



# Graduate Seminar Corporate Development **CORPORATE INNOVATION MANAGEMENT** Winter Term 2021 /2022

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- 1. Concepts of Innovation in Economics and Business Administration**
- 2. Innovation Strategy & Corporate Strategy**
- 3. Structuring the Organisation and the Innovation Process**
- 4. Sources of Innovation**
- 5. Management of Searching & and Forecasting Processes**
- 6. Selection and Management of Innovation Activities**
- 7. Capturing and the Value of Innovation**
- 8. Applications and Models of Corporate Innovation Management**

# Timeline and **Deadline**



1. Fr. 22.10.2021, 15 - 18 h
2. Sa. 24.10.2021, 10 - 13 h
3. Fr. 26.11. 2021, 15 - 18 h
4. Sa. 27.11.2021, 10 - 13 h
5. Fr. 17.12.21, 15 - 18 h
6. Sa. 18.12.21, 10 - 14 h
7. **Submission of Working Papers 04.02.2022**



- Content of the webinar is relevant for preparing and Seminar Working Papers
- The relevant knowledge can be obtained by participating in the webinar or by retrieving the content from the textbook and the slide deck

## Criteria for evaluation:

- Content i.e. lines of thought in the literature
- Context: connections to innovation management
- Research
- Your own thoughts – no „right“ or „wrong“, bonus case studies
- Formal Aspects
- Case Studies and participation in the Seminar as a „Bonus“

## **Seminar Working Papers (2): You need to choose one of these topics**



- S1 Innovation in Family – owned companies**
- S2 “Group Think” and Organizational failure in Corporate Innovation**
- S3 Strategic Human Capital Management and Impact on Innovation**
- S4 Corporate Venture Capital as an Innovation Tool**
- S5 Blue Ocean Strategies**
- S6 Innovation in Tech Companies and Applications to other Industries**
- S7 Organizational Innovation during the Covid Crisis**
- S8 Collaboration and its impact on Innovation**

# Seminar Working Papers (3): Formal Aspects



- **Length of the papers should be minimum 10 and maximum 15 pages (excluding front page, references or appendices).**
- **Formal requirements include font size 10, line spacing of 1.5 and margins of minimum 2 cm on the top, bottom, right and left.**
- **Submission of Working Papers: one copy to be submitted to the Chair for Corporate Development by email; PDF-copy to [torsten.amelung@gmail.com](mailto:torsten.amelung@gmail.com)**

# Literature for Seminar „Corporate Innovation“



## Textbooks:

**Tidd, J., Bessant J. (2014), Strategic Innovation Management. Chichester (West Sussex), Wiley. (ANCHOR TEXT)**

Hausschildt, J., Salomo, S., Schultz, C., Kock Alexander (2016), Innovationsmanagement. München: Vahlen.

## Literature for Presentations and Seminar Papers:

Brigl, M., Roos, A. et al.(2014), The Incubators, Accelerators, Venturing and More. Boston Consulting Group. In: BCG Perspectives

Bielesch, F., Dinesh K. et al. (2012), Corporate Venture Capital. The Boston Consulting Group. In: BCG Perspectives.

Campbell, A. et al. (2014), Strategy for the Corporate Level. San Francisco: Jossey-Bass.

Collins, J. (2001), Good to Great. New York: Harper Collins

Collins, J., Hansen M.T. (2011), Great by Choice. New York: Harper Collins.

Dunne, D., Martin, R. (2006), Design Thinking and How It Will Change Management Education: An Interview and Discussion. Academy of Management Learning & Education, Vol. 5, No. 4, 512–523.

Frese, M, Teng, E. et.al. (1999) Helping to improve suggestion systems: predictors of making suggestions in companies. Journal of Organizational Behavior, 20, 1139-1155

Hansen, M.T. (2009), Collaboration. Boston: Harvard Business School Publishing.

Ingham, J.(2002), Strategic Human Capital Management. Oxford: Elsevier )

Ismail, S. et al. (2014), Exponential Organizations. New York: Diversion

Janis, I.L. (1982), Groupthink. Boston: Houghton Mifflin.

Kim, W.C.; Mauborgne, R. (2005). *Blue Ocean Strategy*. Harvard Business School Press.

Kotter, John P. (1996). Leading Change. Harvard Business School Press.

Kotter, J., Rathgeber, H. (2006), Our Iceberg is Melting. Oxford: McMillan.

Nieto, M.J. Santamaria, L., Fernandez, Z. (2013), Understanding the Innovation Behavior of Family Firms. Journal of Small Business Man

Rifkin, J. (2014), The Zero Marginal Cost Society. New York: St. Martin's Press

Schmidt, E., Rosenberg J. (2014), How Google Works. London: John Murray.

Sutherland, J, Schwaber, K. (2013). Scrum Guides. On: Scrum Guides.org. Retrieved July 26, 2017

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For  
extended list of  
literature  
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look at the web  
page.



# 1. Concepts of Innovation in Economics and Business Administration

- **Definitions and Concepts of Innovation**
- **Making a case for Strategic Innovation Management**





# 1. Innovation in Economics and Business Administration

- **Definitions and Concepts of Innovation**
- **Making a Case for Strategic Innovation Management**



- What does innovation and entrepreneurship mean?
- Why is innovation essential for survival and growth?
- Innovation is a process of series of changes creating value
- Types of innovation: incremental / radical component system



- Innovation = the process of creating value (social, economic) through ideas (J. Tidd, J. Bessant, 2014)
- Schumpeter: An 'innovation' is accomplished only with the first commercial transaction involving the new product, process, system or device. ***It is an invention that becomes part of the economic system.***
- Technological innovations are defined as new products and processes and major technological modifications to products and processes. An innovation is considered performed if it is introduced to the market (**product innovation**) or implemented in the production process (**process innovation**). Innovation includes many research, technological, organizational, financial and commercial activities.
- “R&D represents only one of these **activities** and can take place during various stages of the innovation process. It can play not only the role of the original source of the innovation ideas but also the role of problem solution framework, which can be turned to at any stage of the implementation.” (OECD, Frascati M. 1992)



- Creativity is manifested in the production of a creative work (for example, a new work of art or a scientific hypothesis) that is both *original* and *useful*
- Innovation begins with creative ideas:
  - ↳ creativity by individuals and teams *is a starting point for innovation*
  - ↳ creativity is a necessary *but not sufficient* condition for innovation

# Innovation or creativity?



# Innovation or art?

Prof. Dr. Mark Ebers • Seminar for Business  
Administration, Corporate Development and  
Organization • University of Cologne





# Innovation or garbage?

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# Classification of Innovation by the OECD

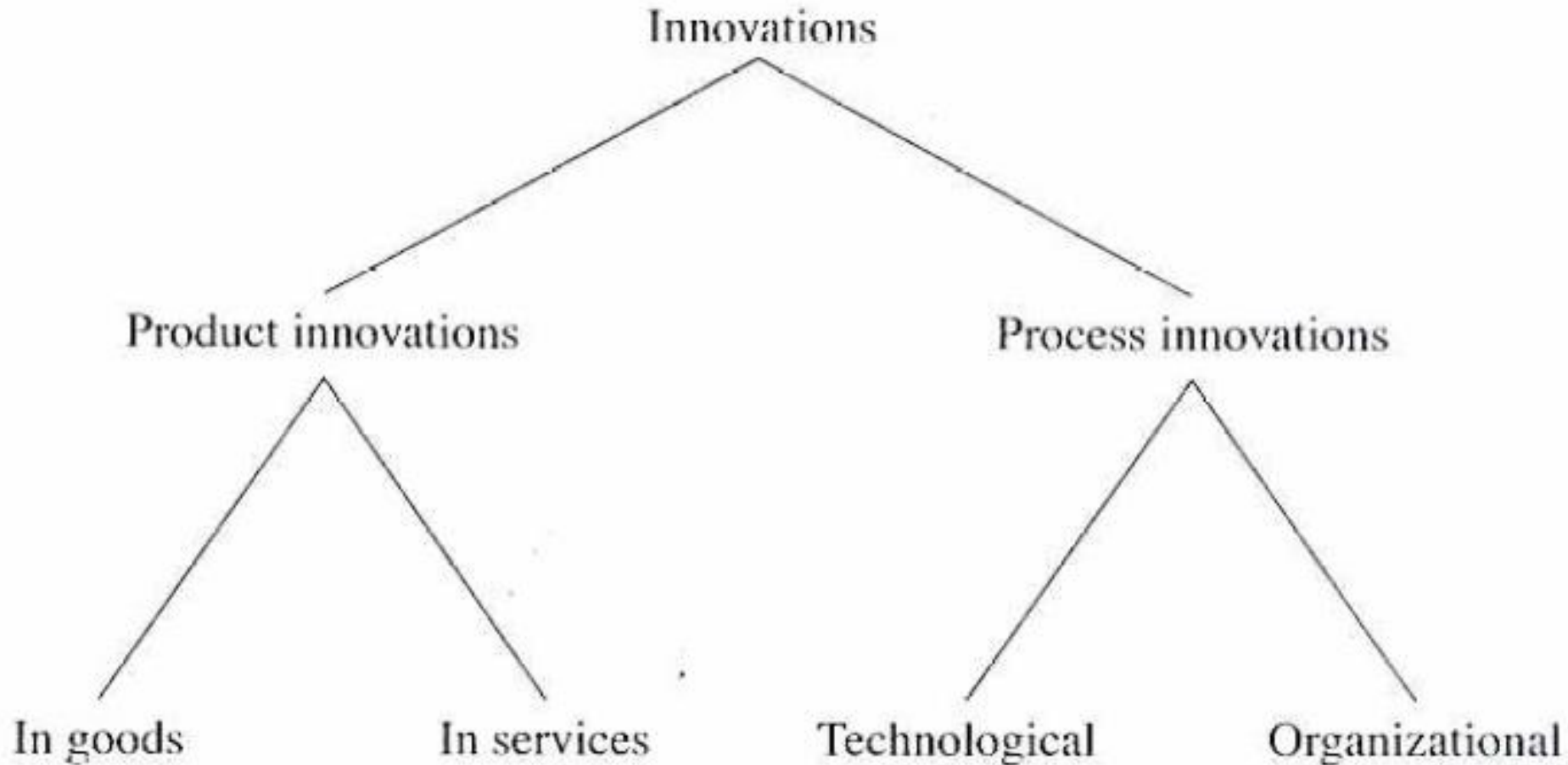


The *Oslo Manual* for measuring innovation defines four types of innovation: **product** innovation, **process** innovation, **marketing** innovation and **organisational** innovation.

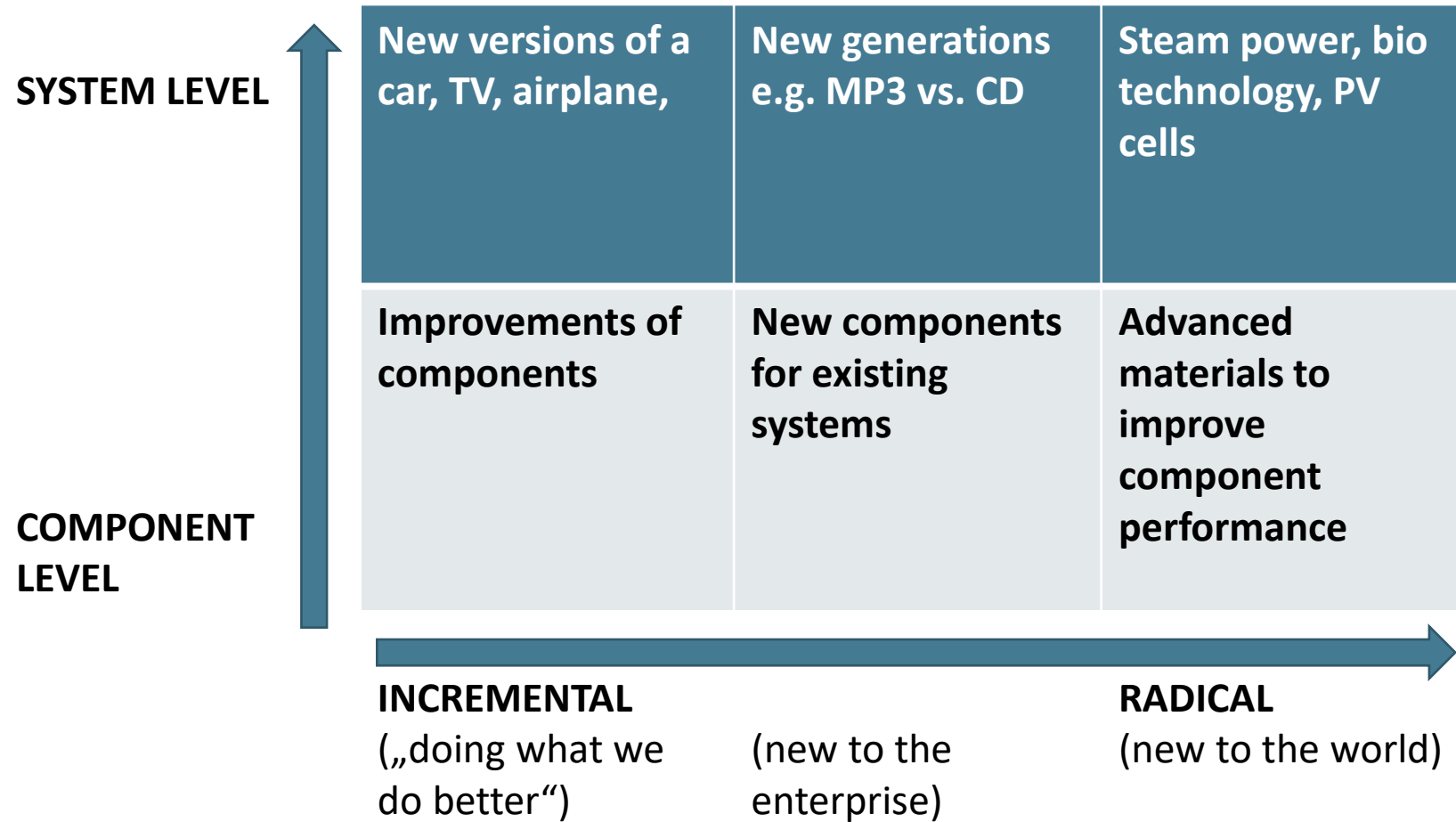
- **Product innovation:** A good or service that is new or significantly improved. This includes significant improvements in technical specifications, components and materials, software in the product, user friendliness or other functional characteristics.
- **Process innovation:** A new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software.
- **Marketing innovation:** A new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.
- **Organisational innovation:** A new organisational method in business practices, workplace organisation or external relations



## Classification of Innovation (2)



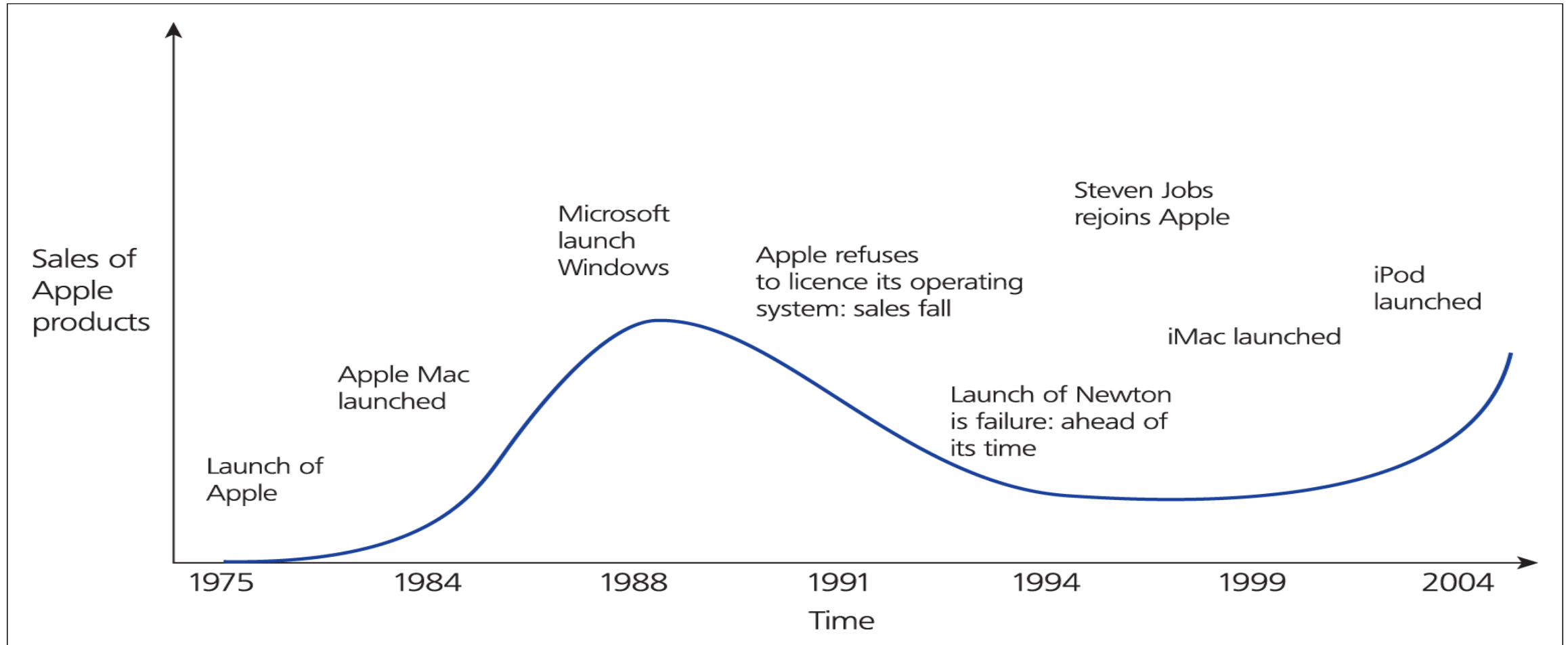
# Classification of Innovation (3): Degree of Novelty and Scope





1. Market-based view of innovation:  
market conditions provide the context which facilitate or constrain the extent of firm innovation activity (Slater & Narver, 1994; Porter, 1980, 1985).
2. Resource-based view of the firm:  
a firm's own resources provide a much more stable context in which to develop its innovation activity, and to shape its markets in accordance to its own view (Tidd *et al.*, 2001; Shavinina, L.V. (ed.) (2003); Patel, P. and Pavitt, K. 2000).
3. Serendipity (the occurrence and development of events by chance in a happy and beneficial way): Innovation is all due to luck and good fortune (Virgin Atlantic, Uber, AirBnB)

# The Innovative Model can change over time: Apple 1975 - 2004





- Joseph Schumpeter: **creative destruction** - old ways of doing things are endogenously destroyed and replaced by the new. The important aspect of understanding creativity is **entrepreneurship**.
- Paul Romer: Innovation is the **recombination of elements** to produce new technologies, products and products and economic growth. **Creativity leads to capital: Creative products are protected by intellectual property rights.**
- The **creative class** as important driver of modern economies. Richard Florida in *The Rise of the Creative Class*, 2002 popularized the notion that regions with "3 T's of economic development: **Technology, Talent** and Tolerance" also have high concentrations of creative professionals and tend to have a higher level of economic development. .



Schumpeter argued that innovation comes from the entrepreneur resulting in

- a new product
- a new process
- opening of new market
- new way of organizing the business
- new sources of supply



- “... The problem that is usually being visualized is how capitalism administers existing structures, whereas the relevant problem is how it creates and destroys them...” (Schumpeter, 1942, p. 84)
- Key to this process is the **entrepreneur**.
- Harmonic, stable innovation conditions are “punctuated by occasional discontinuities – and when these occur, one or more of the basic conditions (technology, markets, social, regulatory etc.) shift dramatically. In the process the underlying ‘rules of the game’ change and a new opportunity space for innovation opens up. ...”
- An **‘invention’** is an idea, a sketch or model for a new or improved device, product, process or system.. It has not yet entered the economic system, and most inventions never do so.
- An **‘innovation’** is accomplished only with the first commercial transaction involving the new product, process, system or device. ***It is part of the economic system.***

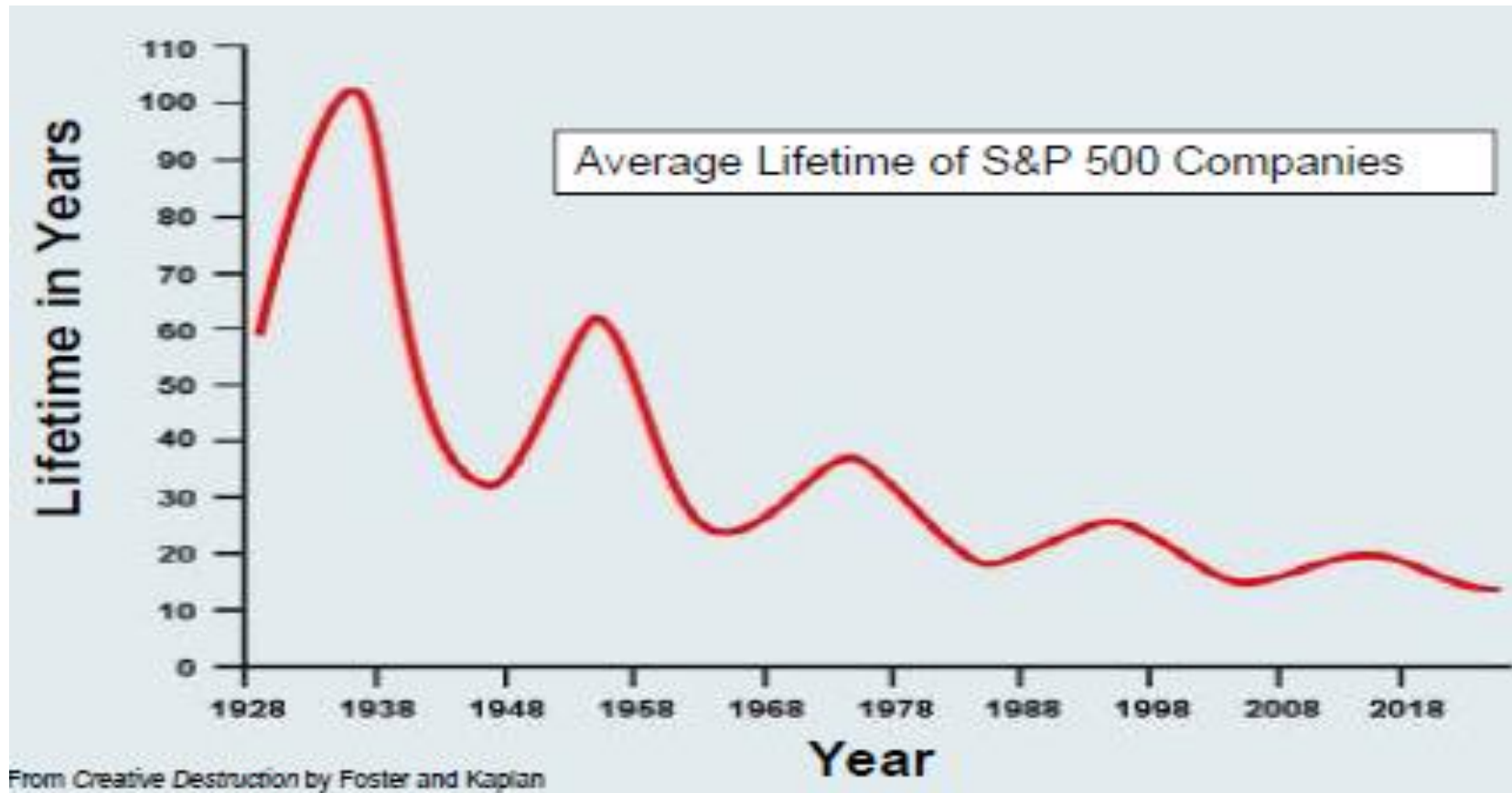


# 1. Innovation in Economics and Business Administration

- Definitions and Concepts of Innovation
- Making a case for Strategic Innovation Management



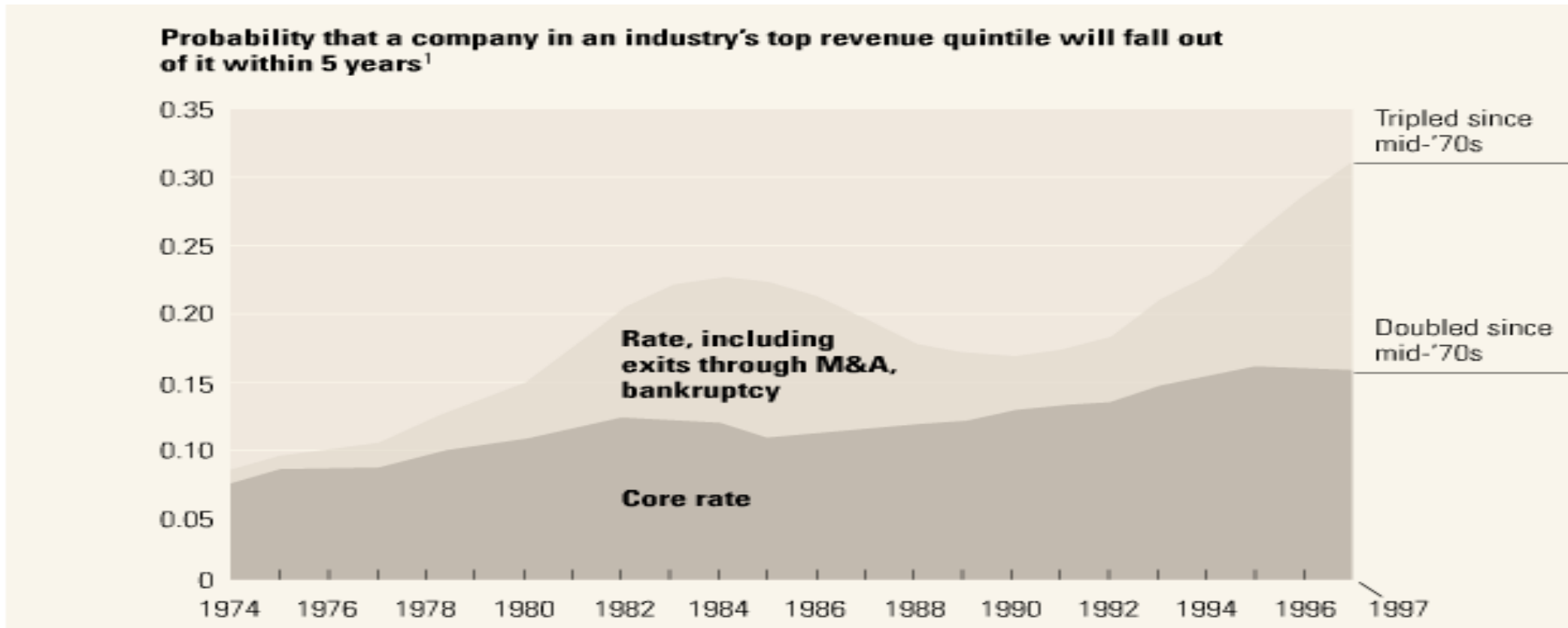
# Innovation to guarantee survival (1)



Average lifetime of S&P 500 Companies has decreased from ~60 years to ~15 years

Sources: *Creative Destruction*, Foster & Kaplan, 2001; "Extreme Competition", McKinsey, 2005

## Innovation to foster growth (2)



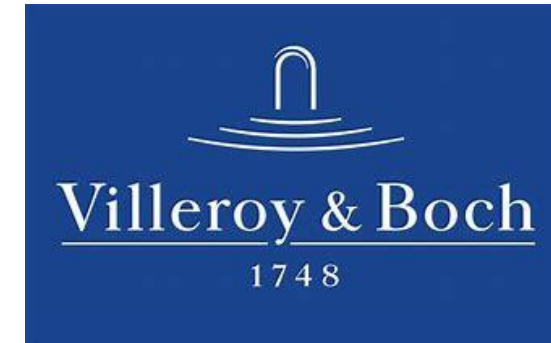
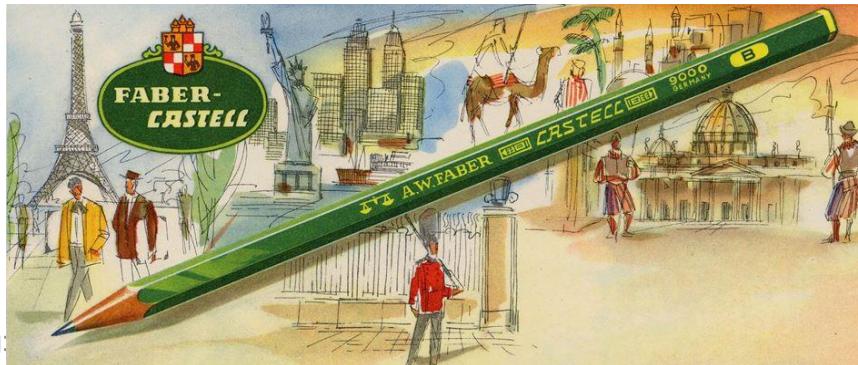
Sources: *Creative Destruction*, Foster & Kaplan, 2001; "Extreme Competition", McKinsey, 2005

**Likelihood of market leaders falling from the top has increased 2-3 times since the 70s**

# CASE 1: Examples for Companies with a Long Tradition



- Graphite and colour pencils: global production capacity over 2 000 million wooden-cased pencils per year (market leader)
- Employees (global 8000, Germany 1000)
- Group Revenue (2015/2016). 613 million EUR
- Production in 9 countries, sales companies in 22 countries, sales agents in 120 countries



- Ceramics for high end usage
- Employees: 7500 global
- Group Revenue (2016): 820 million EUR
- Production in 14 countries, 10 global brands

# CASE 1 (continued): How to survive for more than 200 years...



- What to you think these companies did to survive longer than most of the states in history?
- What kind of changes did they do in the product mix in the course of time?
- What is specific with respect to the management of these companies?
- Why could other companies not copy this success?
- Do you think that these companies will survive another 100 years or rather not and give some reasoning for your intuition.

## Case Study 1: Innovation & Survival: Faber Castell Villeroy Boch

- <https://en.wikipedia.org/wiki/Faber-Castell>
- <https://www.cassart.co.uk/blog/faber-castell-brand-story.htm>
- [https://en.wikipedia.org/wiki/Villeroy\\_%26\\_Boch](https://en.wikipedia.org/wiki/Villeroy_%26_Boch)
- <https://www.villeroyboch-group.com/en/company/innovation.html>

# The Case for Corporate Innovation Management



- **Survival: changes in strategy & structure needed**
- **Growth: recognizing opportunities for new activities**
- **Develop dynamic capabilities and entrepreneurship**
- **Business Intelligence: how does innovation and the creation of new firms threaten the firm's existence**

# The Innovation Management Process = Discipline in Resource Management



- **Searching** – scanning the environment (internal and external), processing relevant signals about threats and opportunities for change
- **Selecting** – deciding which of these signals to respond (on the basis of a strategic view of how the enterprise can best develop)
- **Implementing** – translating the potential in the trigger idea into new business and launching it in an internal or external market.
- **Learning** – enterprises have the opportunity to learn from progressing through this cycle so that they can build their knowledge base and can improve the ways in which the process is managed.

# Resource Constraints requiring Leadership and Management



Use the limited resources in the most efficient way:

- **Human Resources**
- **Tangible Assets**
- **Intellectual Property Rights**
- **System and Process Knowledge**
- **Brand value**



## 2. Innovation Strategy

- **Strategic Analysis**
- **Strategic Selection**
- **Strategy Implementation**
- **Core Capabilities / The Resource-Based View**
- **Creating and Capturing Value**





- 1. Importance of strategy as a framework to guide the change process**
- 2. Three core elements of innovation strategy formulation:**
  - strategic analysis: exploring where we should innovate**
  - strategic choice: choosing between different options**
  - strategic implementation and planning to make innovation happen**
- 3. Dynamic capability and the role of innovation in strategy building**
- 4. The major reason for strategic planning is to link goals and the resource question**



## 2. Innovation Strategy

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## 1. Defining the exploration of the innovation space

- overall environment: threats & opportunities in markets, political trends, customer needs
- resources in the organization; strength and weaknesses (competitive advantage)

## 2. Exploring the innovation space - understanding the range of possibilities

- Product, Process, Position, Paradigm (4 P-Model)
- incremental (do what we do but better) versus radical (do something different)



## Innovation Strategy

- based no positive theory
- defines possible futures of the company and its business on the basis of data
- Increases the strategic options that the company could follow

## Corporate Strategy

- based on normative statements
- defines the vision of the company and the strategic measures (what-why how)
- Reduces the strategic options that the company will follow



- **Financial pressures to reduce costs, increase efficiency**
- **Increased competition**
- **Shorter product life cycles**
- **Value migration**
- **Stricter regulation**
- **Industry and community needs for sustainable development**
- **Increased demand for accountability**
- **Demographic, social and market changes**
- **Rising customer expectations regarding service and quality**
- **Changing economy**
- **Greater availability of potentially useful technologies coupled with a need to exceed the competition in these technologies**



## 1. Product:

**Changes in the products and services that an organization can offer**

## 2. Process:

**Changes in the ways in which these offerings are created and delivered**

## 3. Position:

**Changes in the context into which the products & services are introduced**

## 4. Paradigm:

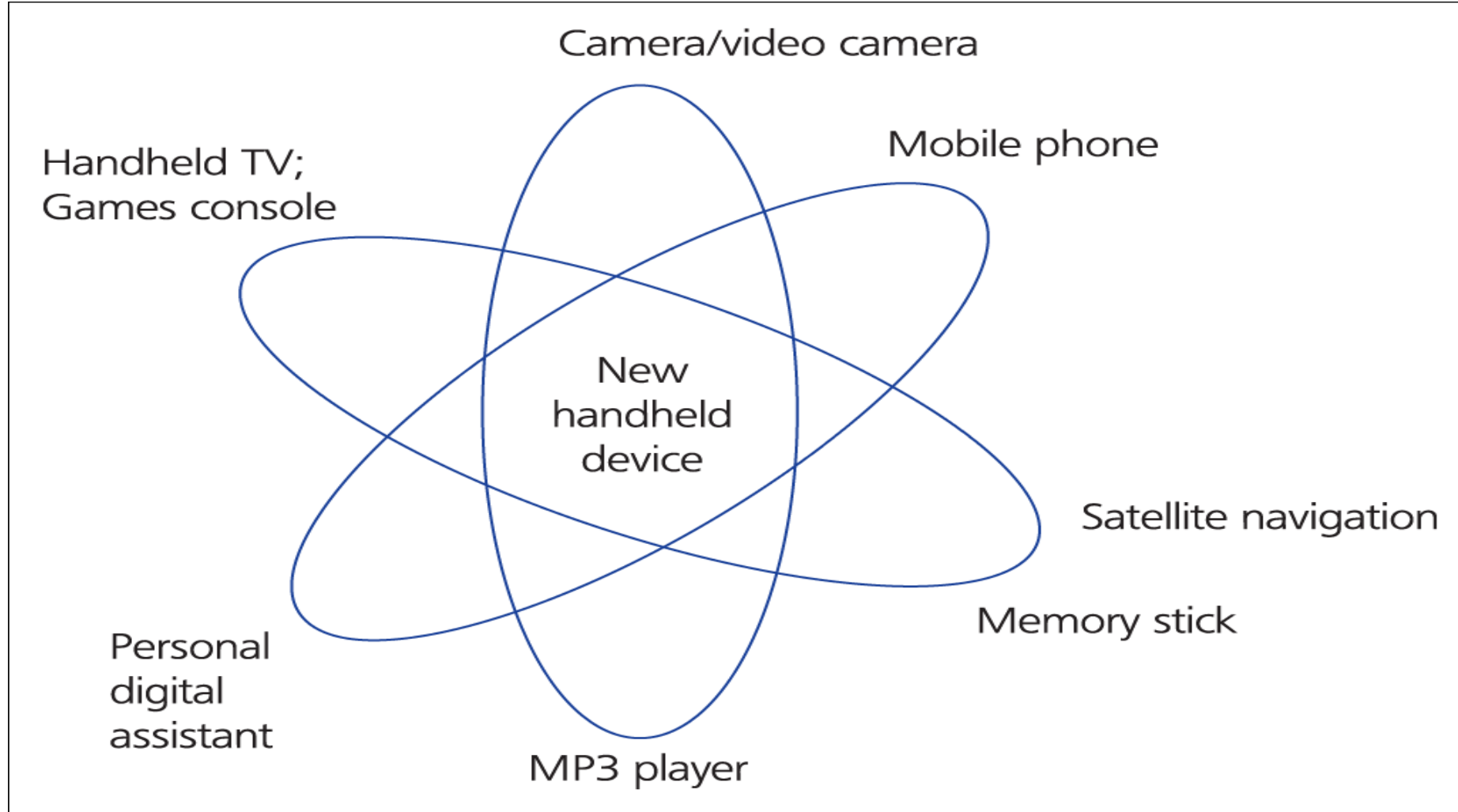
**Changes in the underlying mental models**

# Examples 4P-Modell



Innovation type	Incremental	Radical
Product	Windows Vista -> Windows VW Golf 4 -> VW Golf 5 Vinyl -> CDs	Speech recognition VW ID4 iTunes, Spotify
Process	Improved retail logistics & offerings Flat rates for land line	Online shopping VOIP & skype
Position	Boss offering wearing apparel for women	Nike Women creating a new shopping environment
Paradigm	IBM moving from a machine maker to a service company	Apple focusing on design and on content only

# Examples for Paradigm Changes







## 2. Innovation Strategy

- Strategic Analysis
- Strategic Selection
- Strategy Implementation
- Core Capabilities / The Resource-Based View
- Creating and Capturing Value

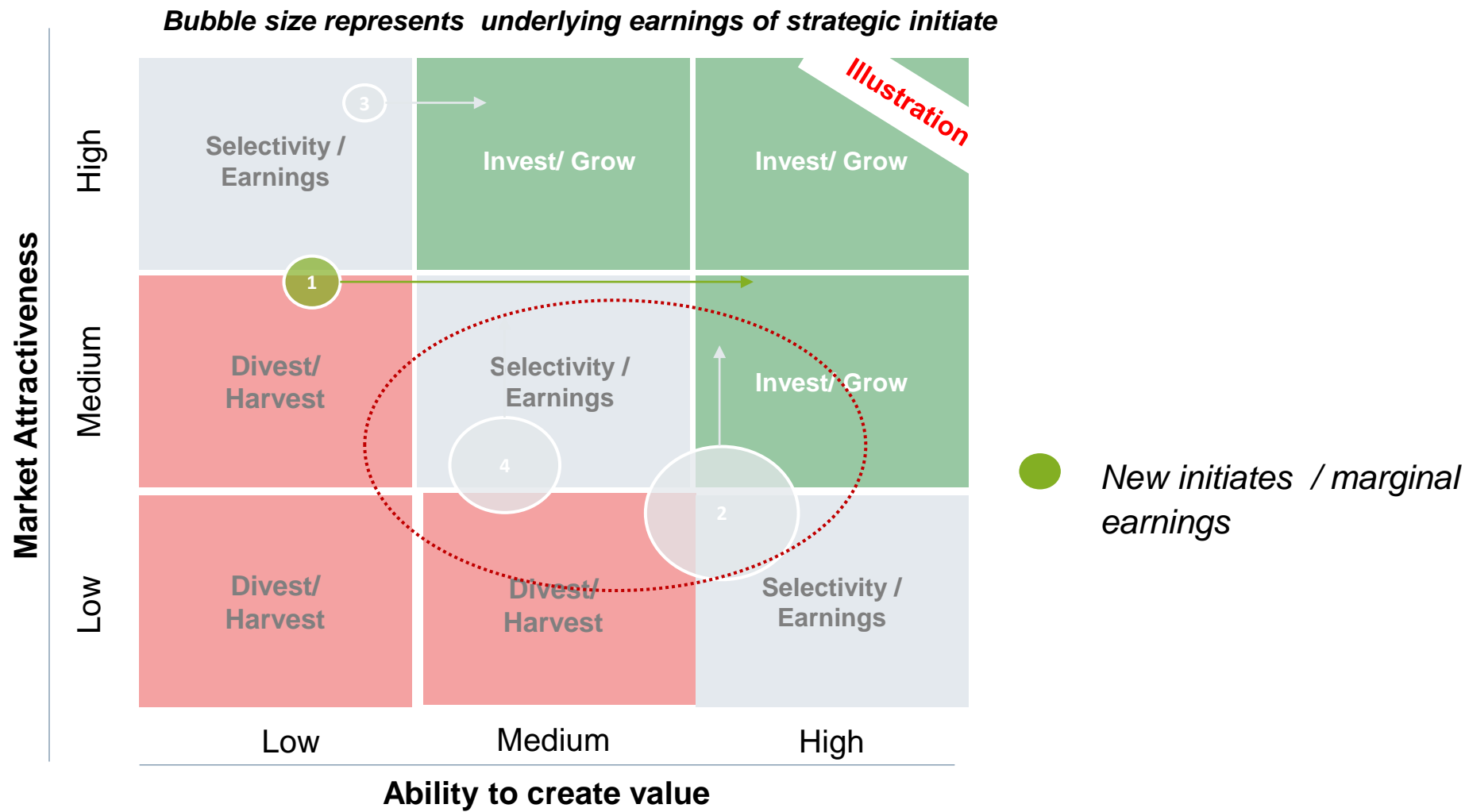
# Strategic Selection: Approaches to Project Selection / Pros & Cons



Selection Approach	Advantages	Disadvantages
Intuition (gut feeling)	fast	Lacks evidence and analysis; higher risk of getting it wrong
Financial measures (ROI, burn-ratio, payback-time)	Fast; using easy-to-calculate financial measurements	Narrow focus on financial measures; disregarding other benefits of innovation such as learning about new markets and technologies
Multidimensional measures (e.g. decision matrix)	Compares several dimensions to build an overall „score“ for attractiveness	Allows consideration of different kinds of benefits which are hard to compare; Thus level of analysis might be limited
Portfolio methods & business cases	Compares projects on several dimensions and provides detailed evidence around core themes	Takes a long time to prepare and present

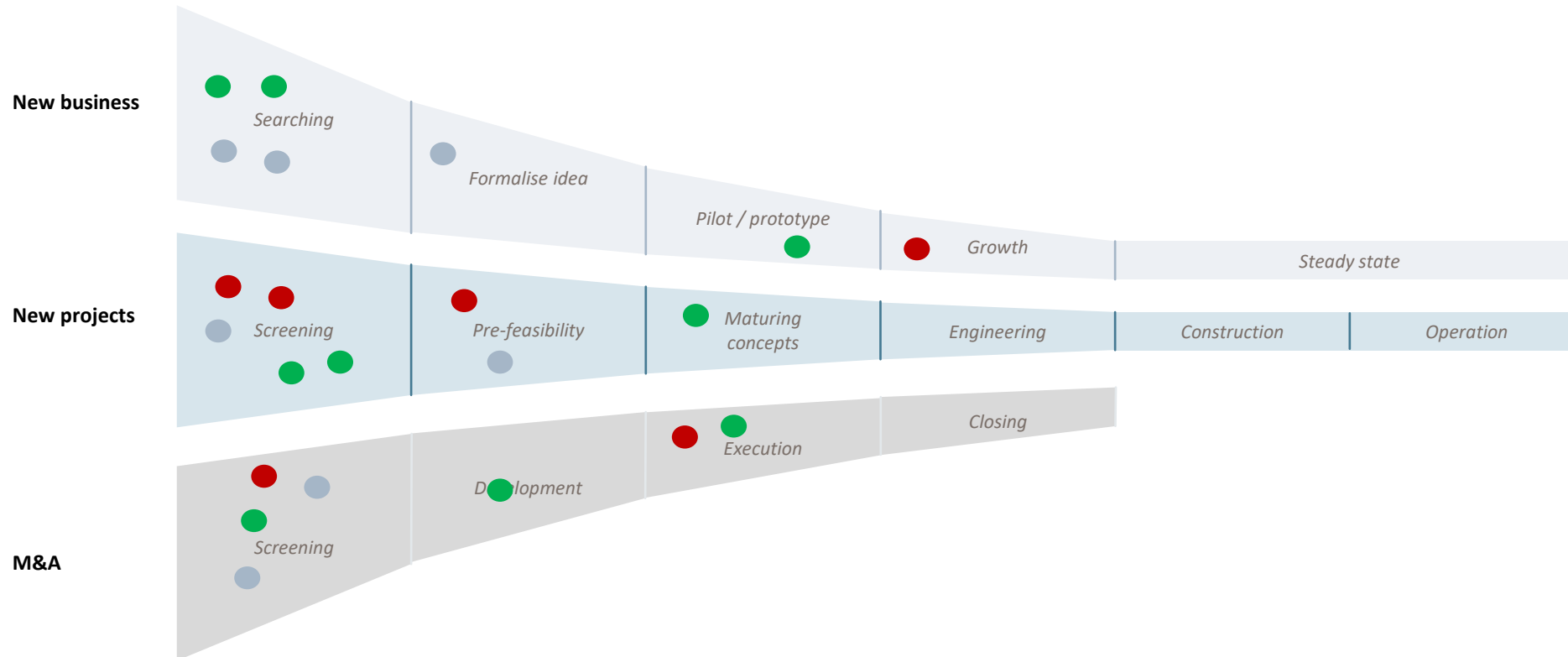
Source: J. Tidd, J. Besson (2014), p.29

# Matrix Approach



# Portfolio Methods

- ▶ Brief market view
- ▶ Overview of financial capacity
- ▶ Prof. Dr. Mark Ebers • Seminar for Business Administration, Corporate Development and Organization • University of Cologne
- ▶ **Overview of SK's investments**
- ▶ Summary / Further Action





## 2. Innovation Strategy

- Strategic Analysis
- Strategic Selection
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- **Communicating and sharing strategies**
  - What should we do more of, enhance and develop?
  - What should we do less or even stop?
  - Which new routines do we need to learn?
  
