wrinkling technology. Meanwhile, a small French Company, Sederma, was working with a new peptide to repair wounds and burns, that also showed great promise with wrinkles.
A partnership quickly developed. Both companies worked hand-in-hand testing Sederma’s peptide and blending it with our own proven ingredients, resulting in the creation of the blockbuster product, Olay Regenerist. It quickly became a global market leader, beating $350 boutique creams”.

SOURCE:
http://www.pgconnectdevelop.com/home/stories/other-case-studies/20130102-olay-regenerist.html

Which VESPA Piaggio is REAL?

WATCHING OTHERS

- Imitating, but what?
  - Products
  - Processes
  - Strategies/Business models
- The role of firms' absorptive capacity (Cohen and Levinthal): "the ability of a firm to recognize the value of new, external information, assimilate it, and apply to commercial ends"

Imitation through reverse engineering

- Reverse engineering consists in extracting knowledge from a product (often disassembling it) with the aim of improving the product itself or to produce a more efficient of effective version of it
- Managerial preconditions for reverse engineering are:
  - Knowledge is explicit in its form (not tacit) and can be easily codified
  - The firm has enough abortive capacity to turn such knowledge into commercial ends

Not all knowledge can be easily copied...

- In 1966 Michael Polany (a former chemistry that became an appreciated philosopher) introduced a distinction between **explicit** and **tacit** knowledge starting from the assumption that "*we can know more than we can tell*" (p. 6).
- In the early Nineties, Nonaka (1991 and 1994) and Nonaka and Takeuchi (1995) based their theory of knowledge management in organizations in this distinction and pointed out that: "tacit knowledge is personal, context-specific, and therefore hard to formalize and communicate. Explicit or codified knowledge, on the other hand, refers to knowledge that is transmittable in formal, systematic language" (p. 59).
- "Tacit" and "explicit" do not refer to different kind of knowledge in absolute. They refer to different status of - maybe the same - knowledge. Ergo, tacit knowledge can become explicit and vice-versa
- Hence, tacit knowledge is difficult to transfer, because its explicitation requires face-to-face contacts, a certain level of cultural similarity, the sharing of codes that make knowledge sharing possible (and effective)

- Nonaka I., 1991, "The Knowledge-Creating Company", Harvard Business Review, november-december.
- Nonaka I., 1994, "A Dynamic Theory of Organizational Knowledge Creation", Organization Science, n. 1
- Nonaka I., Takeuchi H., 1995, The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation, Oxford University Press, New York (trad. it. Guerini e Associati, Milano, 1997).
- Polanyi M., 1966, The Tacit Dimension, Routledge & Kegan Paul, London.

Recombinant innovation

- → Recombinant innovation means applying knowledge that has been developed in other industries and for other aims
- → Managerial preconditions for recombinant innovation are:
  - Knowledge can be both tacit or explicit
  - If tacit, the firm needs absorptive capacity to understand the value of it (and how to recombine it)

Colors, materials, shapes. Everything can be recombined

Seagull wings

Warm and Cozy

2 heat setting options

Heating area

Fan-forced heater

Easy Operation


LUXOTICA®

Luxottica Group overview

1 Group	11 Plants	>7 mn OneSight patients
130 Countries	45 Brands	>55 mn Manufactured frames
62,000 People	>6,300 Stores	>60 mn Customers

The best brand portfolio in the industry

(1) Starting from 2012

THE INSPIRATION

Mysterious and ingenious, Gabrielle Chanel loved being surrounded by mirrors.

She decided to cover of mirrors the famous staircase of her flagship Boutique in Paris 31, rue Cambon.

During press shows, she could appreciate all facets of the silhouettes and evaluate customers' and journalists' reactions without being seen.

How did Luxottica managed the challenge

- → Knowledge to extract was partly CODIFIABLE (colors; shape; brightness; etc.) and partly TACIT (beauty; sensations; emotions)
- → Extracted CODIFIABLE knowledge was transferred to creatives (designers) who have ABSORPTIVE CAPACITY (understand the market)
- → The DESIGN department turned back CODIFIED knowledge into a PRODUCT (glasses) embedding similar knowledge (colors, shape, brightness) and, hopefully, same TACIT knowledge (beauty; sensations; emotions)

