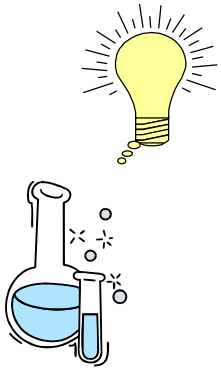
The Innovation Process

Idea, Pre-project **Project** **Project Review**

Steering Committee

Preliminery experiments



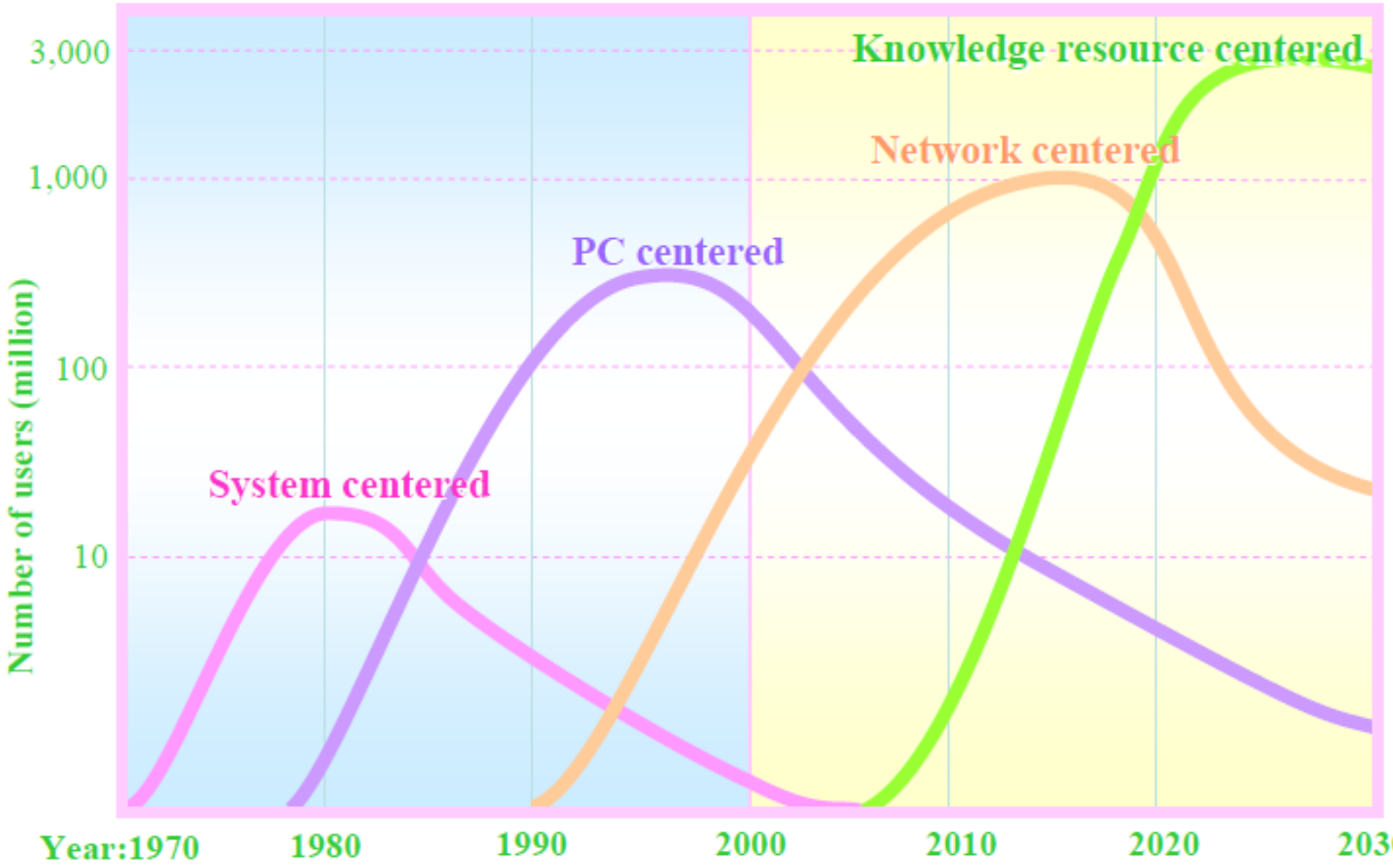
Tandem

Core Team

Prephase → Realization → Follow-up

Standardized process, clear responsibilities

Importance of reading the trends: the Paradigm shift in IT



David C. Moschella: "Waves of Power"

Questions to be answered (by you)

- What are the potential fields for future innovations?

II. Empirical Findings: Success Factors

Results of "Old" Empirical Studies on Innovation Success – Still Relevant

- Two third of all successful innovations come from market impulses *(Myers, Marquis 1968)*.
- Successfully innovating companies understand the needs of customers better *(SAPPHO 1974)*.
- They use more external sources and experts *(SAPPHO 1974)*.
- Project responsibility lies higher in the hierarchy and project managers should have more competencies *(SAPPHO 1974)*.
- When innovations fail this is mostly due to non-technical reasons *(Mansfield, Gerstenfeld 1970s)*.