- **Breaking the strategy down to functional and regional levels**
  
- **Connecting performance dialogues and innovation strategy**



## 2. Innovation Strategy

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# The Resource-Based View (RBV): Core-Competencies-Theory of Prahalad and Hamel:



**„Deep roots = Core Competencies** allowing for growth of a strong trunk (core business) with smaller branches (**business units**) yielding leaves flower and fruit (= products & services.“

## Basic ideas:

- The real sources of competitive advantage does not reside in the products but in their core competencies.
- „The real sources of advantage are to be found in management's ability to consolidate corporate-wide technologies and production skills into competencies that empower individual business to adapt quickly to changing opportunities“
- Core Competencies feed into more than one core product which feeds into more than one business units







- **Resources:**
  - tangible (e.g. real assets, plant, equipment and location)
  - intangible (employee skills, intellectual property).
  - Resources are usually freely available in the market and are not per se competitive advantages .
  
- **Capabilities:**
  - rely on rare combinations of resources
  - are more difficult to imitate and create value for the organization.
  
- **Dynamic capabilities:**
  - allow organizations to adapt, innovate and renew.
  - are critical in conditions of uncertainty and for long-term growth.
  - create value and contribute to competitiveness in a number of ways:
    - a) ability to differentiate processes and products which are difficult to imitate
    - b) setting up processes to facilitate innovation.



Capabilities and competencies disappear over time and are not company-specific.

- Dynamic capabilities are central to innovation strategy.
- There is no consensus on the definition of dynamic capabilities

Competitive advantage is primarily driven by a firm's **resources** that are

valuable

rare

inimitable

non-substitutable



Resources are stocks of available factors that are either

- owned
- controlled or
- accessed on a preferential basis by the firm.

Resources can be

- **tangible** like location, material, building or
- **less tangible** like employee skills.

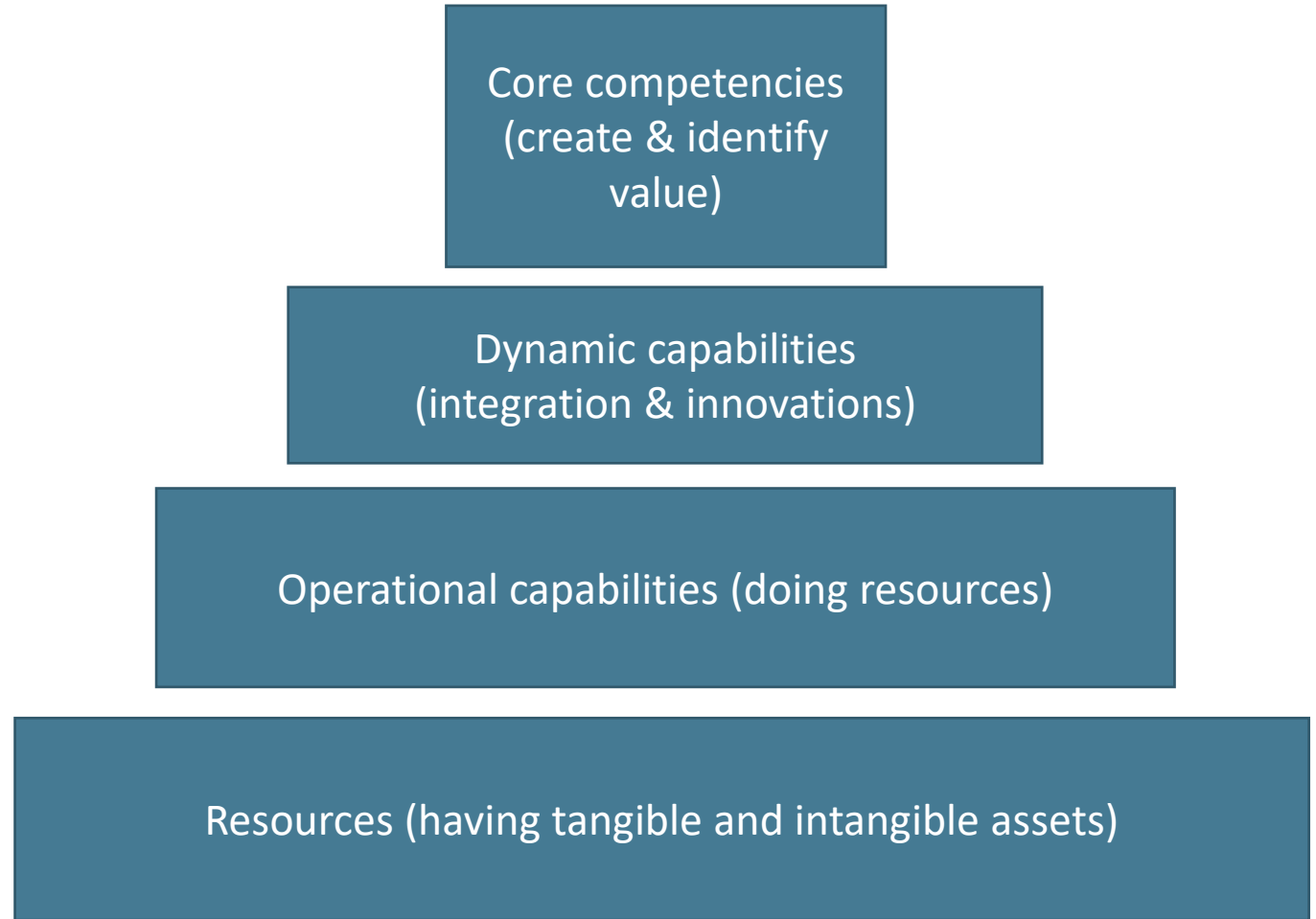
Most resources are tradable and available to most firms tradable.

**Doing and managing resources and dynamic capabilities** are more firm specific.

## Instead of a definition: What can dynamic capabilities do?



- Dynamic capabilities include capabilities to improve, adapt and innovate
- Sensing opportunities and threats
- Absorptive and adaptive capability
- Enhancing combining, protecting and reconfiguring tangible and intangible resources



J. Tidd, J. Bessant (2014); J.D. Teece (2006)

# Examples of Innovative Capabilities



Innovative firm	Explanation for innovative capability
Apple	Innovative chief executive
Google	Scientific freedom for employees
Samsung	Speed of product development
Procter & Gamble	Utilisation of external sources of technology
IBM	Share patents with collaborators
BMW	Design
Starbucks	In-depth understanding of customers and their cultures
Toyota	Close cooperation with suppliers



## 2. Innovation Strategy

- Strategic Analysis
- Strategic Selection
- Strategy Implementation
- Core Capabilities / The Resource-Based View
- Creating and Capturing Value



- Identifying the key attributes of the most successful products and services offered by the organization
- Mapping the key attributes to the resources or competencies of the organization including tangible and intangible resources (assets).
- Assessing the potential for sustaining, protecting and exploiting these resources including knowledge management



## **Regulatory capabilities**

- Tangible and on-balance sheet assets
- Intangible and off-balance sheet assets: (patents, licenses, trademarks, contracts, protectable data).

## **Positional capabilities:**

- Reputation of the company and its products
- Corporate and personal networks
- Distribution and supply chain network
- Process & operating systems (formal and informal)

## **Functional capabilities (within or outside the company):**

- Employee know-how in operations, finance, marketing, R&D
- Know-how of distributors, suppliers and professional advisors

## **Cultural capability:**

- Perception of quality standards
- Tradition of customer service
- Ability to manage change and innovate



# Mapping Resources in a Framework of Capabilities (2)



Capabilities Key product attributes	Regulatory	Positional	Functional	Cultural
<b>Strengths</b>				
1.Availability		Value Chain configuration	Forecasting skills	
2.Quality				High perception of quality
3.Technology	Patents		R&D	
<b>Weaknesses</b>				
1. Supply chain				
2 After sales				
<b>Summary of the key resources</b>				



## Issues with respect to the development of intangible resources

### ■ **Protection:**

- Recognition of intangible resources in the company
- protection of the resource by law

### ■ **Sustainability:**

- Time needed to acquire the resource
- durability and uniqueness
- probability of losing the resource, as it can be bought on the market
- vulnerability with respect to substitution
- possibility to increase the stock of the resource in the future

### ■ **Exploitation:**

- optimal use of the resource within the company
- additional usage of the resource; scopes of synergies
- key linkages between resource pools



- **Definition of the key areas of employee know-how**
- **Codification of know-how (degree of automation, systematic description or is it just in someone's head)**
- **Protection of the human resource base**
- **Sustainability and renewal of the human resource base**
- **Making use of the capabilities of the human resource base**

# Compensation Practices in Traditional and Advanced Manufacturing Firms



Type of Compensation Practice	Traditional Factory	Integrated Manufacturing
Performance-contingent	Focus on <i>individual incentives</i> reflects division of labor and separation of stages and functions.	Extensive use of <i>group incentives</i> to encourage teamwork, cooperation, and joint problem solving.
Job-contingent	Use of <i>hourly wage</i> assumes that differences in employee contribution are captured in job classifications and that performance is determined largely by the production system.	Use of <i>salary</i> assumes that the employees' contributions transcend the job per se to affect output substantially. The distinctions between classes of employment are diminished.
Person-contingent	<i>Seniority pay</i> rewards experience as a surrogate for knowledge and skill in a stable environment and rewards loyalty to reduce uncertainty within the system.	<i>Skill-based</i> pay rewards continuous learning and the value added from increased flexibility in a dynamic environment.

# Factors Determining the Firm's Capacity to Benefit from its Resources and Capabilities



- Secrecy, tacit or implicit knowledge
- Lead time & after sales service
- Learning curve
- Complementary assets
- Product complexity
- Standards
- Pioneering radical new products
- Strength of patent & license protection

Source: J.Tidd, J.Bessant (2014), p. 53

## CASE 2: Core Competencies can become Core Rigidities (Dorothy Leonard Barton (1991), Harvard Business School)



- Risk that established competencies are too dominant
- Risk that established innovation strengths may overshoot the target
- Example Kodak: Digital Camera Case



**1975**



**2001**

## CASE 2: Core Rigidities



- Why did Kodak not use its technological leadership in digital photography?
- When Kodak decided to enter market for digital photography, this did not yield the expected results. What were the reasons for this?
- Why did Kodak have to resort to Chapter 11 despite substantial divestment of assets?

### Case Study 2: Kodak

- <https://en.wikipedia.org/wiki/Kodak>
- <https://brand-minds.medium.com/why-did-kodak-fail-and-what-can-you-learn-from-its-failure-70b92793493c>



### 3. Structuring the Organisation and the Innovation Process

- **Innovative Organisations**
- **Obstacles for Innovation in Corporate Organisation Models**
- **Innovation Leadership**
- **Mapping and Managing the Process**





### 3. Structuring the Organisation and the Innovation Process

- **Innovative Organisations**
- **Leadership**
- **Teamwork**
- **Culture**
- **Organisation and Obstacles for Innovation**
- **Innovation Process Management**

# Classical Innovation Process



- **Research and development (R&D)**
- **Production**
- **Marketing**

# Characteristics of Successful Innovating Companies



- Systematic collection of all impulses that could lead to innovation
- Creativity and agility of employees
- Ability to evaluate the possibility of the innovation idea
- Good team work
- Project-based approach and ability to manage projects
- Cooperation with external experts (universities, research laboratories...)
- Proper rate of risk-taking
- Employees' motivation (The employees are willing to improve the product and the operation of the whole company.)
- Continued education of employees
- Ability to finance the innovation activities

# Components of the Innovative Organization



Component	Key Features
<b>Shared vision &amp; leadership including the drive for innovation</b>	Top management commitment, clearly articulated vision including innovation, share sense of purpose
Appropriate structure	Organization design that enables creativity, learning and interaction. Balance between organic and mechanistic options
Key individuals	Promoters, champions, gatekeepers and other roles which energize and facilitate innovation
<b>Effective team working</b>	Appropriate use of collaboration (x-geographical, x-functional, inter-organizational) to solve problems; requires investment in team selection and team building
High-involvement innovation	Participation in organization-wide continuous improvement activities
<b>Creative Climate</b>	Positive approach to creative ideas, supported by incentive systems
External Focus	Internal & external customer orientation



### 3. Structuring the Organisation and the Innovation Process

- Innovative Organisations
- **Leadership**
- Teamwork
- Culture
- Organisation and Obstacles for Innovation
- Innovation Process Management



## Empirical analysis:

- Leadership directly explains 15 % of the variance in performance of companies
- Strategy explains 35 % of the difference in the performance of companies.

Source: E.H. Bowman, C.E. Helfat (2001)

## Leadership Characteristics identified in research:

- Bright, alert, intelligent
- Seek responsibility and take change
- Skilful in task domain
- Administratively and socially competent
- Energetic, active and resilient
- Good communicators

Source: K.E. Clark, M.B. Clark (1990)

# Empirical Studies on the Role of Leadership are not consistent over time



## There is no brief universal list that proves to be significant over time:

- Study M.S Connelly, J.A. Gilbert et al. (2000): broader cognitive, information-processing skills, creative problem solving, switching from mechanistic to more organic management styles
- G.F. Farris (1972): providing evaluative role is critical; creativity is not important but capability to provide feed-back
- S.G.Scott, R.A Bruce (1994): the leader-member exchange is important
- J.Pinto, D. Slevin (1989): intellectual stimulation by leaders especially important in times of disruptive change
- A.E. Rafferty, M.A.Griffin (2004): vision and inspirational communication, building motivation and confidence,
- S.Ismail et al. (2014): study on tech companies: watching out for the unexpected value of the peripheral data (ability to analyse Black-Swan-problems)

# Leadership Focus derived from 27 Empirical Studies on Leadership and Innovation



- Upper management should establish and promote an **innovation policy** rewarding innovative behavior.
- Team composition should reflect **heterogeneity**: encouraging discussions and disagreement as well as team reflection
- Promotion of a team climate of **emotional safety** through emotional support and shared decision-making.
- Individuals and teams have **autonomy and space for idea generation** and creative problem solving.
- **Time limits for idea creation** and problem solutions need to be set, i.e. in implementation phases
- Team leaders with expertise should engage closely in the evaluation of innovative activities.

Source: L.Denti, S.Hemlin (2012)





### 3. Structuring the Organisation and the Innovation Process

- **Innovative Organisations**
- **Leadership**
- **Teamwork**
- **Culture**
- **Organisation and Obstacles for Innovation**
- **Innovation Process Management**



- **Group of people whose individual members share a common goal**
- **Their expert skills and personal abilities are complementary**
- **Its members' work activities and skills are purposefully and smoothly linked together.**



- **Dynamic balance among members:**
  - ↳ Necessity to perform a joint task
  - ↳ Individual needs of team members
  - ↳ Necessity to maintain a team
  
- **Synergic effect: every member:**
  - ↳ contributes to performance of the mutual task
  - ↳ adopts specific roles necessary for the effective team functioning.
  - ↳ contributes to the satisfaction of the individual needs of other team members

# Use and Usefulness of Techniques for Product and Service Development (2)



Tool type	High Novelty		Low Novelty	
	Usage (%)	Usefulness	Usage (%)	Usefulness
Market Size	89	3.42	42	4.50
Competition	63	4.00	53	3.70
Gap Analysis	63	3.83	37	3.71
Strategic Clusters *	52	4.50	37	4.00
Prototyping *	47	3.67	42	3.50
Market experimentation	37	4.43	58	3.67
QFD	32	4.33	37	3.57
Cross-functional teams *	100	4.37	100	4.32
Heavy weight project manager *	100	4.68	95	4.50

Usefulness Scale: 1-5, 5 = critical based on manager assessments of 50 development projects in 25 firms

\* Denotes difference in usefulness rating is statistically significant at the 5%-level

Source: J. Tidd and K. Bodley (2002), The effect of project novelty on the new product development process. R&D Management, 32, 127-138



- Team members **identify themselves with the team**.
- There is **relaxed, non-bureaucratic atmosphere**, interest in achieving joint goals, optimistic work mood.
- **Tasks and goals are clear** to all members and all identify themselves with them.
- **Differences in opinions** are accepted.
- **Disputable points** are discussed and a **solution** is looked for.
- Communication is **open**, spontaneous and fluent.
- Team members are **sincere** to each other, listen to each other.
- **Criticism is constructive** and it is not taken personally.
- Team management is of **participative**, eventually consulting, character.
- **Rules** are clearly defined.



- **Formal:** clearly visible, represents distribution of work among the team members in order to ensure performance of certain functions.
- **Informal:** influences procedures, in which things are actually done – prestige of people, their influence, power, seniority, ability to convince others play roles there.

# Team Forming by a Manager



Manager	On the way to rigidity	On the way to teamwork
Defines	Everything if possible	Vision
Prefers	Conformity	Individuality, mutuality
Believes in	Plan, task, control	Trust, motivation climate
Views the problem solving by the team	As denial of his/ her authority, waste of time	As natural and necessary
Communicates with team members	When they require it or need it	As much as possible
Conflicts inside or outside the team	Ignores them or solves them	Opens them for team solving before they become destructive
Understands group unity	As a potential threat to his/ her position	As necessity
Anticipates	People's worries of responsibility	Independence and responsibility of people



- Initiator
- Company employee
- Chairman
- Forming person
- Operational employee
- Coordinator
- Resource researcher
- Observer
- Team worker
- Finisher
- Orienting member
- Energy supplier
- Recorder
- Harmonizer





**Forming**

**Storming**

**Norming**

**Performing**

**Dissolving**

# Advantages and disadvantages of team work



- (+) Mutual cooperation and support
- (?) teams often accept more risk than individuals
- (+) can produce high quality ideas by accepting the conflict and exploring differences in the individual members' opinions

# Group cohesion and its impact on innovation



- Positive Impact:
  - larger degree of cooperation
  - better communication
  - higher resistance against frustration
  - lower fluctuation and absences,
  - lower level of tolerance towards lazy people
  
- Negative Impact:
  - difficult for new members
  - limited possibility to enforce new ideas,
  - opposition against changes in work procedures
  - often overprotective against outsiders



## Impact of team work on innovation:

- Experiments indicate that teams are more successful in idea generation.
- Teams bridge boundaries within the organization (x-functional teams)
- Self-Managed teams working within a defined area of autonomy can be very effective.

## Key elements of high performance team management:

- Clearly defined task and objectives
- Effective team leadership
- good balance of team roles (diversity) and match to individual behavioral style, diversity
- Continuing liaison with external organisation

Source: R.Holti, J.Neumann, H.Standing (1995)

# Potential Pros and Cons for using a Group (Team)



Pros of using a team	Cons of using a team
Better availability of knowledge and information	Social pressure towards uniform thought levels
Better cross-fertilization across functions and regions	„Group think“: groups tend to focus on options that have the broadest agreement regardless of quality
Broader range of experiences and perspectives	Dominant individuals have a high amount of influence on the results
Participation and involvement increases understanding, acceptance, commitment and ownership of outcomes	Individuals are less accountable in groups allowing groups to make riskier decisions
More opportunities for group development, increased cohesion, communication and companionship („fun“)	Conflicting individual biases cause unproductive levels of competition leading to „winners“ and „loser“

*Source: S. Isaksen, J. Tidd (2006)*

**A survey of 1207 firms on innovation performance has confirmed that teams and team incentives have conducive results both for incremental and radical product development . (Prester, M.G. Bozac (2012)). Quality circles and ISO 9000 quality standard processes did not perform well on radical product development.**

# Characteristics of High-Performance Teams (1)



- **Clear common goals: identification with respect to the primary task**
- **Result-driven set-up: performance monitoring with respect to time, resources & results**
- **Competent of team members: both social and functional skills**
- **Unified Commitment: self-sacrifice to reach organizational goals**
- **Collaborative climate: mutual trust, comfort zone**
- **Standards of Excellence: establish clear standards of excellence**

## Characteristics of High-Performance Teams (2)



- **External support and recognition: resources, rewards, popularity and social success**
- **Principles for leadership: support from inside and outside the group, clear guidance, support and encouragement (holds true for formal and informal leadership)**
- **Appropriate use of the team: overuse of teams is destructive**
- **Participation in decision making: engaging members in identifying challenges and opportunities**
- **Team spirit: knowing how to have a good time and release tension.**
- **Creative teams work together despite conflicts in personalities**
- **Embracing appropriate change: control functional or personal loyalties**



- **Conflicting Messages** (Group versus Team): some groups of people are called teams (e.g. a „Management Team“) but the evaluation is done on an individual level.
- **Over-management of details** (results should be detailed but not the means how to get to these results)
- **„Structured Freedom“**: vage terms about the task and expectation of detailed results;  
very detailed terms about the task and expectation of high creativity
- **Support structures and systems**: access to information, reward system, adequate material and financial resources
- **Assumed competence**: if selection of team members is primarily based on their functional or regional experience, they need a lot of coaching, as they might lack social & creative aspects





### 3. Structuring the Organisation and the Innovation Process

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## Climate impacts much more on Innovation than Culture:

- **Climate = recurring patterns of behavior, attitudes and feelings that determines daily life in an organization.**
  - Research on organizational culture is more quantitative.
  - Climate is measured in Corporate Engagement Surveys, Employee Satisfaction Survey, Leadership Surveys.
  
- **Culture refers to the deeper and enduring values, norms and beliefs of the organisation.**
  - Research on Culture is usually more qualitative.
  - Culture is based on vision statements, strategy and code of conducts.

# Climate Factors Impacting on Innovation



Climate factor	Definition	Impact on Innovation
<b>Trust &amp; Openness</b>	Refers to the emotional safety in relationships.	When there is strong level of trust , employees dare to put forward ideas and opinion without any fear of reprisals or ridicule in the case of failure.
<b>Challenge and Involvement</b>	Degree to which people are involved in daily operations, long term goals and visions.	High levels of involvement means that people are intrinsically motivated.
<b>Support &amp; Space for Innovation</b>	Amount of idea time that people are given for exploring innovation	If there is not enough idea time , people are only occupied with their current projects and tasks. There is not enough time allocated for activities that might lead to innovation.
<b>Conflict and Debate</b>	Conflict refers to the presence of personal, interpersonal or emotional tension	Relationship conflicts are very time-consuming and destructive. Lack of a prudent debate culture leads to anxiety and holding back of information needed for innovation.
<b>Risk-taking</b>	Tolerance of uncertainty and ambiguity	Risk avoiding climate will let people always stay on the safe side and avoid both commercial and personal risk.
<b>Freedom</b>	Independence of behavior exerted by the people in the organization	In companies with freedom people are given autonomy to define much of their own work. In environments with little freedom people tend to show less initiative.

# Climate Factors Impacting on Innovation: Empirical Evidence from Research



Climate factor	Most Innovative Score	Least Innovative Score	Difference
Trust & Openness	253	88	165
Challenge and Involvement	260	100	160
Support & Space for Innovation	218	70	148
Conflict and Debate	231	83	148
Risk-taking	210	65	145
Freedom	202	110	92

*Source: S. Isaksen, J. Tidd (2006), Meeting the Innovation Challenge. Chichester: John Wiley*



### 3. Structuring the Organisation and the Innovation Process

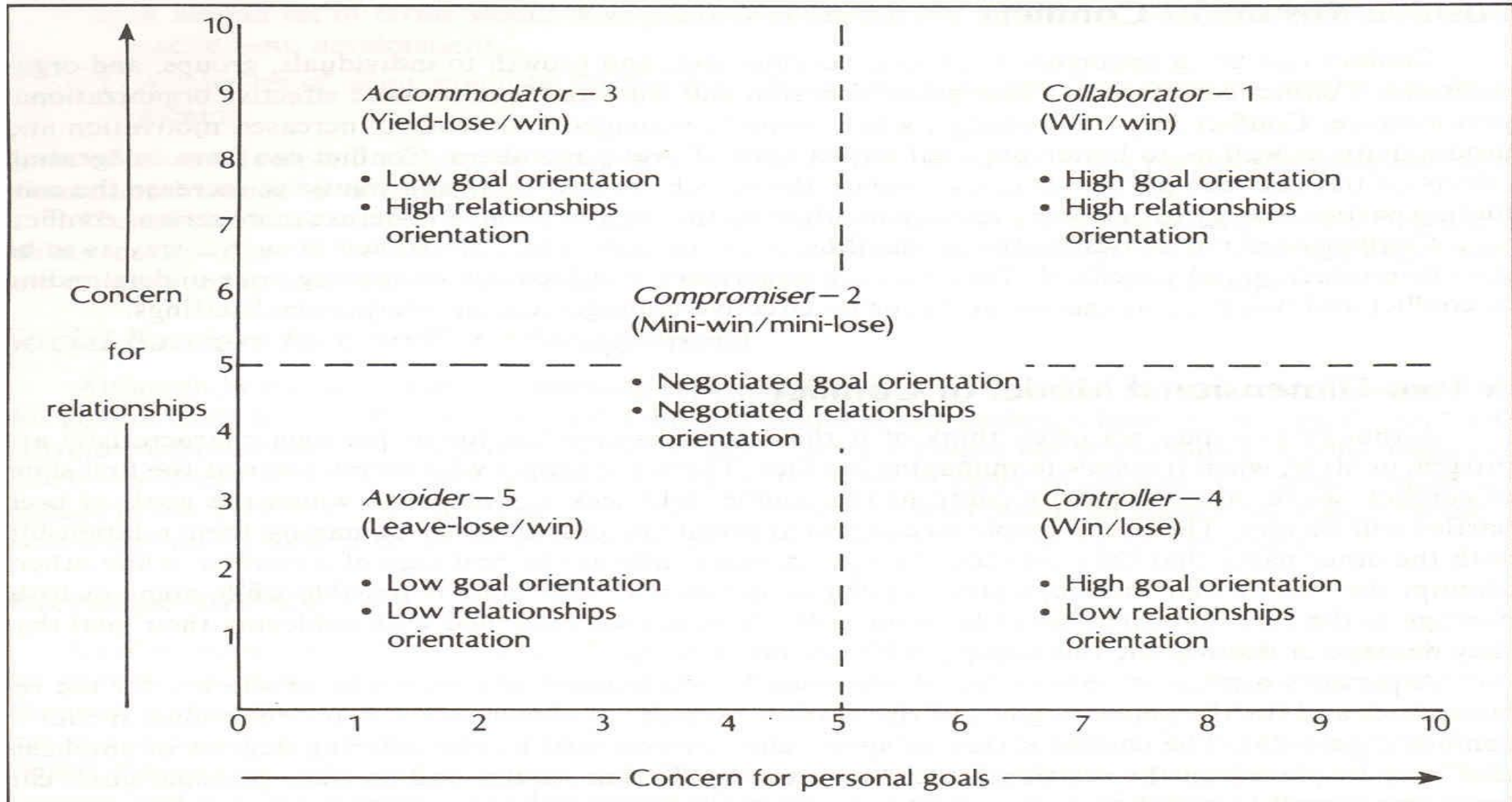
- **Innovative Organisations**
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# Obstacles to Innovation in Organization based on the Theory of the Firm



- Transaction-cost Theory (Ronald Coase (1937), "The Nature of the Firm". Economica. Blackwell Publishing. 4 (16): 386–405)
- Theory of Bureaucracy (William A. Niskanen (1968): Bureaucracy and Representative Governments, 1968)
- Theories on Co-operation and Game Theory
- Principal-Agent-Approach

# Collaboration: Two-dimensional model of a conflict





### 3. Structuring the Organisation and the Innovation Process

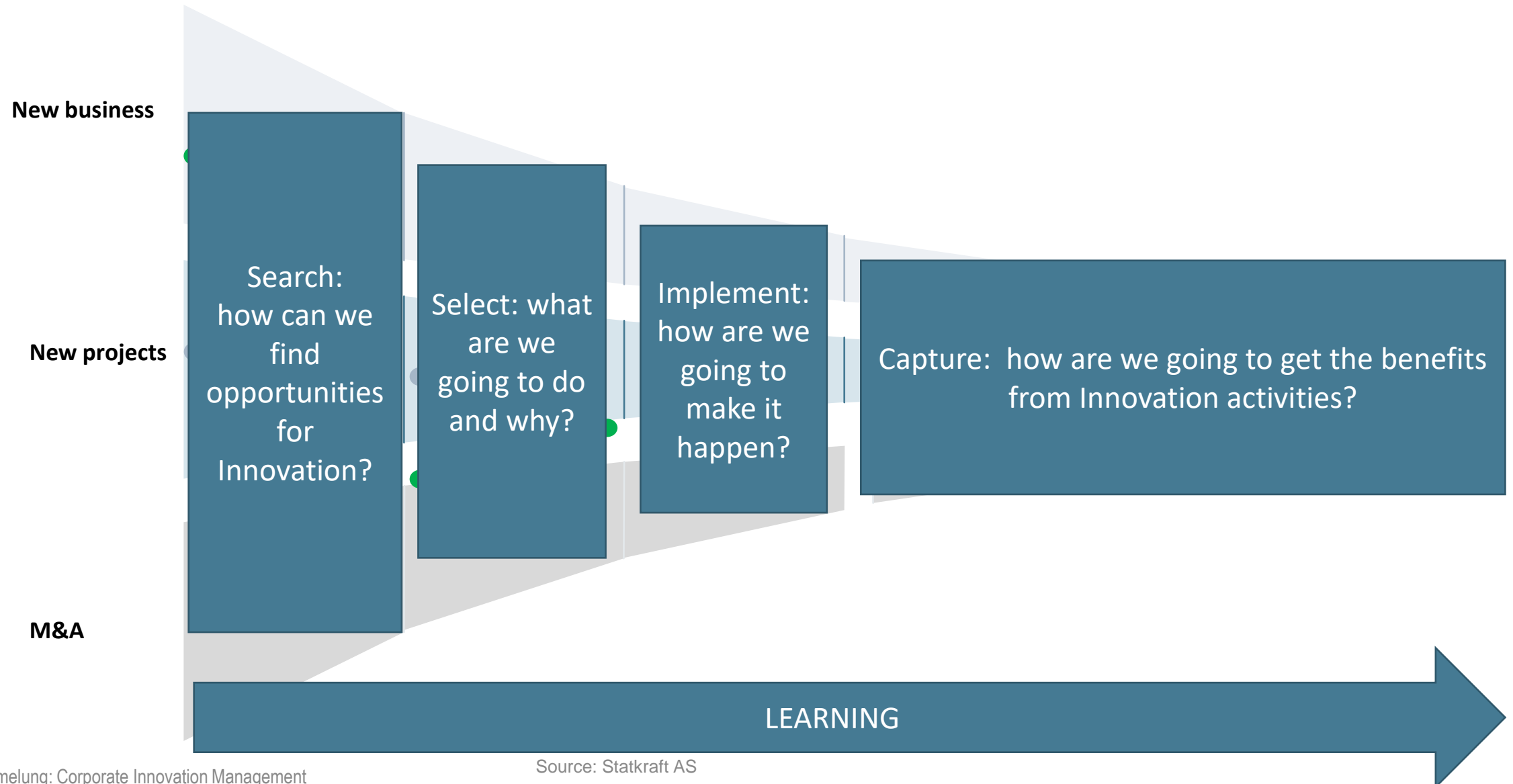
- **Innovative Organisations**
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- Inventions are events, Corporate Innovation is a process.
- There is a difference between the Innovation process of a start-up entrepreneur and Corporate Innovation: corporations manage a process and not a company with a single idea .
- The major difference is the process design (Stage-Gate-Approach):
  - searching for ideas
  - selecting the possibilities that the corporation is to follow up
  - acquiring the resources to make it happen
  - developing the idea (prototyping)
  - managing its diffusion
  - capturing the value from the process through growth

# Stage-Gate-Approach: The Funnel Model



# Advantages and Disadvantages of Small Firm Innovators



ADVANTAGES	DISADVANTAGES
Speed of decision making	Lack of formal systems for management control
Informal culture	Lack of access to key resources, i.e. finance
High quality communication	Lack of key skills and experience
Shared and clear vision	Lack of long-term strategy and direction
Flexibility, agility	Lack of structure & succession planning
Entrepreneurial spirit & risk taking	Poor risk management



## 4. Sources of Innovation

- **Innovation Impulses**
- **Supply Side: Knowledge Push, Imitation, Recombinant Innovation, Process Improvements**  
**Demand Side: Need Pull, Unserved Needs, Mass Customisation,**
- **Futures and Forecasting and Design-driven Innovation**
- **Disruption, Accidents and Crisis Driven Innovation**



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## Internal

1. unexpected event
2. contradiction
3. change of work process
4. change in the structure of industry or market

## External

5. demographic changes
6. changes in attitudes
7. new knowledge



- Non-compliance with economic reality
- Contradiction between reality and anticipations about it
- Contradiction between the anticipated and real behavior of customers and their values



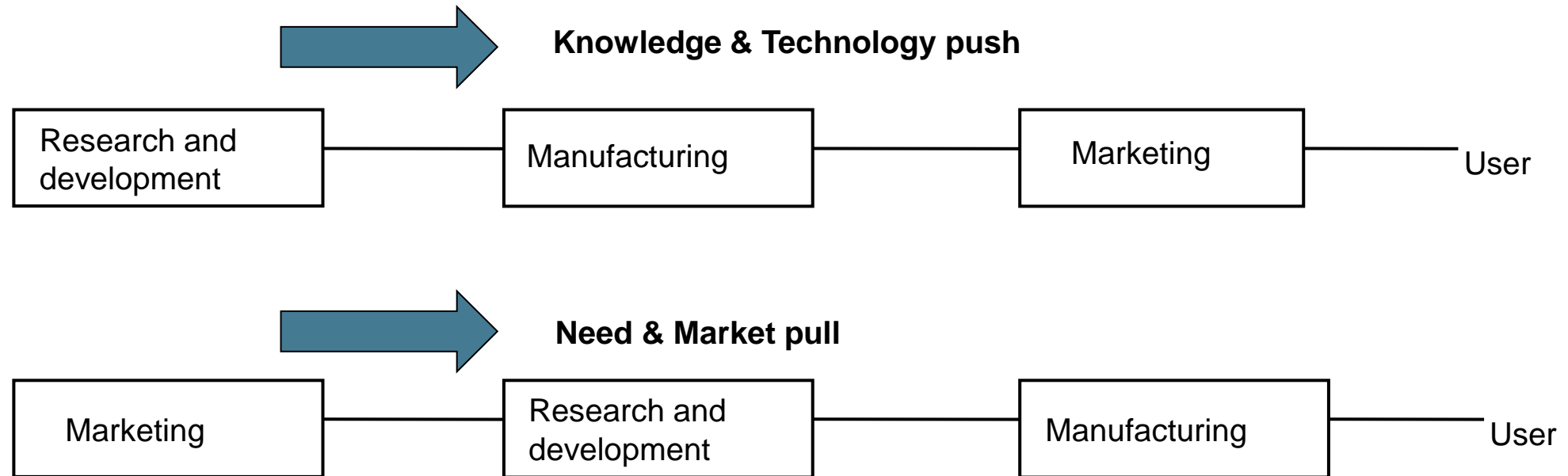
- Unexpected success
  - 1. What will the use of the offered opportunity mean to us?
  - 2. Where will its introduction take us?
  - 3. What do we need to do for its implementation?
  - 4. How can we achieve that?
- Unexpected failure
- Unexpected external event





- **Market pull**
  - ↳ looking for the best way of satisfying a newly emerging customer demand
  - ↳ improvement of the existing products, extension of the existing offer or decrease of price
  - ↳ impulses for continuous, incremental innovations or for process innovations
- **Research and development push**
  - ↳ looking for commercial use of new impulses resulting from the R&D results
  - ↳ generating of new markets for conceptually different products

# Linear models of Innovation management





## 4. Sources of Innovation

### - Innovation Impulses

**- Supply Side: Knowledge Push, Imitation, Recombinant Innovation,**

**Process Improvements**

**- Demand Side: Need Pull, Unserved Needs, Mass Customisation,**

**Futures and Forecasting and Design-driven Innovation**

**- Disruption, Accidents and Crisis Driven Innovation**



## Internal environment

- Own R&D
- Technical divisions – design, technology
- Production divisions (production, provision of services)
- Marketing and sales
- Logistics (purchase and supplies)
- Guarantee and post-guarantee service
- Owners

# Change in the structure of industry and market



- Rapid growth of the industry
- Identification of new market segments
- Convergence of technologies (e.g. use of computers in telecommunications)
- Rapid change of the industry and resulting need of a structural change



- **identification research:** to monitor the scientific, technical and economic information and identify innovation impulses applicable in the company
- **basic research**
- **applied research:** acquire knowledge and means applicable for the meeting of specific, beforehand-defined goals
- **development:** systemic use of knowledge and means acquired in the applied research for the creation of a new or improvement of the existing product or for the creation or modification of processes
- **recombinant innovation:** cross-overs from other designs and other applications
- **design-driven innovation**

# Improvement in Processes



- 1. Increasing productivity through automization**
- 2. Digitalization**
- 3. Business & process reengineering**
- 4. Continuous improvement programs**



## 4. Sources of Innovation

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- easiest to describe and to predict
- influence what will be bought, who and in which amounts will purchase



- change in the approach to health: health-care, food, spending the leisure time
- “upper-middle class”: a chance to offer non-standard services at non-standard prices
- increasing migration, feminism, regionalism etc.



## External environment

- Customers
- Suppliers
- Competitors
- Consultants, R&D institutions
- Schools, universities
- Professional publications, Internet
- Exhibitions, fairs, specialized seminars and conferences
- Advertising agencies
- Investors
- Media
- Authorized testing laboratories, certification agencies
- State institutions, public sector
- Legislation
- Globalization

# Need Pull



- 1. New products and services**
- 2. Repositioning: product differentiation and customizing**
- 3. Mass customization through cost reduction**
- 4. Incremental product improvements**
- 5. User led customization**

# Options in Customization



- 1. Distribution customization**
- 2. Assembly customization**
- 3. Fabrication customization**
- 4. Design customization**

# Hidden Needs



- Creative techniques and innovation tools
- usually combined with external sources



## 4. Sources of Innovation

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- Demand Side: Need Pull, Unserved Needs, Mass Customisation, Futures and Forecasting and Design-driven Innovation
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- **Disruptive innovation** refers to an innovation that
  - creates a new market and value
  - eventually disrupts an existing market and value network
  - displaces established market leading firms, products, and alliances
- Disruptive innovations tend to be produced by outsiders and entrepreneurs rather than existing market-leading companies.
- Analysis of the pattern of change in different industries: incl. Computer disks, earthmover equipment & steelmaking
- Common pattern in these industries: for a long time there is stability
- “Low-end disruption”: targets customers who do not need the full performance valued by customers at the high end of the market,
- “New-market disruption” targets customers who have needs that were previously unserved by existing incumbents.





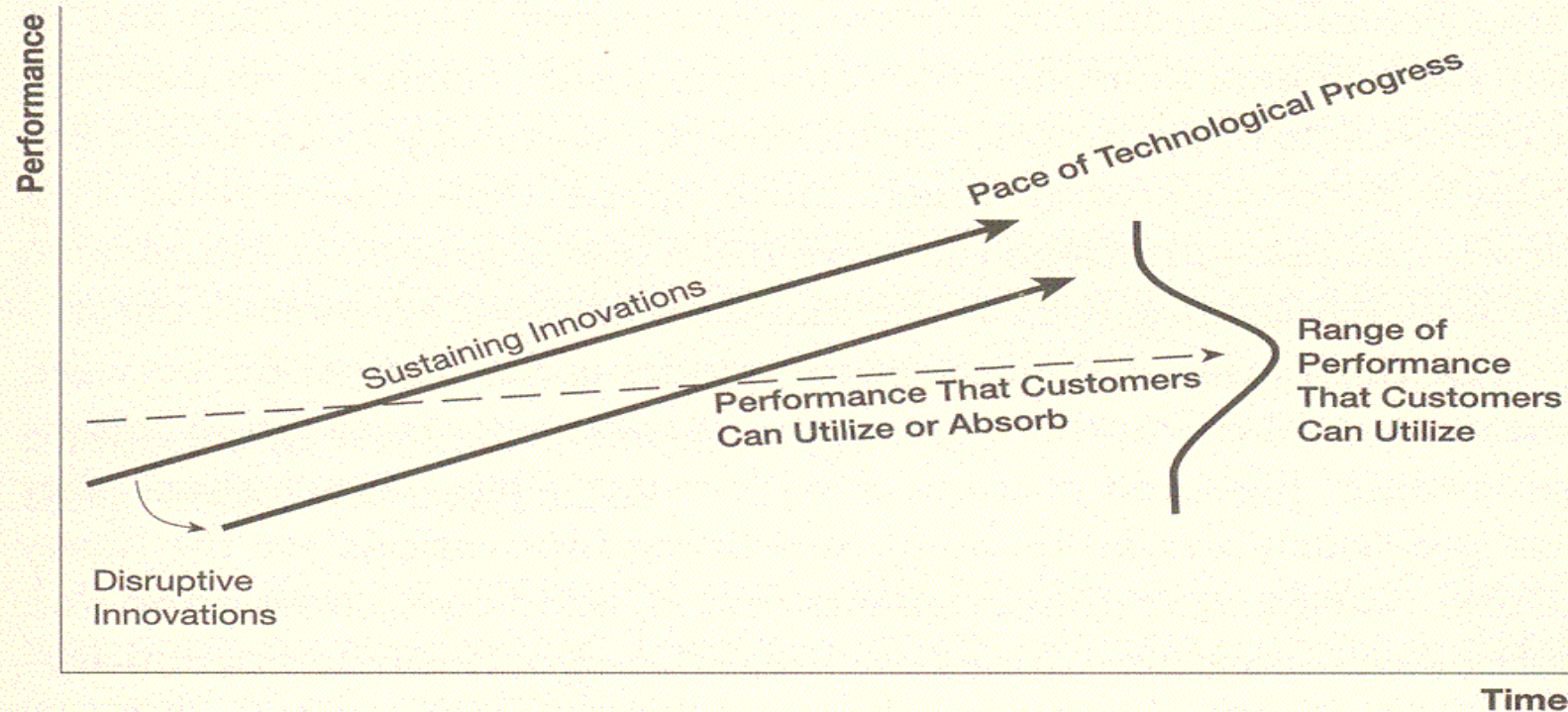
- DT damage established companies that do make use of these technologies.
- DTs are usually not radically new or difficult from a technological point of view.
- Disruptive technologies present a different package of performance attributes that, at the beginning are not valued by existing customers.
- These performance attributes that existing customers do value improve at such a rapid rate that the new technology can later invade those established markets.

# Disruptive Innovation Models



FIGURE 2 - 1

## The Disruptive Innovation Model



Source: Clayton M. Christensen: The Innovator's Solution, Harvard  
Business Press, 2003



- **Sustaining:** focused on demanding customers; both incremental and radical. Incumbents have resources and motivation.
- **Disruptive:** introduce products and services not as advanced as existing ones, but offering other advantages (simpler, cheaper, more user friendly, ...) and focus on new or less demanding customers.