The result

(Technological) Forecasting

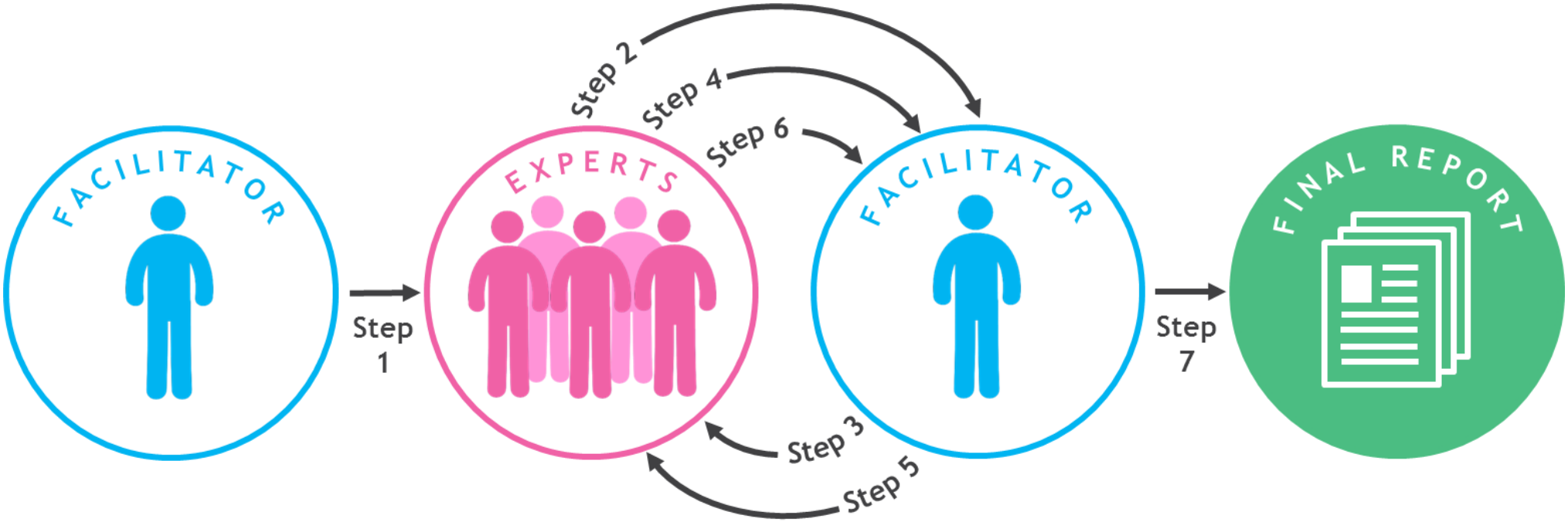
Different techniques can be used:

→ DELPHI approach

→ Scenario analysis

→ Technology experts and Futurologists

DELPHI approach



Facilitator seeks individual assessments from a pool of experts.

Experts respond to the request, receive feedback and revise their responses.

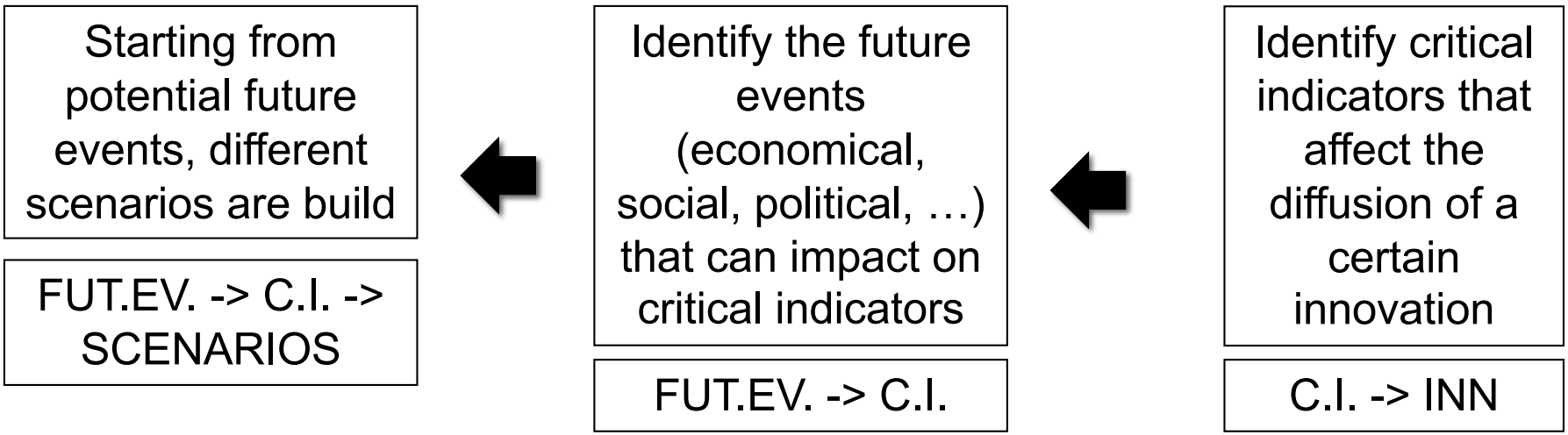
Facilitator compiles the responses and sends a revised set of questions to each expert. Several cycles of feedback may be needed.

Facilitator produces report on experts' responses, noting key outliers.