CHARACTERISTICS OF SUCCESSFUL INNOVATING COMPANIES - 1

- Systematic collection of all impulses that could lead to innovation
- Creativity of employees
- Ability to evaluate the possibility of the innovation idea
- Good team work
- Project-based approach and ability to manage projects

CHARACTERISTICS OF SUCCESSFUL INNOVATING COMPANIES - 2

- 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

Success Factors of Innovation Performance

1. Efficient innovation process implemented
2. Clear and communicated innovation strategy
3. Sufficient resources for innovations
4. Commitment of higher management for innovations
5. Entrepreneurial climate for innovations
6. Strategic focus and realization of synergies
7. Cross-functional high-performance teams

Source: Cooper, Kleinschmidt 1995

Key Success Factors of Product Innovation

1. A superior product that delivers unique benefits to the user
2. A well-defined product and project prior to the development phase.
3. Technological synergy
4. Quality of execution of technological activities
5. Quality of execution of pre-development activities
6. Marketing synergy
7. Quality of execution of marketing activities
8. Market attractiveness

Source: Cooper, Kleinschmidt 1990

WHAT TO DO

1. Start with analysis and study of opportunities.
2. Go among people, ask questions, listen.
3. Effective innovations are surprisingly simple. They must be focused on specific needs and on specific final products.
4. Effective innovation starts on a small scale.
5. A successful innovation always tries to win a leading position, otherwise you create opportunities for your competitors.

Why do Product Innovations fail?

- Insufficient market analyses
- Unsystematic or superficial marketing
- No or too late cost and price calculations
- Costs too high
- Strong competition
- Technical deficiencies or shortcomings

WHAT TO AVOID

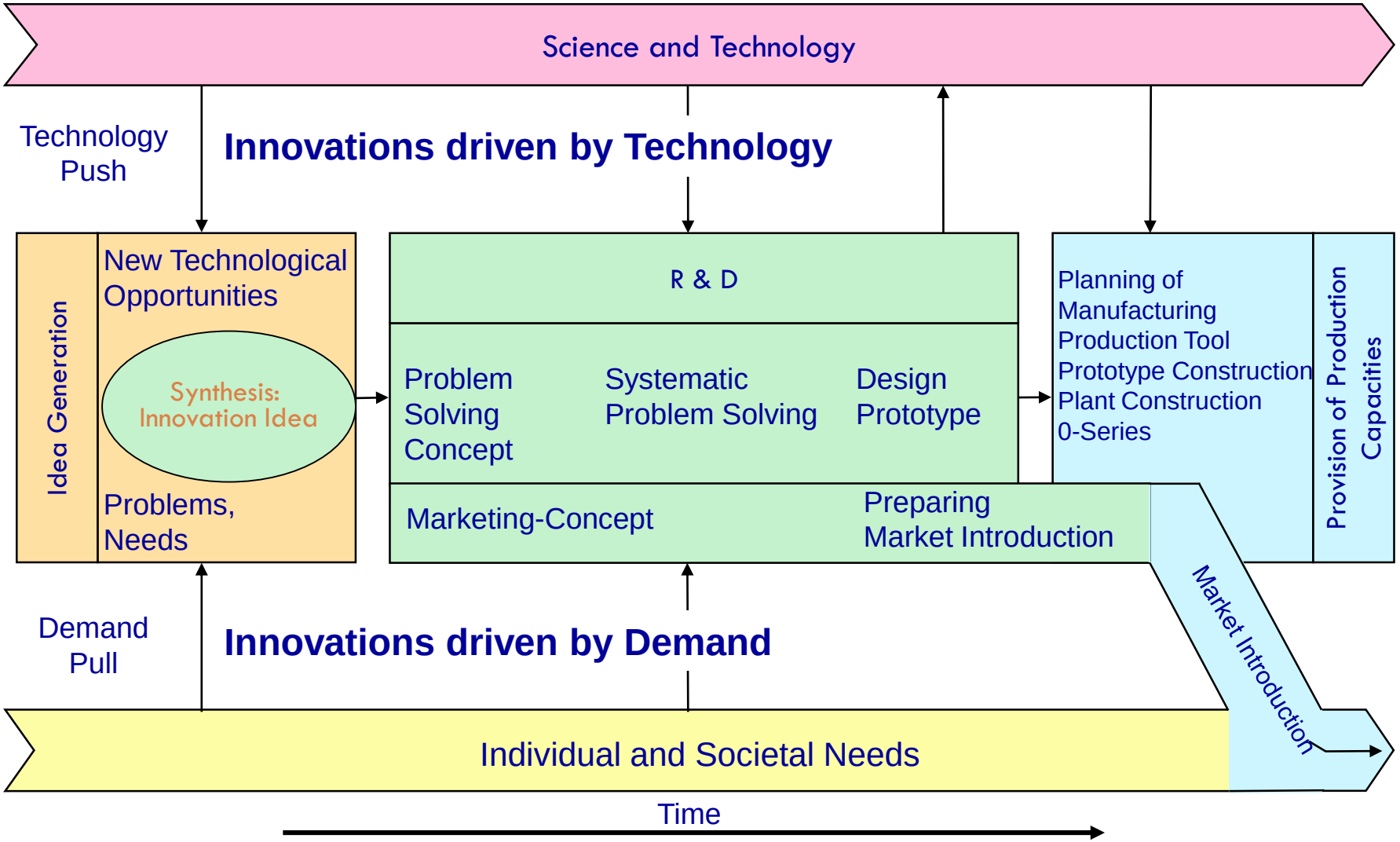
1. Don't try to be too "clever". All that is too sophisticated will almost certainly go wrong.
2. Don't try to do too many things at once. Focus on the core of the problem.
3. Don't try to make innovations for the future but for today. An innovation can have a long-term impact but there must be an immediate need for it.