# Examples for Disruptive Innovation



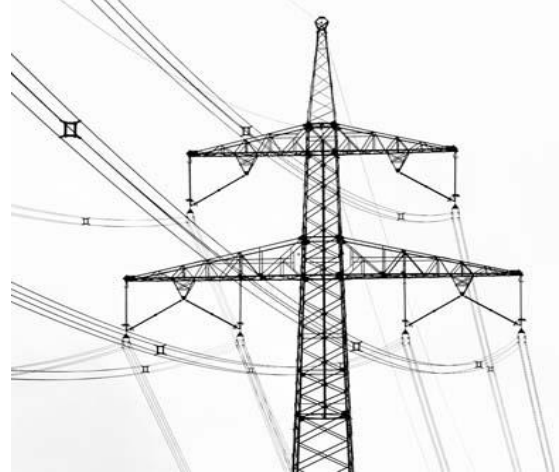
Sector	Disruptive Technology	Market being disrupted
Academia	Wikipedia	Traditional encyclopedias
Communication	Telephony	Telegraphy
Computer hardware	Personal computers	Mainframes
Steel	Mini electric steel mills	Vertically integrated steel mills
Photography	Digital Photography	Chemical Photography
Transportation	Steam ships	Sailing ships
Medicine	Ultra sound	X-ray
Light	LEDs	Light bulbs
Music industry	Streaming	CDs

# Dealing with Discontinuous Innovation



- **Search at the periphery and pick up weak signals**
- **Use multiple and alternative perspectives**



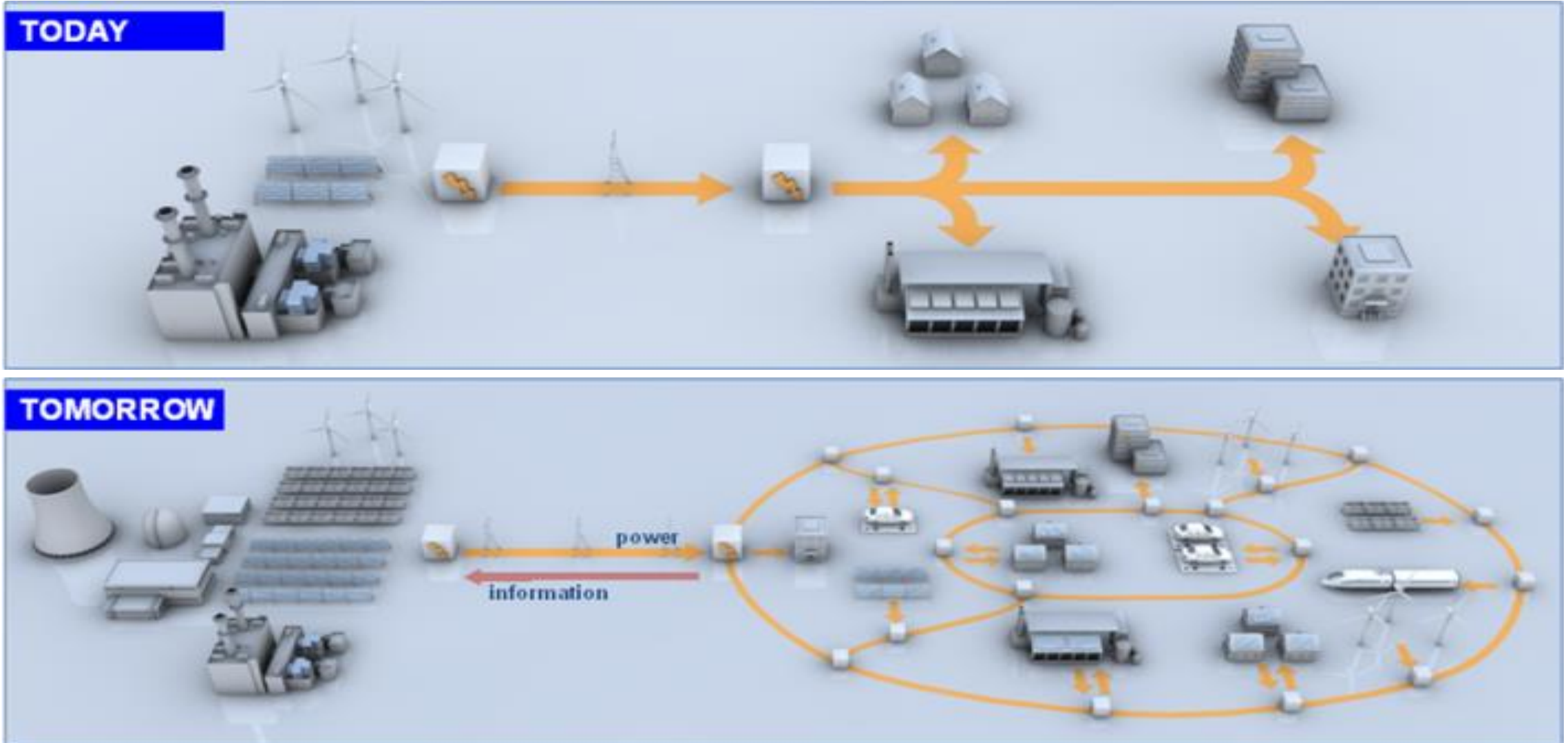


# disruption



# Value chain is changing: are we in the circle or are we out?

Prof. Dr. Mark Ebers • Seminar for Business  
Administration, Corporate Development and  
Organization • University of Cologne



# CASE STUDY 3: What kind of Organizational Innovation was triggered by COVID19?



## 1. Description of Innovation

- Idea (it can be an idea that you had in your mind or one that has been developed by others):  
.....

- Describe Economic and/or Social value:  
.....

## 2. Innovation Process

- Innovation impulse
- Supply side or knowledge push
- Demand side or need pull
- Sustainable or disruptive





## 5. Search Strategies and Forecasting

- **Innovation Search Strategies**
- **Innovation Networks**
- **Knowledge Management and Learning**
- **Forecasting Emerging Opportunities**



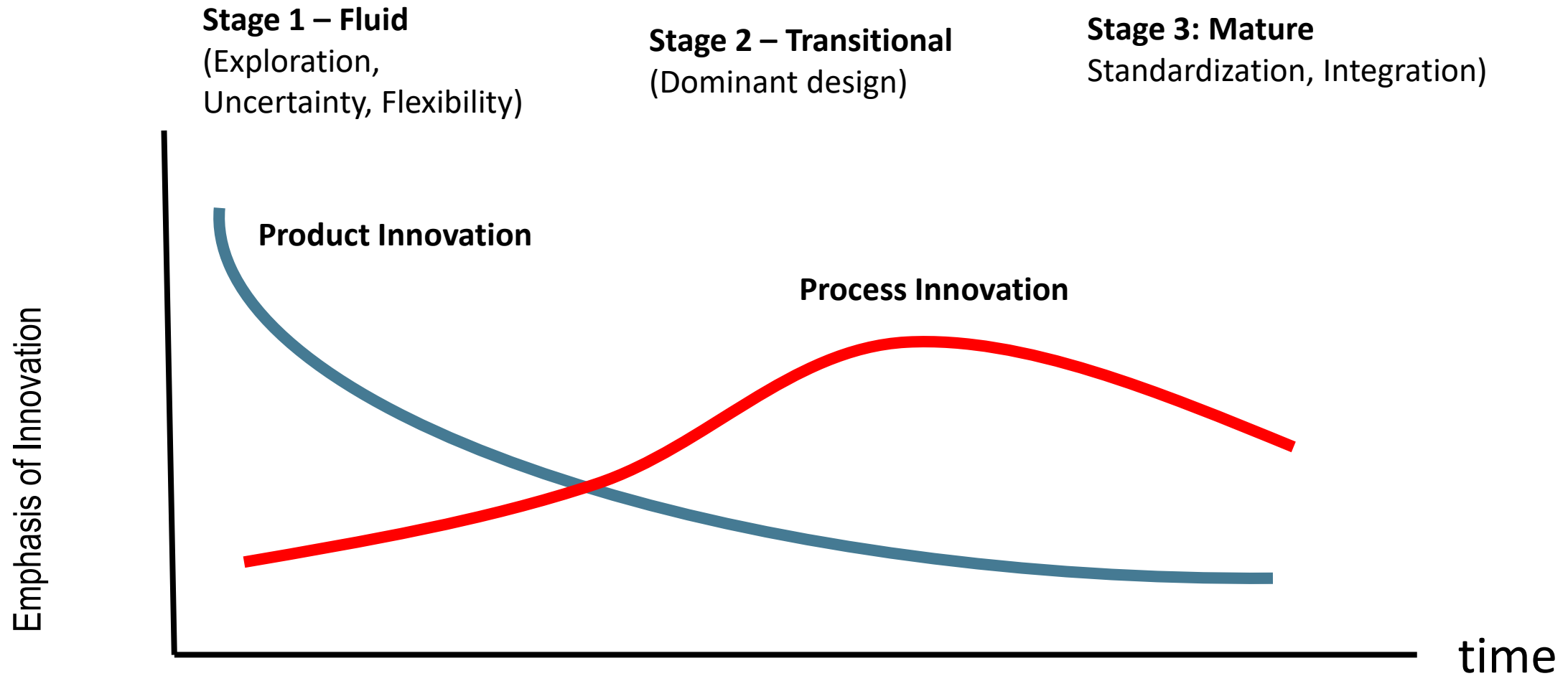
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- Opportunities for innovation are not short of supply, as they come from many different directions & sources
- Management: challenge: spotting the potential in the wide range of possibilities and innovation impulses **given limited resources**
- Push or Pull Innovation: most sources of innovation involve both push and pull factors. It is also a question of timing regarding the product or process life cycle
- Incremental or Radical: most of the time Corporate Innovation is about exploiting, elaborating and creating variations. Trajectory changes are less common.
- Timing, adoption & diffusion: the question is when to enter in the Innovation-Life-Cycle: radical changes are likely to happen in the first phase.

# The Innovation Lifecycle



Source: Abernathy, W, J. Utterback (1975), A dynamic Model of Product and Process Innovation.

# Usage of Ideation Sources in Searching Strategies for Product Innovation (1)



Approach	Extent of Usage (% of sample using)	Rank	Effectiveness (scale of 1 – 10)	Rank
Ethnography	12.9	13	6.8	1
Customer visits teams	30.6	4	6.6	2
Customer focus groups for problem detection	25.5.	5	6.4	3
Lead-user methods	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 Boards	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 & vendors	22.2	7	5.5	12

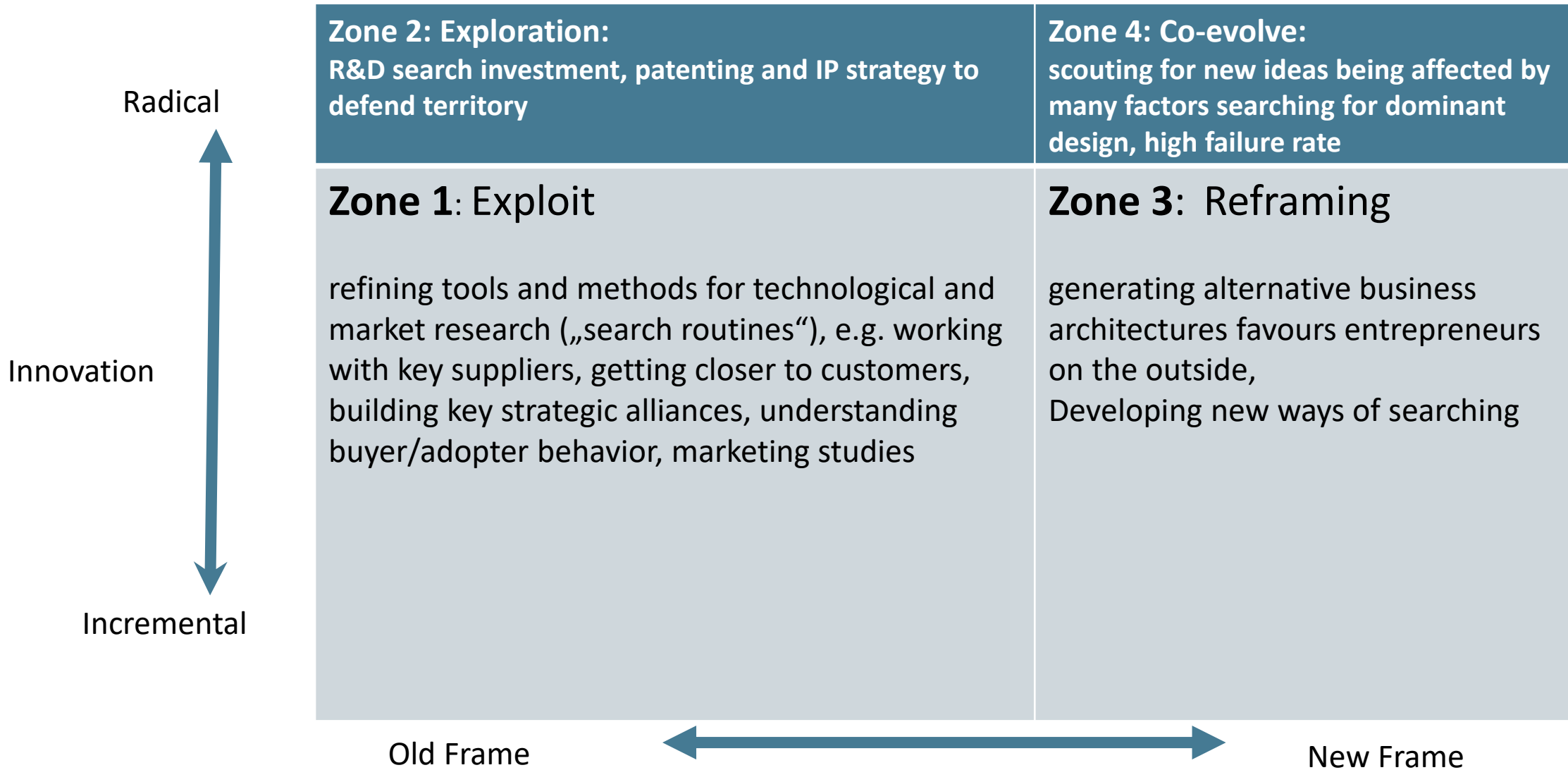
## Usage of Ideation Sources for Product Innovation (2)



Approach	Extent of Usage (% of sample using)	Rank	Effectiveness (scale of 1 – 10)	Rank
Patent mining	33.0	3	5.5	13
Assessing external technical community	19.5	9	4.9	14
Scanning small businesses and start-ups	13.0	13	4.9	15
External product design & crowd sourcing	2.0	18	4.8	16
External submitted ideas	7.9	16	4.5	17
External idea contests	4.1	17	4.3	18

Source: Cooper R. , R and S. Edgett (2008), Ideation for Product Innovation: What are the best methods?

# A Map of the Innovation Search Space





## 5. Search Strategies and Forecasting

- Innovation Search Strategies
- **Innovation Networks**
- Knowledge Management and Learning
- Forecasting Emerging Opportunities



# Developing New Ways of Searching for Exploration and Co-evolution Strategies



- **Sending out scouts:** dispatch idea hunters to track down new innovation triggers
- **Exploring multiple futures:** use future techniques to explore alternative possible futures and develop innovation options
- **Using the web:** online communities and virtual worlds to detect new trend
- **Working with active users:** team up with product and service users to see the ways in which they change and develop offerings
- **Deep diving:** study what people do, rather than what they say they do
- **Probe and Learn:** Use prototyping as a mechanism to explore emergent phenomena
- **Mobilize the mainstream:** bring mainstream actors into the product and services development process
- **Corporate Venturing:** create and deploy corporate venture units
- **Corporate entrepreneurship and intrapreneuring:** stimulate the entrepreneurial talent inside the organization
- **Use brokers and bridges:** cast the ideas net wider, connect with other industries
- **Deliberate diversity:** create diverse teams and a diverse workforce
- **Idea generators:** use creativity tools
- **Artificial Creativity:** being used in programming, film industry, music industry, financial services



- Open Innovation
  - using online innovation markets
  - university research
  - strategic alliances and joint ventures
  - Corporate Venturing
- Networks for Innovation
  - collective efficiency
  - collective learning
  - collective risk taking
  - intersection of different knowledge sets
- Knowledge Management:
  - Mobilizing employee ideas and knowledge around incremental product and process innovation
  - Voice of the Customer, social networks, communities of practice
  - Intrapreneurship



## 5. Search Strategies and Forecasting

- Innovation Search Strategies
- Innovation Networks
- **Knowledge Management and Learning**
- Forecasting Emerging Opportunities



- R&D: Balance between basic research and applied research
- Market Research: dynamic capability of the organization
- Absorptive capacity of the firm with regards to knowledge development and dissemination:
  - adaptive learning: establishing and enforcing routines for dealing with a particular level of environmental complexity
  - generative learning for taking new levels of complexity



- components could change without causing any change in other components
- modular design enables to assemble system more easily, from “plug and play” components whose interfaces are well understood
- modular architecture makes it easy for many companies to innovate components without worrying about possible impact on other parts of the system

# Closed Innovation versus Open Innovation (1)



<b>Closed innovation</b>	<b>Open innovation</b>
All the best people are working for us	Not all the best people are working for us . We must work with clever people within and outside our company.
R&D creates profit only when we invent, develop and market everything ourselves.	External R&D can create remarkable value; to employ it, we need absorption capacity, often as internal R&D.
If we develop the product ourselves, we will be the first on the market.	R&D can create profit even if we do not initialize and perform it ourselves.
Winner is who gets the innovation to the market first.	To develop better business model is more important than to be the first in the market.
We will win if we develop most of the ideas (an the best of them).	We will win if we make best use of internal and external ideas.
We must have our intellectual property under control so that our competitors can make advantage of it.	We must be able to profit from others using our intellectual property and we must license the intellectual property if it supports our business model.

# Closed Innovation versus Open Innovation



<b>Closed innovation</b>	<b>Open innovation</b>
Examples: nuclear industry, mainframe computers	Examples : PC, movies
Mostly internal ideas	Many external ideas
Low workforce mobility	High workforce mobility
Low role of the venture capital	Active venture capital
Few new businesses, weak ones	Many new businesses
Universities are not important as the sources of ideas	Universities are not important as the sources of ideas and people

# Preferred Models of Innovation 2016



Innovation Models	Percentage Use *)
Open Innovation (excl. Corporate Venture Capital)	61
Design Thinking	59
Joint development with customers, partners, competitors and suppliers	55
Traditional R&D	34
Innovating in fast growing markets (exports and products)	34
Take risk, fail fast and try again	31
Corporate Innovators	27
Investing in start-ups through Corporate Venture Capital Funds	21

\* Based on a Survey of 1,200 companies from 44 countries

Source: PWC Innovation Benchmark





## **5. Search Strategies and Forecasting**

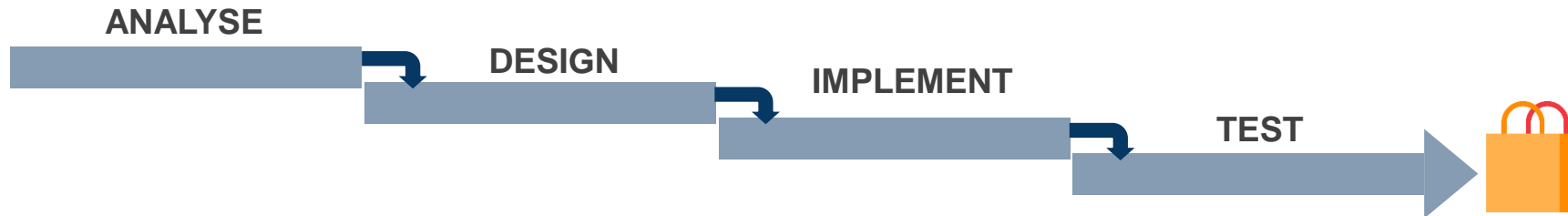
- Innovation Search Strategies**
- Innovation Networks**
- Knowledge Management and Learning**
- Ideation Tools**
- Forecasting Emerging Opportunities**

# Ideation Tools developed by Tech companies



- **Waterfall**
- **Agile/Scrum**
- **Design Thinking**

# Waterfall



## PRO

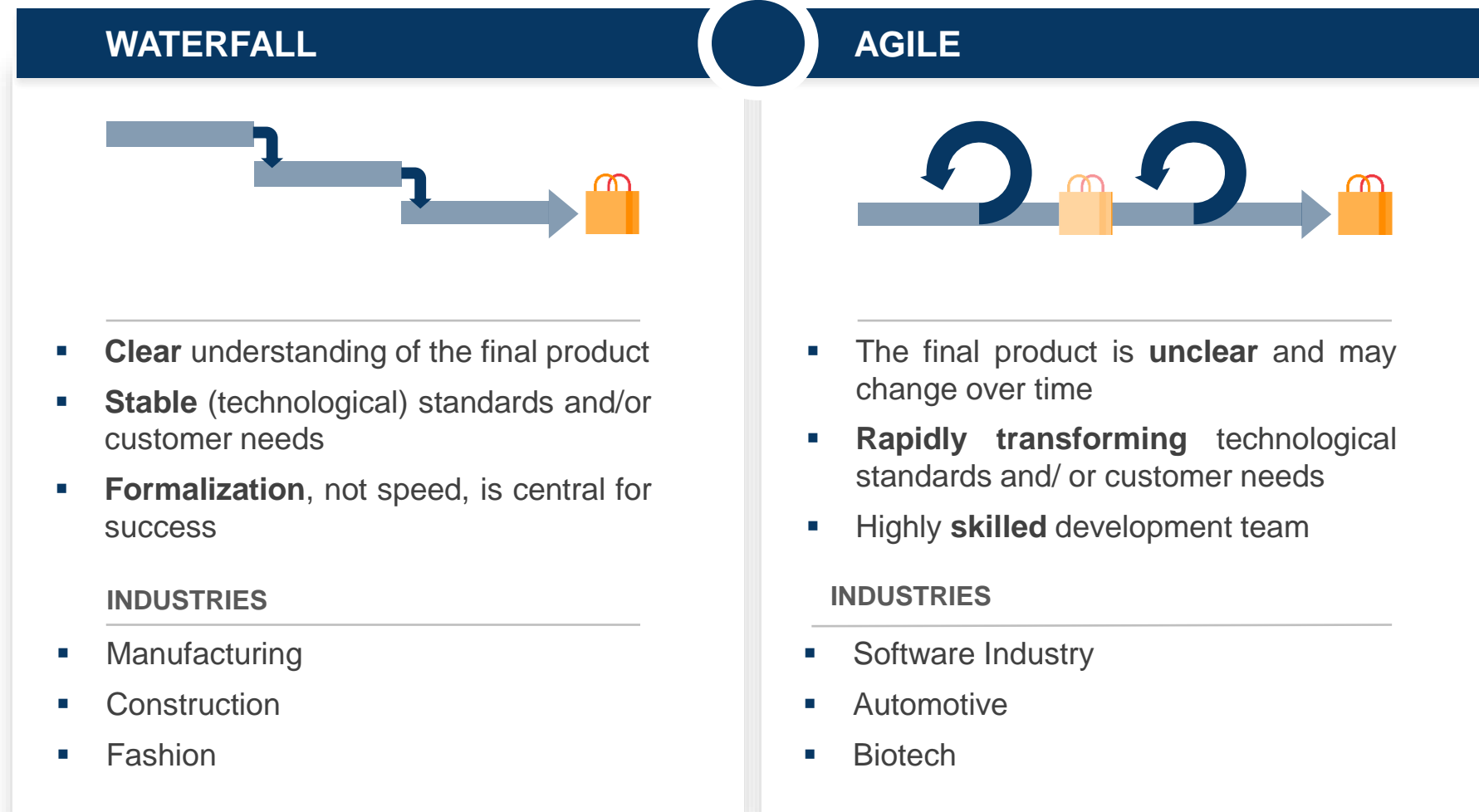
- Clear way for goal achievement before implementation starts
- Easy to understand & employ
- Process is well documented



## CON

- Reversing development is difficult and costly
- Risk of introducing the “wrong” product as the market & technology change quickly
- Full plan of action needs to be developed before acting

# Waterfall Applicability and Advantages of Agile Approaches





# Scrum: addressing adaptive problems through iteration

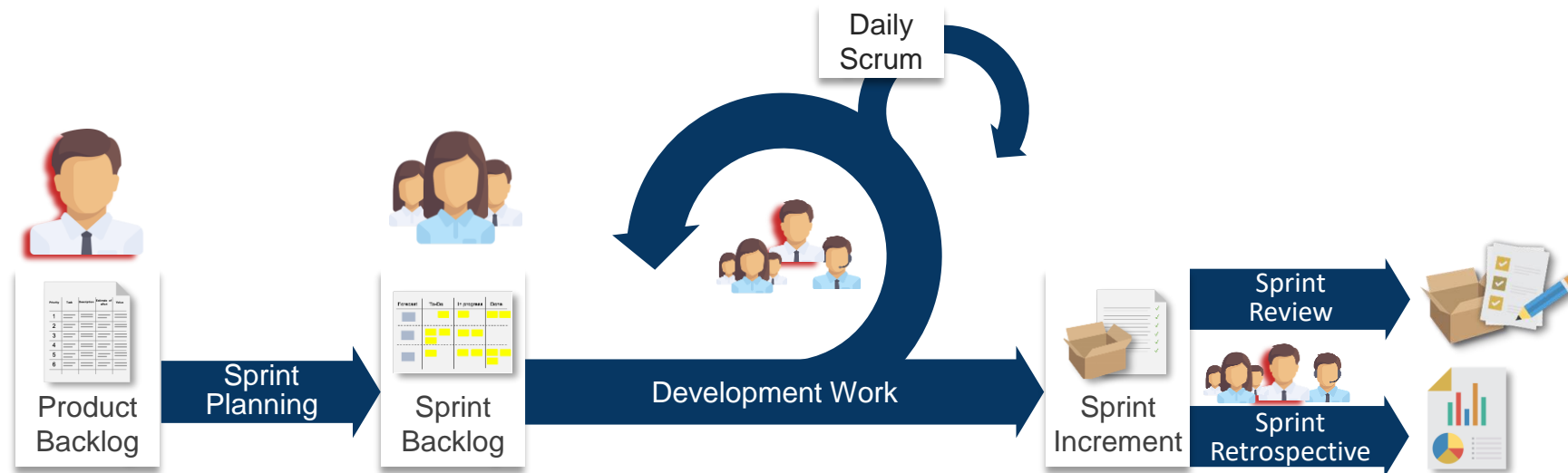
“[...] **framework**  
within which people can  
address **complex**  
**adaptive problems**,  
while productively and  
creatively delivering  
products of the  
**highest possible**  
**value**”

The Scrum Guide, '17

- Scrum is a framework for implementing the **agile mindset** that helps teams move and learn faster, it is **not a methodology or tool**
- Scrum employs an **incremental** (= many small changes), **iterative** (= cyclic, repetitious, in several sprints) approach
- Strongly oriented on **customers needs**



# The Product Owner: responsible needs of the stakeholders



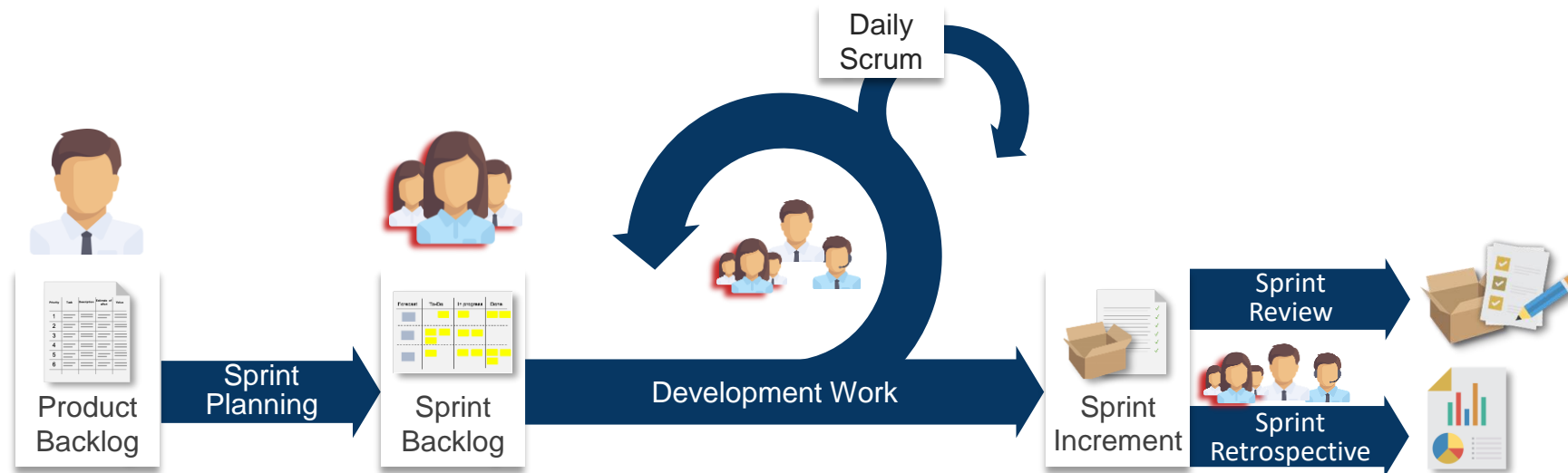
## Product Owner



- Represents the **stakeholder's interests**
- Manages and defines the **Backlog**
- Conveys **customer needs** to development team
- **Controls** whether needs are fulfilled
- Responsible for **economic success** and outcome



# The Development Team implements the selected features

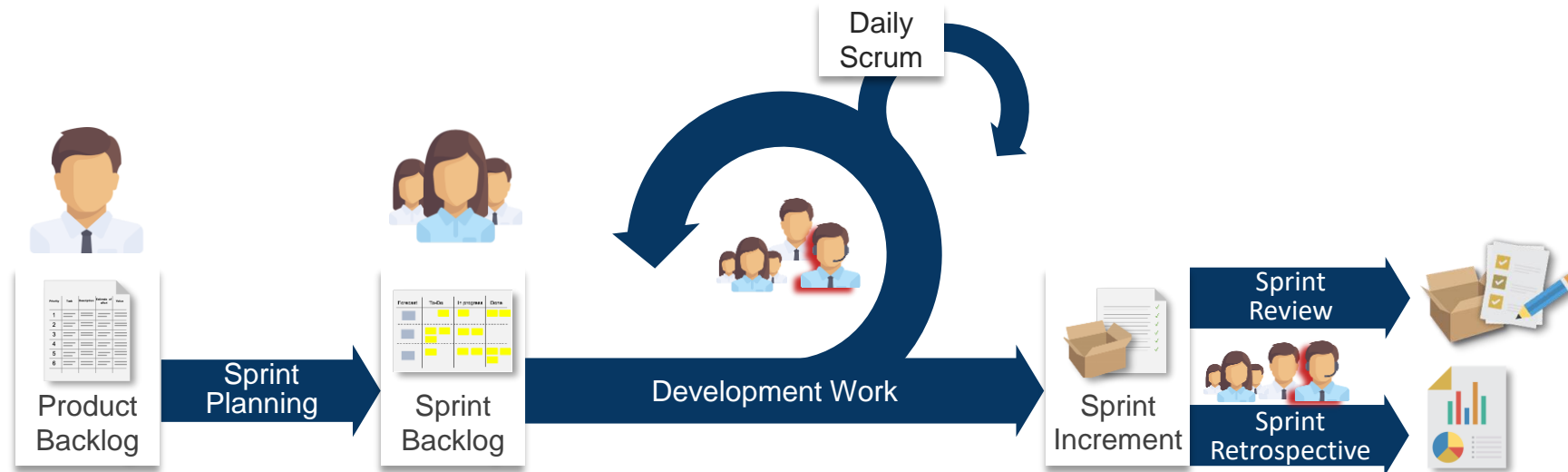


## Development Team



- Usually 4-7 people, **self-organizing** and independent
- **Cross-functional** composition
- Implement the selected **product requirements**
- Make **estimations**
- **Responsible for delivering** a potentially releasable product

# The Scrum Master is responsible for ensuring Scrum framework is understood and enacted



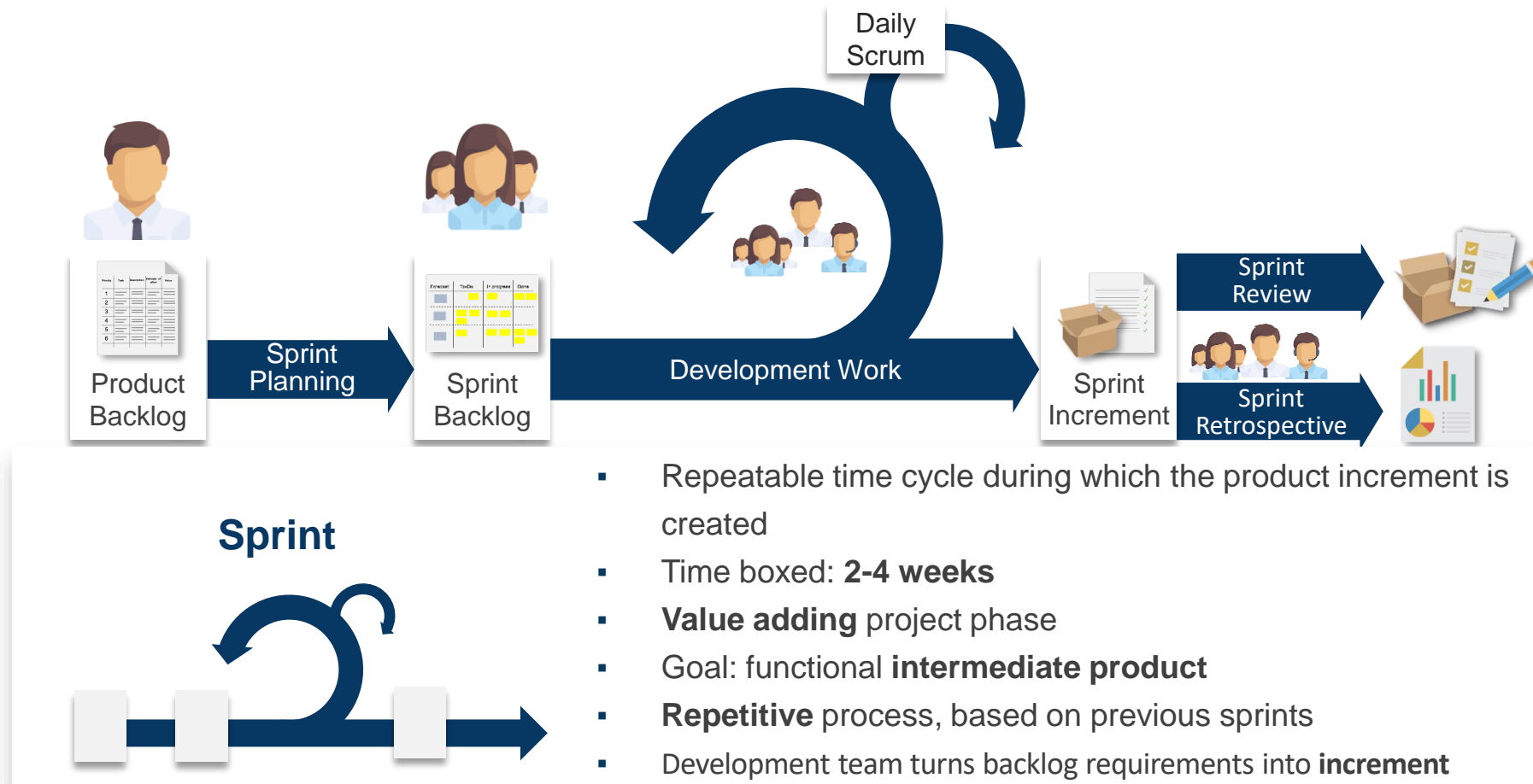
## Scrum Master



- Represents the **management of the scrum process**
- Acts as a “**servant-leader**” securing problem-free fulfillment
- Ensures scrum **rules are understood** and followed
- Continuously **improves scrum** framework
- **Connects** externals and employees

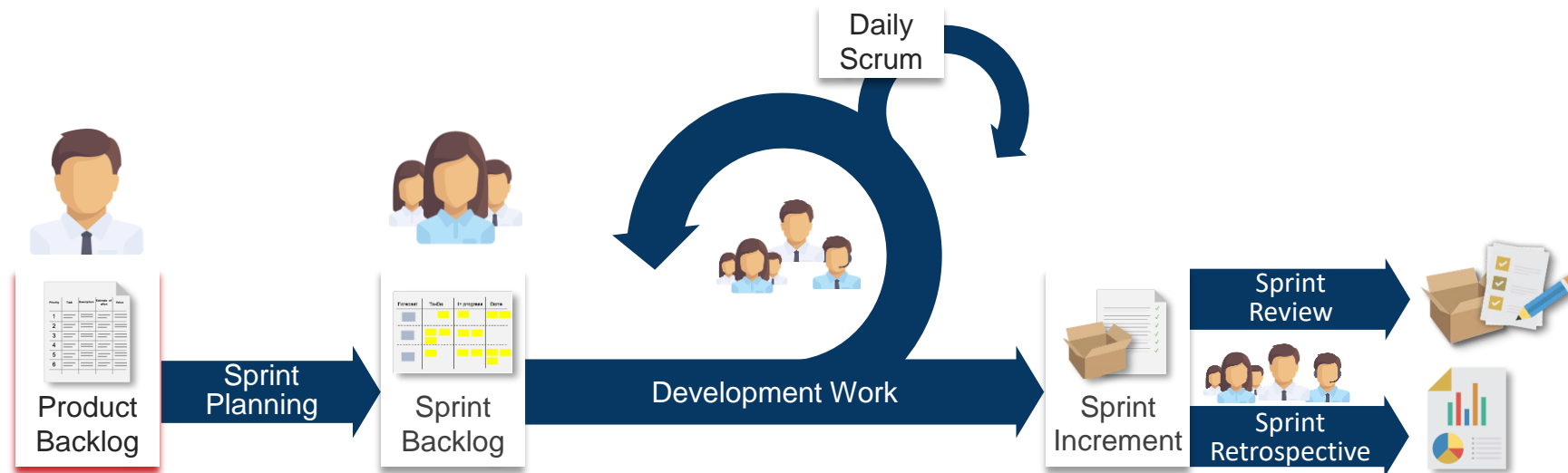


# Scrum sprint: a repeatable work cycle during which a product Increment is created





# The Product Backlog describes all product features

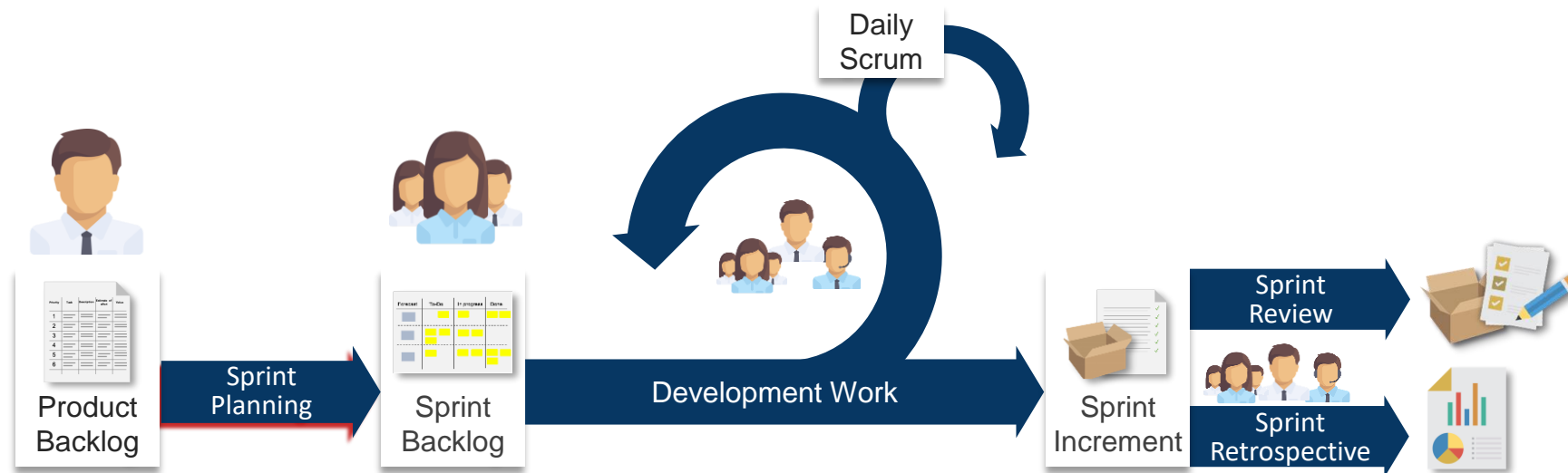


## Product Backlog

Priority	Task	Description	Estimate of effort	Value
1				
2				
3				
4				
5				
6				

- List of all **requirements of the increment**
- Features listed according to their **priority**
- Managed by the **Product Owner**
- Dynamic list, **continuously revised**
- Each entry incl.: description, priority, estimate of effort & value

# During the Sprint Planning the work for the sprint gets organized



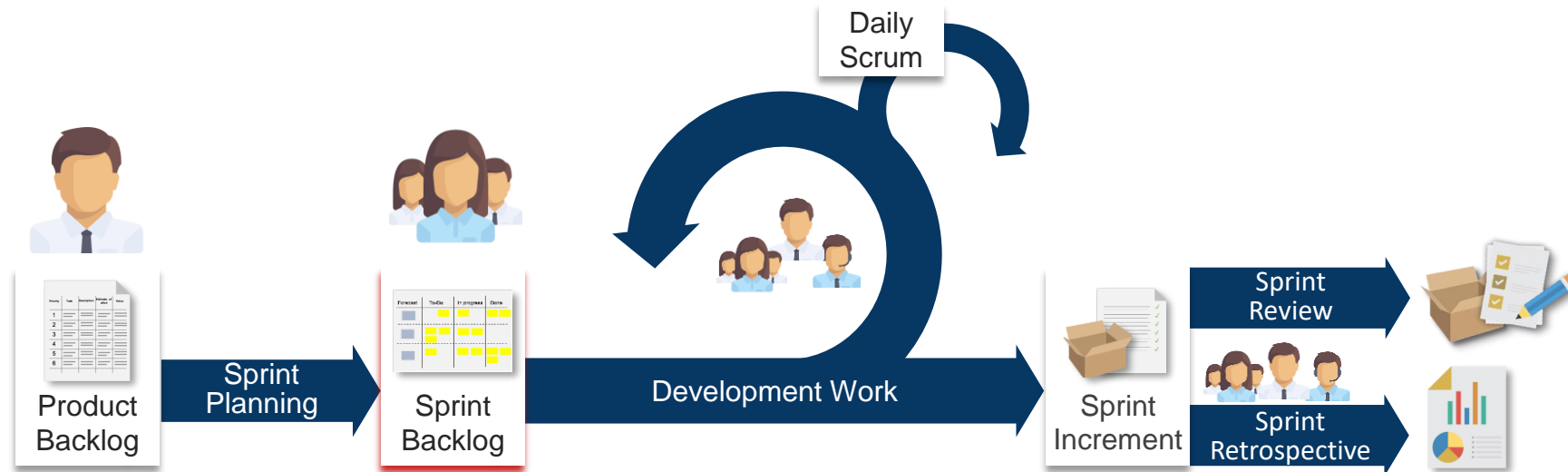
## Sprint Planning

Priority	Task	Description	Estimate in effort	Value
1				✓
2				✓
3				✗
4				✓
5				✗
6				✓

- Time boxed: 8h /month
- Consists of **two parts**
  - **What:** Product owner describes and presents Product Backlog items and Sprint goal
  - **How:** definition of tasks necessary to fulfill Sprint Goal
- **Team commits** on defined increment



# The Sprint Backlog: Plan for delivering the increment



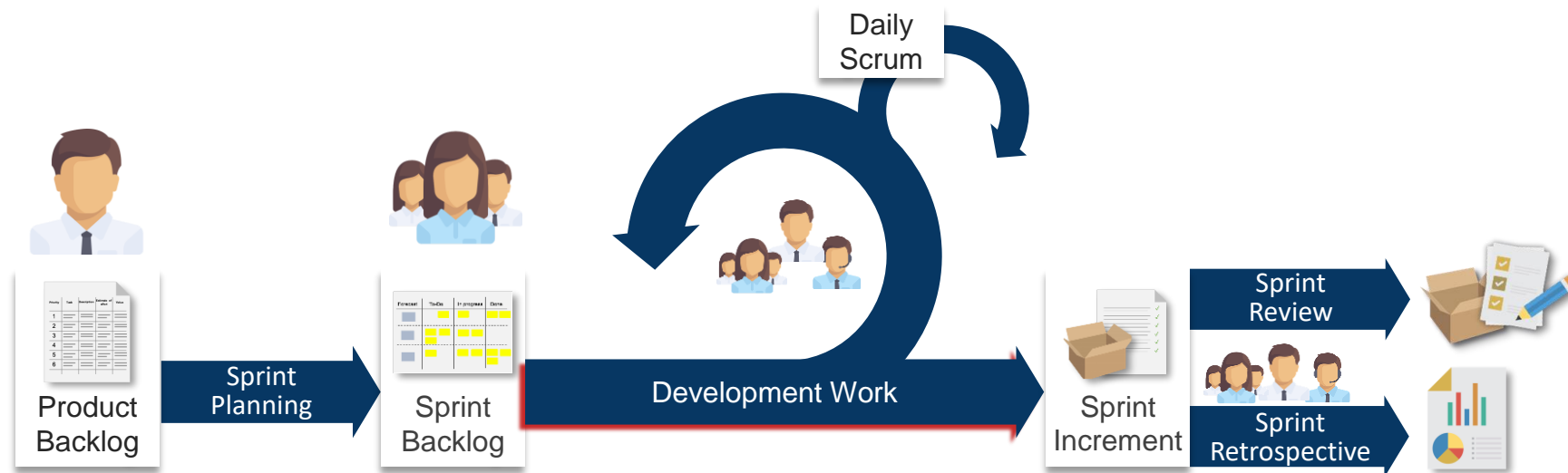
## Sprint Backlog

Forecast	To-Do	In progress	Done
■	■	■	■
■	■	■	■
■	■	■	■

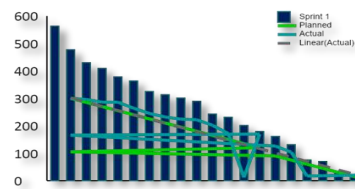
- Plan for **delivering** the Sprint **Increment**
- Based on **selected Product Backlog** features
- Contains **information needed for the realization**
- Estimates the **total amount of work**
- **Can be adjusted** by the Development Team