Source: The Delphi technique Heuer and Pherson (2011)
http://portal.healthworkforce.eu/pilot-study-experiences-in-belgium-using-horizon-scanning-and-delphi/

Scenario analysis

Scenarios are internally consistent descriptions of alternative possible futures, based upon different assumptions and interpretations of the driving forces of change



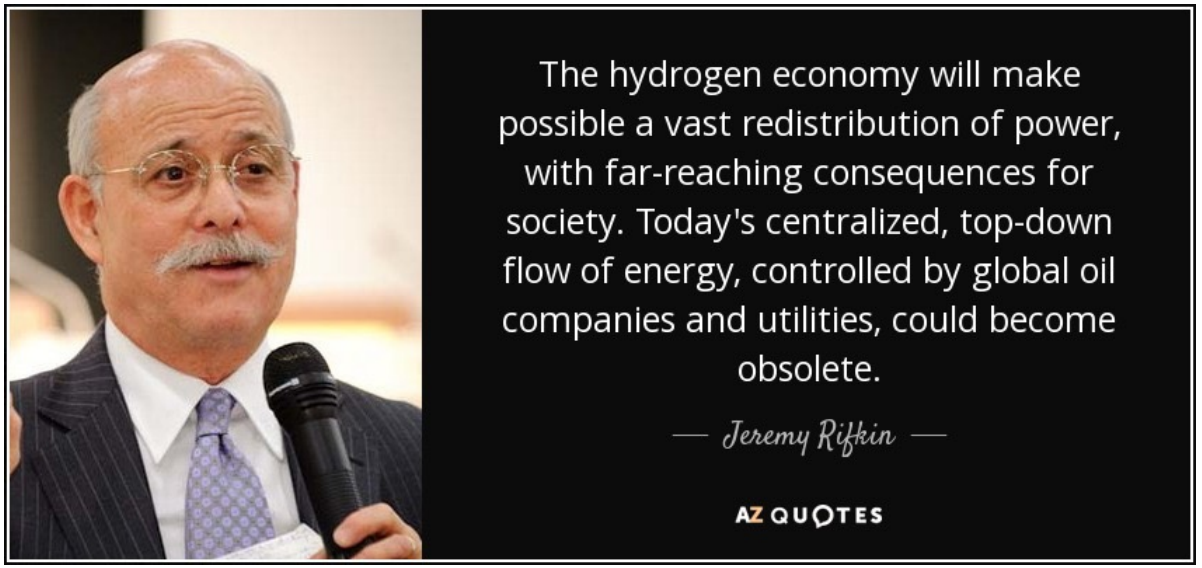
An example of SCENARIO Analysis

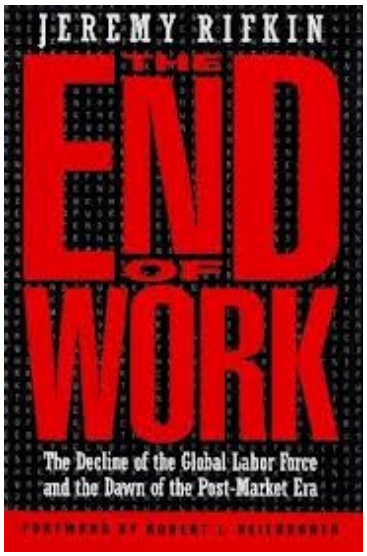
Click me

WÄRTSILÄ

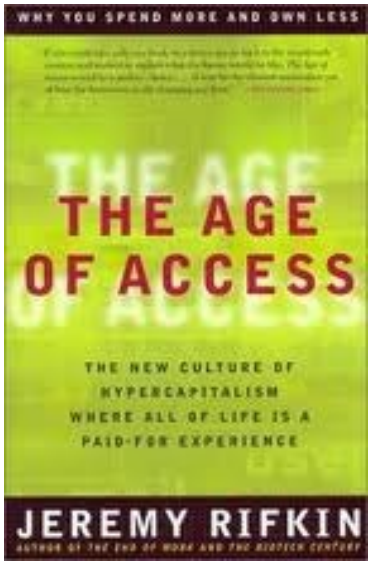
GLOBAL SCENARIOS OF
SHIPPING IN 2030

Technology experts and futurologists

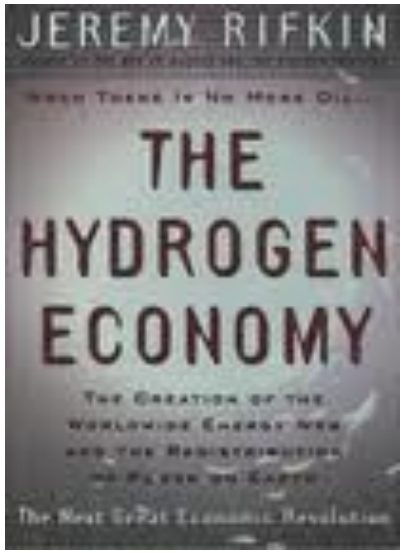




1995



2000



2002

Learning from mistakes

→ Accidental circumstances always happen

→ What firms should do:

- Activate routines for learning from mistakes;
- Analyzing "false negatives"

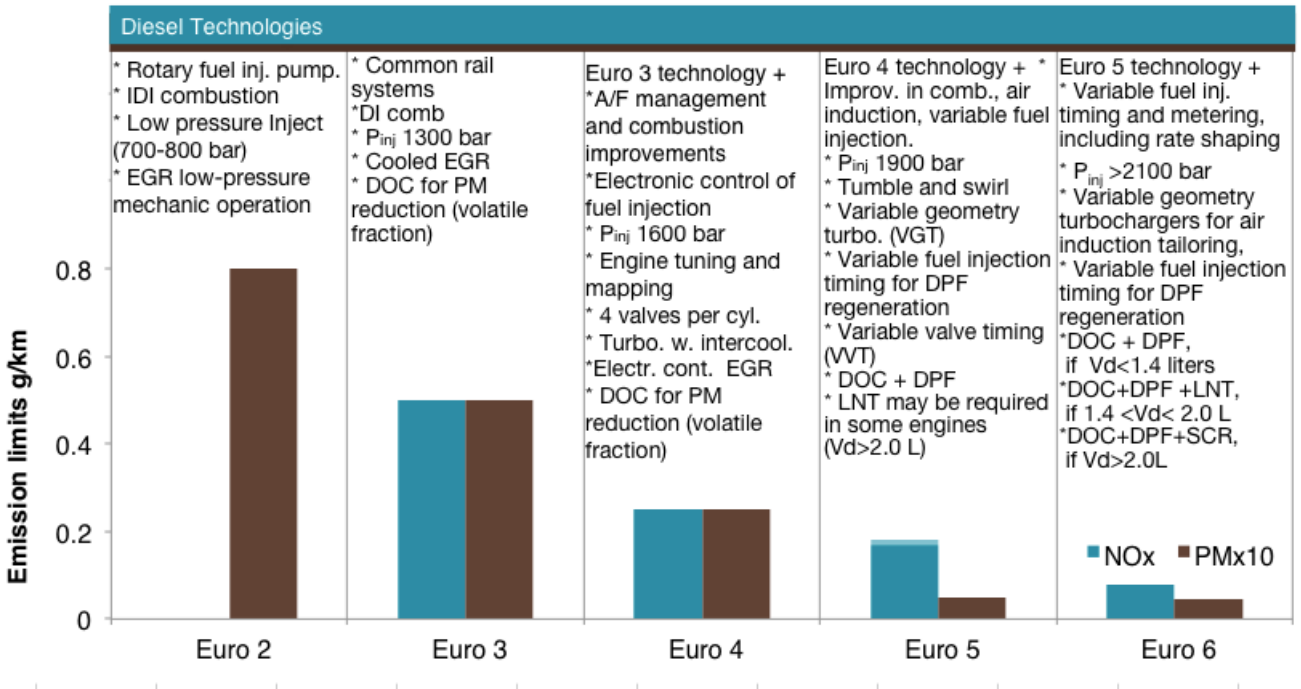
in 3M a chemist produced by accident a "not very sticky" adhesive

in Pfizer a researcher was looking for a treatment for angina. He produced a new compound that had an unexpected side effect...

Penicillin, Corn flakes, Pacemaker and many others…

Norms and regulations

→ Norms and regulations restrict (and close off) certain innovation streams but can open up new ones and force innovation to proceed along certain technological streams



Various EC directives on Conventional pollutant emission limits of vehicles

Approach	How extensively used (% of sample)	Rank	How effective (1-10)	Rank
Ethnography	12,9	13	6,8	1
Customer visit team	30,6	4	6,6	2
Customer focus groups for problem detection	25,5	5	6,4	3
Lead user method	24,0	6	6,4	4
User design	17,4	11	6,0	5
Customer brainstorming	17,4	11	5,9	6
Peripheral vision tools	33,1	2	5,9	7
Customer advisory board	17,6	10	5,8	8
Community of enthusiasts	8,0	15	5,7	9
Disruptive technologies	22,0	8	5,7	10
Internal idea capture	38,0	1	5,5	11
Partners and vendors	22,1	7	5,5	12
Patent mining	33,0	3	5,5	13
Accessing external technical community	19,5	9	4,9	14
Scanning small businesses and start-ups	13,0	13	4,9	15
External product design/crowdsourcing	2,0	18	4,8	16
External submitted ideas	7,9	16	4,5	17
External idea contest	4,1	17	4,3	18