# The Development Work: phase of increment realization



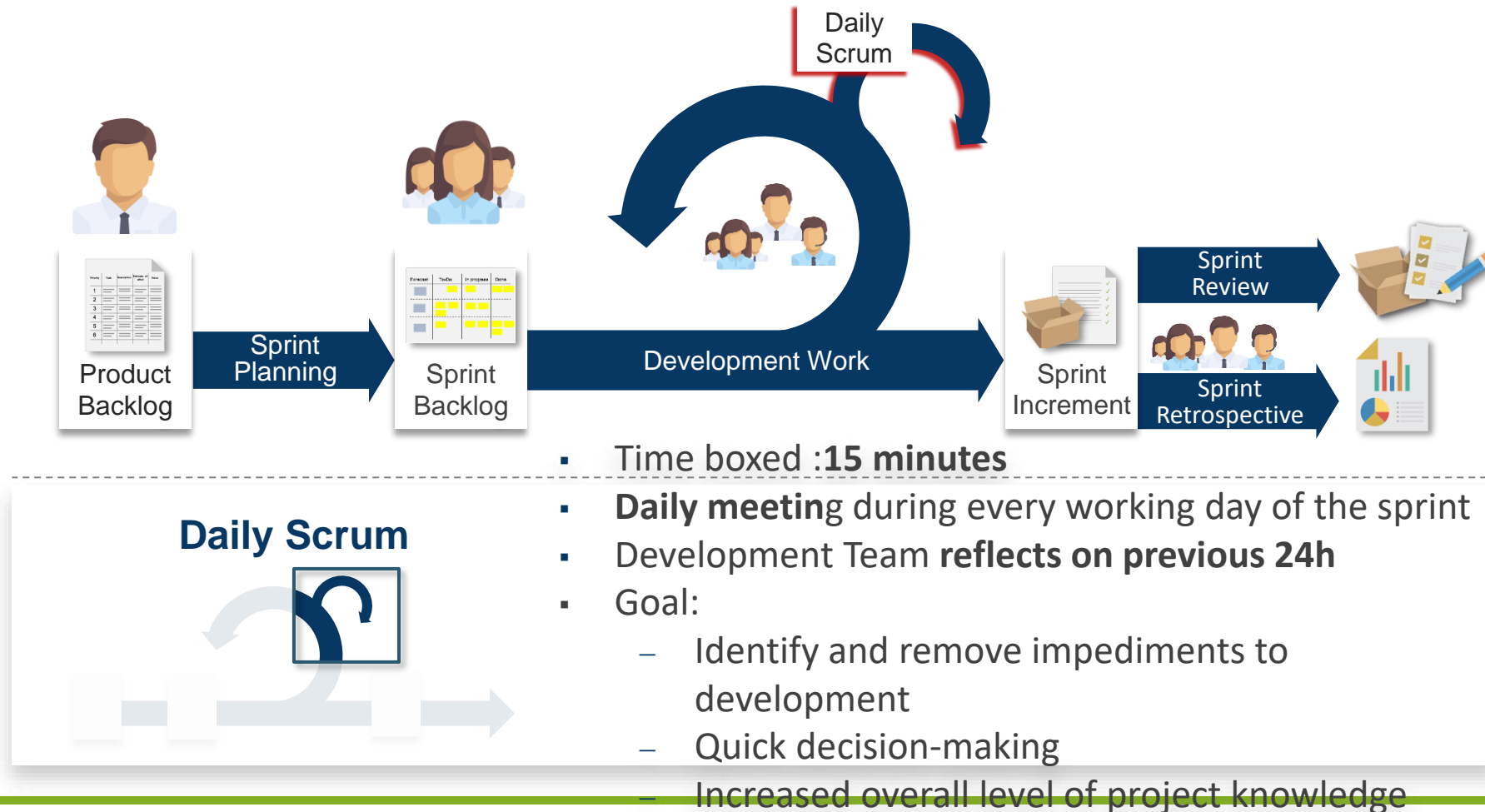
## Development Work



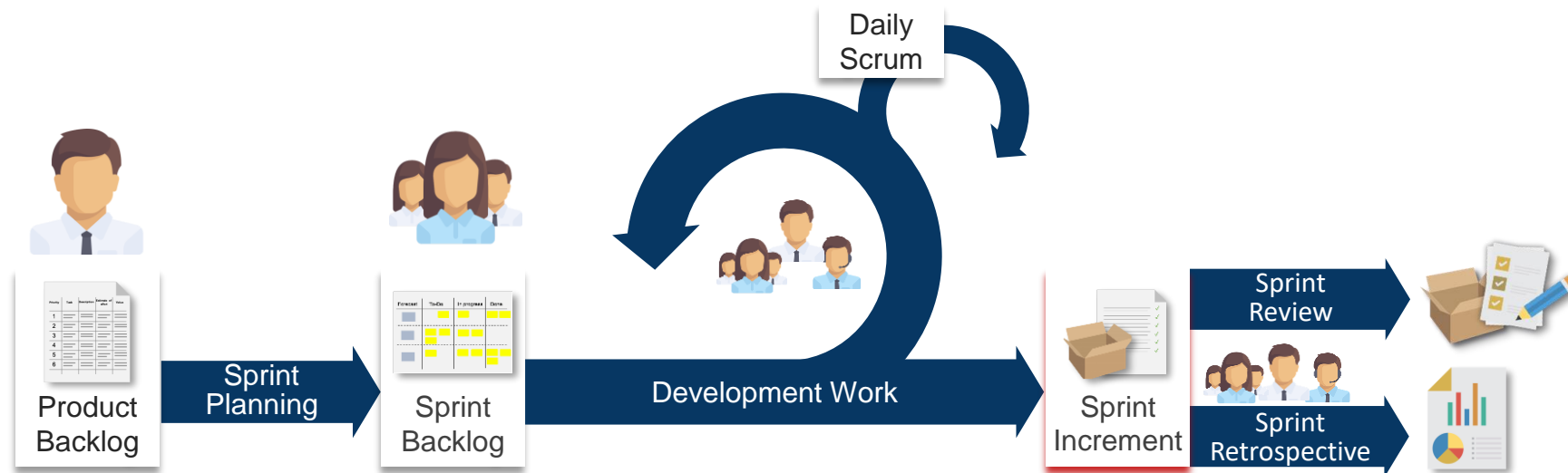
- Development Work realizes the increments
- Development of the pre-defined functions and features
- Accomplished and still **remaining work** are often displayed in a **burndown chart**



# Daily Scrum: provides regular feedback



# Sprint increments sum up all work done during the sprints

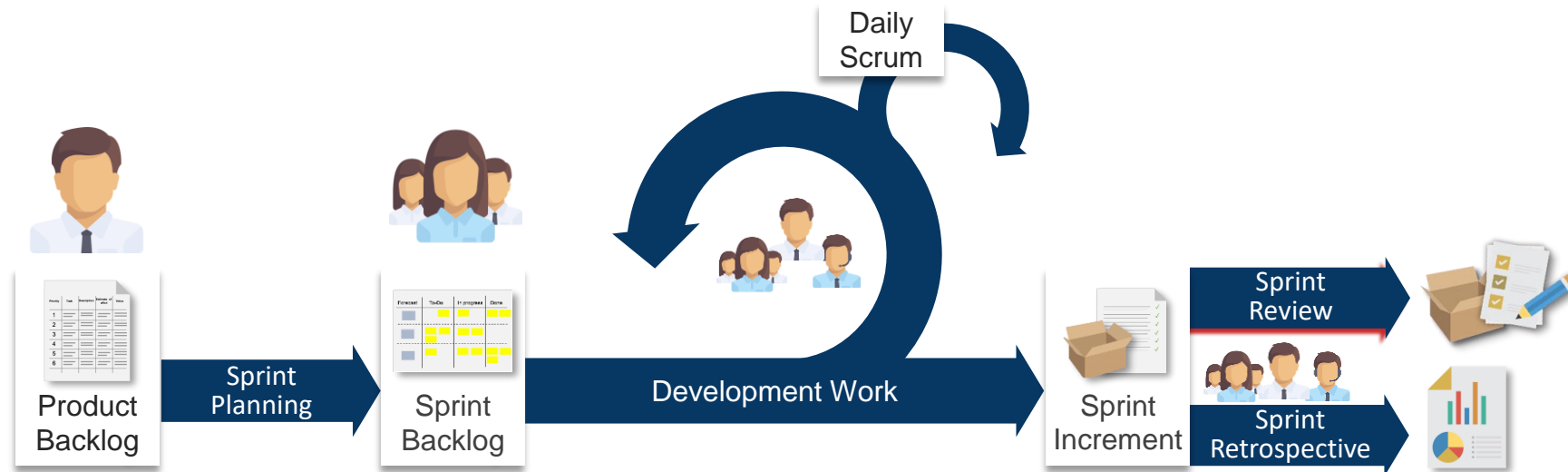


## Sprint Increment



- Increment = Body of inspectable, **done work**
- Sum of all Product **Backlog** items **completed during a Sprint** and value of the increments of all previous sprints
- Items are **completed** if in a **usable condition**, meeting further scrum requirements

# Sprint Review: held at the end of the Sprint to inspect the Increment and adapt the Product Backlog



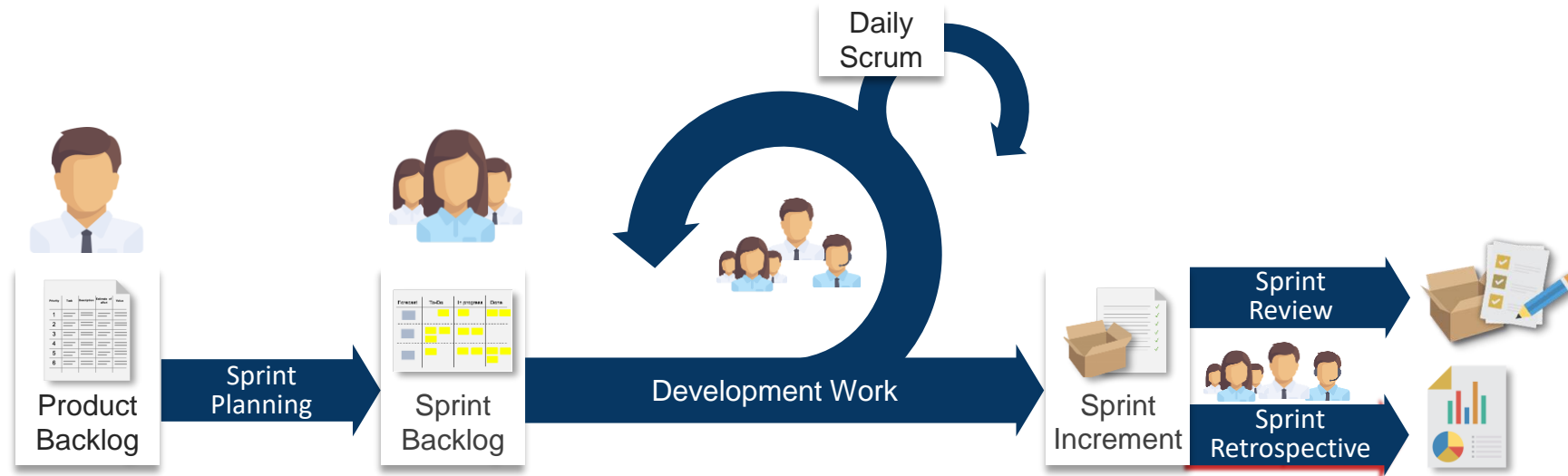
## Sprint Review



- Time-boxed: **4h**
- Team **presents** sprint **achievements**
- **Feedback** of Product Owner and stakeholders
- **Joint evaluation** of goal achievement
- Adjustment of Product Backlog according to new needs



# The Sprint Retrospective: Opportunity for self-reflection and improvements for the next Sprint



## Sprint Retrospective



- Time-boxed: **3h**
- Event for **self-reflection**
- Meeting at the **end of each sprint**
- Plan & decide on measures to **improve & adapt future sprints**

### Key questions

“What went wrong?”  
“What went well?”  
“How can we do better?”

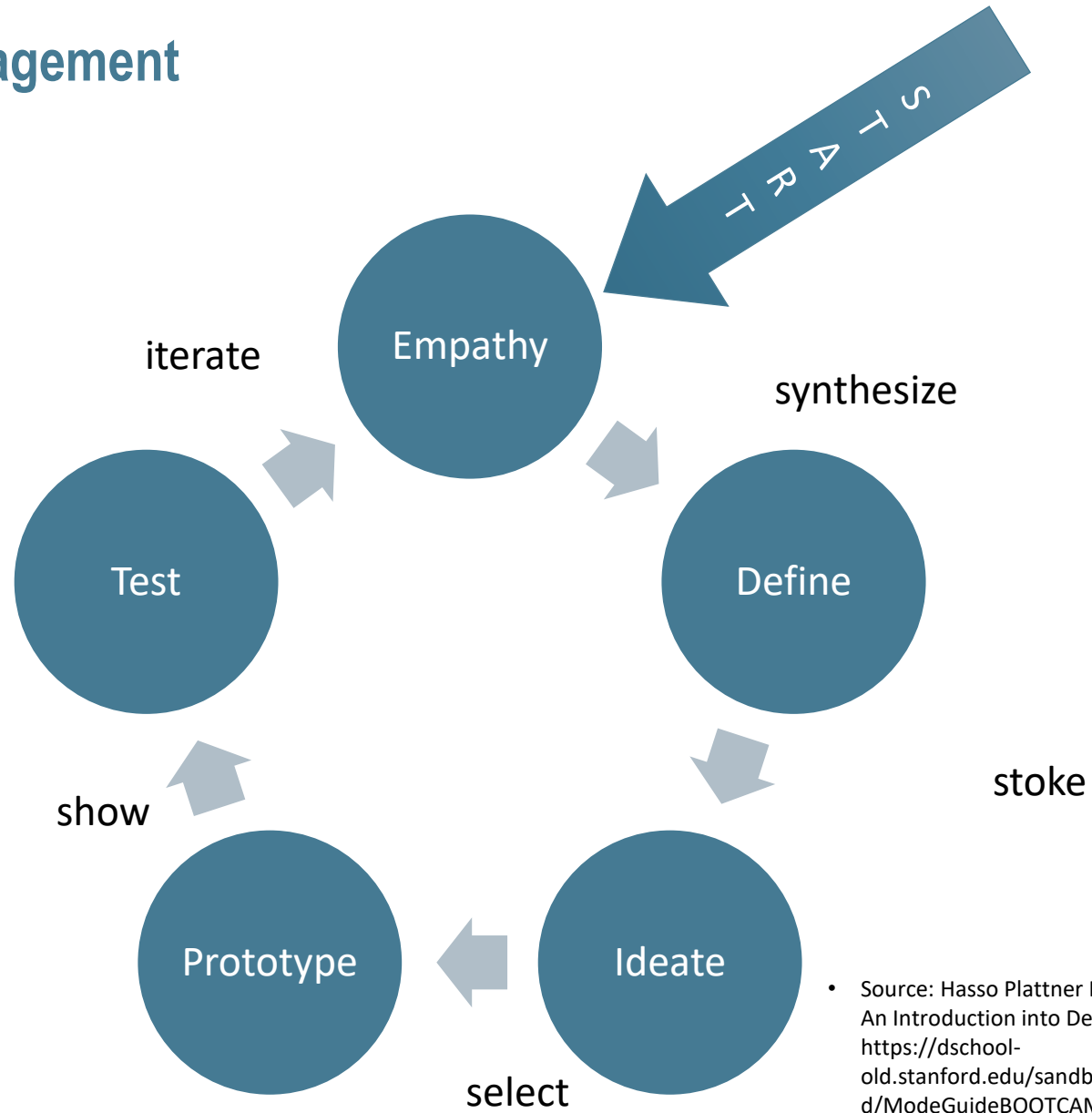


## Henry Ford:

- „People don't tell what they need but what they want.“
- If I had asked people what they wanted, they would have said faster horses.
- Thinking is the hardest work there is, which is probably the reason why so few people engage in it.

## Steve Jobs:

- „Creativity is just connecting things“
- Get closer than ever to your customers. So close that you tell them what they need well before they realize it themselves
- „Details matter, it's worth waiting to get them right“.



- Source: Hasso Plattner Institute of Design at Stanford University, :  
An Introduction into Design Thinking – Process Guide.  
<https://dschool-old.stanford.edu/sandbox/groups/designresources/wiki/36873/attachments/74b3d/ModeGuideBOOTCAMP2010L.pdf>

# What is the Empathize Mode



- Empathy is the centerpiece of a human-centered design process.
- The Empathize mode is the work you do to understand people, within the context of your design challenge.
- It is your effort to understand the way they do things and why, their physical and emotional needs, how they think about world, and what is meaningful to them.



- As a design thinker, **the problems you are trying to solve are rarely your own**—they are those of a particular group of people; in order to design for them, you must gain **empathy** for who they are and what is important to them.
- **Observing** what people do and how they interact with their environment gives you clues about what they think and feel. It also helps you learn about what they need.
- By **watching people**, you can capture physical manifestations of their experiences – what they do and say. This will allow you to infer the intangible meaning of those experiences in order to uncover insights. These insights give you direction to create innovative solutions.
- The **best solutions** come out of the **best insights into human behavior**. But learning to recognize those insights is harder than you might think. Why? Because **our minds automatically filter out a lot of information** without our even realizing it.
- We need to learn to see things “with a fresh set of eyes,” and empathizing is what gives us those new eyes.
- **Engaging** with people directly reveals a tremendous amount about **the way they think** and the **values they hold**. Sometimes these thoughts and values are not obvious to the people who hold them, and a good conversation can surprise both the designer and the subject by the unanticipated insights that are revealed.
- The stories that people tell and the things that people say they do (even if they are different from what they actually do) are strong indicators of their deeply held beliefs about the way the world is. **Good designs** are built on a solid understanding of these **beliefs** and **values**.



- **Observe.** View users and their behavior in the context of their lives. As much as possible do observations in relevant contexts in addition to interviews. Some of the most powerful realizations come from noticing a disconnect between what someone says and what he does. Others come from a work-around someone has created which may be very surprising to you as the designer, but she may not even think to mention in conversation.
- **Engage.** Sometimes we call this technique ‘interviewing’ but it should really feel more like a conversation. Prepare some questions you’d like to ask, but expect to let the conversation deviate from them. Keep the conversation only loosely bounded. Elicit stories from the people you talk to, and always ask “Why?” to uncover deeper meaning. Engagement can come through both short ‘intercept’ encounters and longer scheduled conversations. –
- **Watch and Listen.** Certainly you can, and should, combine observation and engagement. Ask someone to show you how they complete a task. Have them physically go through the steps, and talk you through why they are doing what they do. Ask them to vocalize what’s going through their mind as they perform a task or interact with an object. Have a conversation in the context of someone’s home or workplace – so many stories are embodied in artifacts.
- Use the environment to prompt deeper questions. “To create meaningful innovations, you need to know your users and care about their lives.”

# Transition from Empathize to Define



- Define Unpack: When you move from empathy work to drawing conclusions from that work, you need to process all the things you heard and saw in order to understand the big picture and grasp the takeaways of it all.
- Unpacking is a chance to start that process – sharing what you found with fellow designers and capturing the important parts in a visual form.
- Get all the information out of your head and onto a wall where you can start to make connections—post pictures of your user, post-its with quotes, maps of journeys or experiences—anything that captures impressions and information about your user.
- This is the beginning of the synthesis process, which leads into a ‘Define’ mode.



- The Define mode of the design process is all about bringing clarity and focus to the design space.
- It is your chance, and responsibility, as a design thinker to define the challenge you are taking on, based on what you have learned about your user and about the context.
- After becoming an instant-expert on the subject and gaining invaluable empathy for the person you are designing for, this stage is about making sense of the widespread information you have gathered.
- The goal of the Define mode is to craft a meaningful and actionable problem statement – this is what we call a point-of-view. This should be a guiding statement that focuses on insights and needs of a particular user, or composite character. Insights don't often just jump in your lap; rather they emerge from a process of synthesizing information to discover connections and patterns.
- In a word, the Define mode is **sense-making**.





- The Define mode is critical to the design process because it results in your point-of-view (POV): the explicit expression of the problem you are striving to address.
- More importantly, your POV defines the RIGHT challenge to address, based on your new understanding of people and the problem space.
- It may seem counterintuitive but crafting a more narrowly focused problem statement tends to yield both greater quantity and higher quality solutions when you are generating ideas.
- The Define mode is also an endeavor to synthesize your scattered findings into powerful insights.
- It is this synthesis of your empathy work that gives you the advantage that no one else has: discoveries that you can leverage to tackle the design challenge; that is, INSIGHT.



- Consider what stood out to you when talking and observing people.
  - What patterns emerge when you look at the set?
  - If you noticed something interesting ask yourself (and your team) why that might be. In asking why someone had a certain behavior or feeling you are making connections from that person to the larger context.
- Develop an understanding of the type of person you are designing for – your USER.
- Synthesize and select a limited set of NEEDS that you think are important to fulfill; you may in fact express a just one single salient need to address.
- Work to express INSIGHTS you developed through the synthesis of information your have gathered through empathy and research work.
- Then articulate a point-of-view by combining these three elements – user, need, and insight – as an actionable problem statement that will drive the rest of your design work.
- A good point-of-view is one that:
  - Provides focus and frames the problem - Inspires your team
  - Informs criteria for evaluating competing ideas
  - Empowers your team to make decisions independently in parallel
  - Captures the hearts and minds of people you meet
  - Saves you from the impossible task of developing concepts that are all things to all people (i.e. your problem statement should be discrete, not broad.) “Framing the right problem is the only way to create the right solution.”



- In the Define mode you determine the specific meaningful challenge to take on.
- In the Ideate mode you focus on generating solutions to address that challenge.
- A well-scoped and -articulated point-of-view will lead you into ideation in a very natural way. In fact, it is a great litmus test of your point-of-view to see if brainstorming topics fall out your POV.
- A great transition step to take is to create a list of “How-Might-We . . .?” brainstorming topics that flow from your problem statement.
- These brainstorming topics typically are subsets of the entire problem, focusing on different aspects of the challenge.
- Then when you move into ideation you can select different topics, and try out a few to find the sweet spot of where the group can really churn out a large quantity of compelling ideas.
- Articulate the meaningful challenge

# What is the Ideate Mode



- Ideate is the mode of the design process in which you concentrate on idea generation.
- Mentally it represents a process of “going wide” in terms of concepts and outcomes.
- Ideation provides both the fuel and also the source material for building prototypes and getting innovative solutions into the hands of your users.



- You ideate in order to transition from identifying problems to creating solutions for your users.
- Ideation is your chance to combine the understanding you have of the problem space and people you are designing for with your imagination to generate solution concepts.
- Particularly early in a design project, ideation is about pushing for a widest possible range of ideas from which you can select, not simply finding a single, best solution.
- The determination of the best solution will be discovered later, through user testing and feedback.
- Various forms of ideation are leveraged to:
  - Step beyond obvious solutions and thus increase the innovation potential of your solution set
  - Harness the collective perspectives and strengths of your teams
  - Uncover unexpected areas of exploration
  - Create fluency (volume) and flexibility (variety) in your innovation options
  - Get obvious solutions out of your heads, and drive your team beyond them



- You ideate by combining your conscious and unconscious mind, and rational thoughts with imagination.
- For example, in a brainstorm you leverage the synergy of the group to reach new ideas by building on others' ideas.
- Adding constraints, surrounding yourself with inspiring related materials, and embracing misunderstanding all allow you to reach further than you could by simply thinking about a problem.
- Another ideation technique is building – that is, prototyping itself can be an ideation technique. In physically making something you come to points where decisions need to be made; this encourages new ideas to come forward.
- There are other ideation techniques such as body-storming, mind-mapping, and sketching.
- But one theme throughout all of them is deferring judgment – that is, separating the generation of ideas from the evaluation of ideas. In doing so, you give your imagination and creativity a voice, while placating your rational side in knowing that you will get to the examination of merits later.

# Transition from Ideate to Prototype



- Transition: In order to avoid losing all of the innovation potential you have just generated through ideation, we recommend a process of considered selection, by which you bring multiple ideas forward into prototyping, thus maintaining your innovation potential.
- As a team, designate three voting criteria (we might suggest “the most likely to delight,” “the rational choice,” “the most unexpected” as potential criteria, but they’re really up to you) to use to vote on three different ideas that your team generated during brainstorming.
- Carry the two or three ideas that receive the most votes forward into prototyping. In this way, you preserve innovation potential by carrying multiple ideas forward—a radically different approach than settling on the single idea that at least the majority of the team can agree upon.



- The Prototype mode is the iterative generation of artifacts intended to answer questions that get you closer to your final solution.
- In the early stages of a project that question may be broad – such as “do my users enjoy cooking in a competitive manner?” In these early stages, you should create low-resolution prototypes that are quick and cheap to make (think minutes and cents) but can elicit useful feedback from users and colleagues.
- In later stages both your prototype and question may get a little more refined. For example, you may create a later stage prototype for the cooking project that aims to find out: “do my users enjoy cooking with voice commands or visual commands”.
- A prototype can be anything that a user can interact with – be it a wall of post-it notes, a gadget you put together, a role-playing activity, or even a storyboard. Ideally you bias toward something a user can experience. Walking someone through a scenario with a storyboard is good, but having them role-play through a physical environment that you have created will likely bring out more emotions and responses from that person.





- To ideate and problem-solve.
- Build to think.
- To communicate. If a picture is worth a thousand words, a prototype is worth a thousand pictures.
- To start a conversation. Your interactions with users are often richer when centered around a conversation piece. A prototype is an opportunity to have another, directed conversation with a user.
- To fail quickly and cheaply. Committing as few resources as possible to each idea means less time and money invested up front.
- To test possibilities. Staying low-res allows you to pursue many different ideas without committing to a direction too early on. To manage the solution-building process. Identifying a variable also encourages you to break a large problem down into smaller, testable chunks.



- Start building. Even if you aren't sure what you're doing, the act of picking up some materials (post-its, tape, and found objects are a good way to start!) will be enough to get you going.
- Don't spend too long on one prototype. Let go before you find yourself getting too emotionally attached to any one prototype.
- ID a variable: Identify what's being tested with each prototype. A prototype should answer a particular question when tested. That said, don't be blind to the other tangential understanding you can gain as someone responds to a prototype.
- Build with the user in mind. What do you hope to test with the user? What sorts of behavior do you expect? Answering these questions will help focus your prototyping and help you receive meaningful feedback in the testing phase.



- Test Prototype and Test are modes that you consider in tandem more than you transition between.
- What you are trying to test and how you are going to test that aspect are critically important to consider before you create a prototype.
- Examining these two modes in conjunction brings up the layers of testing a prototype.
- Though prototyping and testing are sometimes entirely intertwined, it is often the case that planning and executing a successful testing scenario is a considerable additional step after creating a prototype.
- Don't assume you can simply put a prototype in front of a user to test it; often the most informative results will be a product of careful thinking about how to test in a way that will let users give you the most natural and honest feedback



- The Test mode is when you solicit feedback, about the prototypes you have created, from your users and have another opportunity to gain empathy for the people you are designing for.
- Testing is another opportunity to understand your user, but unlike your initial empathy mode, you have now likely done more framing of the problem and created prototypes to test. Both these things tend to focus the interaction with users, but don't reduce your "testing" work to asking whether or not people like your solution.
- Instead, continue to ask "Why?", and focus on what, you can learn about the person and the problem as well as your potential solutions. Ideally you can test within a real context of the user's life.
- For a physical object, ask people to take it with them and use it within their normal routines. For an experience, try to create a scenario in a location that would capture the real situation.
- If testing a prototype in situ is not possible, frame a more realistic situation by having users take on a role or task when approaching your prototype.
- A rule of thumb: always prototype as if you know you're right, but test as if you know you're wrong—testing is the chance to refine your solutions and make them better.



- To refine prototypes and solutions.
- Testing informs the next iterations of prototypes.
- Sometimes this means going back to the drawing board.
- To learn more about your user.
- Testing is another opportunity to build empathy through observation and engagement—it often yields unexpected insights.
- To refine your Point of View (POV): Sometimes testing reveals that not only did you not get the solution right, but also that you failed to frame the problem correctly.



- Put your prototype in the user's hands – or your user within an experience. And don't explain everything (yet).
- Let your tester interpret the prototype. Watch how they use (and misuse!) what you have given them, and how they handle and interact with it; then listen to what they say about it, and the questions they have.
- Create Experiences. Create your prototypes and test them in a way that feels like an experience that your user is reacting to, rather than an explanation that your user is evaluating.
- Ask users to compare. Bringing multiple prototypes to the field to test gives users a basis for comparison, and comparisons often reveal latent needs.



- Iteration and making the process your own Iteration is a fundamental of good design.
- Iterate both by cycling through the process multiple times, and also by iterating within a step—for example by creating multiple prototypes or trying variations of a brainstorming topics with multiple groups.
- Generally as you take multiple cycles through the design process your scope narrows and you move from working on the broad concept to the nuanced details, but the process still supports this development.
- For simplicity, the process is articulated here as a linear progression, but design challenges can be taken on by using the design modes in various orders; furthermore there are an unlimited number of design frameworks with which to work.
- The process presented here is one suggestion of a framework; ultimately you will make the process your own and adapt it to your style and your work. Hone your own process that works for you. Most importantly, as you continue to practice innovation you take on a designerly mindset that permeates the way you work, regardless of what process you use

## Case 4: Ideation in 20 minutes – elevator pitch 1 minute



- 1. Step 1: sit down as group or alone and watch the behavior of people around you: can you figure out a problem that is pointing towards a hidden need or a solution that they might not be aware of?**
- 2. Step 2: What kind of solutions could you think of the might be solutions to the underlying problem?**
- 3. Step 3: What would be your proposal for a prototype?**





- **Fishbone Diagram**
- **Idea Boards or Suggestion Boxes**
- **Target Costing**
- **Orchestrator Model**
- **Artificial Intelligence**

# The Orchestrator Model: Key Concept



- Chief Marketing Operators and other marketing leaders increasingly operate as orchestrators,
- Tapping talent from inside and outside the company to staff short-term task forces.
- Those task forces bring together people, each with one of three kinds of focus: **think**, **feel**, or **do**.
- Depending on the task, the mix of those three types shifts.
- Model is being used e.g. Google, Nike, Red Bull, Amazon, **Liberty Global**

Source: <https://hbr.org/2014/07/the-ultimate-marketing-machine>



## „Think“

Focused on data and analytics

- **Architecture and modeling director**
- **Digital privacy analyst**
- **Market data analyst**
- **Senior data architect**
- **Senior data modeler**
- **Web analyst**

## „Feel“

Focused on consumer engagement

- **Customer service representative**
- **Member engagement coordinator**
- **Online community manager**
- **PR executive**
- **Social media community manager**
- **Usability specialist**

## „Do“

Focused on content and production

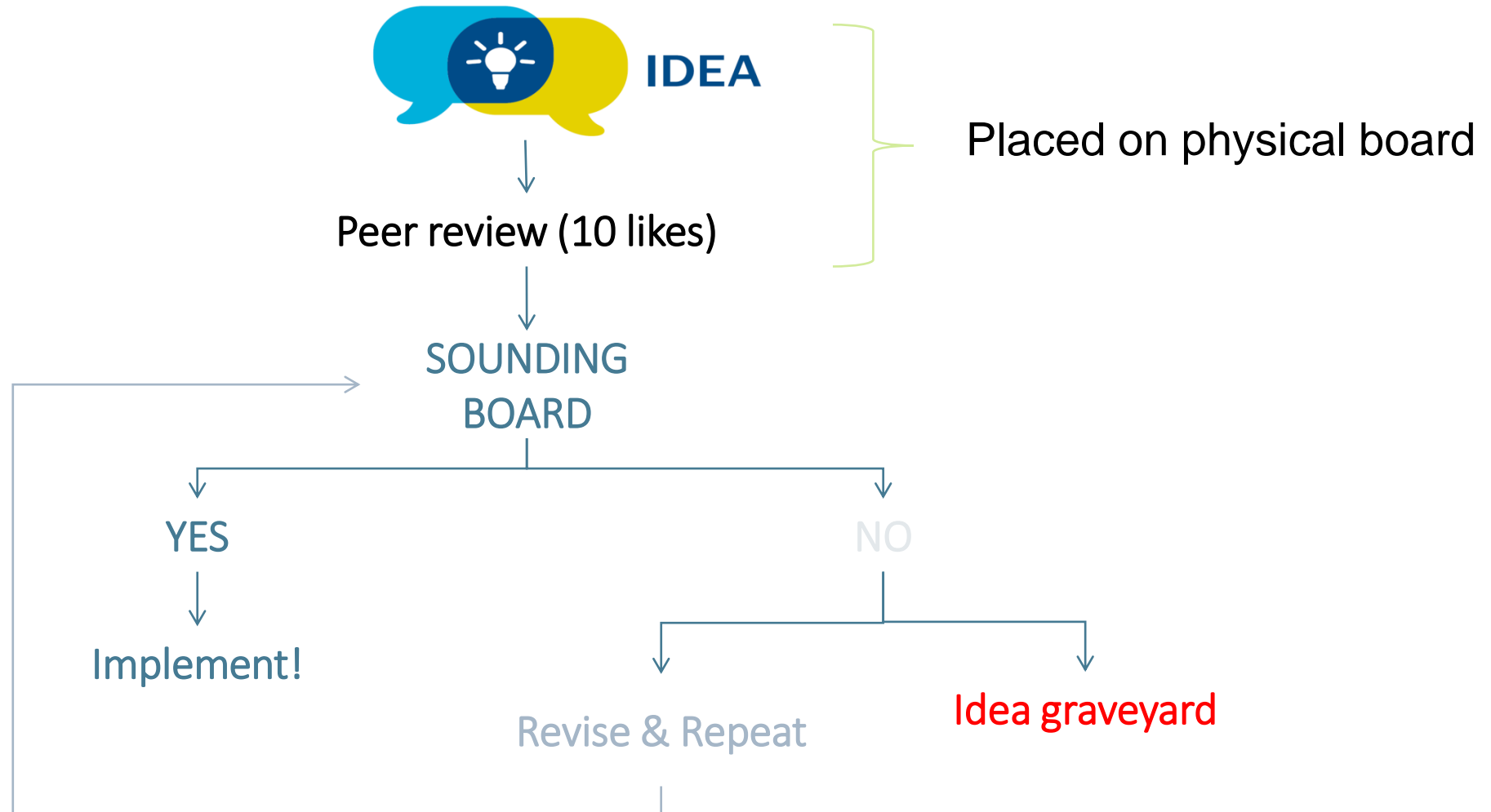
- **Concept creator**
- **Designer**
- **Digital studio producer**
- **Marketing content manager**
- **Senior digital content strategist**
- **Web design production specialist**



- Employee idea management process is one of the oldest forms of an employee involvement tool (back dated to 1721) which plays a pivotal role for organizations wishing to improve its performance and to become more innovative
- Implementation of this process in Statkraft will help us to
  - Identify opportunities to improve work conditions and efficiency
  - Benefit from the innovation power of personnel
  - Encourage creativity, responsibility and loyalty of personnel

A screenshot of The Wall Street Journal website. The top navigation bar includes the title 'THE WALL STREET JOURNAL.' and a menu icon. Below the navigation bar, there are two main sections. The left section, titled 'TOP STORIES IN U.S.', features two articles: 'Democratic Rifts Surface After Defeat' and 'Ferguson Residents Help Clean Up, Join ...'. The right section, titled 'Xerox Employees' Green Ideas Save Company \$10.2 Million', features an article by Leon Kaye dated Monday November 15th, 2010, with 3 comments. Below the Xerox article, there is a Siemens AG article titled 'Every employee is a pioneer: 100 years of idea management at Siemens', which states that over 1.5 million implemented ideas boost the productivity and innovative strength of Siemens. The Siemens article is highlighted with a blue border.

# Transparent Idea Management Process

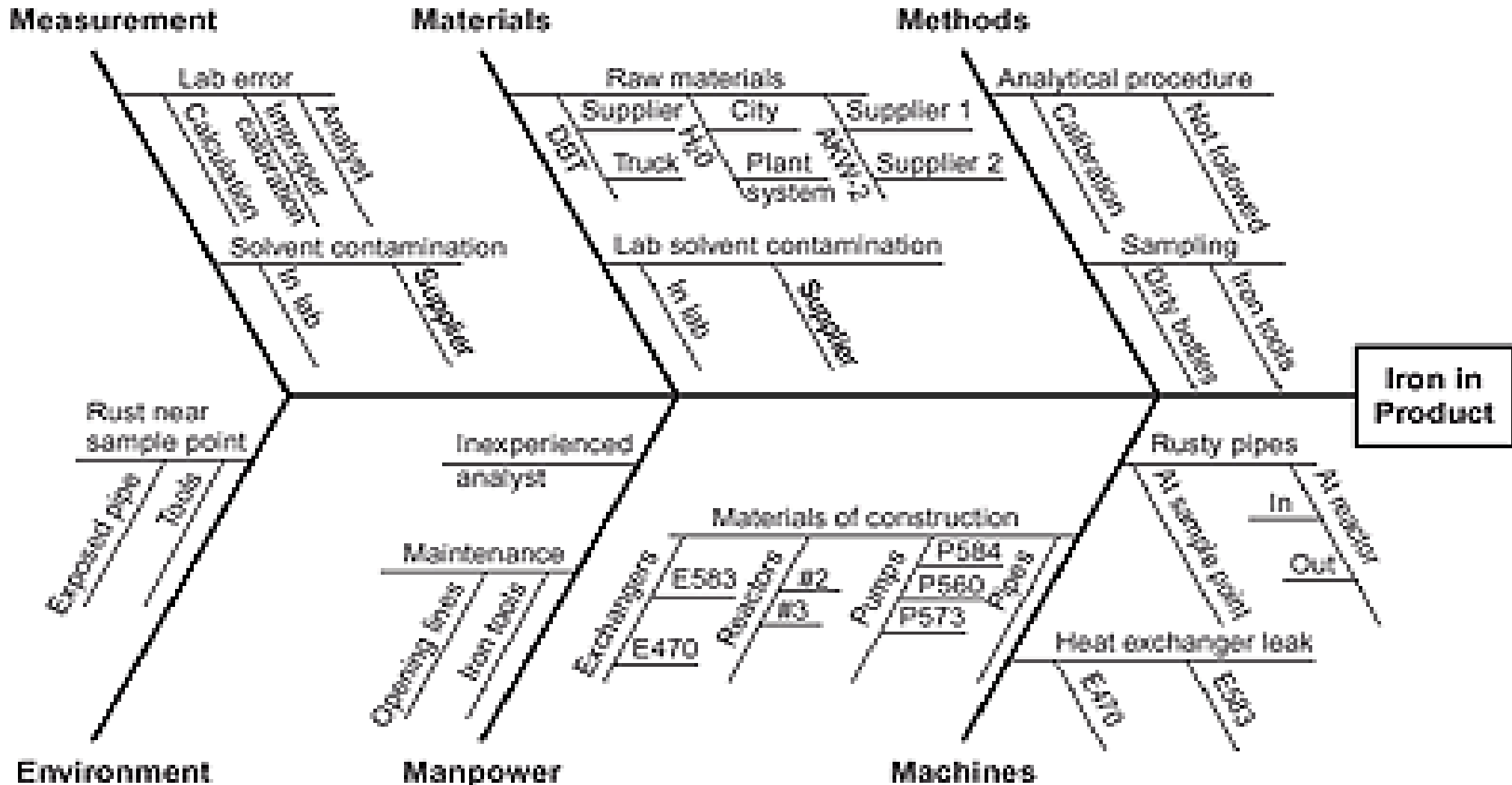


# Key Success Factors



- Simple and effective system
- Communication
- Quick and transparent evaluation and feedback
- Leadership and top management support
- Employee participation and empowerment
- Resources
- Reward

# Continuous Improvement based on the Fishbone Diagram (Cause & Effects – Diagram, Ishikawa-Diagram)



# Continuous Improvement based on the Fishbone Diagram



- Materials needed: flipchart or whiteboard, marking pens.
- Agree on a problem statement (effect). Write it at the center right of the flipchart or whiteboard. Draw a box around it and draw a horizontal arrow running to it.
- Brainstorm the major categories of causes of the problem. If this is difficult use generic headings:
  - Methods
  - Machines (equipment)
  - People (manpower)
  - Materials
  - Measurement
  - Environment
- Write the categories of causes as branches from the main arrow.
- Brainstorm all the possible causes of the problem. Ask: “Why does this happen?” As each idea is given, the facilitator writes it as a branch from the appropriate category. Causes can be written in several places if they relate to several categories.
- Again ask “why does this happen?” about each cause. Write sub–causes branching off the causes. Continue to ask “Why?” and generate deeper levels of causes. Layers of branches indicate causal relationships.
- When the teams run out of ideas, focus attention to places on the chart where ideas are few.





## 5. Search Strategies and Forecasting

- Innovation Search Strategies
- Innovation Networks
- Knowledge Management and Learning
- **Forecasting Emerging Opportunities**



Method	Uses	Limitations
Trend extrapolation	Short-term stable environment	Relies on past data and assumes constant data patterns
Product & Technology Road Mapping	Medium-term stable environment	Incremental, fails to identify future uncertainties
Regression Analysis, Econometric Models and Simulation	Medium-term where relationship between independent and dependent variables is understood	Identification and behavior of independent variables limited
Customer & Marketing Methods	Medium –term, product attributes and market segments understood	Sophistication of users, limitation of tools to distinguish noise and information
Benchmarking	Medium-term product and process improvement	Identifying relevant benchmarking candidates
Delphi and experts	Long-term, consensus building	Expensive, experts might disagree or consensus is wrong (group think)
Scenarios	Long-term, high uncertainty	Time consuming; outcomes might be useless

# The „Black Swan“-Problem (Nicolas Taleb)



- **Some facts are taken as given until they are proven wrong**
- **Unlikely events of people's lives, the economy and business than anticipated**
- **Stochastic models implicitly assume that the structure of the past will be structure of the future**
- **Even if an unlikely event happens people tend to believe in mean reversion to the long term trend predicted in the past**

# Usefulness of Techniques for Products & Service Development



Forecasting Method	High-novelty/ Radical Projects		Low –novelty Incremental Projects	
	Usage %	Usefulness	Usage (%)	Usefulness
Segmentation*	89	3.4	42	4.5
Delhi/Industry Experts	63	3.8	37	3.7
Surveys/Focus Groups	52	4.5	37	4.0
User-practice Observation	47	3.7	42	3.5
Scenario Development	21	3.8	26	2.8

Usefulness Scale: 1-5 while 5 = critical, based on manager assessments of 50 development projects in 25 firms

\*) denotes differences in usefulness rating which is significant at 5 % level

Source: J. Tidd, K. Bodley (2002), The effect of project novelty on the new project development process. R&D Management, 32(2), pp 127-138



- Used by most companies
- B2C: Problem for Consumer goods: customers might not be able to articulate their future needs
- B2B: In industrial markets future needs are more reliable: B2B innovation often originate from customers
- Results are often biased in favor of existing products and services and current sales performance.

# Internal Brainstorming (Structure Idea Generation)



- Used to detect new products and services
- Typically a gathering of a small group of experts chaired by a moderator that refrains from comments and criticism
- Aim is to identify as many solutions as possible.
- Brainstorming does not produce a forecast as such but it is complementary to other methods of forecasting
- The evaluation of the ideas happens later in a separate meeting based on clear criteria for selection, review and rejection

# Critical Requirements for Using Brainstorming



- Relaxed atmosphere: meetings should be disciplined but informal; choosing an informal venue.
- Right size of the team: 5-7 people are optimal
- Choose a neutral (ideally external chairperson). Senior managers should chair a meeting, as they might restrict the flow of ideas.
- Define the problem or objectives clearly
- Generate as many ideas as possible. Write down every idea where everybody can see them.
- Do not allow any evaluation or discussion on the ranking of the ideas.
- Give everyone an equal opportunity to contribute
- When all ideas are listed, review them for clarification and avoid duplication.
- Allow ideas to incubate: brainstorm in sessions with a few days in between if possible



- Systematic comparison of products, technology, services, design and processes.
- Benchmarking differs from process analysis, as there is a clear reference to the performance of a competitor, another industry or regulatory standards.
- Benchmarking provides persuasive and detailed data on others' superior performance.
- Cross-Industry benchmarking refers to comparisons of processes and technologies in different industries.
- Benchmarking often used as a reference for constant improvement processes.
- Benefits of benchmarking: Establishing realistic goals and achieving better practice detecting problems, aids implementation and change



# Difference between Competitor Analysis and Benchmarking



## Competitor Analysis

- What to do
- Competitors
- Products and services
- Distant desk top analysis
- Secondary data

## Benchmarking

- How to do it
- Best in Class irrespective of sector
- Performance and processes
- Site visit & exchange of knowledge
- Primary data



- **Opinion of outside experts** that are asked for their opinion in an **iterative process**
- Often used when there is a **substantial uncertainty** or a long time horizon
- Delphi methods are supposed to deliver a **consensus** on the identification and timing of future technology trends and consumer trends
- Delphi begins with a **postal survey of a questionnaire** to get the experts' opinion on the future.
- The result is then analyzed and some new more **detailed question are** added and sent to the same experts. The procedure is continued until there is a convergence of opinions is observed.
- If there is a consensus, this result is referred to as the Delphi forecast.
- The iterative process is to avoid the disadvantages of face-to-face meetings that might lead to difference to authority of reputation, a reluctance to admit error, a desire to conform or differences in persuasion.
- Quality of the process is highly dependent on selection of the experts.
- Delphi results might become **self-fulfilling prophecy**.



- Scenarios are internally consistent descriptions of alternative possible futures based upon different assumption of the driving forces of change.
- Scenario Analysis is based on a disciplined methodology on which corporate decisions can be based. It is used for long-term planning.
- Inputs include quantitative data and analysis as well as qualitative assumptions and assessments such as
- Scenario development is an important contribution and part of strategic planning.
- Scenario Development may involve a number of different techniques such as decision trees, linear programming, stochastic and regression models as well as game-theory.
- The outcome is the best, worst and most likely scenario.

# Difference of Scenario Analysis in Innovation Management and Strategic Planning

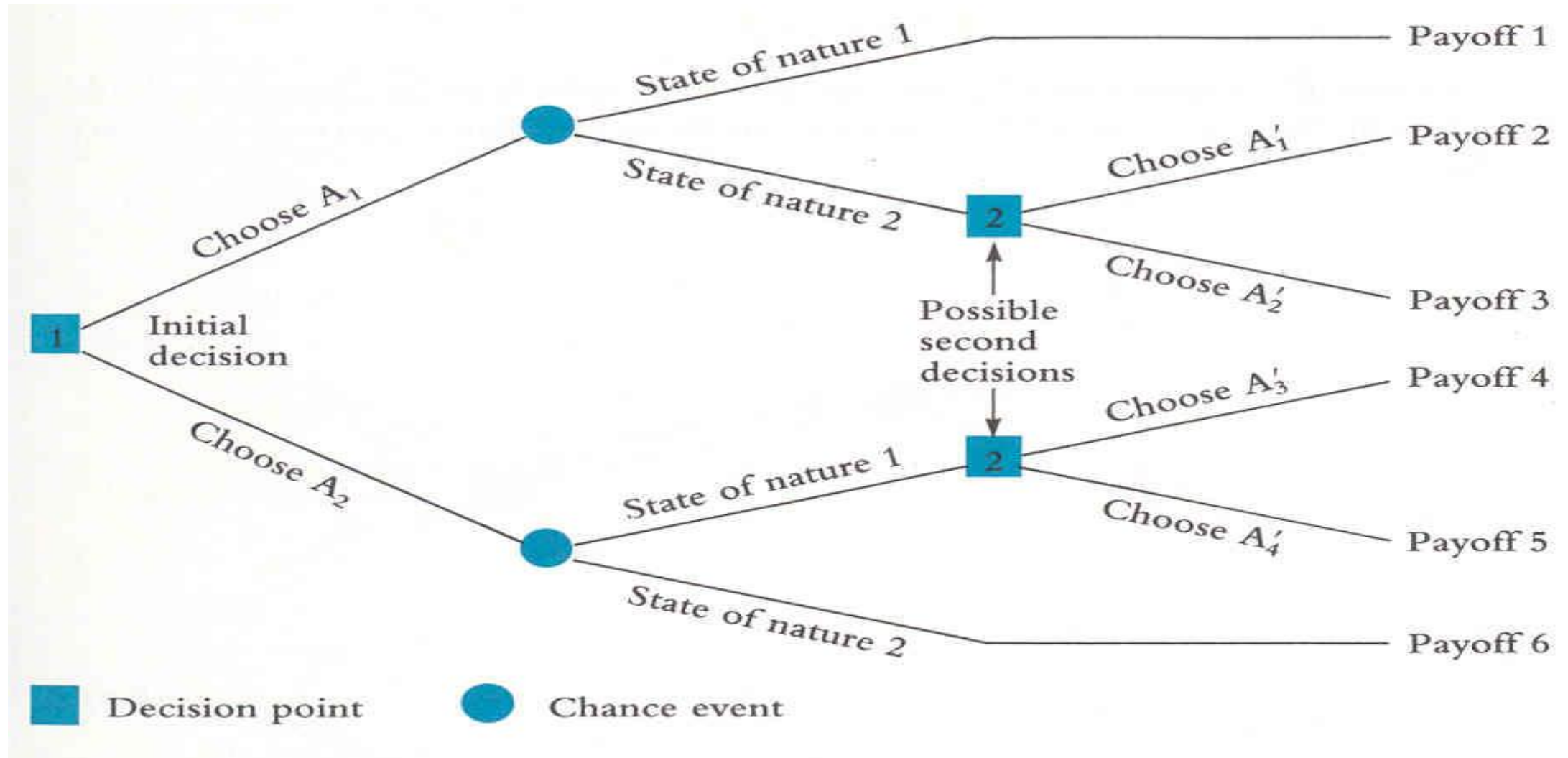


Innovation Scenarios	Strategic Planning Scenarios
Explores potential futures	Explores desired futures
Evidence-based (positive)	Value-based (normative)
Emerging structures and relationships	Know structures and relationships
Incorporates uncertainty	Assumes perfect knowledge
a number of different outcomes	one outcome, no Plan B



- Define the system level, boundaries and time horizon
- Develop the focal questions: normative or positive
- Identify trends, drivers and uncertainties
- Analyze the structures and relationships (cause-loop diagrams, cross-impact analysis, cause & effects charts, spider diagrams mind maps, lotus blossom, graphical recording)
- Built alternative scenarios and assess the consequences
  - inductive: underlying trends and relationships and describe a storyline for each
  - deductive: identify a number of critical uncertainties and describe each of it on a map or matrix
- Communicate an action plan and communicate to stakeholders: consistent, transparent, differentiated, communicable, practical to support action

# DECISION TREES



# Top Risks Analysis



## Current risk picture

(included of already implemented measures)

Likelihood	Very high					
	High	O-1		F-6, F-8	F-7	
	Medium	F-2		F-4		
	Low	F-3		F-1		
	Very low					F-5
		Very low	Low	Medium	High	Very high
		Consequence				

## Residual risk picture

(assumed long term effect of planned risk treatment)

Likelihood	Very high					
	High					
	Medium	F-2	F-6, F-8	F-4	F-7	
	Low	F-3		F-1		
	Very low	O-1				F-5
		Very low	Low	Medium	High	Very high
		Consequence				

## Consequence scale:

Very low = < 3 MEUR

Low = 3 – 6 MEUR

Medium = 6 – 9 MEUR

High = 9 – 12 MEUR

Very high = > 12 MEUR

## Probability scale:

Very low = < 20%

Low = 20% - 40%

Medium = 40% - 60%

High = 60% - 80%

Very high = > 80%



## 6. Selection and Management of Innovation Activities

- **Selection of Ideas and Projects as a Management Challenge**
- **Developing new Products and Services**
- **Developing Business Models and Ventures**





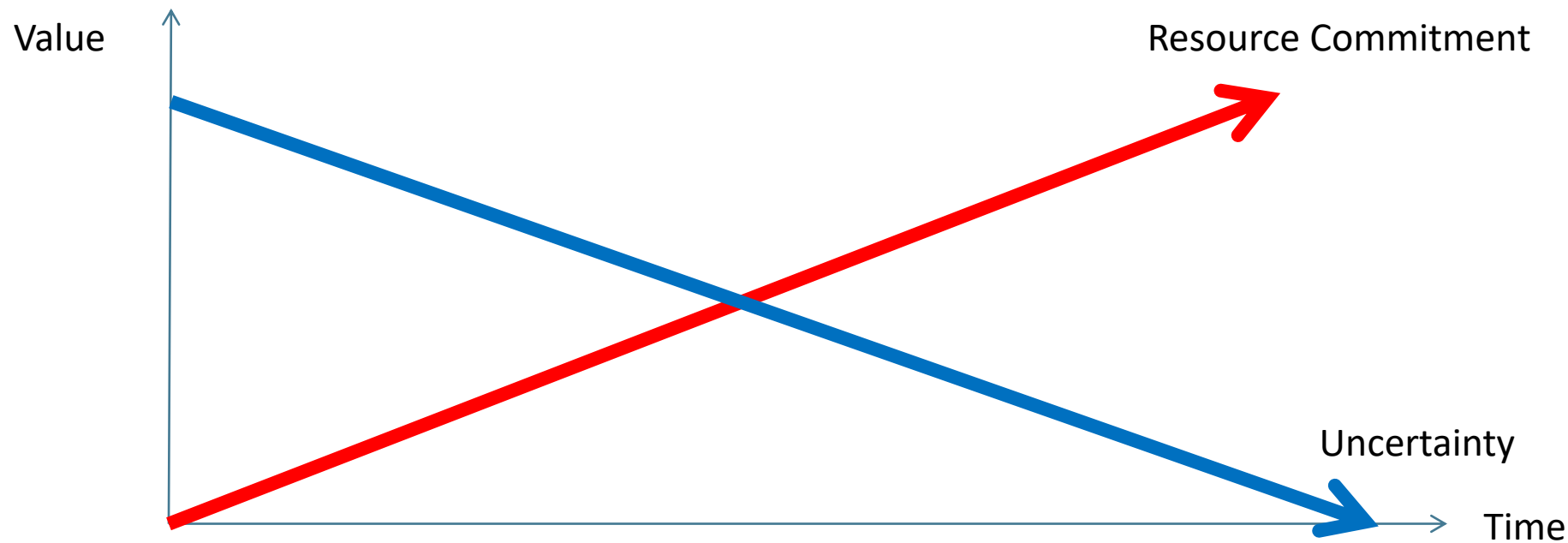
## 6. Selection and Management of Innovation Activities

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# Selection as a Management Challenge

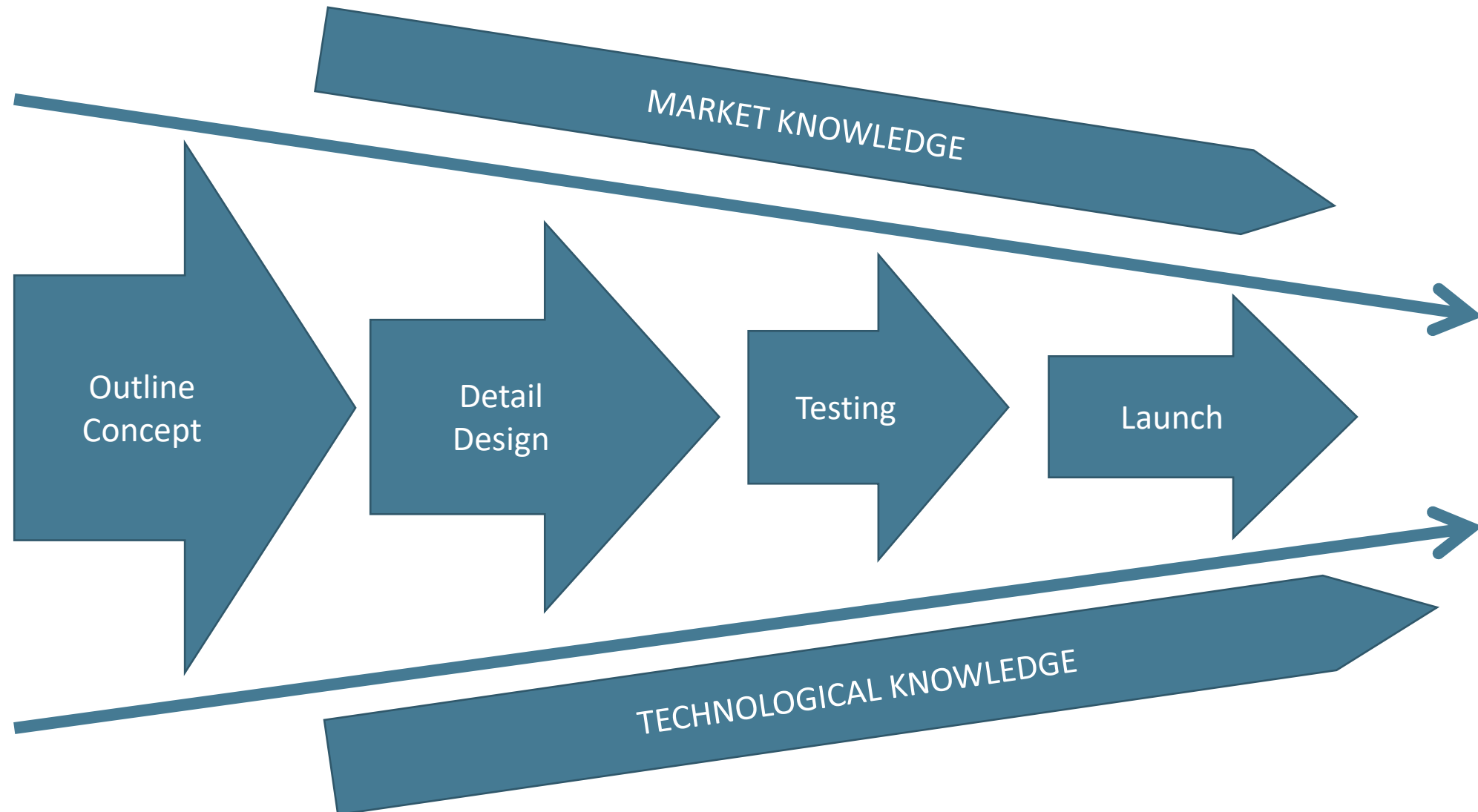


- Organizations cannot afford to innovate at random.
- Resources have to in line with the financial capacity of the company.
- Uncertainty



# Development Funnel for New Product Development

Prof. Dr. Mark Ebers • Seminar for Business  
Administration, Corporate Development and  
Organization • University of Cologne





## 6. Selection and Management of Innovation Activities

- Selection of Ideas and Projects as a Management Challenge
- Developing new Products and Services
- Developing Business Models and Ventures

# Approaches to Project Selection



Selection Method	Advantages	Disadvantages
Simple „gut feeling“, intuition	Fast	Lacks evidence and analysis, may be wrong
Simple qualitative techniques (checklists, decision matrix)	Fast and easy to share, provides a useful focus for initial discussion	Lacks factual information and little or no quantitative dimension
Financial measures, e.g. return on investment, payback time, burn ratio	Fast and uses some simple measurement	Fringe benefits from innovation are left out such as learning about new technologies and markets etc.
Complex financial measures e.g. real option approach	Takes account of learning dimension and the knowledge that might generate benefits or profits in other parts of the organization	More complex and time-consuming, difficult to predict the benefits and the future option value
Multidimensional measures e.g. decision matrix	Compares on several dimensions to build an overall score for attractiveness	Allows consideration of different kinds of benefits but level of analysis may be limited
Portfolio methods and business cases	Compares between projects on several dimensions and provides detail on core themes	Takes a long time to prepare and present

# List of Potential Factors for Project Evaluation



Factors	Objectives	Score (1-5)	Weight (%)	Score * Weight
<b>Corporate Objectives</b>	Fit to Strategy			
	Corporate Image			
<b>Marketing &amp; Distribution</b>	Size of potential market			
	Capability to market product			
	Market trend and growth			
	Customer acceptance			
	Potential Market share			
	Expected product sales life			
<b>Manufacturing</b>	Cost Savings			
	Capability of manufacturing the product			
<b>Research and Development</b>	Likelihood of technical success in given time			
<b>Regulatory and legal factors</b>	Product liability			
	Potential trade mark or IP restrictions			



To facilitate Portfolio Management is based on a matrix which groups technological knowledge into four key groups

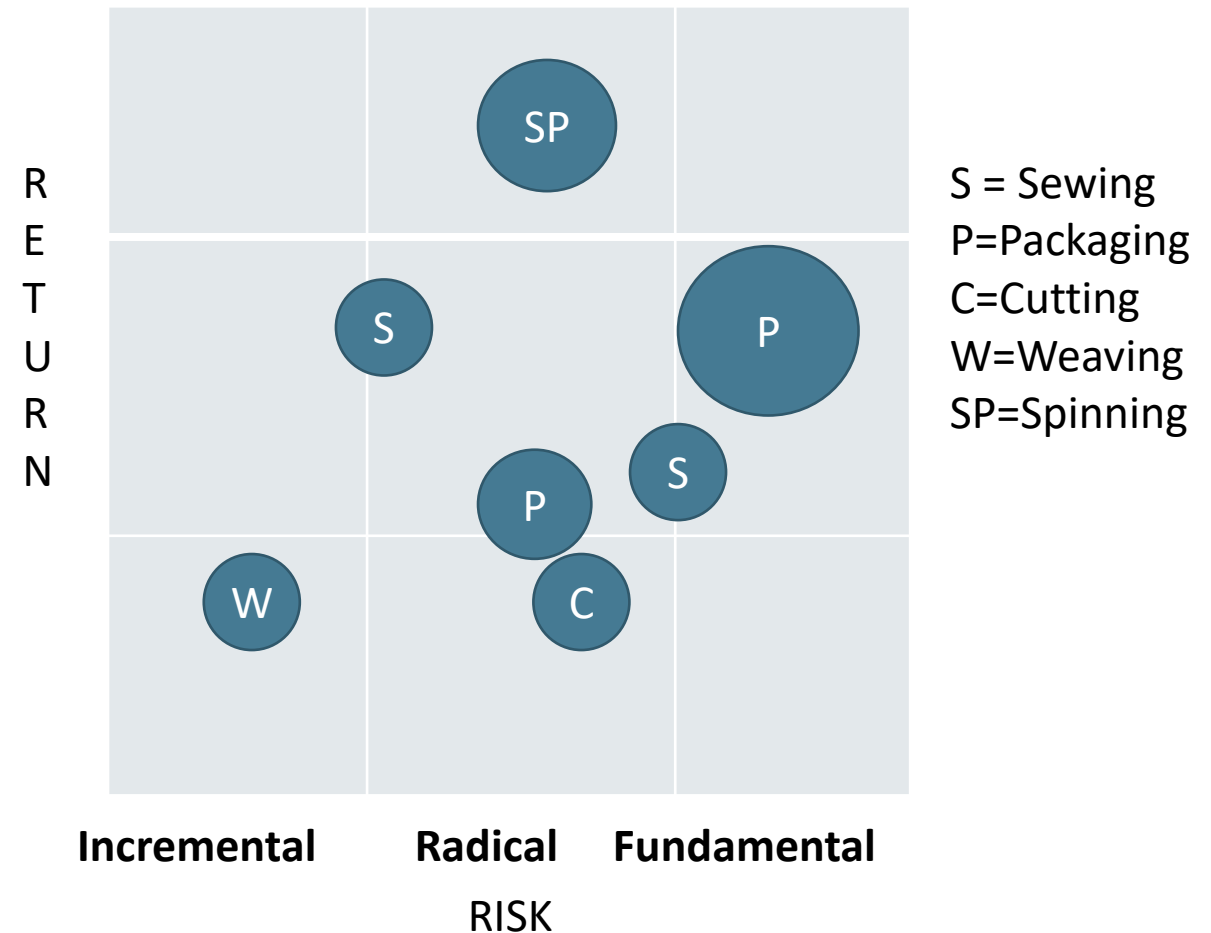
- **Base technologies** represent those on which product/service innovations are based and which are vital to the business. However they are also widely known about and deployed by competitors and offer little potential competitive advantage.
- **Key technologies** represent those which form the core of current products/services or processes and which have a high competitive impact – they are strategically important to the organization and may well be protectable through patent or other form
- **Pacing technologies** are those which are at the leading edge of the current competitive game and may be under experimentation by competitors – they have high but as yet unfulfilled competitive potential.
- **Emerging technologies** are those which are at the technological frontier, still under development and whose impact is promising but not yet clear. Making this distinction helps identify a strategy for acquisition based on the degree

# Process Innovation Matrix – Fruit of the Loom



Use of simple categories for Portfolio  
Management in Process Innovation:

- **Incremental:** essentially continuous improvement projects
- **Radical:** using the same basic technology but with more advanced implementation
- **Fundamental:** using different technologies (e.g. laser cutting instead of mechanical)





# Examples of Justifications for Non-Adoption of Radical Ideas



- „It's not our business“: perception that the idea is too distant from core competencies
- It's not profitable“: evaluation suggest the business plan is flawed often underestimating the potential of the idea or overestimating the profitability of the traditional business
- “It's not big enough for us“: emerging growth markets are too small compared to traditional business of large firms
- „We are not cannibals“:
- „Not invented here“: mistrust about the technology or products with regards to external sources
- „Invented here“: judgement that internal resources cannot are not good enough to compete with external resources
- „We have never done it before“: perception that risk is too high
- „We are doing OK as we are“: the success trap if established operations perform very well
- „Let's set up a pilot“: recognition of the prospects of the but no clear commitment and resources.



- Product advantage: product superiority in the eyes of the customer, real differential advantage, high performance to cost ratio, delivering unique benefits to user
- Market knowledge: better development preparation including initial screening, preliminary market assessment, preliminary technical appraisal, detailed market studies, business/financial analysis, competitive analysis.
- Clear product definition: defining target markets, clear concept definition, clear positioning strategy, list of product requirements and features before development begins
- Risk assessment: to be built into business and feasibility studies
- Project organization: use of cross-functional, multidisciplinary TEAMS responsible for the product from the beginning to the end
- Proficiency of execution: quality of technological and production activities, detailed marketing studies , measuring new product success
- Top management support from concept to launch: creating an atmosphere of trust, coordination and control; key individuals or champions often play a critical role in the innovation process



- **Differences between Service Operations and Manufacturing:**
- **Tangibility:** Goods tend to be tangible, while services are intangible.
- **Perception of performance and quality are more important in services such**
  - **tangible aspects such as appearance of facilities**
  - **responsiveness – prompt service deliveries**
  - **competence: the ability to perform the service dependably**
  - **assurance: knowledge and courtesy of staff and ability to convey trust and confidence**
  - **empathy:: provision of caring, individual attention**
- **Simultaneity:** lag between production and consumption in services is shorter is shorter or does not exist
- **Storage:** services cannot be stored, hence pricing, waiting and reserve capacity are used to cover peaks
- **Customer contact:** close in services; very distant in production
- **Location:** more important with services because of the proximity of production and consumption

# Characteristics of Service „High Innovators“ (1)



Business descriptor	Measurement	Low innovators	High innovators
Innovation outcomes	% sales from services introduce 3 y ago	< 1%	17 %
	% new services versus competitors	0%	5%
Customer base	Focus on key customers	average	high
	Relative customer base: similarity to competitors	high	low
Value chain	Focus on key suppliers	average	high
	Value-added/sales in %	72 %	60 %
	Operating cost added/sales	36 %	25 %
	Vertical integration versus competitors	Same or more	Same or less
Innovation input	R&D intensity as % of sales	0.1 %	0.7 %
	Growth of fixed assets/sales p.a.	10 %	> 25 %
	Overhead/shares	8%	11%

# Characteristics of Service „High Innovators“ (2)



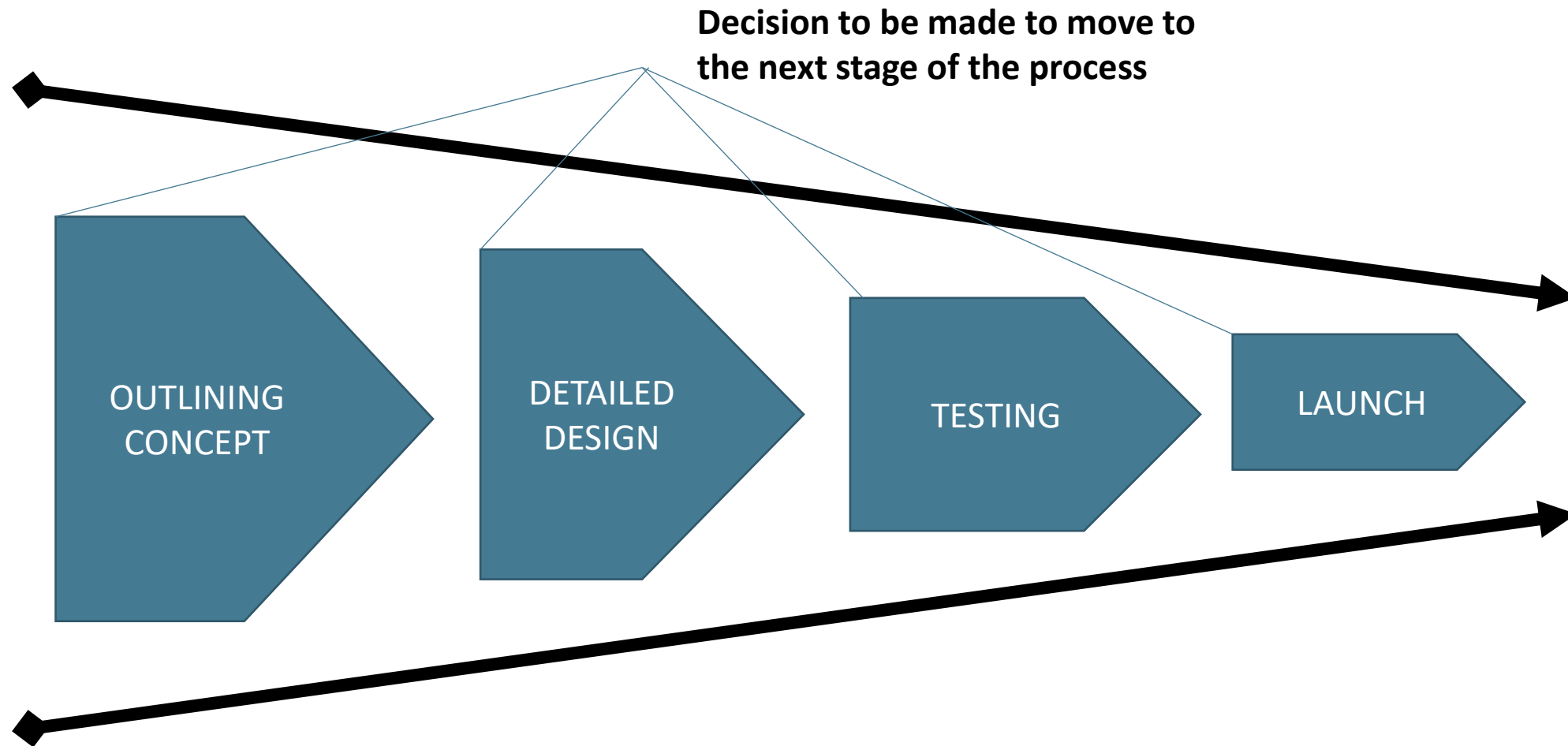
Business descriptor	Measurement	Low innovators	High innovators
Innovation context	Recent technology change	20 %	40 %
	Time-to-market	> 1 year	< 1 year
Competition	Competitor entry	10 %	40%
Quality of offer	Relative quality versus competitors	declining	improving
	Value for money compared to competitors	Just below	better
Output	Real sales growth	9 %	15 %

Source: J. Tidd and F.M. Hull (2003), Service Innovation: Organizational Responses in Technology Opportunities, London: Imperial College Press



- AIM-Model (Accelerated Ideas-to-Market-Process, R. Cooper, 1960's)
- phases with inputs and outputs specified beforehand
- gates, in which the gatekeepers decide about the continuation of the process
- Activities were standardized and the indicators of the process performance significantly improved.

# Innovation Funnel

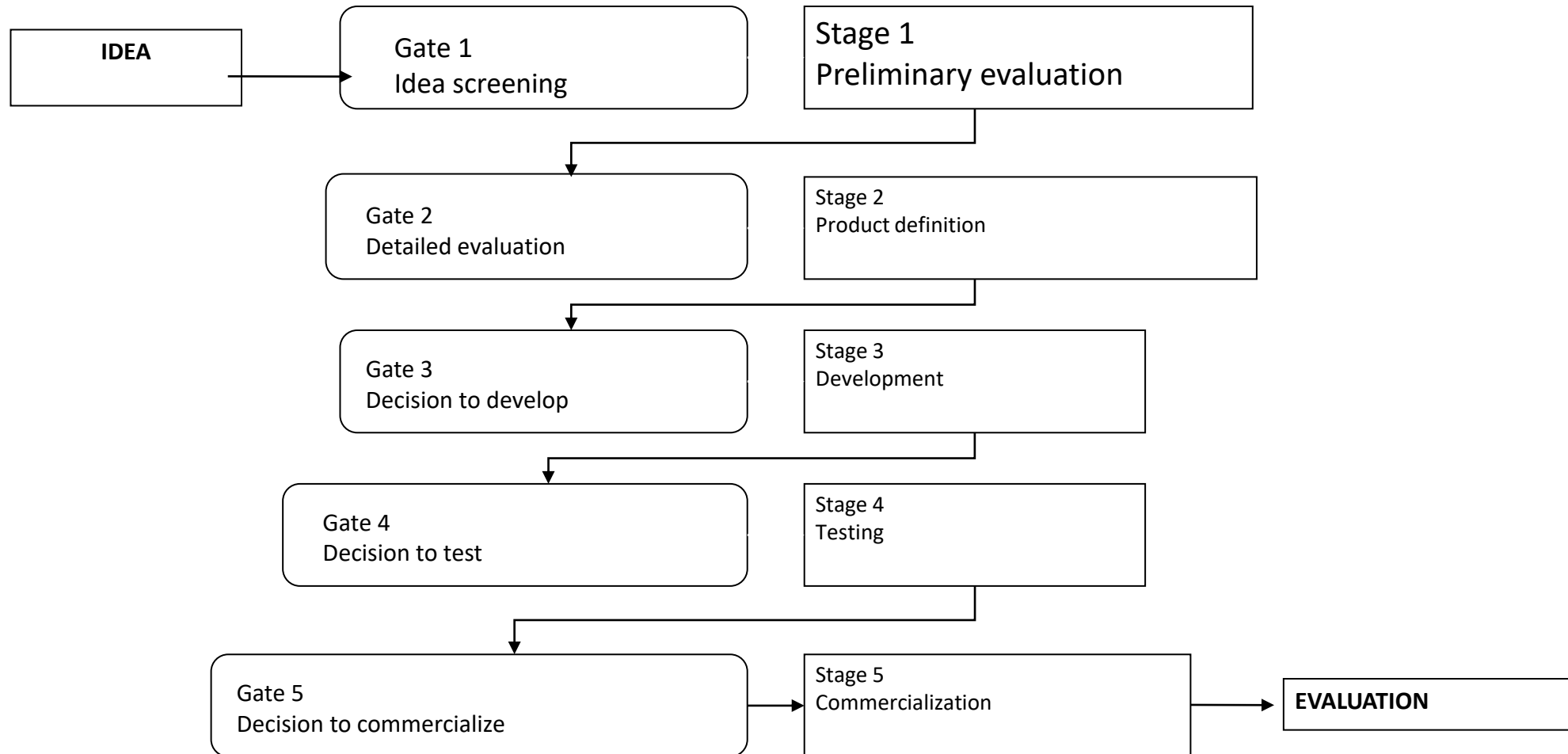




- **Concept Generation:**
  - market pull or technology push
  - hidden needs – revealed needs
  
- **Project Selection:**
  - filtering through aggregate product plan
  - fit to concepts
  
- **Product Development:**
  - cross-functional teams
  - iterative design-built-test-review-cycles
  
- **Product Commercialization and Review:**
  - customer co-development
  - test marketing,
  - alpha-, beta- or gamma-tests on customer requirements



# Stage-gate process for Product and Process Innovation (AIM Model = Accelerating Ideas to Market)



# Objectives of the AIM Process / Stage-Gate-System

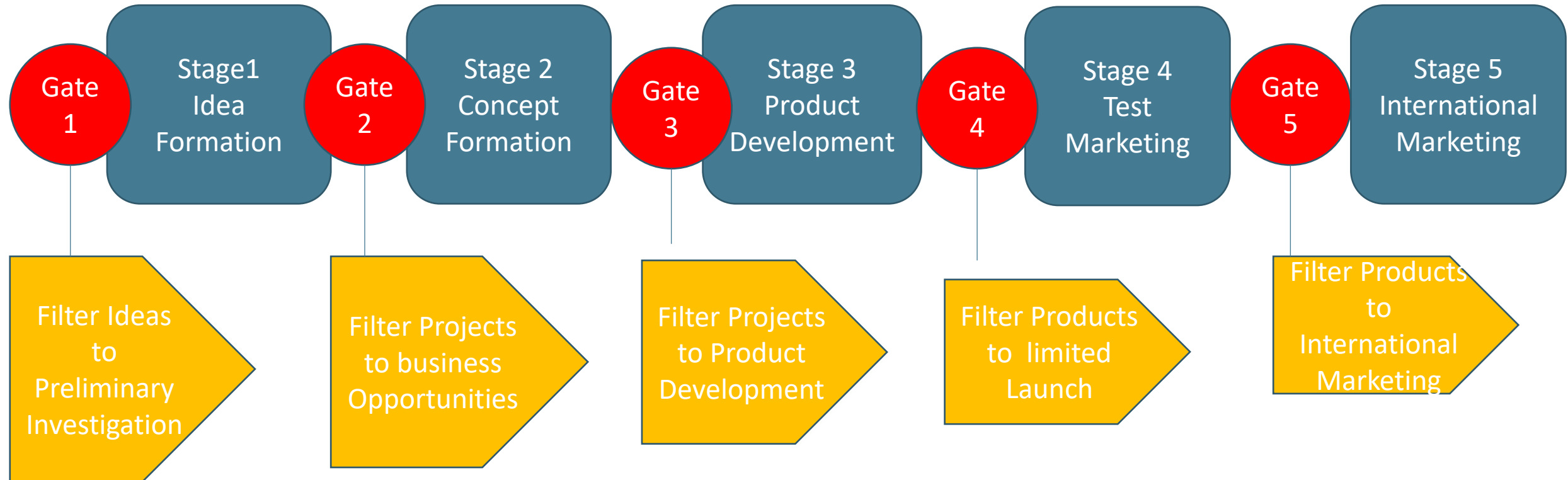


- Make sure that the development is carried out by project teams consisting of selected specialists from different functions
- By dividing the decision process up into a number of stage (3-7) it is easier to follow up
- After each stage of the process there is a reassessment before moving towards the next stage
- Providing common rules of the game of product and process development
- Making clear decisions at the right time
- Clarify responsibility
- Make sure that unattractive ideas die fast
- Make sure attractive ideas are quickly implemented
- Allocate scarce resources to the promising projects

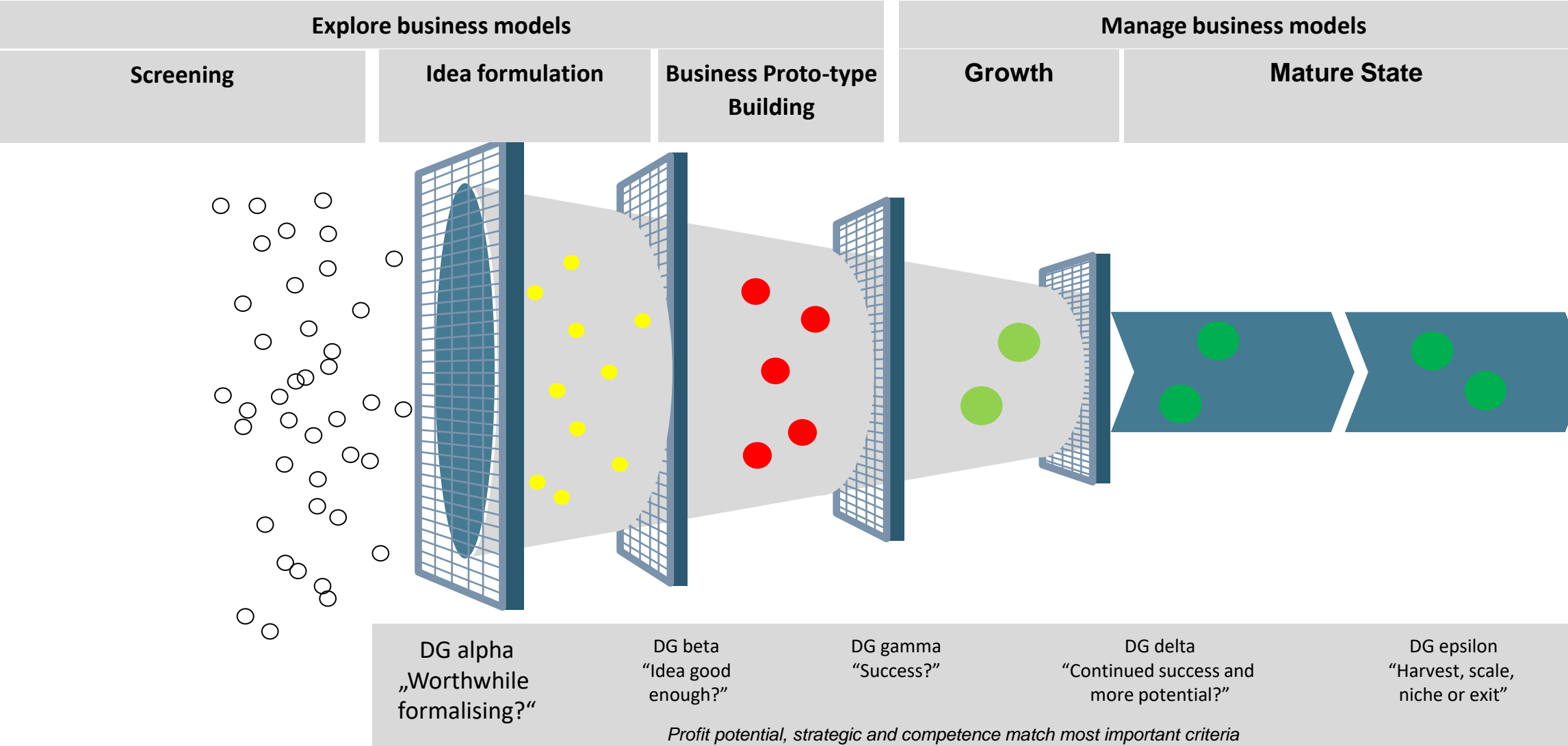
# Stage Gate Model for Product Development (Cooper)



Length of Process is different across product groups: handbags (1 month) , automotive 2 years



# Stage Gate Model organised as Projects to allow Tracking



# Key Questions to be addressed at Decision Gates



DG alpha: Formalize idea?	DG beta: Prototype?	DG gamma: Enter growth phase?	DG delta: Steady state?	
<ul style="list-style-type: none"><li>▶ Is it a good idea? (profitability market potential, competition)</li><li>▶ Does the idea fit our strategy? (Competence, resources, synergies, strategy)</li><li>▶ Costs and time to formalize idea?</li></ul>	<ul style="list-style-type: none"><li>▶ Business case and fit with Statkraft?</li><li>▶ How can it be operated as a “prototype”? (invoicing, reporting, ...)</li><li>▶ Costs, time and risks for prototype?</li></ul>	<ul style="list-style-type: none"><li>▶ Was the prototype successful, how big is the potential?</li><li>▶ What are the success criteria?</li><li>▶ What is needed to grow? How will we grow and where?</li><li>▶ What is the plan for implementation?</li></ul>	<ul style="list-style-type: none"><li>▶ Evaluation of growth and future potential</li><li>▶ Geographical expansion</li></ul>	
<p>and assessing ness SK role, value and resources t stage formalising the</p>	<ul style="list-style-type: none"><li>▶ Mature key issues, attractiveness, value creation ability</li><li>▶ Likely go externally to test idea, customer reaction, suppliers etc.</li><li>▶ Formulate desired learnings of prototype phase and plan</li><li>▶ Develop financials model</li></ul>	<ul style="list-style-type: none"><li>▶ Implement plan</li><li>▶ Does the prototype deliver according to plan?</li><li>▶ Continue, kill or ramp up?</li><li>▶ Do we have the right resources available and working on this?</li></ul>	<ul style="list-style-type: none"><li>▶ Implement plan</li><li>▶ Are we growing fast enough, what is our competition doing, is the profitability (margin 2) healthy, are there synergies? Status vs plan?</li><li>▶ Continue, kill, sell or ramp up?</li><li>▶ Do we have the right resources available and working on this?</li></ul>	<ul style="list-style-type: none"><li>▶ Strategic mode shifts from top-line focus (e.g. TWh, Revenue) to bottom-line focus (EBITDA, net profit);</li></ul>
<p>something, looking at our strategy. Is the overall portfolio balanced?</p> <p>disseminate lessons learnt; and take action from them</p>				



- **Team** to develop the business prototype plan: Names, roles, expertise; why are they relevant for the idea formalisation?
- **Timeline** taking into account the relevant decision-making process given the scale of the proposed business.
- **Problem:** What problem do we address? Why and for whom is this problem relevant? Who is willing to pay for a solution?
- **Solution Hypothesis:** What is the target-company's solution? How is it different from state of the art? What are the resulting products/services?
- **Business Modell:** How would this solution earn money? Revenue model: units, pricing, recurring revenues, margins,... Parties involved and their role (e.g. suppliers, customers, partners, agents, brokers, regulators)
- **Necessary capabilities:** How does it work? What is the underlying technology, what is unique about it? Does it build barriers to entry?



- **Addressable Market:** What is the relevant market-segment, Size, (CAGR); Bottom-up analysis of addressable market. Planned market-share. Trends in that market.
- **Market entry, first revenues:** How are first customers acquired? Sale cycles? Steps in the sales-process, customers decision making. Barriers to enter. Description of first customers (if any). Reference-calls with (potential) customers
- **Competition:** Direct competitors and indirect competitors with their KPIs strengths and weaknesses. What is today's state of the art/ what are potential substitutes, alternatives. How could competitors react? What barriers to enter protect target-company?
- Summary of market attractiveness and ability to create value with the definitions used in the corporate portfolio review.

## DG beta “Idea good enough to develop a business prototype” – description



- Scope: This is the decision to enter into a prototype development with dedicated resources and agreed milestones.
- Time: Set at DG alpha.
- Decision Taker: Depending on mandates necessary, normally EVP or CEO
- Decision Matter: Using manpower, Opex, capex and other necessary resources to build up a business prototype. I.e. a running business which proves the viability of the concept and provides lessons learnt for scaling up. Decisions will normally cover >5 FTEs, >1 mm NOK Opex, >10m NOK capex, involve foundation of legal entities and stretch over a period of > 1 year.
- Decision input: Refinement and improvement of information from DG alpha. How can the initiative be operated as a “prototype”? (invoicing, reporting, ...) Costs, time and risks for prototype?



# DG beta “Idea good enough to develop a business prototype” – template



- Refinement and update of assessment at DG alpha. Including explicit learnings and changes since DG alpha.
- **Team** to deliver the business prototype plan: Names, roles, expertise; why are they relevant for the implementation?
- **Timeline** for building up and implementing the business prototype.
- **Building blocks:** E.g. Sales & Marketing, IT, Finance, Technology, ...
- **Financial model and business plan:** The business plan shall be summarised into the following categories and can provide various scenarios. The business plan must in any case allow for follow-up and for tracking deviations from the planned development path.
  - Start date for implementation and going live and other milestones, expected DG gamma, expected mature state of business; Opex; Capex; FTEs; Working capital ; Expected; FTEs in mature state; OPEX in mature state p.a.; Expected EBITDA p.a., EBITDA (Low), EBITDA (High) in mature state
- **Milestones** (dates, revenue, organizational, technological, ...)

## DG gamma “Enter Growth Phase” – description



- Scope: This is the conscious decision to end the business prototype phase and let it follow by a growth phase, accept a niche business or target an exit/closing. This shall avoid a silent, never ending continuation of a subcritical size business and lack of dedication after a working business prototype has been created.
- Time: Set at DG beta or decided in the Business Division's Business Development portfolio review or decided (ad-hoc) by SVP/EVP/CEO based on specific event or reporting.
- Decision Taker: Responsible SVP for making a suggestion. Decision depending on the necessary mandates, normally EVP, sometimes CEO.
- Decision Matter: Scaling up prototype, integrating in the best possible way as a “niche” business (which did not reach initial ambitions) or controlled exit or closing of the initiative.
- Decision input: **Performance Review by Controlling** Was the prototype successful, how big is the potential? What are the success criteria? What is needed to grow? How will we grow and where? What is the plan for implementation?

# DG gamma “Enter Growth Phase?” – template



- Report about the status. Compare original and updated plans with current status re.
  - ▶ Start date for implementation and going live and other milestones, expected DG gamma, expected mature state of business; Opex; Capex; FTEs; Working capital ; Expected; FTEs in mature state; OPEX in mature state p.a.; Expected EBITDA p.a., EBITDA (Low), EBITDA (High) in mature state
  - ▶ Lessons learnt from prototype implementation and operation.
  - ▶ Refinement and update of assessment at DG alpha and beta. Including explicit learnings and changes since DG alpha and beta.
- Updated business plan for next phase incl. need for key capability in addition to FTEs, Opex, capex.
- **Team** to deliver the business prototype plan: Names, roles, expertise; why are they relevant for the implementation?
- **Timeline** for building up and implementing the business prototype.
- **Building blocks:** E.g. Sales & Marketing, IT, Finance, Technology, ...

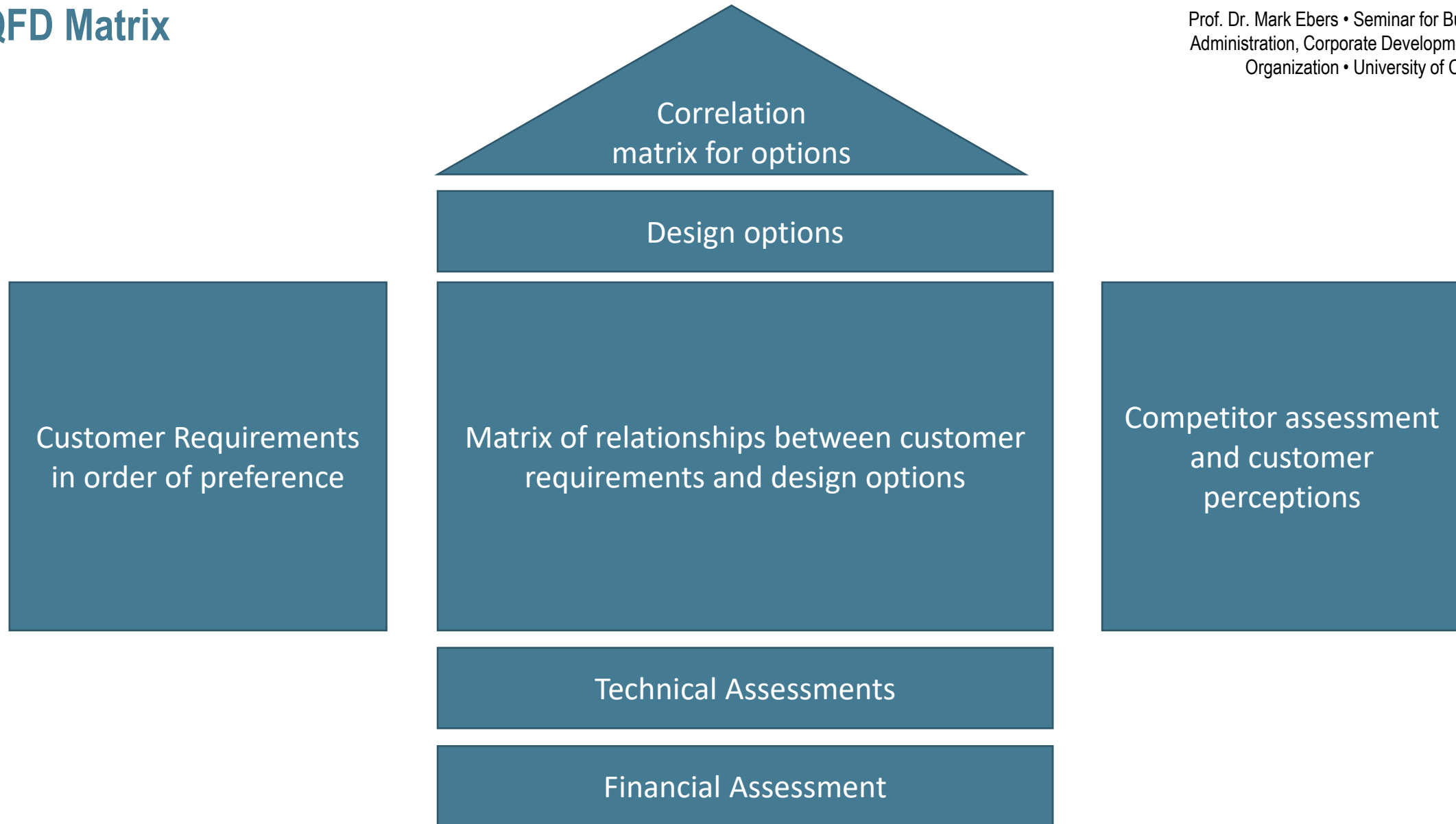


- Using a combination of criteria such as Discounted Cash-flows, net present value, internal rate of return, NPV-margin, cost- benefit-analysis, amortization period
- Rankings: based on weights of a number of criteria, mostly used in early stages of the selection process
- Profiles: profiles are given scores on each of several characteristics and are rejected if they do not meet defined thresholds. This method can be used in all stages of the process.
- Simulated outcomes: alternative outcomes to which probabilities or alternative paths can be attached. Used especially if the set of projects are interdependent or complementary
- Strategic clusters: projects are not only clustered by financial measures but also by strategic importance
- Interactive: iterative process between the R&D director and project managers where project proposals are improved at each stage



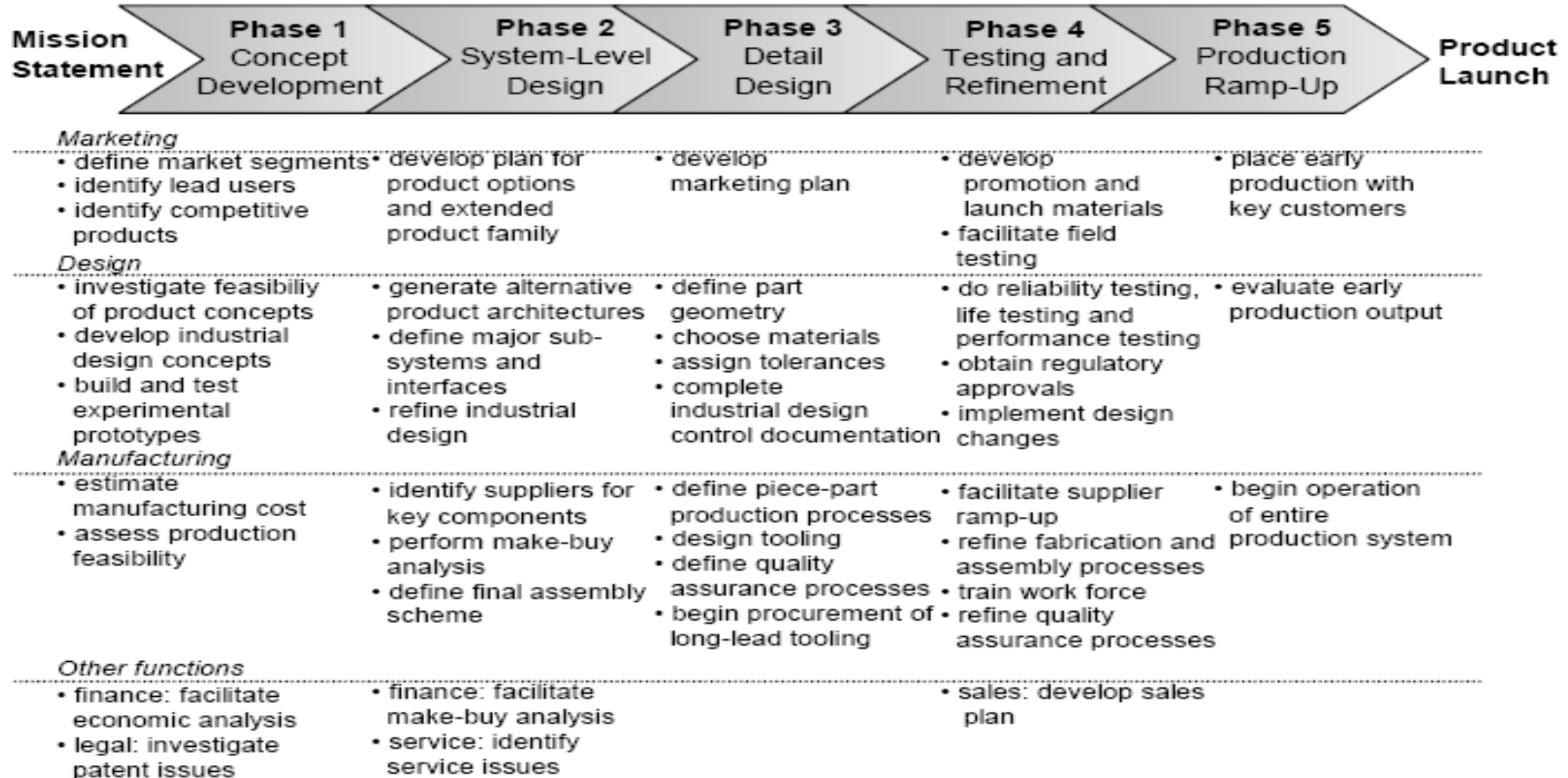
- **Design-for-manufacture (DFM):** it includes design for assembly (DFA, design for produce-ability (DFP) and other design rule approaches. Used especially in automotive where 80 % of the final production costs are determined at this stage
- **Rapid prototyping:** iterative process forming the core element of design-built-test-cycle
- **Computer aided techniques:** using CAD/CAM reduces development lead times; especially effective when linked to production automation (used in machine building, automotive, F1)
- **Quality Function Development (QFD):** set of planning and communication routines which are used to identify critical customer attributes and create a specific link between these design parameters (originally developed by Toyota):
  - Identify customer requirements, primary and secondary and major dislikes
  - Rank requirements according to importance
  - Establish a relationship between customer requirements and technical product characteristics and estimate the strength of that relationship
  - Choose appropriate units of measurement and determine target values based on customer requirements and competitor benchmarks.
  - Requires the compilation of a lot of data from technical development and marketing

# QFD Matrix



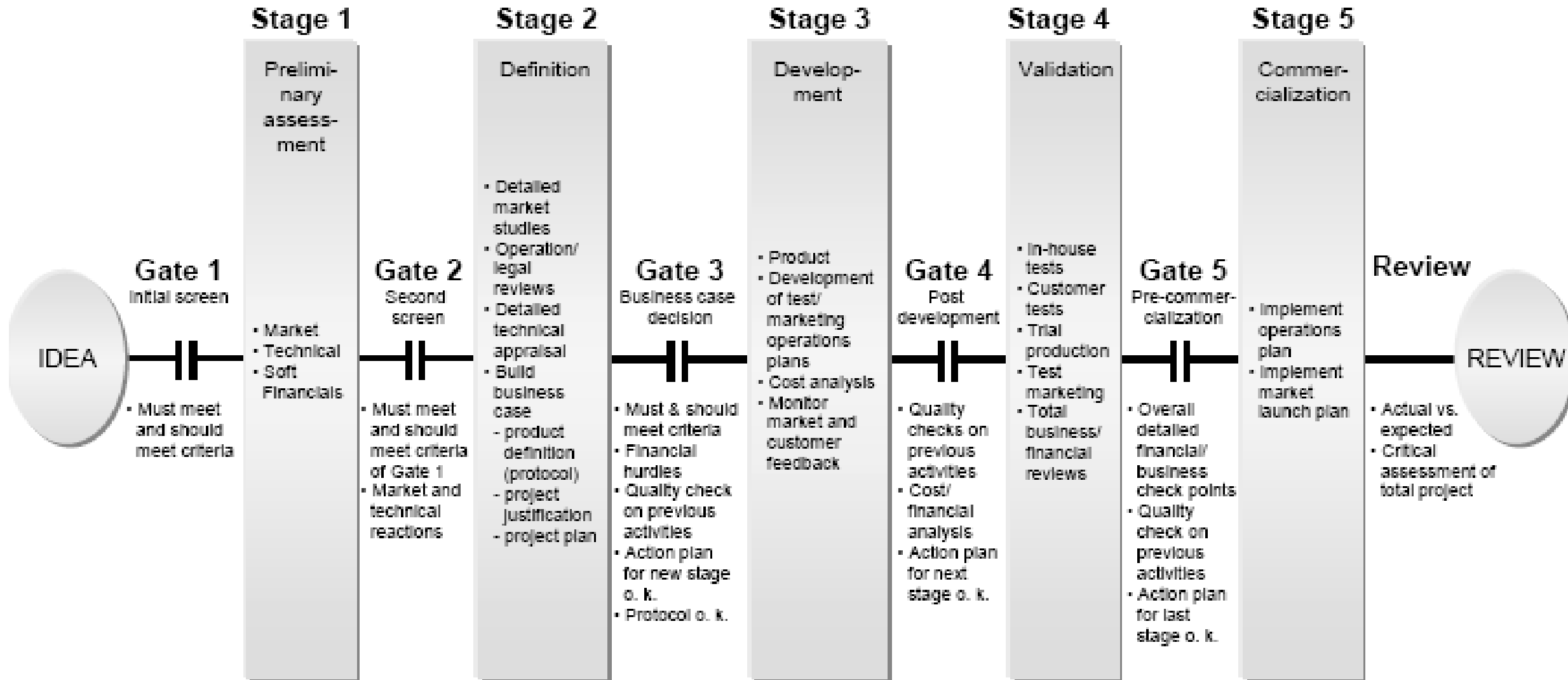


- The generally accepted method of evaluation of investment, is based on discounted cash flows (DCF).
- The method is successfully used for investment projects with low level of uncertainty and duration from several months up to few years.
- In many cases it is not suited to long-term NPD and R&D projects, as it penalizes projects with high risk and potentially valuable projects can be rejected or terminated.

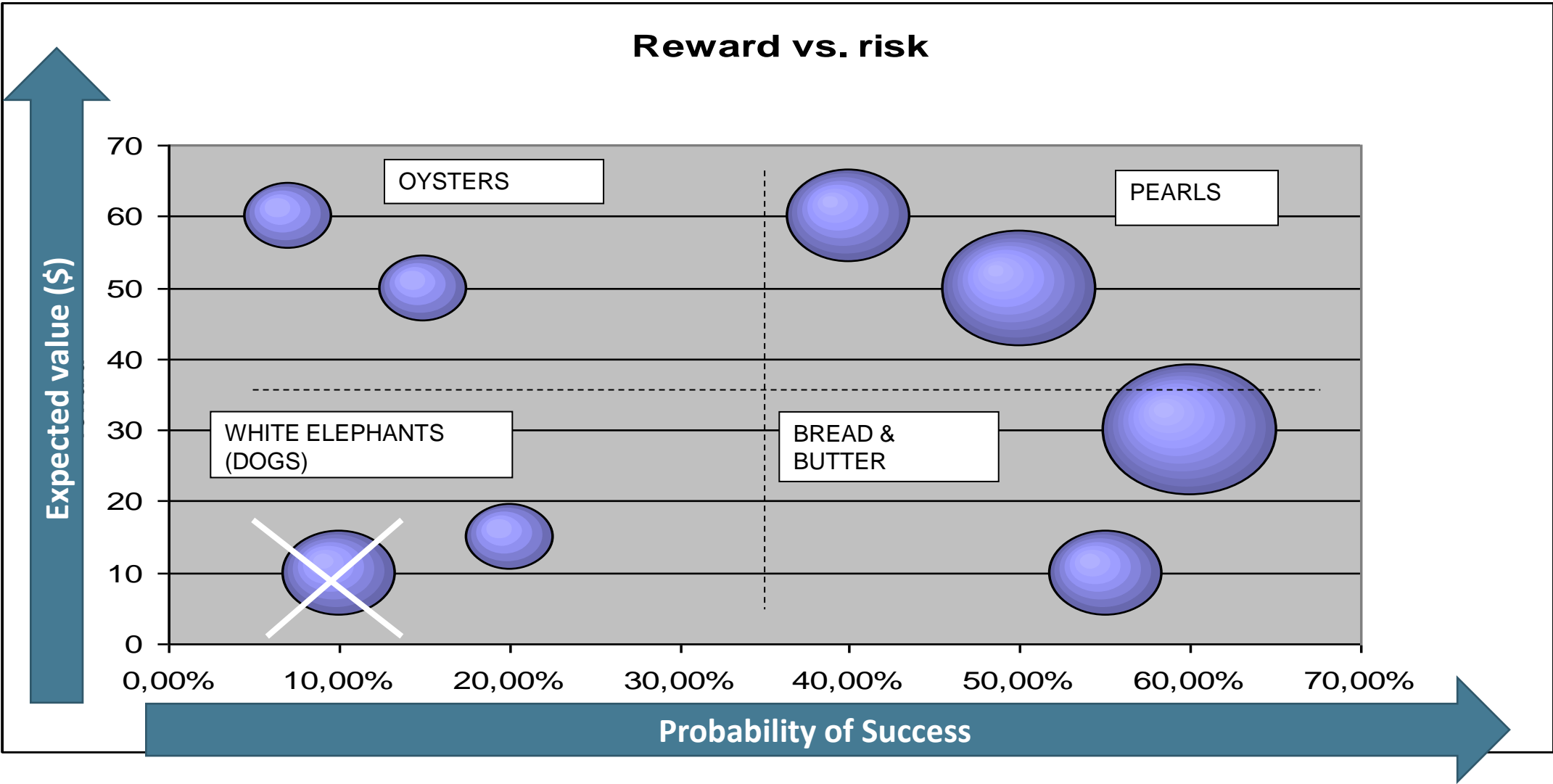




## 2-nd generation SG process



# Matrix-Based Portfolio: Risk-Reward bubble diagram





- **Pearls:** potential „star“ projects: high probability of success, high expected reward. We would like many of such projects.
- **Oysters:** highly speculative projects: low probability of success, high expected reward. Here the breakthroughs pave the way for solid payoffs.
- **Bread and butter:** simple projects, high probability of success, low expected reward. Often too many of them in the portfolio, consuming substantial ratio of resources.
- **White elephants:** low probability of success, low expected reward; projects that are difficult to kill, often from personal reasons.



- Management, decides what resources will be allocated to basic categories of development projects e.g.  
X % to platforms  
Y % to new products  
Z % to incremental innovations
- Then projects are then prioritized within those buckets on the basis of the strategy.
- Resources originally allocated to one category may not sufficient, while there are still free resources in the other bucket. In such a case the resources can be redistributed.
- However, after the final allocation of resources to strategic buckets it should not be possible to reshuffle the resources between buckets. Especially it should be avoided to take resources originally allocated for strategic, long-term goals and use them for short-term, more “urgent” projects, often backed from “political” reasons. Such redistribution undermines long-term strategic goals and all the strategic planning

# Multi-Criteria Project Valuation: Final project ranking



Project	IRR * PTS	Ranking by IPR*PTS	NPV * PTS	Ranking by NPV*P TS	Strategic Impact (SI)	Ranking by SI	Avg.	Final
A	16,0%	2	8	2	5	1	1,67	1
B	10,5%	5	1,4	6	2	4	5,00	6
C	9,0%	6	4,5	5	3	3	4,67	5
D	11,1%	3	7,8	3	2	4	3,33	3
E	10,8%	4	18	1	4	2	2,33	2
F	18,7%	1	5,1	4	1	6	3,67	4

# Technology Stage-Gate Process (TSG)



- Management of high-risk projects within and at the transition between the fuzzy front end and new product development
- traditional SG: gates are transparent, the product development team can "see" all the deliverables at the gates
- TSG: gates are opaque: the team can only "see" to the next gate and understands that the deliverable may change as the technology is developed

# Use and Usefulness of Techniques for Product and Service Development (1)



Tool type	High Novelty		Low Novelty	
	Usage (%)	Usefulness	Usage (%)	Usefulness
Segmentation *	89	3.42	42	4.50
Market experimentation	63	4.00	53	3.70
Industry experts	63	3.83	37	3.71
Surveys/Focus groups *	52	4.50	37	4.00
User-practice observation	47	3.67	42	3.50
Partnering customers *	37	4.43	58	3.67
Lead users *	32	4.33	37	3.57
Probability of technical success	100	4.37	100	4.32
Probability of commercial success	100	4.68	95	4.50
Market share *	100	3.63	84	4.00
Core competencies *	95	3.61	79	3.00
Degree of internal commitment	89	3.82	79	3.67

## Use and Usefulness of Techniques for Product and Service Development (2)



Tool type	High Novelty		Low Novelty	
	Usage (%)	Usefulness	Usage (%)	Usefulness
Market Size	89	3.42	42	4.50
Competition	63	4.00	53	3.70
Gap Analysis	63	3.83	37	3.71
Strategic Clusters *	52	4.50	37	4.00
Prototyping *	47	3.67	42	3.50
Market experimentation	37	4.43	58	3.67
QFD	32	4.33	37	3.57
Cross-functional teams *	100	4.37	100	4.32
Heavy weight project manager *	100	4.68	95	4.50

Usefulness Scale: 1-5, 5 = critical based on manager assessments of 50 development projects in 25 firms

\* Denotes difference in usefulness rating is statistically significant at the 5%-level

Source: J. Tidd and K. Bodley (2002), The effect of project novelty on the new product development process. R&D Management, 32, 127-138





## 6. Selection and Management of Innovation Activities

- Selection of Ideas and Projects as a Management Challenge
- Developing new Products and Services
- Developing Business Models and Ventures



- Formulate **value proposition**, i.e. the value delivered to the customer by the product based on specific technology.
- Identify **market segment**, i.e. users to whom the technology brings value and performs the job to be done.
- Define structure of the **value chain**, required for the product creation and distribution. Value creation is necessary, however not sufficient condition of profitability; value creation is conditioned by:
  - ↳ balance of forces among our business, suppliers and competitors
  - ↳ presence of complementary assets (e.g. in production, distribution, etc.) necessary for supporting the company position in the value chain.

# Content of Business Cases (usually 14 – 20 pages)



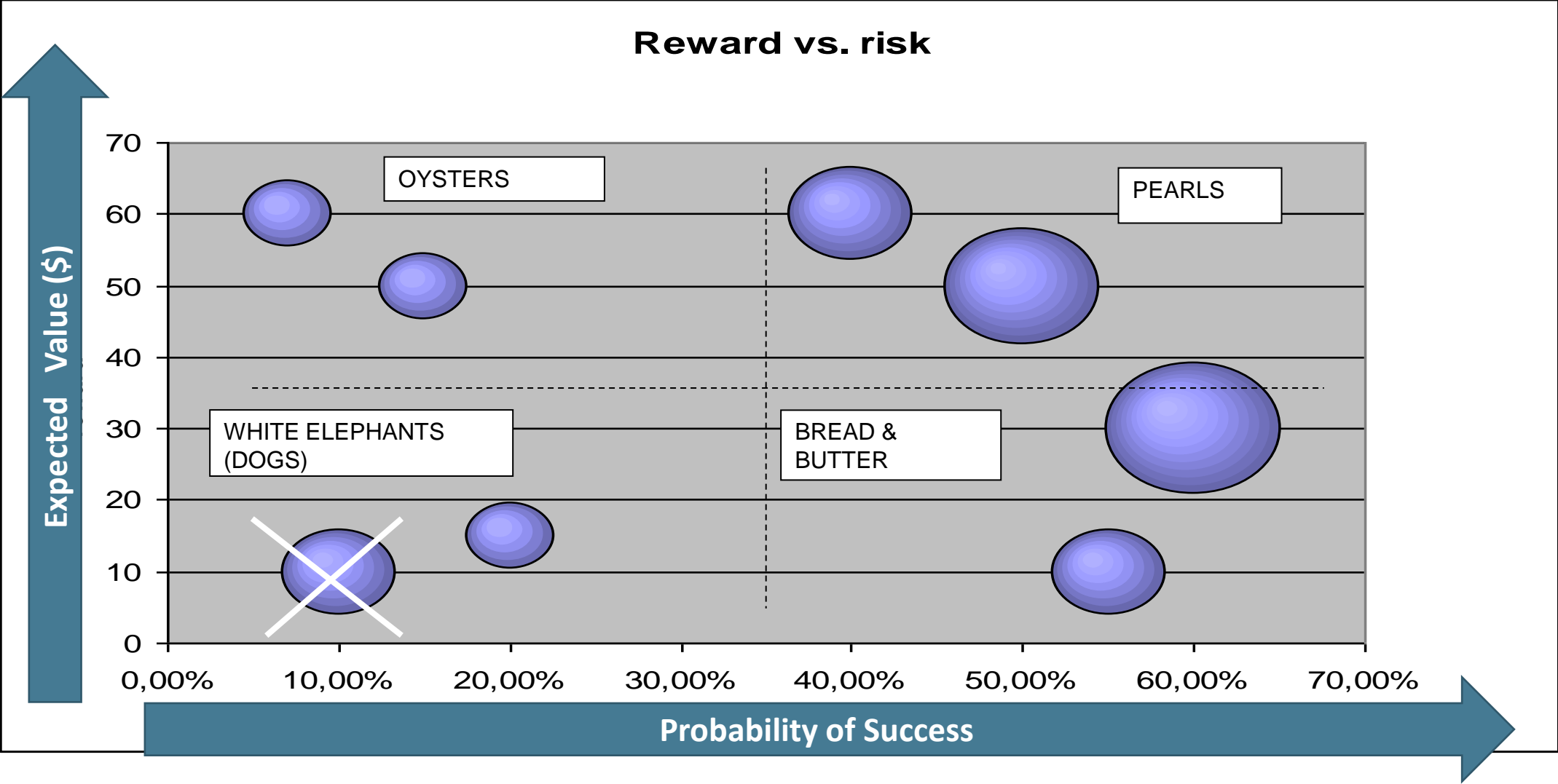
- Details of the Product or Service
- Assessment of the Market Opportunity
- Identification of Target Customers
- Barriers to Entry and Competitor Analysis
- Experience, Expertise and Commitment of the Management Team
- Strategy for Pricing, Marketing, Distribution & Sales
- Identification and Planning of Key Risks
- Cash-flow Calculation incl. Breakeven points and Sensitivity Analysis
- Financial and other Resource Requirements for the Business



## Advantages of Portfolio Management

- All corporations have a number of innovation activities that can be compared to make a selection
- Limits to number of projects taken on, avoiding resources being spread too thinly
- Decreasing reluctance to kill-off or de-select projects, reducing time & cost overrun
- Avoiding lack of strategic focus in project mix and looking out for synergies
- Better selection criteria: avoiding that projects find their way into the portfolio because of politics, emotion or other factors
- Better decision criteria: less average projects selected

# Matrix-Based Portfolio: Risk-Reward Bubble Diagram





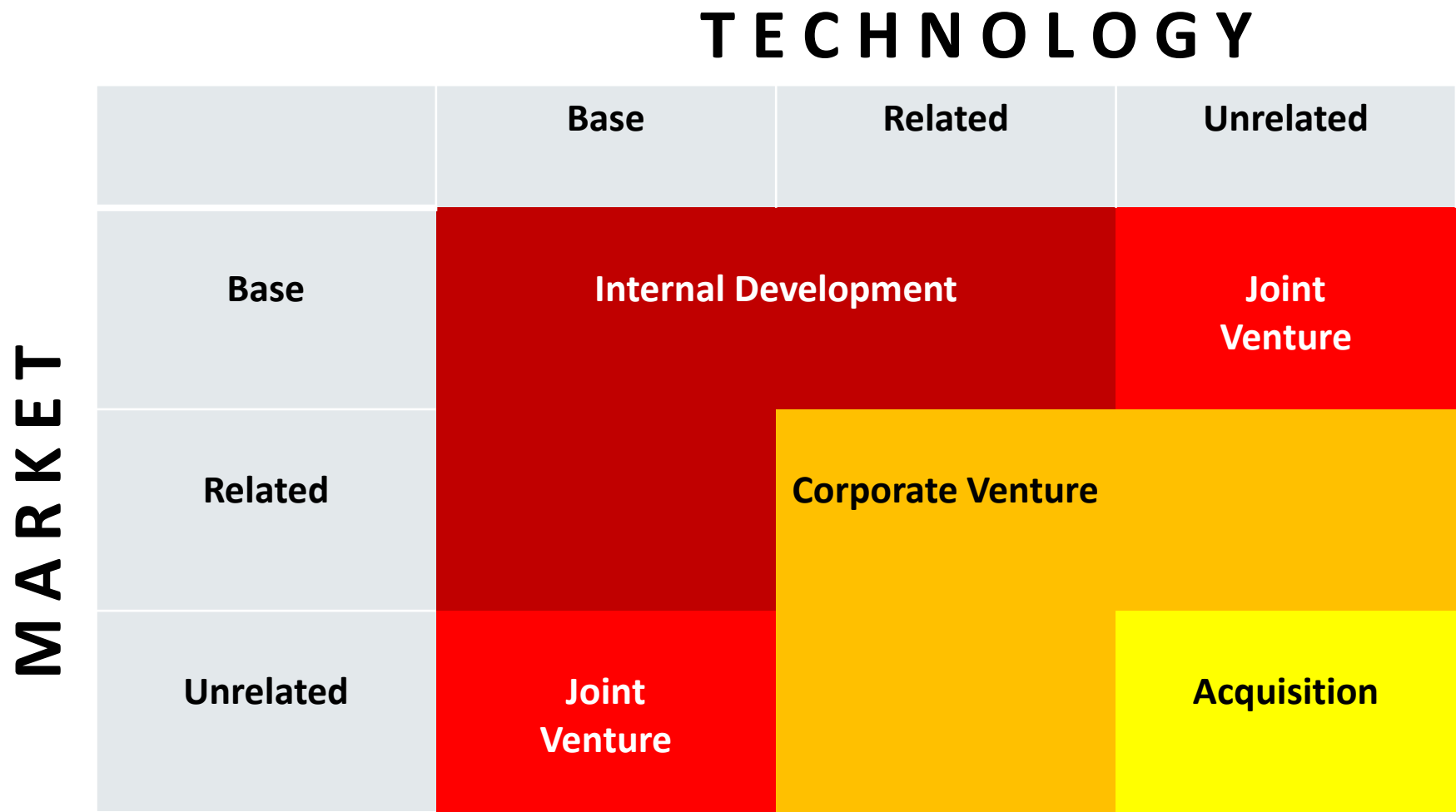
## 7. Capturing the Value of Innovation



## 7. Capturing the Value of Innovation

- **Commercialization and Diffusion**
- **Exploiting the Knowledge and Intellectual Property**
- **Capturing the Value of New Business Models**
- **Learning to Manage Innovation**

# Commercialization: Structural Set-up (Burgelman)



Source: Burgelman, R. (1984), Managing the internal corporate venturing process. Sloan Management Review, 25 (2), 33 – 48.





- Internal Development: only if either technology or market are already base activity of the company
- Corporate Ventures: a range of alternative ways of developing innovations as alternatives to conventional processes for new product and services development
- Innovation management techniques such as the funnel approach are likely to go beyond the **comfort zone** of the existing organization.
- **Risk:** different gates are likely to favour those innovations **close to existing strategy**, markets and products
- Internal corporate venture attempts is to exploit the resources of the large corporation.
- Key factors to distinguish a new venture from the core business are: **risk, uncertainty, newness and significance.**
- There are three basic organizational approaches to innovation:
  - Corporate Venture
  - Joint Venture
  - Acquisition



- Grow the business: especially when core business is maturing
- Ringfence exceptions to standard operating procedures: unleash internal entrepreneurial drive
- Exploit underutilized resources in new ways: both human resources and technology
- Introduce pressure on internal suppliers: common motive to introduce pressure of choice
- Divest non-core activities: divesting without reducing skill diversity and reducing control
- Satisfy managers' ambitions: retaining valuable human resources; attract ambitious new resources
- Spread the risk and cost of product development
- Combat cyclical demands of mainstream activities
- Learn about the process of venturing
- Diversify the business
- Develop new technological or market competencies

# Structure and Management of Corporate Ventures



Primary motive	Preferred Structure	Key management task
Satisfy managers' ambition	Integrated business team	Motivation and reward
Spread cost and risks of development	Integrated business team	Resource allocation
Exploit economies of scope	Micro-venture department	Reintegration of venture
Learn about venturing	New venture division	Develop new skills
Diversify the business	Special business unit	Develop new assets
Divest non-core activities	Independent business unit	Management of intellectual property rights

Source: Tidd, J. and S. Taurins (1999), Learn or leverage? Strategic diversification and organizational learning through corporate ventures. Creativity and Innovation Management, 8 (2), 122-129



- **Opportunistic:**
  - no dedicated ownership or resources for venturing,  
relying on supportive organisational climate to encourage proposals developed locally on a project basis
- **Enabling:**
  - no formal corporate ownership  
but provision of dedicated support, processes and resources
  - works best when new ventures can be owned by existing divisions
- **Advocacy:**
  - organizational ownership is clearly assigned but little funding is provided.
  - Works if there are sufficient resources in the business, but insufficient specialist skills or support for venturing
- **Producer:**
  - includes both formal ownership and and dedicated funding of ventures
  - requires significant corporate resources and commitment to venturing
  - needs critical mass of potential projects to justify this approach



## Definition Stages

- Establish an environment that encourages the generation of new ideas
- Select and evaluate opportunities for new ventures and select managers to implement the venturing program
- Develop a business plan for the new venture
- Decide the best location and organization

## Development Stages:

- Monitor the development of the venture and venturing process
- Champion the new venture as it grows and becomes institutionalized within the corporation
- Learn from experience in order to improve the overall venturing process
- Diffusion or information and learning effect to other parts of the company



## Alternatives for identifying opportunities

- Rely on the R&D or Development personnel (= technology push)
- Rely on the Marketing managers (= market pull approach)
- Encourage Marketing and R&D / Development to work together

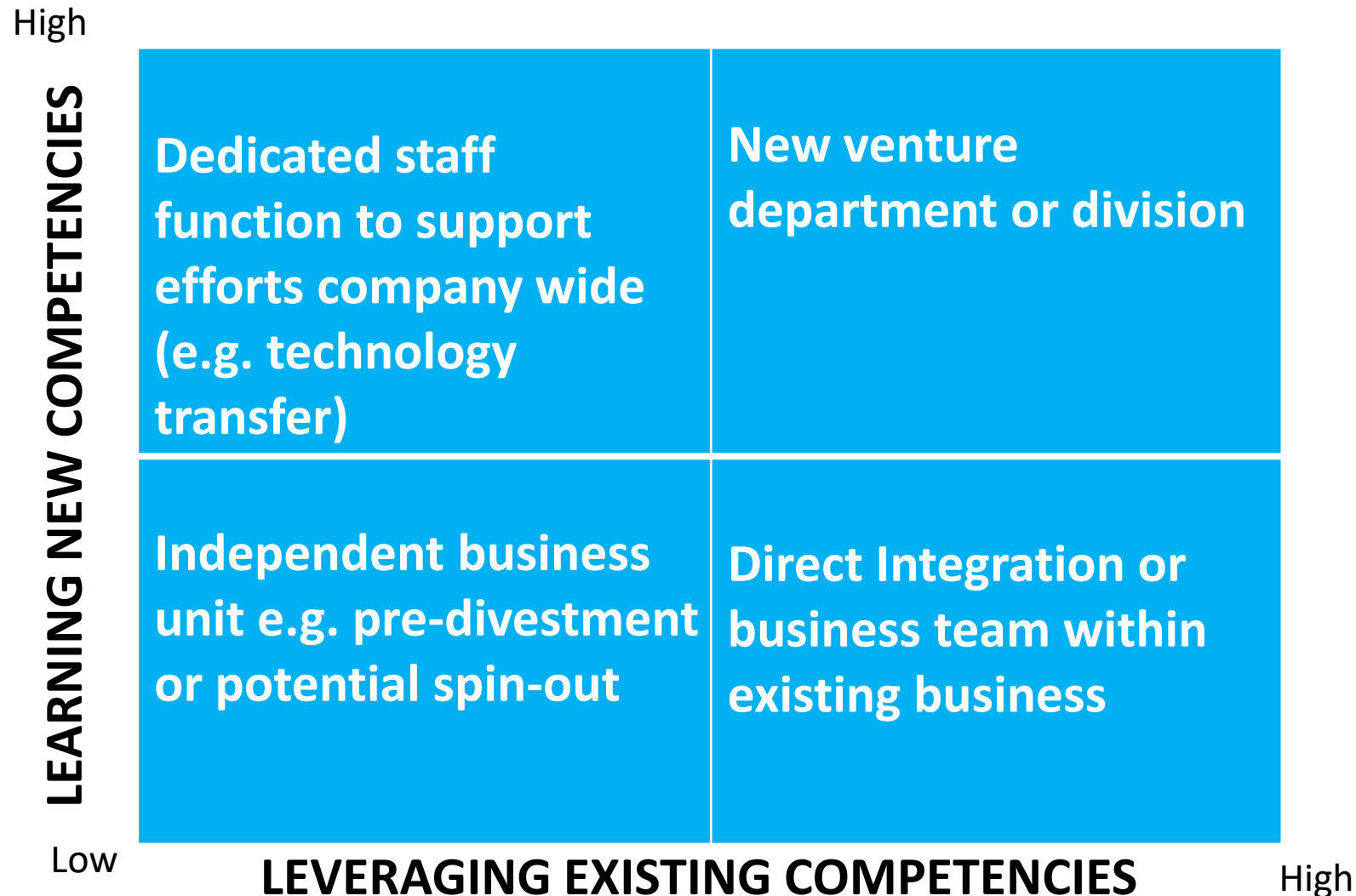
## Potential barriers to corporate entrepreneurs:

- They must establish a legitimacy within in the firm by convincin others of the importance and viability of the venture
- They are likely to be short of resources and will have to compete internally agains established and powerful departments and managers
- As advocates of change of innovation, they are likely to face at best organizational indifference or at worst hostile attacks



- Technical Innovator responsible for the main technological development
- Business Innovator or Venture Manager responsible for the the overall progress of the venture
- Product Champion promoting the venture through the early critical phases
- Executive Champion or Organizational Champion acting as a protector and buffer between the corporation and the venture
- High-level Executive responsible for evaluating, monitoring and authorizing resources for the venture but not the operation of specific ventures

# Balance between Leveraging & Learning and Impact on the Corporate Venturing Structure







- Preferred choice where radical changes in product or process design are likely to impact on mainstream operations
- People involved in the new venture are involved deeply in day-to-day operations
- Examples:
  - many engineering companies have introduced consultancy to their business portfolio
  - technical organizations with large laboratory facilities can offer services like analysis of samples testing and materials
- These activities cannot be outsourced, as the same personnel and equipment are required for the core business



- **A business team of secondees is established to coordinate sourcing of both internal and external clients**
- **Most appropriate where the expertise will be developed within the mainstream operations**
- **Mutual support given between the integrated business teams and the mainstream operation**
- **Strategically the service, product or technology is sufficiently related to the mainstream business**
- **Mainstream business need to maintain some control of these technologies**



- A new ventures department is a unit that runs separate from mainstream line management
- It is suitable when innovative projects are likely to emerge from the operational business on a frequent basis.
- In addition, proposed activities need to be different from the mainstream concepts, products or services.
- New Venture Departments engage in the trading of the existing expertise to be developed.
- This trading makes sense when the expertise is very fragmented across the organization.
- The New Venture Departments have responsibility for marketing, contracting and negotiations.
- Technical negotiations and supply services are performed by operational units.



- Reasons to establish a NVD:
  - bring existing technologies from the company for adaption to new or existing markets.
  - combine research from different fields to accelerate the development of new products
  - examine new market areas as potential targets for existing or adapted products
- A New Venture Division provides a safe haven where a critical mass of projects emerge from the organization.
- New Venture Divisions are given a separate administrative supervision of these activities.
- Strategically top management might choose to retain some management control.
- Operational links are supposed to allow exchange of information and know-how with the corporate environment.
- Risk: the Division might become a dustbin for every new opportunity, if limits of its operation and mission are not defined.



- Wholly owned by the corporation
- High strategic relevance: requires strong administrative control
- Business needs to have enough potential to stand alone as a separate profit centre (on around 10 – 12 % of corporate turnover)
- In addition, SBUs should have the ability to carry their own development costs
- Key people can be identified and extracted from their mainstream operational role
- Physical separation does not safeguard autonomy:
  - impediment in a cosy corporate mentality (impression that the parent company will always support and assist)
  - if parent retains total ownership, there is no independence as needed for venture activities



- Differing degrees of ownership ranging from full—owned subsidiary to minority interest
- Control is exercised through **Board presence**
- Major reasons for an IBU:
  - focus on the core business by removing the managerial and administrative burden
  - facilitate learning from external sources in the case of enabling technologies or activities
- Benefits of IBU's for the parent and the venture:
  - less risk for parent, higher degrees of freedom for the venture
  - less supervisory requirement for parent, less interference for venture
  - continued share of financial returns for parent; higher commitment from venture management
  - learning for both the parent and the venture
- Assignment of personnel is difficult if leaving is associated with less security or comfort



- **Divestment is appropriate if activity is not critical for mainstream business**
- **Support for the venture does not require managerial or strategic control**
- **Complete spin-off: no ownership is retained**
- **Reason is strategic unrelatedness or strategic redundancy, as a result of change in corporate focus**
- **Complete spin-off:**
  - **parent and venture can realize the hidden value of the venture**
  - **senior management of the parent can focus on their main business**



- Diffusion is the means by which innovations are translated into social and economic benefits
- Impact of the use of innovation is higher than the generation of innovation itself
- Adoption of process innovation has the highest benefit:
  - technological innovations are the source of productivity and quality improvements
  - organizational innovations are the basis for social, health and educational gains
  - commercial innovations create new services and products
- Benefits of innovation need more than 10 years to unfold
- Cross country comparisons show that cultural factors play an important role such as
  - high individuality limits the influence of imitation and contagion mechanisms
  - high power distance (measure of the hierarchies) promotes diffusion because innovations may be adopted faster

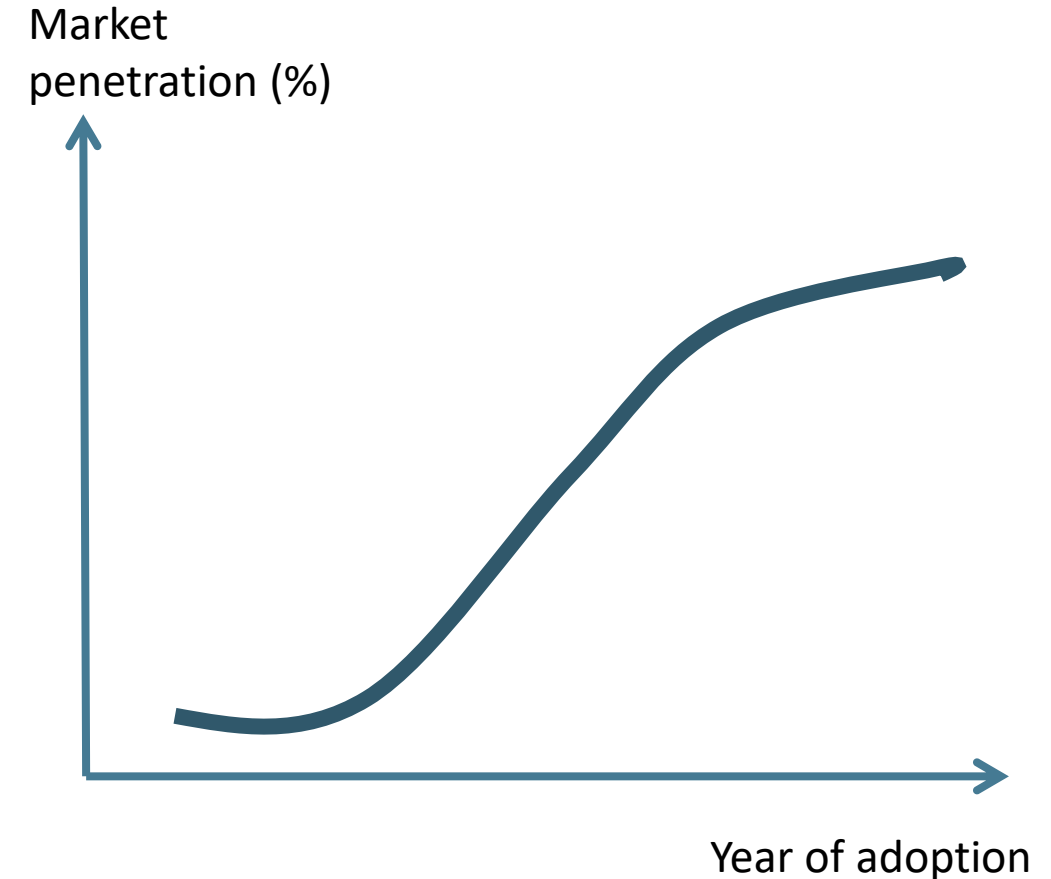


# Diffusion and the rate of Adoption of Innovation



In practice the precise pattern depends on

- Demand-side factors:
  - information availability
  - direct contact with imitations or adoptors
  - bandwagon effect
- Supply-side factors:
  - relative advantage of an innovation
  - barriers to adoption



Source: Meade, N. and Islam, T. (2006), Modelling and forecasting the diffusion of innovation. International Journal of Forecasting 22(3), 519-545.

# Barriers to the widespread Adoption of Innovations



- Economic:
  - personal costs versus social benefits
  - access to information
  - insufficient incentives
- Behavioral:
  - priorities, motivations, rationality, inertia
  - propensity for change or risk
- Organizational:
  - goals, routines, culture
  - power, influence, stakeholder
- Structural:
  - infrastructure
  - sunk costs
  - governance



- Relative advantage: degree to which an innovation is perceived as better than competing products
  - primary attributes: size, costs
  - secondary attributes: relative advantage and compatibility, convenience, satisfaction, prestige
  - The higher the relative advantage the faster the rate of adoption
- Compatibility: degree to which an innovation is perceived to be consistent with the existing values, experience, needs of the adopters
  - compatibility with existing practices might be less important than fit with existing values and norms
  - few innovations fit the user environment into which they are introduced
  - organization: misalignments between the user environment and the adoption environment
- Complexity: degree to which an innovation is perceived as being difficult to understand or use
  - innovation that are perceived simpler for users will be adopted quicker
  - costs of adoption also depend on network externalities: complementary innovations, availability of information from other skilled or trained users, technical assistance and maintenance,



- Trialability: degree to which an innovation can be experimented with on a limited basis
  - an innovation that is trialable represents less uncertainty for potential adopters and allows learning by doing based on intuitive use of the product or the concept
  - Innovations that are more trialable will be generally adopted more quickly
  - Exceptions: risks of damage and HSE risks
  - Early involvement of users may reduce the risk and increase the users' tolerance
  - selection of user groups is key: atypically high levels of technical knowledge (-), degree and time of involvement (-), degree to which user groups will be followed by mainstream users
  
- Observability: degree to which the results of an innovation are visible to others
  - the easier it is to see for others, the faster the adoption
  - Safety credibility: peers who have already adopted an innovation
  - Vicarious learning: learning from the experience of others (=decentralized activity)
  - demonstrations of innovations are highly effective: including pilots



- Market introduction of an innovation is typically followed by an erratic pattern of diffusion (=pre-diffusion phase)
- Pre-diffusion phase start with the market introduction of the first new product and ends when the S-curve begins to climb exponentially
- Instead of a smooth S-curve, an unstable process might occur: periodic introduction, decline, reintroduction of product variants before the mainstream applications and product design take off
- Diffusion is increasingly viewed as a communication process in a population or a segment of customers. (Rogers, 2003)
- Sociology: first group of customers (the innovators) are often deviant from the remainder of the potential customers. This can undermine the communication process needed for diffusion.
- Innovation Management: the communication between early users and mainstream users needs to be managed
- Business Planning. Pre-Diffusion Phase is very risky (50 % of the pioneers fail in this phase) and very long: Innovators need to have patience and financial resources.

# Pre-Diffusion Phase for Different Technologies

Prof. Dr. Mark Ebers • Seminar for Business  
Administration, Corporate Development and  
Organization • University of Cologne



Product	Industry	Market Introduction	Start of Diffusion	Pre- Diffusion (years)
Jet engine	Aerospace & defense	1941	1943	2
Radar	Aerospace & defense	1934	1939	5
ABS	Automotive	1959	1978	19
Airbag	Automotive	1972	1988	16
Memory metal	Materials & Metals	1968	1972	4
Mobile Telephony	IT & Telecommunications	1946	1983	37
Transistor	Electronics	1949	1953	4
Television	Electronics	1939	1946	7
Contraceptive pill	Pharma	1928	1962	34
Microwave oven	Household equipment	1947	1955	8
Air conditioning	Household equipment	1902	1915	13
MRI	Medical equipment	1980	1983	3

*Source: Ortt, J.R. (2010), Understanding the pre-diffusion phases. In Tidd, J. (Ed.), Gaining Momentum: Managing the diffusion of innovations. London Imperial College Press.*



Moore G. (1991):

- “Crossing the chasm” (study on the success factors and failures in Silicon Valley)
- Success factors for early adopters and mass markets are fundamentally different

**Frattini (2010):**

Study on factors influencing the adoption and diffusion of innovations based on case studies  
(e.g. Sony Play Station, Sony Mini Disc, Apple iPod, Apple Newton, TomTom Go, RIM BlackBerry)

- **Critical factor influencing successful diffusion:** careful management and **acceptance by the early adopters** that impact on the adoption by the main market.
  - Strategic issues: positioning, timing and management of the adoption network
  - Adoption network: configuration of uses, peers, competitors, complementary products and services, infrastructure.
  - Timing and adoption networks are different for early and main **market adopters**.
  - Promoting the use by early adopters: legitimate the use through reference customers and visible performance advantage, spread the information within specialist communities of practices, stimulate imitation to increase the customer base and peer pressure, collaborate with opinion leaders,
- Subsequent diffusion into the mainstream markets: positive acceptance of early adopters, repositioning and targeting the main market by influencing the relevant adoption network; merits of the products itself are of less importance



## 7. Capturing the Value of Innovation

- Commercialization and Diffusion
- **Exploiting the Knowledge and Intellectual Property**
- Capturing the Value of New Business Models
- Learning to Manage Innovation

1.





- Organizational learning, intellectual property
- Knowledge management: identifying, translating, sharing and exploiting the knowledge within an organization
- Nature of knowledge: explicit vs. Tacit knowledge
- Locus of knowledge: individual vs. organizational
- Distribution of knowledge across the organization
- Knowledge management involves 5 critical tasks:
  - Generating and acquiring new knowledge
  - Identifying and codifying existing knowledge
  - Storing and retrieving knowledge
  - Sharing and distributing knowledge
  - Exploiting and embedding knowledge in processes, products and services

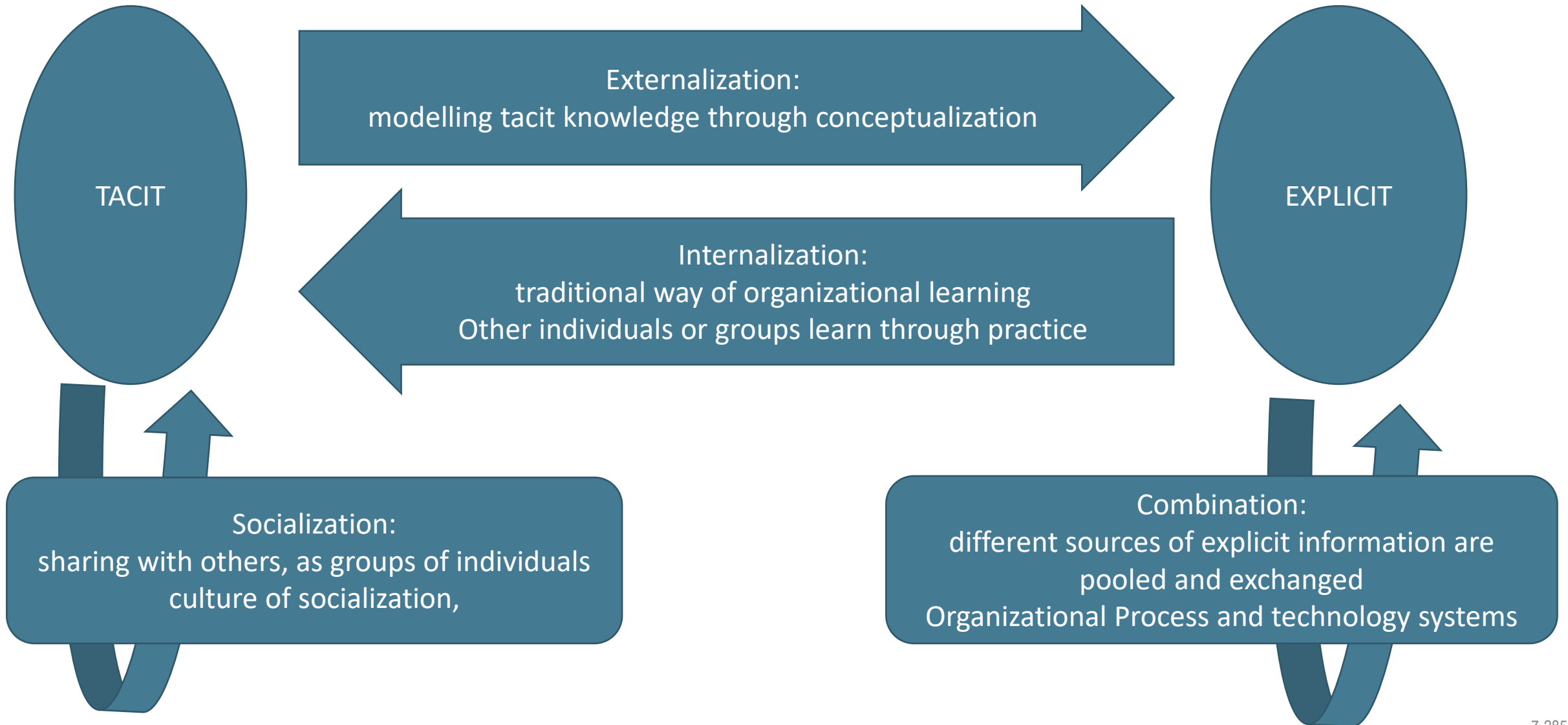


- Organizations can acquire new knowledge by experience, experimentation or acquisition.
- Learning from experience: least effective
  - long lead time, internal focus, self-destructive habits
  - Competency trap: knowledge might be faulty or irrelevant
- Experimentation: more systematic way of learning
  - includes incremental learning (R&D, market research), organizational alliances, networks
  - incremental learning needs a strategy of learning through trial & error acknowledgement
  - use of alliances and networks is less common: requires partners with sufficient transparency
- Acquisition of knowledge: more active approach
  - scanning the internal and external environments
  - system for searching and filtering new market opportunities



- **Types of knowledge:**
  - data that are easy to structure, record and store: discrete raw observations, numbers, words, names, records
  - Information: data that been organized, grouped and categorized into patterns
  - Knowledge is contextualized information: processes, systems
- **Explicit / Implicit knowledge:**
  - Explicit knowledge can be codified, i.e. expressed in numerical, textual or graphical terms
  - Tacit or implicit knowledge which is personal, experimental, context-specific and hard to formalize or communicate (e.g. how to ride a bicycle, leadership approach)
- **Process of conversion of knowledge from tacit to explicit** and personal to organizational (i.e. reducing transaction costs): sharing knowledge by creating knowledge networks (Nonaka, Takeuchi 1995).

# Transformation of Individual Knowledge into Organizational Knowledge



# Concept of Disembodied Knowledge identified in the Biotech and Telecom Industries (Marques et al.)



- Depth & Variety of knowledge
- Source of knowledge: external, internal
- Knowledge of Intellectual property rights (IPR), own and external
- Evaluation of knowledge and awareness of competencies
- Knowledge management practices: capability to identify, share and acquire knowledge
- Capability of IT systems to find, store, share and reuse knowledge
- Identification and assimilation of external knowledge
- Commercial knowledge of markets, customers and competitors: current & potential
- Knowledge of supplier networks and value chain
- Regulatory knowledge
- Financial and funding stakeholder knowledge
- Knowledge practices: documentation, intranets, work organization, multidisciplinary teams



- 2 different approaches to knowledge management:
  - investment in IT, usually based on groupware and intranet technologies (favored approach)
  - incentive systems to contribute and use knowledge in systems: more people and process based
- Managers believe that the most significant intangible resources are reputation and employees' know how (case studies analysed by Richard Hall (2012))
- Organizational culture is most important factor:
  - off balance sheet assets, i.e. patents licencess, trade marks, contracts and protectable data
  - Positional: result of previous endeavor with a high path dependency such as processes, operating systems, individual and corporate reputation & networks
  - Functional: individual skills, team skills
  - Cultural incl. Traditions of quality, customer service, human resources or innovation
- Key Questions: best use of knowledge (resources), scope of synergies identified and exploited, awareness of key linkages which exist between the resources



- Large organizations often do not know what they know.
- Knowledge sharing and distribution is a process by which information from different knowledge is share.
- This process contributes to a new knowledge understanding and organizational learning.
- Problem: tacit knowledge is not fully encoded and not fully visible.
- The more information is codified, the higher is the organizational learning.
- „Communities of Practice“: group of people related by shared tasks, process and the need to solve a problem rather than by functional relationships and silos.
- Within communities of practice people share tacit knowledge and learn from experimentation.
- These communities naturally evolve around local work practice.

# Communities of Practice: Mechanisms to foster Knowledge Transfer



- Organizational translator: individual able to express the interest of one community in terms of another community's perspective. Translators must be familiar with both knowledge domains and trusted (f.i, heavy weight product managers).
- Knowledge broker: participating in different communities rather than mediating between them (f.i. quality managers that are responsible for an entire process).
- Boundary object: a practice that is of interest to two or more communities of practice. A boundary object could be a shared document (e.g. quality manual, an artefact (e.g. prototype), a technology (e.g. database) or a practice (e.g. a product design).
- Problem: CoP and extensive x-functional may also have a negative effect on group cohesiveness increase costs of decision making.





- In some cases explicit and codified knowledge can be transformed into legal rights IPRs and thus commercialized.
- There are different IPRs:
  - patents
  - copyrights
  - design rights
  - licensing
- For some companies the royalties from the IPRs form a larger part of the income.
- IPRs constitute some legal rights that are however useless if not effectively enforced.
- In some cases, secrecy is a more effective mechanism than IPRs.



- All developed countries have some form of patent legislation.
- Aim: encouraging innovation by granting a limited monopoly for up to 20 years.
- Many developing and emerging countries signed up to Trade Related Intellectual Property Systems (TRIP).
- Patents can be also used to identify and assess innovation at the firm level. Downside: defensive patent strategies.
- Legal regimes to register a patent differ in detail but in most countries there are standard legal tests to be satisfied
- Innovative strength of companies is often measured referring to number and quality of patents



- Novelty: first-to-file is granted the rights rather than the first one to invent
- Inventive step: „not obvious to a person skilled in the art.
- Industrial application: the patent requires the invention to be capable to be applied to a machine, product or process.
- Patentable subject: discoveries, laws of physics, chemistry and biology as well as formulas, new organisms (Europe) and software (Europe) cannot be patented; different in the US
- Clear and competent disclosure: conflicts with secrecy with patent only provides certain legal property rights; in case of infringement legal actions need to be taken.



- **Number of patents:** indicates level of technology activity but limited explanatory power.
- Cites per patent: indicates the impact of a company's patents.
- **Current Impact Index (CII)** = the number of times the patents of last 5 years have been cited in the current year divided by all patents cited on average per year.
- Technology strength (TS) indicates the strenght of the patent portfolio (inflated or deflated by patent quality):  $TS = CII \times \text{number of patents}$ .
- **Technology Cycle Time (TCT)** indicates the speed of innnovation = Median Age of Patents (years) of the patent references cited on the front page of the patent
- **Science linkage (SL)** indicates leadership in R&D = average number of science papers referenced on the front page of the patent
- Science strength (SS) indicates how the patent applies basic science = number of patents  $\times$  SL

# Patent Indicators for Different Sectors



Sector	CII (%)	TCT (years)	SL
Oil & Gas	84	11.9	0.8
Chemicals	79	9.0	2.7
Pharmaceuticals	79	8.1	7.3
Biotechnology	68	7.7	14.4
Medical equipment	238	8.3	1.1
Computers	188	5.8	1.0
Telecommunication	165	5.7	0.8
Semiconductors	135	6.0	1.3
Aerospace	68	13.2	0.3

Source: Narin, F. (2012), Assessing technological competencies. In Tidd, J. (ed.) From Knowledge Management to Strategic Competence. 3rd edn. London, imperial College Press, 172 – 219.



- Each year around 400,000 patents are filed, only a small proportion are exploited by the owners
- Offensive strategies: multiple patents in related fields to limit or prevent competition and imitation; often multiple solutions for the solution of a technical problem or a design are patented
- Defensive strategies: specific patents for key technologies which are intended to be developed to restrict imitation
- Financial: primary focus is to increase income through sales and licenses
- Bargaining: patents designed to promote strategic alliances, adoption of standards or cross-licensing
- Reputation: to improve the image or position of the company (to attract partners, talent or funding, build brands or enhance market position)
- In practice firms combine strategies. (Gilardoni, E, (2017), Basic approaches to patent strategy. Internation Journal of Innovation Management, 111 (3), 417 – 440.



Copyright is concerned with the expression of ideas rather the ideas themselves

Type or material covered by Copyright:

- original literature dramatic, musical and artistic works (70 years after the death of the author; in USA 50 years)
- software and databases
- recordings, films and broadcasts (50 years after creation)
- typographical arrangements or layout of a published edition (25 years)



- Similar to copyright protection but apply mainly to three-dimensional objects
- Covers any aspect of the shape or configuration
- Internal & external
- Whole or part
- Design rights exist for 15 years or 10 years if commercially exploited
- Design registration is a cross over of patent and copyright protection but rather limited in scope.
- Protection can get up to 25 years, but this covers only visual appearance (visual appearance, shape, configuration, pattern and ornament)
- Protection of colours, letters and shapes are not granted in general by design rights but by brand name and trade mark protection





## Benefits of licensing:

- Increasing cash flow by selling the user rights
- Reduce or eliminate production and distribution costs and risks
- Reach a larger market
- Exploit in other applications
- Establish standards
- Gain access to complementary technology
- Block competing developments
- Convert competitor into defender

## Common Methods of pricing licences:

- Going market rate based on industry standards (x% of sales)
- 25 % rule based on licensee's gross profit earned through the technology
- Return-on-investment based on the licensors costs
- Profit sharing



## Main strategic motives for licensing:

- Strategic freedom to operate
- Access to knowledge
- Entry to new markets
- Establish technological leadership
- Enhance reputation
- Ability to grow faster
- Ability to grow in markets with cultural or legal barriers-to-entry

## Costs and risks of licensing:

- Cost of search, registration and renewal
- Need to register in various national markets
- Full an public disclosure of an idea thus being exposed to the risk of imitation
- Ability to control and to enforce



## Franchiser:

- Develops an innovative business with a larger growth potential and gives to license to operate to independent entrepreneurs
- Receives franchise fees for the use of the business model and for its further development
- Major innovation efforts need to be driven by the Franchiser including user-led innovation

## Franchisee:

- Raises the funds for investment into the licensed business model developed by the franchiser
- Gives feed-back to the Franchiser and passes on customer feed-back as well as data and findings regarding product innovation, service innovation and process innovation
- Introduces the innovations developed by the franchiser and the franchisee network



## 7. Capturing the Value of Innovation

- Commercialization and Diffusion
- Exploiting the Knowledge and Intellectual Property
- Capturing the Value of New Business Models
- Learning to Manage Innovation

1.



- Provide a clear representation of where and how value is created
- Creating a roadmap for how an innovation create value
- Making the business vision explicit by providing a concept to share it
- Compiling a checklist of areas to make sure that the route of value creation is well thought through.

# Example of Business Models



Business Model	Value Proposition	Target Market	Key Supplier	Core Activities
Razor blades	Shaving with a fresh sharp blade instead of sharpening a razor	Men (later women)	e.g. Gillette	Development, design. Manufacturing, marketing
Online banking	24/7 bank opening and independent of official banking hours	Customers unavailable or unwilling to use normal banking hours	IT platforms, call center staff, Back Office, system provider	Customer service and relationship management
Streaming music services	Rent a huge collection of music and have it available on many mobile devices	Customers keen to access large volume and variety of music and have it available whenever they want it	IT platforms, IP relationship with providers	Access control, IT distribution and streaming rights management, retail processing

# Generic Business Models



Category	Description	Example
Product or service provider	Delivering an end product or service	
Ownership of key assets and renting them out		Car parks, rental cars, storage business
Finance provider	Offers access to money and services around that	Apps for access to stock and securities markets
System Integrator	Pulling together components on behalf of end customers	Building contractors, software service providers
Platform provider	Providing a platform creating value for its users and or customers	Smartphones, apps, social networks
Skill provider	Sells or rents access to human resources and knowledge	Recruitment agencies, professional consultancies, contract services
Outsourcer	Offers to take over responsibility for management of a process and delivery	IT services, financial transaction processing



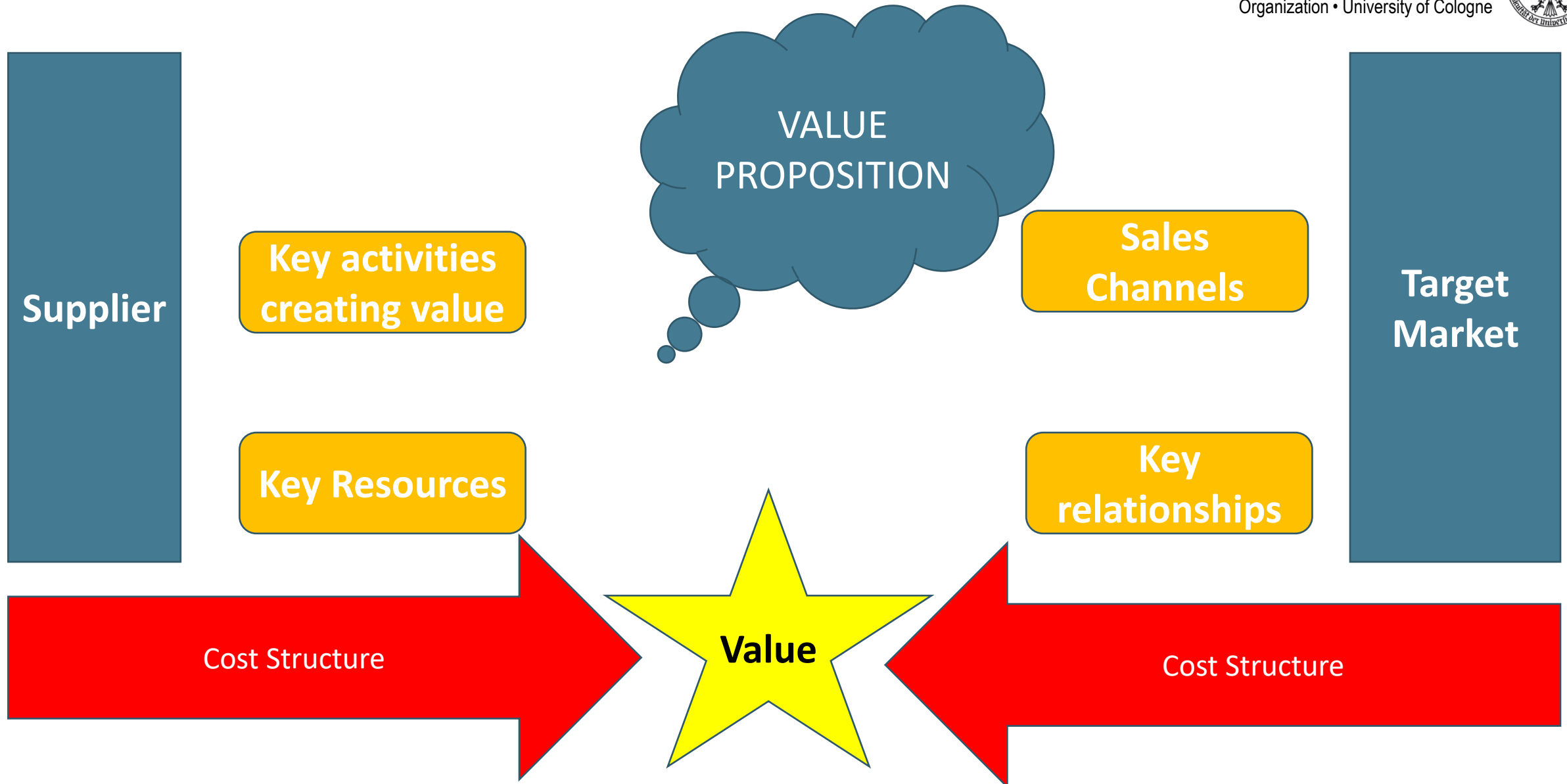
## Business Model Innovation:

- creating new models
- changing existing ones to maximize the value created through streamlining or changing processes
- Alteration of the 4Ps (product, price, promotion, place)
- New USP



# Building of Business Models and Innovation

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- Blue Ocean Strategies
- User-driven instead of supplier driven: encyclopedia  
Example (= expert driven) versus Wikipedia – driven by crowd intelligence
- Servitization in which manufacturing operations are increasingly being reframed as service offering, Rolls Royce Jet engines (power by the hour), Asset Lease contracts including all services
- Rent and not own: customers get the functionality but not the asset such as car leasing, car sharing, spotify



- **Blue Ocean Strategy** is a marketing theory from a book published in 2005 which was written by W. Chan Kim and Renée Mauborgne (Professors and co-directors of the INSEAD Blue Ocean Strategy Institute).
- Based on a study of 150 strategic moves spanning more than a hundred years and thirty industries
- Companies can succeed by creating "**blue oceans**" of **uncontested market space**,
- As opposed to "red oceans" where competitors fight for dominance, the analogy being that an ocean full of vicious competition turns red with blood.
- Blue Ocean strategic moves create a leap in value for the company, its buyers, and its employees
- Unlocking new demand and making the competition irrelevant.
- Analytical frameworks and tools to foster an organization's ability to systematically create and capture blue oceans.
- The expanded edition of Blue Ocean Strategy was published in February, 2015.



- how to create uncontested market space by reconstructing market boundaries i.e. offering the concept globally with few exceptions
- focusing on the big picture i.e. deliberately leave certain products out
- reaching beyond existing demand and supply in new market spaces thus try to find out about the hidden needs
- getting the strategic sequence right.



- Raise: This questions which factors must be raised within an industry in terms of product, pricing or service standards.
- Eliminate: This questions which areas of a company or industry could be completely eliminated to reduce costs and to create an entirely new market.
- Reduce: This questions which areas of a company's product or service are not entirely necessary but play a significant role in our industry, for example, the cost of manufacturing a certain material for a product could be reduced. Therefore, it can be reduced without completely eliminating it.  
**(Target Costing !!!)**
- Create: This prompts companies to be innovative with their products. By creating an entirely new product or service, a company can create their own market through differentiation from the competition.
- Exponential Growth: growing number of customers with less increase of costs



## 7. Capturing the Value of Innovation

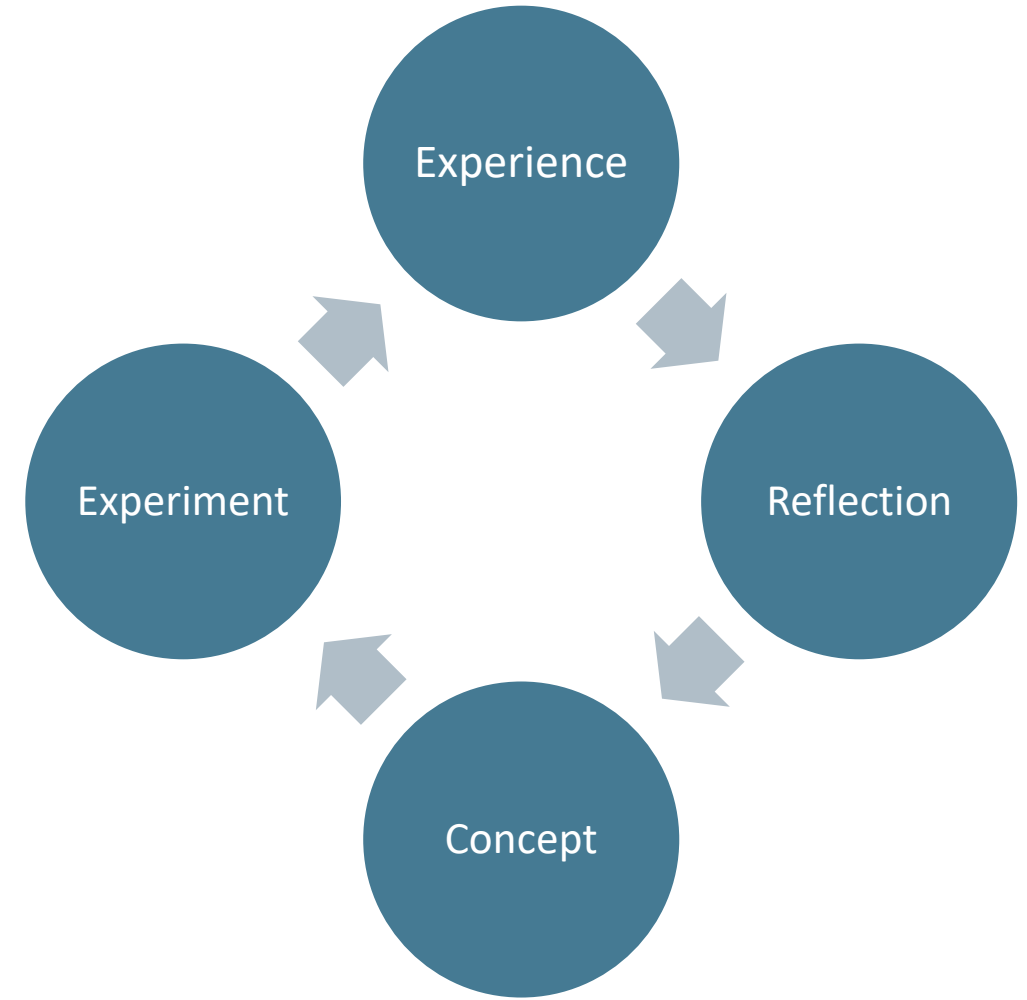
- Commercialization and Diffusion
- Exploiting the Knowledge and Intellectual Property
- Capturing the Value of New Business Models
- Learning to Manage Innovation

1.



## Simple Model of Learning (David Kolb):

- Capture and reflect on our experiences
- Trying to distill patterns what does work and what does not work.
- Create models of how the world works (concepts) and link these to existing concepts
- Use our revised models to again engage in innovation





- There is no „Theory of Innovation“ but rather experiences by winners.
- Instead of finding answers we could develop structured questions
- Asking externals to help on the learning process:..using ideas developed elsewhere: Make sure
- „Learning from the mistakes of others is cheaper than learning from our own mistakes“
- Combining existing ideas „Stealing one idea is a crime. Stealing two ideas and combining them is creativity.“
- Management: Taking active time for reflection and auditing: Innovation Audits



# Components of the Innovative Organization



Components	Key Feature	Examples
Innovation being part of the vision	Top Management Commitment	
„Structure follows innovation“	Organization design enables creativity, learning and interaction.	
Key individuals	Promoters, champions, gatekeepers, Innovation evangelists facilitating innovation	
Effective team working	Appropriate use of teams to solve problems, investment in team selection and building	
Extensive communication	Up down and sideways	
Creative climate	Positive approach to creative ideas supported by the motivation systems, culture to deal with mistakes	
Learning organization	High levels of involvement within and outside the firm, proactive experimentation knowledge capture and dissemination External focus	

# Tools and Frameworks to support Innovation Management

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Key Management Area	Tools
Quality Information Management	Innovation Audits
Start-up phase for new ventures	Entrepreneurs' checklists, OKRs
Employee engagement in Innovation	Engagement Surveys
Management of discontinuous innovation	Audits of early warning systems, risk management and forecasting models
Creative Climate	Creative Climate Review

# Objectives and Key Results (OKR)



OKRs are a system to manage an organization goal:  
Defining Objectives on the company, entity, team and individual level.  
Add 3 – 5 results that one want to achieve in the short term.

## PURPOSE

statement explaining what the company, the  
team or individual is supposed to do and what it  
exists

## VISION

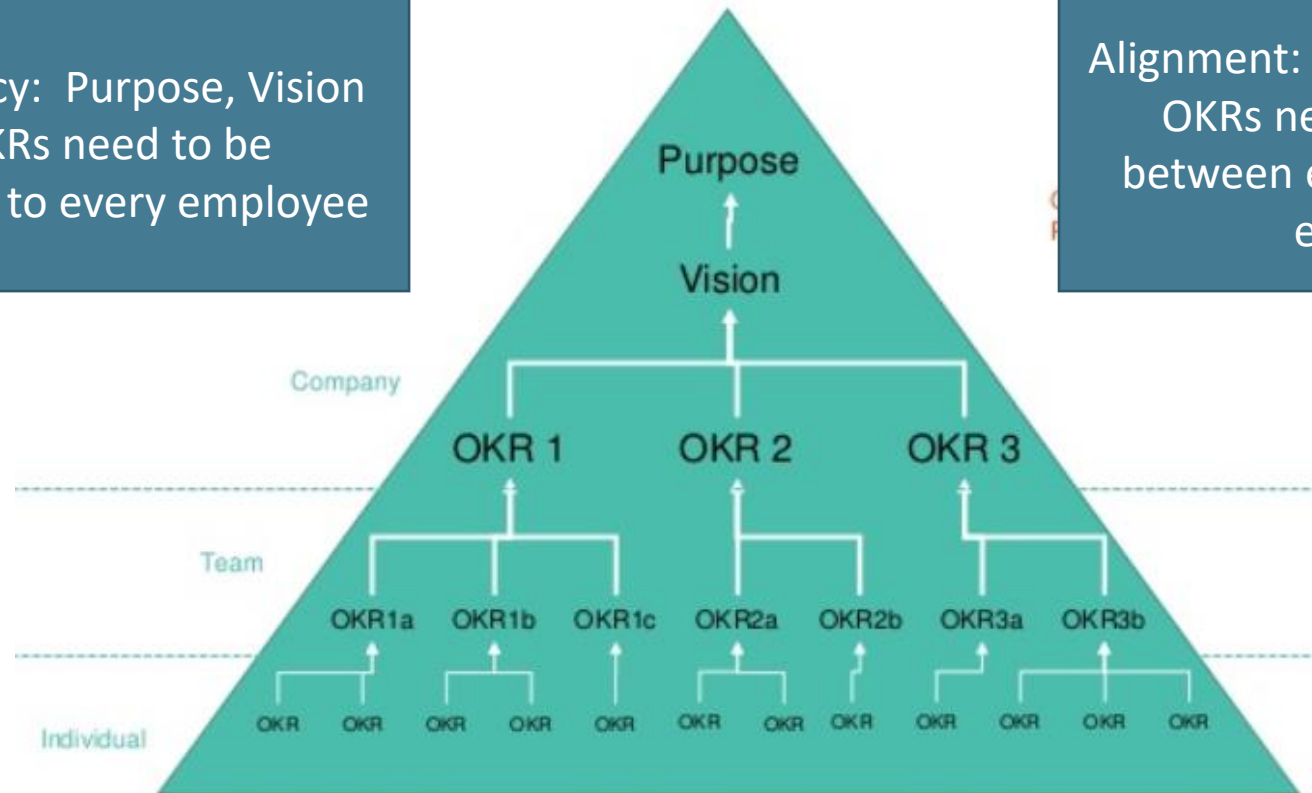
An holistic description of how the  
company, team or entity will look at  
some point far in the future

# Alignment and Transparency of OKRs of Objectives and Key Results across the Company



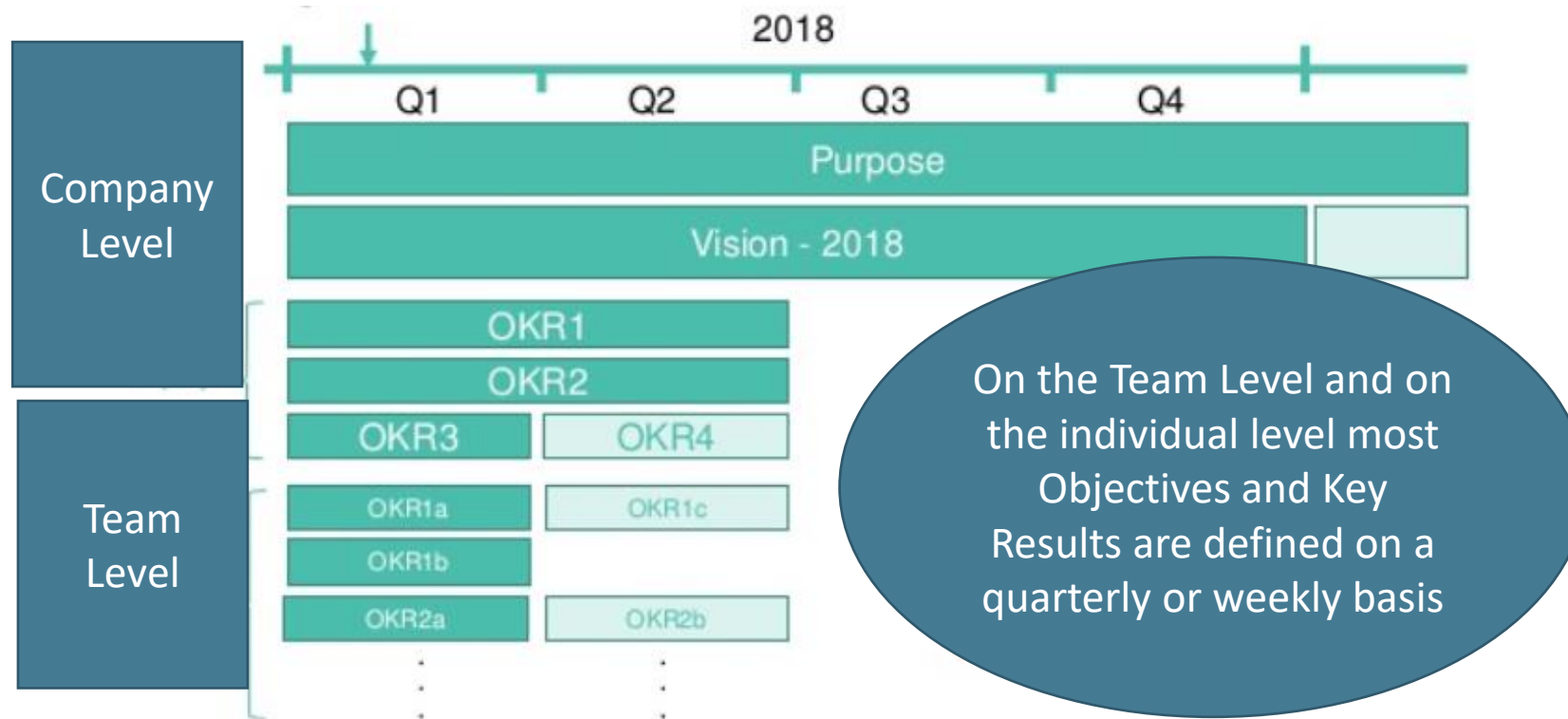
Transparency: Purpose, Vision and OKRs need to be transparent to every employee

Alignment: Purpose, Vision and OKRs need to be aligned between entities, teams and employees



By Marshall King @marshallking www.align.work

## Timing: most OKR are short-term



By Marshall King @marshallkingk www.align.work

# OKR Description on the entity level



OKR Description	
Launch our business into the USA Market by end of Q1-2018	
Delivery of a US legal entity, with staff, initial proof of concept sales, and clear path to profitability measured in terms of sales pipeline	
Key Result Outcomes	KR Score
Plan was abandoned	0
US legal entity + run from UK + no local staff or sales completed	1
US subsidiary formed + run from UK + local manager hired + £0 sales completed + sales pipeline >£50k in place	2
US subsidiary formed + local manager in place + sales >£10k completed + sales pipeline >£50k in place	3
US subsidiary formed + local team hired, sales >£30k completed + pipeline >£100k exists	4
US subsidiary formed + local team hired + sales >£50k completed + pipeline >£100k exists	5

## Key Results have to be precise and if possible value-based



### Examples:

- Improve Net Promoter Score from X to Y.
- Increase Repurchase Rate from X to Y.
- Maintain Customer Acquisition cost under Y.
- Reduce revenue churn (cancellation) from X% to Y%.
- Increase Net Promoter Score from X to Y.
- Improve average weekly visits per active user from X to Y.
- Increase non-paid (organic) traffic to from X to Y.
- Improve engagement (users that complete a full profile) from X to Y.

# Check Ins



Check ins are supposed to

- Drive focus
- Help senior management to remove blocks
- Enable 1-2-1 coaching

Check Ins are not

- a Goal & Development Dialogue
- an assessment of results or balanced scorecard

Check In	
Achievement since last check in (optional)	
Next steps (optional)	
Progress blockers (optional)	
Estimated OKR score at end of period (mandatory)	0 -5
Reasons for change in estimated OKR score (mandatory)	1. ... 2. .... 3. ...
Improvement opportunities (optional, private)	1. ... 2. ... 3. ...





**Detecting areas that need  
more resources or attention**

**Reducing risk of surprises**

**Inducing reallocation of  
objectives across teams**



# Example: Quarterly Objectives and Key Results for the Managing Director of an Energy Retail Company



Ziele	Wichtige Ergebnisse	Bewertung
Ziel 1 Wachstum von Kunden und Absatz	Ergebnis 1.1 + 4000 Kunden in Q2	1- 5
	Ergebnis 1.2 Absatz 13,1 GWh kumulativ an Kundengewinnung	
	Ergebnis 1.3 Einstellung eines Leiters Vertrieb /Berlin	
Ziel 2 Übernahme von X GmbH	Ergebnis 2.1 Durchführung der Due Diligence	
	Ergebnis 2.2 Übernahme der Anteile	
	Ergebnis 2.3 Plan für die Integration von Kunden, Systemen, Personal	
Ziel 3 Einführung des ZwErge-Systems für alle Mitarbeiter	Ergebnis 3.1: Formulierung von Zwergen für Jeden in Einzelgesprächen	
	Ergebnis 3.2 Monatliche Updates mit allen Mitarbeitern (gemeinsamer Termin)	
	Ergebnis 3.3 Wöchentliche Updates mit jedem Einzelnen (Einzeltermin)	

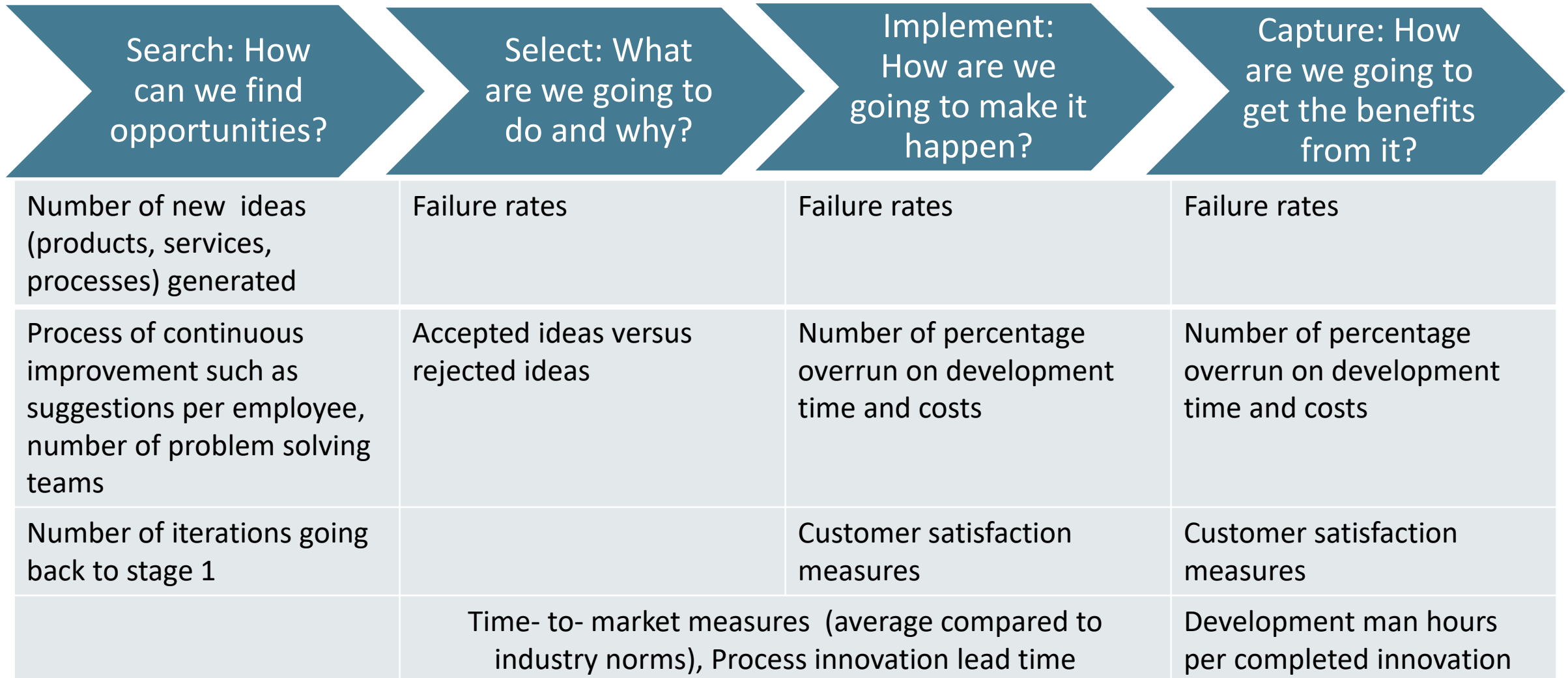


Do we have an innovation strategy?



Do we have an innovative organization?

# Measuring Innovation Performance





## 8. Applications and Models of Corporate Innovation

- **Corporate Venture Capital Funds**
- **Democratic Innovation Models**
- **Open Innovation and Strategic Alliances**
- **Social Innovation**



## 8. Applications and Models of Corporate Innovation

- **Corporate Venture Capital Funds**
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# CVC Investment Strategy: Focus on Leveraging Capabilities for New Business Models

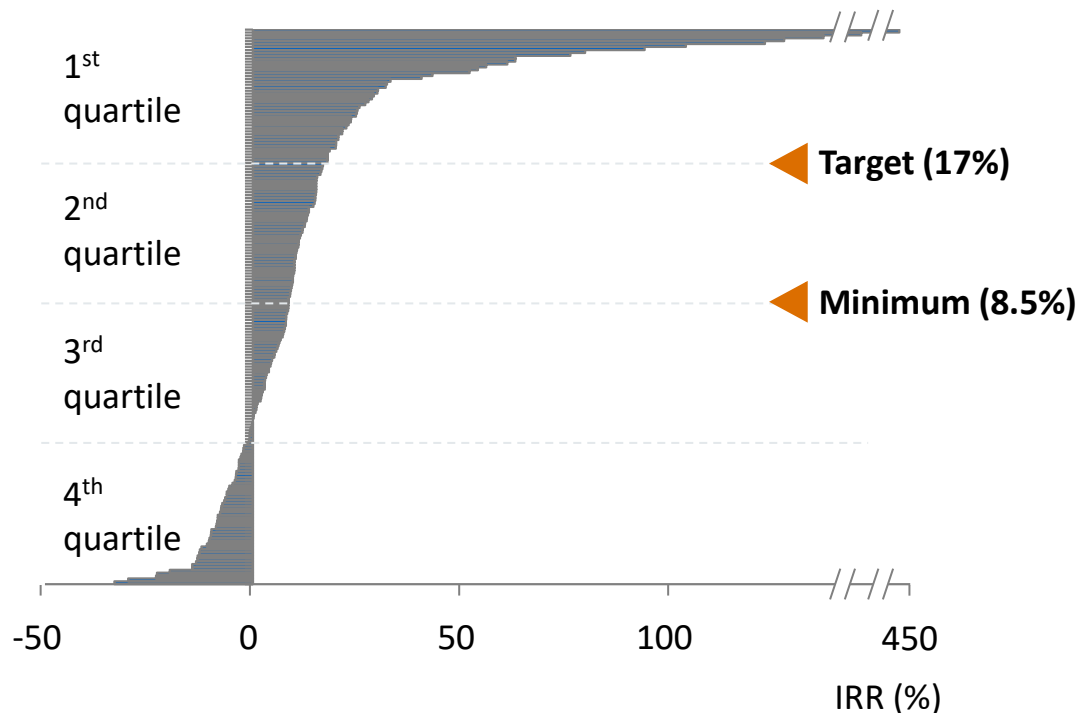


	Primary investment focus	Opportunistic investments
Investment approach	<ul style="list-style-type: none"><li>• <b>Direct investments</b> in funding rounds</li><li>• <b>Minority stakes</b> with limited control<ul style="list-style-type: none"><li>– Risk-sharing with co-investors</li><li>– Influential observer role</li></ul></li></ul>	<ul style="list-style-type: none"><li>• <b>Indirect investments</b> (via independent venture capital funds focused on energy) may facilitate entry/learning</li></ul>
Target stage	<ul style="list-style-type: none"><li>• Companies in <b>start-up</b> and <b>early stage/development</b> phase</li><li>• Key requirement: <b>no more than three years</b> to operating cash-flow generation</li><li>• No investment in expensive technology developments</li></ul>	<ul style="list-style-type: none"><li>• Companies in <b>seed</b> and <b>expansion/late stage</b> investments</li></ul>
Region	<ul style="list-style-type: none"><li>• to keep resource requirements manageable</li></ul>	<ul style="list-style-type: none"><li>• Attractive investments in <b>further regions</b> to be considered in <b>later stage 3-5 years</b></li></ul>

# Financial targets: We aim at 8.5-17% IRR



## Historical VC performance<sup>1</sup>



1. Represents 191 funds with European focus  
Source: Preqin, BCG analysis

## Approached hurdle rate performance based on benchmarks

In general VC funds in Europe show average IRR of 8.5%, top quartile with >17% IRR<sup>1</sup> (pre tax)

### CVC to target above-average performance

- Average VC performance can be outperformed based on strategic benefits/synergies
- Broadly in line with T&O performance target: 12 % after tax (~17% pre tax IRR)
- Based on Statoil CVC, value triplication in 5-10 years should to be achieved (~17% over 7 yrs)

### Caveat: Energy focused VC funds show below average performance in recent years

- High partly overrated investments based on "Clean-tech" hype
- High failure rate especially in solar business

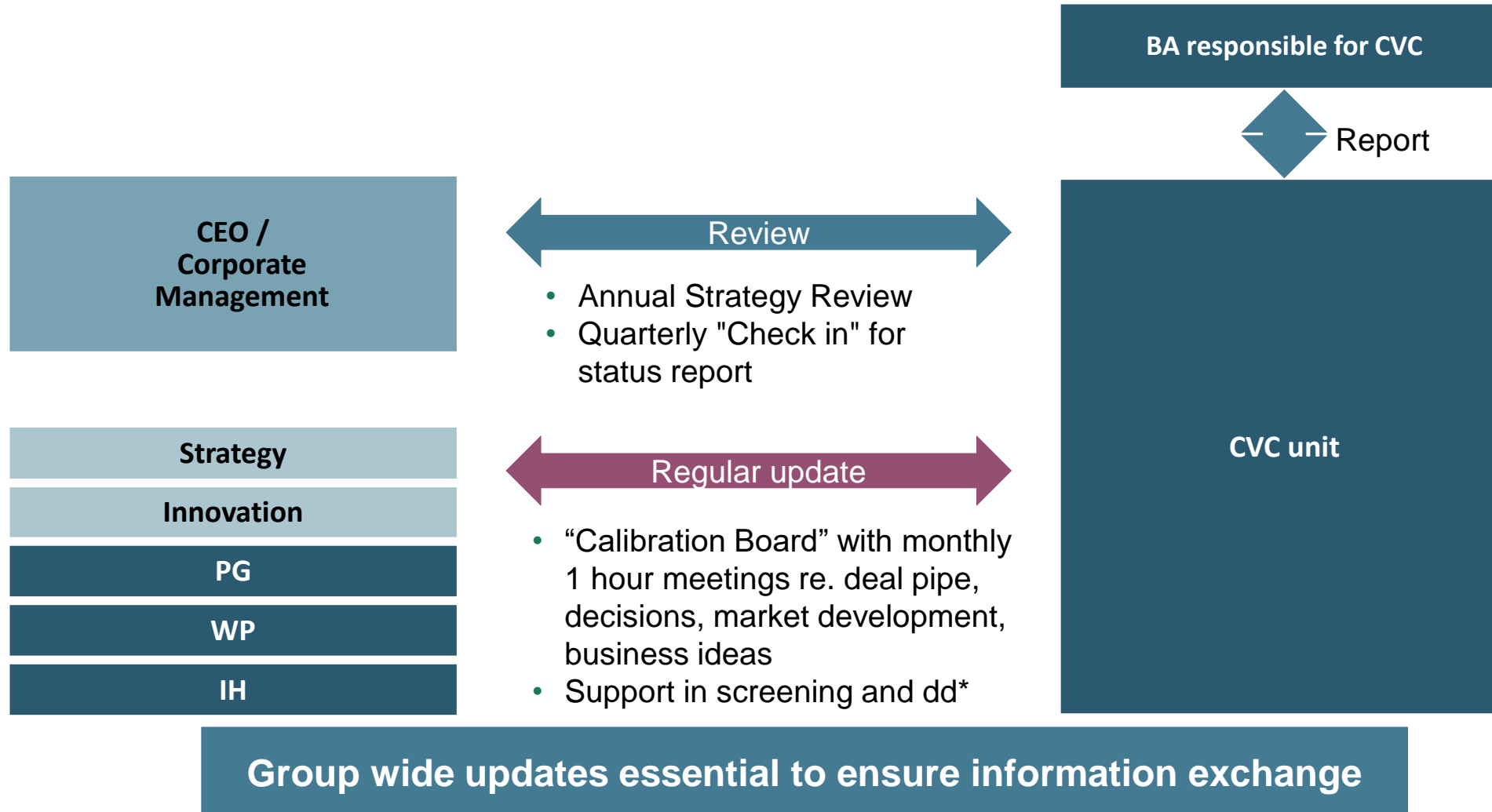


# CVC: Option for Organizational Afiliation



	<i>"Corporate solution"</i>		<i>"Business Unit solution"</i>
	CEO	CD ("Strategy")	BU
Content fit (market & technology)	<b>O</b> Attention largely focused on large core projects	<b>+</b> Good & broad overview of current business	<b>Market ++</b> Given the focus on market related search f. <b>Technology</b> Basic knowledge of other search fields
Connectivity to Business Units and Corporate Staff	<b>++</b> Strong signal to organization	<b>+</b> Established connections to all units	<b>BA M/Corp. ++</b> Close ties for M/Corp. <b>Other BAs -</b> Limited links to other BAs
Organizational readiness	<b>-</b> Exception from usual CEO role	<b>-</b> No operational role	<b>++</b> Ability to drive change (seen by Corp./BAs)
Peer practice	<b>+</b> Seen in industry peers	<b>+</b> Seen in industry peers	<b>-</b> Exception among peers
Summary	<ul style="list-style-type: none"> <li>• <b>Strong option</b> due to big signal, if <b>broader investment focus</b> is pursued</li> <li>• Limited by CEO availability</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Alternative option</b> for <b>broader investment focus</b>, allowing Corp. Strategy to take more operational role</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Pragmatic option</b> as long as predominantly <b>focused/limited to BA M</b> search fields</li> </ul>

# Diffusion of Knowledge to other Business Areas and Staff Units



# CVC Investment Decision: Deal decision level to match CVC unit housing



## "Corporate solution" Involvement of Corporate in CVC Investment Committee

Department	Role	Level
Head of CVC	Moderator/ Chairman	SVP/VP
BA representative <sup>1</sup>	Deal Advocate/ (Guardian)	SVP/VP
Finance/Risk <i>Veto right<sup>2</sup></i>	Challenger	SVP/VP
(Head of) Strategy	Challenger	SVP/VP
(Head of) R&D/Innovation	Challenger	SVP/VP

*3 out of 5 votes required  
for investment decision*

1. Representative of respective BA responsible for search field 2. Escalation process to EVP level

## "BA solution"

### Deal decisions on BA level

Department	Role	Level
M representative (e.g. Head of T&O)	Moderator/ Decision maker	SVP
Head of CVC	Deal responsible	VP
Senior business representative	Guardian	SVP/VP
Finance/Risk <i>Veto right<sup>2</sup></i>	Challenger	VP

Will seek input from Legal,  
Innovation, Strategy, Finance,  
other BAs as appropriate

*Line decision*

BA level

Corporate level

# Business Case: >8.5% IRR is achievable, need to balance OPEX with scale of investment



*Illustrative*

Headcount (p.a.)					
Position	FTE	Cost (k€)	Position	FTE	Cost (k€)
Head of CVC	100%	195	BA experts	202%	263
Inv. Manager	200%	260	BA manager	5%	9
Inv. Analyst	100%	98	Legal/Finance	137%	133
					<b>958</b>

Other cost (p.a.)			
Position	Cost (k€)	Position	Cost (k€)
Office space	28	Further marketing	15
IT infrastructure	5	Travel	35
Web representation	10	Ext. support	350
			<b>443</b>

Investments (k€)				
Year	First round (1,500)	Second round (2,500)	Third round (3,000)	Investment
2015	2	0	0	3,000
2016	4	1	0	8,500
2017	3	1	1	10,000
2018	5	1	0	10,000
2019	3	1	1	10,000
				<b>41,500</b>

Estimated investment performance <sup>1</sup>					
Average holding period before exit: 6 years					
Performance distribution (IRR)					
Write off (0%)		10%	Avg. performance (20%)		30%
Poor performance (15%)		30%	Top performance (40%)		30%
Performance impact to SK existing business (% of group revenue)					
2020	2021	2022	2023	2024	2025
0.1%	0.1%	0.1%	0.2%	0.2%	0.3%

Cashflow (k€)										
2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
-4,401	-9,901	-11,401	-11,401	-11,401	2,479	12,617	31,202	40,151	40,151	44,031

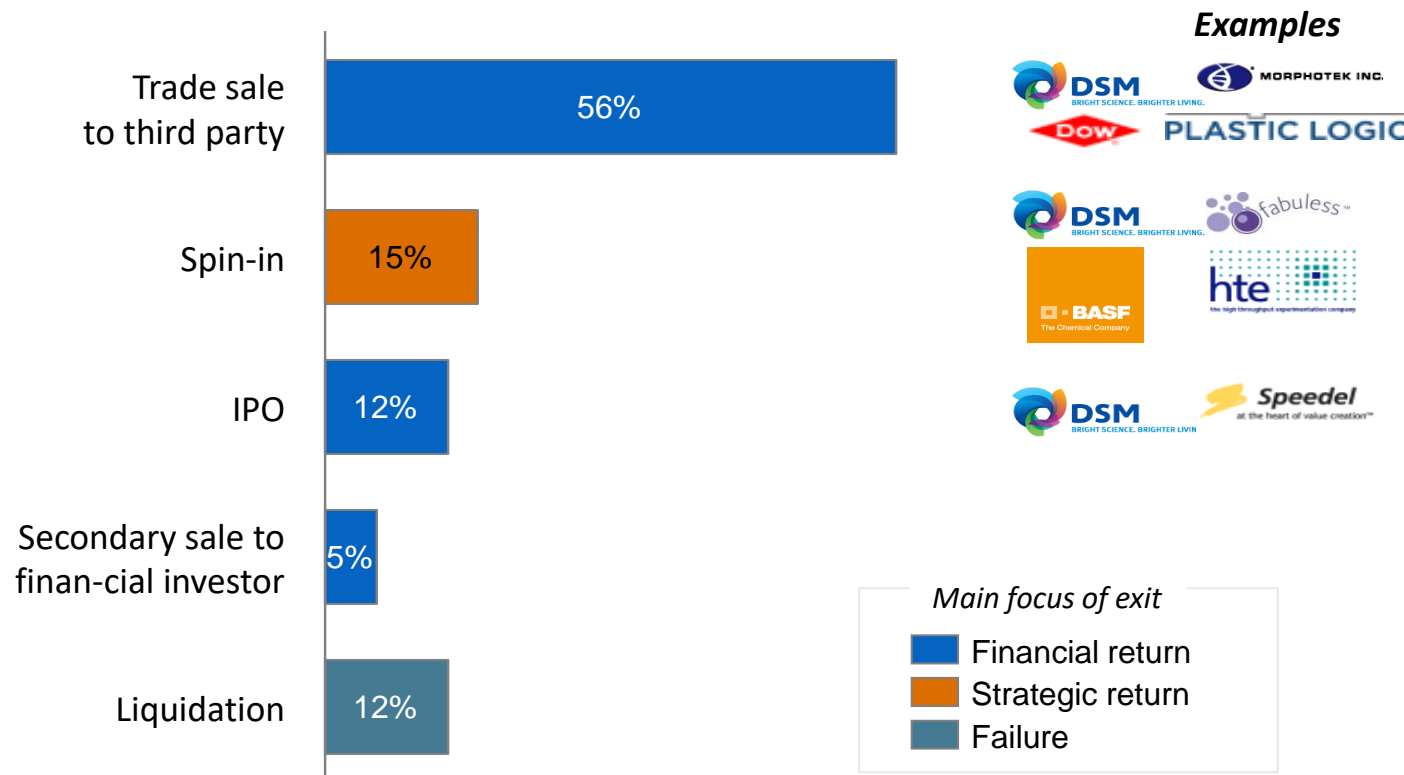
IRR
<b>2015-2025</b>
23.1%

1. Based on BCG experience, Source: BCG analysis

# Tangible CVC benefits: Most investments eventually divested to realize financial gains



Nearly  $\frac{3}{4}$  of CVC investments eventually sold for financial returns



Multiple options to realize gain from portfolio companies

- In mid to long term, portfolio companies develop beyond "start-up" status
- Portfolio companies are sold to third parties and generate financial gain – but can still cooperate with the (former) CVC owner
- 15% see a spin-in to realize complete integration and expand upon prior cooperation
- Only 12% end as failure w/o strategic or financial return

# Strategic benefits: Many potential upsides from CVC

Selected quotes: BCG benchmarking of chemical Corporate VCs

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## Strategy and innovation

▪ "The overriding objective of our investment is to link the strategic and operational interests of BASF Group with innovative technologies of emerging businesses. We not only invest venture capital, but also support our investments through targeted interaction between BASF Group's worldwide know-how and research network and our portfolio companies."

▪ BASF Corporate Web site



## Innovation

▪ "By investing in young, promising companies, either directly or indirectly (through venture capital firms), Solvay gains a preview of nascent technologies that could potentially enrich its technological portfolio in the short term."

▪ Solvay Corporate Web site



## Build valuable business

▪ "Syngenta Ventures is seeking to identify early-stage companies with a strong technology base or new business model ... where our team of investment professionals ... can help build valuable businesses benefitting both Syngenta and the investee company stakeholders."

Syngenta Corporate Website



## Leverage expertise

▪ "Our goal is to help entrepreneurs bring smart solutions to market faster. We can leverage our global science and manufacturing expertise to accelerate commercialization, and draw on our vast industry relationships to increase market access."

▪ DuPont Corporate Web site

▪ "We invest, in part, through institutional venture capital firms and also directly in start-up companies. ... We support portfolio companies with access to Dow's R&D and manufacturing organizations for technology development."

▪ Dow Corporate Web site

▪ "We (DSM Ventures) transferred two new products Fabuless and Hidrox into DSM Nutrition—both with double-digit sales (in M€) and an outstanding ROI (return on investment)."

DSM Venturing Investment Manager



## Leverage expertise



## Add-on sales



Source: Press search

# Strategic benefits example: Main CVC objectives can be realized through collaboration



## Citi cooperation with Square following US\$ 50m investment enables next level of mobile payment

## Strategic benefits for both partners



- Square allows to realize credit card payments from any web connected device (desktop, tablet, mobile phone)
- Solution incl. secure software and required hardware to read credit cards



- Leading global bank
- Citi provides consumers, corporations, governments and institutions with a broad range of financial services and products

Series D investment by four co-investors including Starbucks (in total \$200m, valuing Square at \$3.25B)



- **Close alliance/collaboration** of in addition to CVC investment with focus on leveraging Citi's global footprint and local market expertise for international expansion of Square
- **Advantages for Square:**
  - Client access (scale-up)
  - Strong brand reputation
  - Banking/country expertise
- **Advantages for Citi:**
  - Additional customer contacts
  - Close coverage of technology development in new payment space



## What went wrong at Statkraft's past venturing activities

### CVC objectives

- **Primary focus on financial objectives** (esp. IRR)
- Investments to accelerate **growth "across the board"**
- **R&D driven** – focus on technology development

### CVC set-up

- **Operating at "arm's length"** due to co-ownership with other energy players
- CVC team primarily consisting of **financial/investment experts**
- **Vague approach** to realizing strategic benefits (e.g., unclear linkages to BAs)

## Implications for future success

- **Focus on specific benefits** – with **financial returns** also necessary
- Focus on spaces allowing for **SK to leverage core competencies**
- **Market driven** – Focus on new business models/opportunities – technology only enabler
- CVC unit to be **integrated into SK organization**
- **Balanced CVC team** to reflect dual strategic and financial objective
- **Involvement of BAs** to be clearly defined – for mutual benefits



# Benchmark: Best practices in mission/objectives



## Best practice elements from top in class

### Strategic objective

**Strategic objectives are at the center of the mission statement/objectives and clearly defined**

- Financial success is a prerequisite as leading CVs are aiming at evergreen setup

### Focus

**Focus on areas that are not mature enough for M&A and not accessible through own R&D for BUs**

- Focus areas are agreed and aligned with business units and corporate goals

### Market insights

**Corporate Venturing provides insights into technology and business model developments**

- Value for BUs comes not just from active investments but from new lead flow/business plans

### Commercial partnership

**Value creation comes from establishing long-term commercial partnerships with portfolio firms**

- Commercial partnerships that work independently from venture investment

### Commitment

**Top management support to establish a long-term Corporate Venturing commitment**

- Clear understanding that occasional failures are the inevitable cost of engaging in VC

# Benchmark: Best practices in governance and process



## Best practice elements from top in class

### Balance BUs and Corporate

#### **Corporate board approves portfolio strategy, investment themes and reviews performance**

- Ensures that both corporate and BUs' strat. objectives are balanced in CV objectives

### Empowered inv. committee

#### **Investment committee is lean, flexible and empowered to make investment decisions up to ~ €10M**

- Has necessary (deal by deal relevant) BU and R&D representation

### Close BU involvement

#### **Governance ensures that each BU and CV jointly develop new investment ideas**

- Also supervises the progress of the implementation of the value creation plan with start-ups

### Guardian role

#### **One dedicated BU "guardian" is the key interface between start-up and BU/corporate**

- Is a senior executive from guardian BU who is well connected with adequate decision power

### Incentivize

#### **BU/R&D is incentivized to be involved in deal from deal identification to post-deal mgmt. to exit**

- But a back-up plan is in place if BU loses strategic interest in a company

Source: BCG experience

# Benchmark: Best practices in portfolio management



## Best practice elements from top in class

### KPIs/Analysis format

#### Standardized reporting format with financial and strategic KPIs

- Consistent analysis format and report structure for both pre-deal and post-deal reporting

### Agenda

#### Predefined agenda for regular investment committee meetings

- Focus on portfolio review through agenda setting and standard reporting
- Review of deals, incl. cont. tracking of milestones and active steering

### Strategy

#### The strategic rationale for each investment must be continuously tracked

- With no further strategic alignment the portfolio company will be managed as a financial investment
- Short to midterm exit to be approached

### Risk reduction

#### Measures to protect the capital invested have top priority

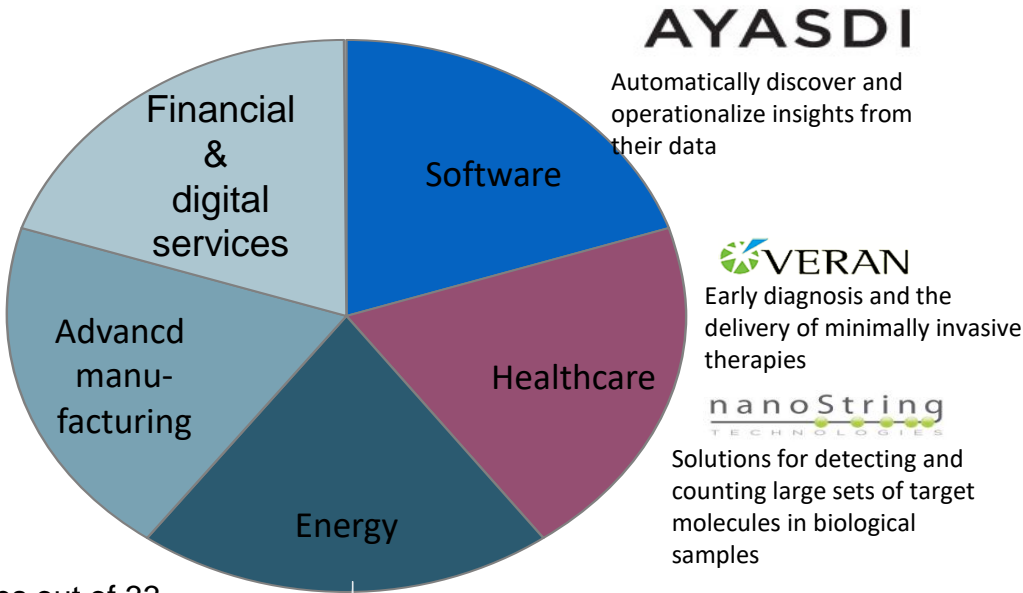
- Professional portfolio management is the key success factor for financial performance

Source: BCG experience

# GE: wide spectrum of searchfields includes Energy



## Exemplary<sup>1</sup>: Wide portfolio with currently 33 energy focused companies



## Global portfolio with strong focus in Silicon Valley area



5 examples out of 33

**ALTADEVICES**  
High efficiency solar PV applications

**中国传动**  
World's largest wind power transmission manufacturer.

**NUVENTIX**  
Synthetic jet cooling technology that is revolutionizing how and where we use air cooling.

**GRIDNET**  
Cellular smart grid model has created the Grid Net Platform, a centrally-managed, highly-distributed smart grid network operating system

**Hara**  
Environmental and energy monitoring & management cloud-based software

9 out of 33 energy focused portfolio companies focus on service solutions

1. In total 49 companies in portfolio  
Source: Global Corporate Venturing, Company website, BCG analysis  
Torsten Amelung: Corporate Innovation Management

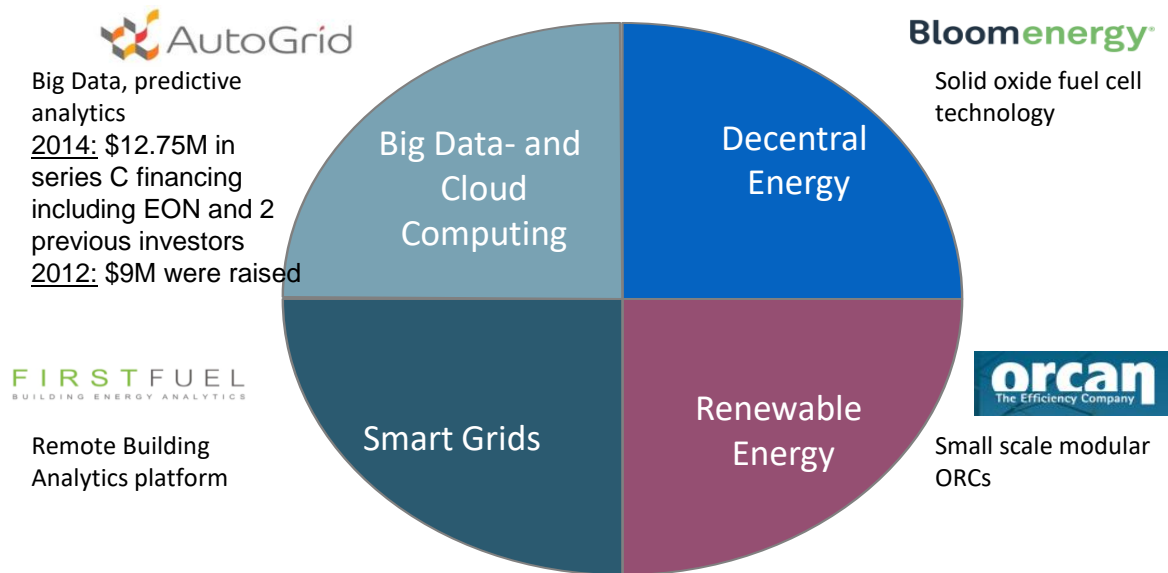
# EON: Developing strong position in Silicon Valley



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## Portfolio diversified across technology sectors

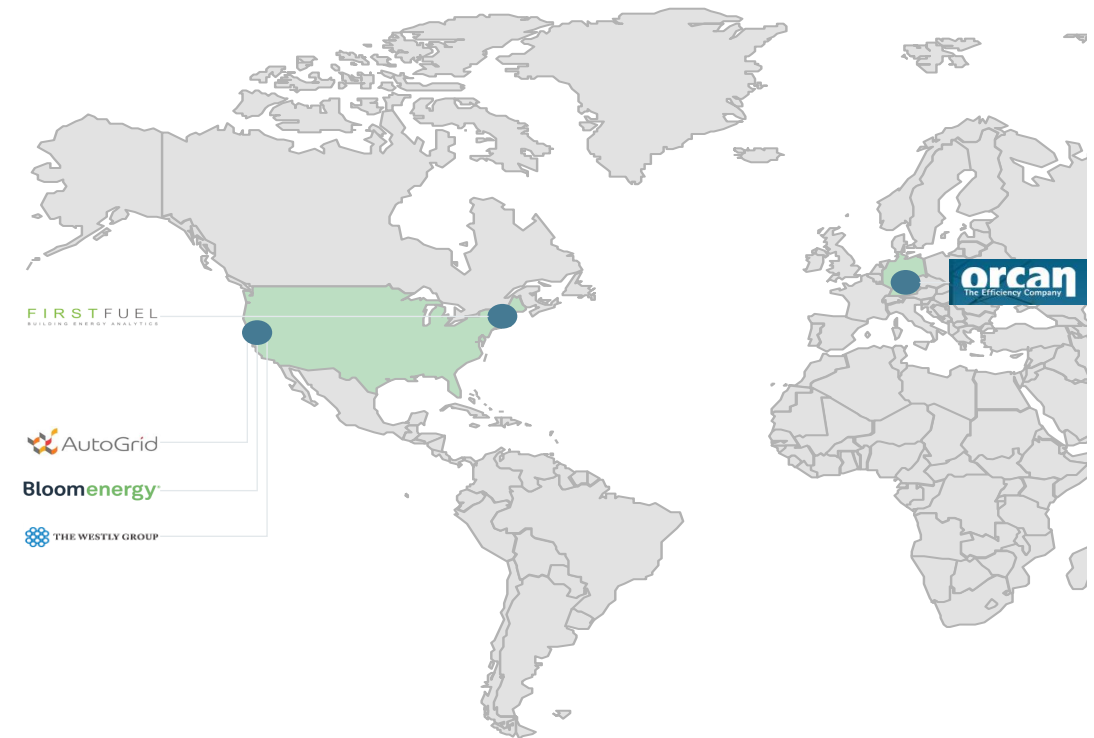


Westly evaluates roughly **800 companies** a year in over **20 different sectors of clean tech** including renewable energy and smart grid, building energy efficiency, and transportation and biofuels

Source: Global Corporate Venturing, Company website, BCG analysis

Torsten Amelung: Corporate Innovation Management

## Global portfolio with strong focus in Silicon Valley area





## 8. New Applications of Corporate Innovation

- Corporate Venture Capital Funds
- **Democratic Innovation Models**
- Open Innovation and Strategic Alliances
- Social Innovation



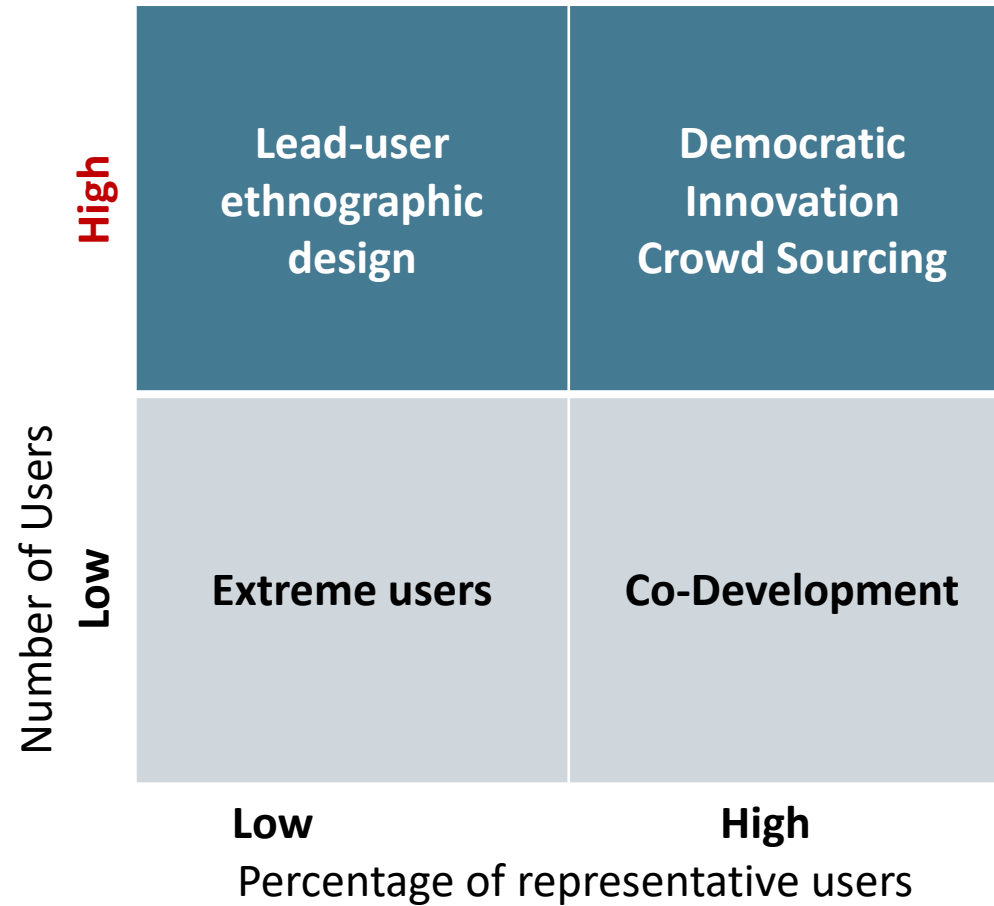
## ■ User-led innovation models

- Marketing Departments have had a tendency to think that users are passive recipients of new goods and services based on their revealed and hidden needs
- History shows that active users are ever so often well ahead of the development (for instance pick-up trucks, convertible cars, apps, medicine)

## ■ Crowdsourcing (Howe, Jeff (2006): The power of Crowd Sourcing

- Open call to a large network to provide voluntary input or perform some functions
- Network requirements: call is open and the network is large

# Types of User Innovation



Many users involved = loose links  
Few users involved = close relationships

Low percentage of representative users = high level of avant-garde or lead users





- Representative users are often recruited in large numbers to fast-track diffusion especially in short product cycles i.e. fashion
- Lead users recognize requirements early and are ahead of the market needs.
  - Usually they expect high levels of benefits.
  - They are often used in searching and planning processes.
  - They are perceived as being pioneers and innovators by the peer group.
  - Lead users contribute development and are usually early adopters
  - The importance of Lead users increases with technological complexity.
  - Especially in Capital Goods Complete diffusion in capital goods for industrial use, telecoms & medical appliances might take up to 20 years and are led by early adopters.
- Extreme users as a source of innovation:
  - Facing very challenging & tough environments has very likely an impact on technological design
  - Often employed when radical innovation is needed such as ABS/premium cars.



- Variety of implementation alternatives: Peer & User Communities, Competitions and Events
- Peer or User communities
  - Precondition is that communities are open and sufficiently large
  - Innovation networks can be competitive in terms of searching for new ideas or collaborative
  - Some communities will freely share innovation findings  
(e.g. online communities for open-source software, music, sports)
  - Some participants are driven by intrinsic motivation; others by (recognition & community) status (e.g. User)
  - Some user-led innovation create uses innovative solutions on a continuous basis especially in software development
- Competitions & events: active calls by corporates offering awards and prizes (more extrinsic motivation)

# Examples for User-led Innovation Communities



- **Linux** community building applications and freeware around this operating system
- **Apache** server community around web server development applications
- **Lego** makes extensive use of communities in its Lego Factory
- **Adidas**: users are encouraged to co-create shoes using a combination of websites and mini factories
- **Apple's** i-platform
- **Dell** crowd-sourcing platform „idea storm“-competition: 15000 ideas of which 400 have been implemented
- **Facebook** received help from crowds to translate the platform into 100 languages and dialects



## 8. New Applications of Corporate Innovation

- Corporate Venture Capital Funds
- Democratic Innovation Models
- **Open Innovation and Strategic Alliances**
- Social Innovation



- Open innovation employs different knowledge sets inside and outside the corporation.
- Even large scale R&D in a closed system of a corporation is not likely to keep up with dramatic accelerations in technology push and user needs since 2000.
- Especially large firms (e.g. GE, GSK, P&G, Siemens, 3M) started to co-operate in what is called open innovation.

# Principles of Open Innovation according to Chesbrough



- Economies of Scale: Not all smart people work for one corporation.
- Synergies: External ideas can help create value, but it takes internal R&D to claim a portion of that value for you
- Second Mover Advantage: It is better to build a better business model than get to market first.
- If a corporation makes best use of internal and external ideas you will win.
- Trading IP: not only should you make profit from others' use of IP you should also buy others' IP whenever it fosters your own business model.
- You should expand R&D's role to include not only knowledge generation but knowledge brokering as well

Source: Chesbrough, H. (2003), Open Innovation. Boston: Harvard Business School Press.



- Underlying problem: company losing market cap as percentage of new products in sales was going down in 2001
- Stretch goal: 50 % of innovations should be coming from outside the company in 2009 compared to 15 % in 2000. By 2008 it was 45 % .
- Mobilizing rich linkages between people within the wider group of companies: for instances linking oral care experts with researchers working on film technology and others in the cleach and household cleaning groups.
- Using extensive intranet via an intranet site „Ask me“ linking 10.000 technicians and engineers worldwide
- Group of 80 technology entrepreneurs to visit conferences, exhibitions, universities and suppliers
- Extensive Use of the Internet: becoming founder member of a site called Innocentive ([www.innocentive.com](http://www.innocentive.com)). This is a Web-based market place on which problem owners can easily link with problem solvers (90000 problem solvers available around the world).
- YourEncore: website allowing companies to find and hire scientists for one-off-assignments.
- Nine Sigma: website innovation seekers with innovation providers giving access to disruptive technologies.
- Yet2.com: web-based network matching buyers and sellers of technologies including 40 % of world's major R&D players.



- „Orchestra Model“ (e.g. Boeing / B787 Dreamliner):
  - Creating an active global network of suppliers, partners, investors moving from built-to-print to design&build-to-performance.
  - Every participant is an independent „musician“ while the conductor does the final integrating and decision making.
  - Model also used in automotive
- „Creative Bazaar“:
  - Crowd sourcing approach involving web based solutions used by Corporates
  - Examples: BMW Innovation Agency, Innocentive.Com, „Partners-in-Innovation“
- Jam Central
  - Creating a central vision and then mobilizing a wide variety of players to contribute reaching it.
  - Examples: Japan's 5th generation computer project creating more than 1000 patents; Philips
- Innohub
- Mod Station:
  - Open source model which draws on a term used in the PC industry allowing users to make modifications to games and other software and hardware
  - Examples: Symbian (Nokia), Android (Google), OpenSPARC (Sun Microsystems)



# Pros and Cons of Applying Open Innovation



Open Innovation Principles	Benefits	Challenges
Tap into external knowledge	Increasing the pool of knowledge, decrease dependency on limited internal knowledge	Know-how re searching and identifying relevant knowledge sources Sharing or transferring knowledge especially if it is tacit or systemic
External R&D has significant value	Opportunity to reduce costs and risks of internal R&D, increase of focus and depth of internal R&D	Less likely to lead to distinctive capabilities External R&D also available to competitors
Second Mover Advantage	Building a better business model focus is on capturing rather than creating value	Developing the business model might need time-consuming negotiations with other actors
Best use of internal and external resources	Focus is on resources not on generation of ideas	Generation of ideas is only a small part of the innovation process; most ideas are unproven re costs of development
Profits from others IP	Value of IP very sensitive to complimentary capabilities, such as brand sales network, logistics as well as products and services	Conflicts of commercial interests or strategic direction Negotiation of acceptable terms for IP licenses

# Collaboration Strategies Supporting Open Innovation

Prof. Dr. Mark Ebers • Seminar for Business  
Administration, Corporate Development and  
Organization • University of Cologne



	Complementary	Substitutional
Relational versus Organizational solutions	License	Joint Venture
Contractual-Market based solutions	Outsourcing	Strategic Alliance



- **Principal agent problems traditionally short-term and arm's length**
- **Alternative:**  
**Japanese partnership model fewer suppliers, long-term relations, greater equity & real cost transparency, focus on relationship and less on contract, mutual learning, vendor assessment and development, two-way or third party assessment)**



- **Reducing or eliminating production and distribution costs**
- **Reaching a larger market**
- **Exploiting other applications**
- **Establishing standards**
- **Gaining access to complementary technology**
- **Blocking competing developments**
- **Converting competitors to defenders**



- **Formal company established**
- **Usually for a longer period**
- **Built critical mass through co-option**
- **Reach new markets by leveraging co-specialized resources**
- **Gain new competencies through organizational**
- **Commitment: aligned objectives and trust**
- **Usually established by 2 companies; number of partners stay limited**



- **Critical mass achieved through temporary alliances with competitors, customers or companies with complementary technology**
- **Partners usually come from the same industries**
- **Co-operation might lead to a JV later (e.g. Airbus)**

**Strategic Alliances have become more common than JVs because:**

- **Speed: transitory versus careful planning (of JV): lead time, speed of response to changing or disruptive market conditions**
- **Partner Fit: network vs. 2 (or sometimes 3) JV partners**
- **Partner type: complementary versus familiarity; strategic alliances occur across sectors, markets & technologies rather than from within**
- **Focus: few specific tasks rather than relationship**

# Common Reasons for the Failure of Alliances



Reasons for failure	Percentage of studies *)
Divergence of strategy & goals	50
Partner problems	38
Strong-weak relation	38
Cultural mismatch	25
Lack of trust	25
Operational/geographical overlap	25
Personal clashes	25
Lack of commitment	25
Unrealistic expectation/time	25
Asymmetric incentives	13

\* Based on a review of 16 studies on failures of strategic alliances

Source: Duysters, G., G. Kok and M. Vaandrager (1999), Crafting successful strategic technology partnerships. R&D Management, 29 (4), 343-351.



- Surveys and Focus Groups: finding out about consumer preferences in similar products
- Latest needs analysis: uncover unarticulated requirements of customers to more novel products
- Lead-users: users representing the future needs of the market (not the majority of users)
- Customer developers: acquiring products that are created by customers
- Competitive Analysis: analysis of competing products, reverse engineering or benchmarking features of competing products
- Industry experts or consultants: who have wide range of experience and vision to evaluate the innovation.
- Extrapolating trends: in technology, markets and society to guess medium term needs.
- Building Scenarios: creating alternative visions of the future
- Market experimentation: testing market response with different products, but able to adapt or withdraw rapidly
- Scrum Approach
- Design thinking (D-School of Management)





## 8. New Applications of Corporate Innovation

- Corporate Venture Capital Funds
- Democratic Innovation Models
- Open Innovation and Strategic Alliances
- **Social Innovation**



- Social enterprises have a long tradition: mutual insurances and self help, microcredit, housing programmes, cooperatives, ...
- The tradition has led into a trend of social entrepreneurship.
- Social entrepreneurs establish business models for social enterprises that make sufficient income to be sustainable
- Social innovations are usually combinations or hybrids of existing solutions
- Implementing needs interaction between beneficiary groups, customers, sources of finance, governments
- Social innovation can take various forms:
  - Individual start ups (Grameen Bank, Waka Waka)
  - Foundations (Melissa & Bill Gates Foundation, Nike Foundation)
  - Governments, state-owned institutions and NGOs
  - Corporates (BT)



- Ambition of owners to create social value, mission driven but strategic (e.g. Gates, Google, Wikipedia)
- Corporate Social Responsibility to secure the „licence to operate“
  - Guarantee support from stakeholders: customers, owners, employees
  - Supporting the brand of a company
- Learning laboratory:
  - Programs for employees („Seitenwechsel“, LA Works)
  - Transferring business models from social to commercial (Grameen Bank to changing business models in banking)



THE END  
Thanks for  
joining.