Three conditions for innovations

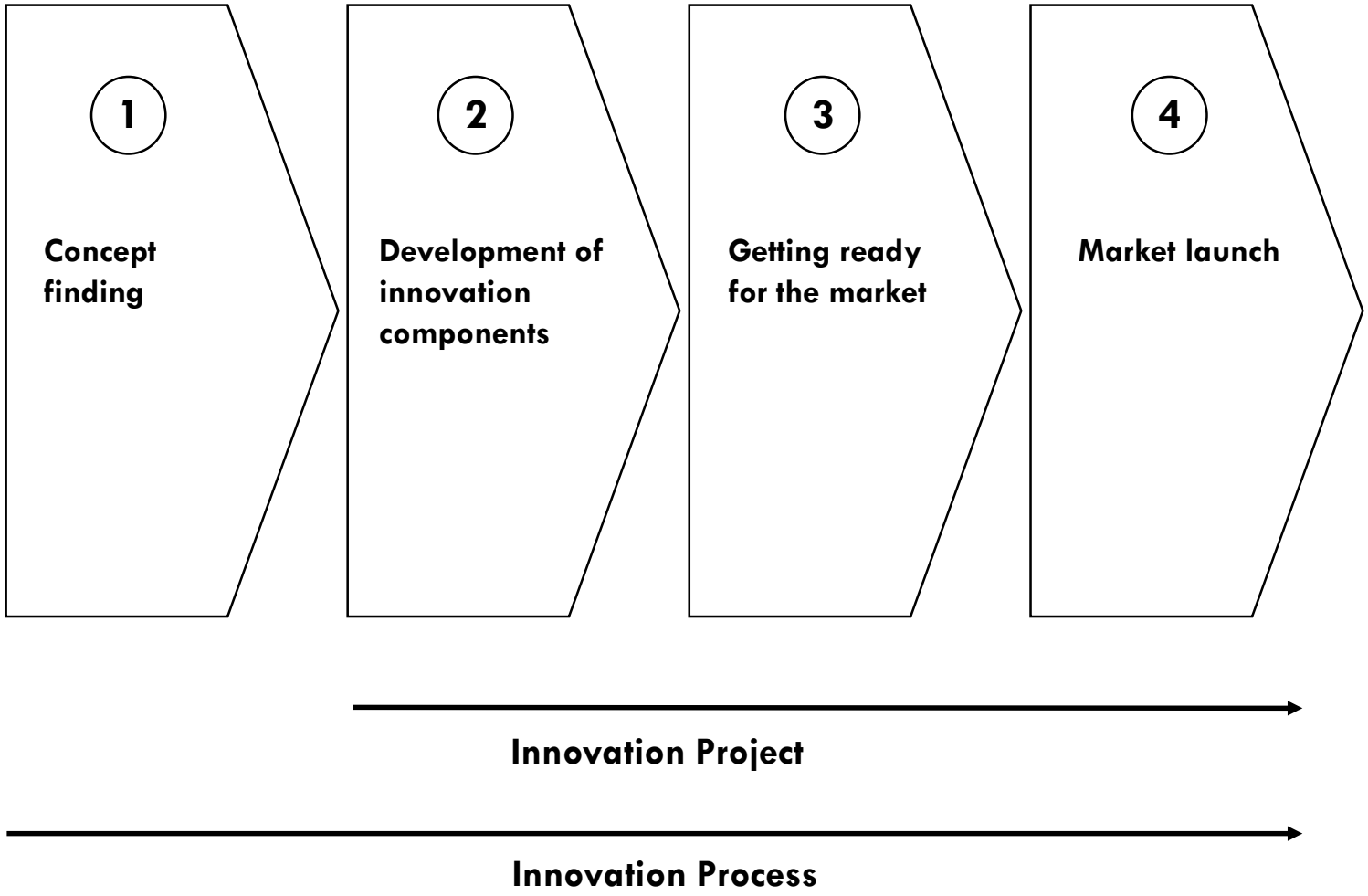
1. Innovation means work; **hard, concentrated and thorough work**. If these qualities are lacking then there is no use for the big talent, cleverness or knowledge.
2. Successful innovations must build on your strong points. The innovation must be important to the innovator.
3. Innovation must focus on a market, must be controlled by the market (market-pull).

III. Basic Concepts of Innovation Management

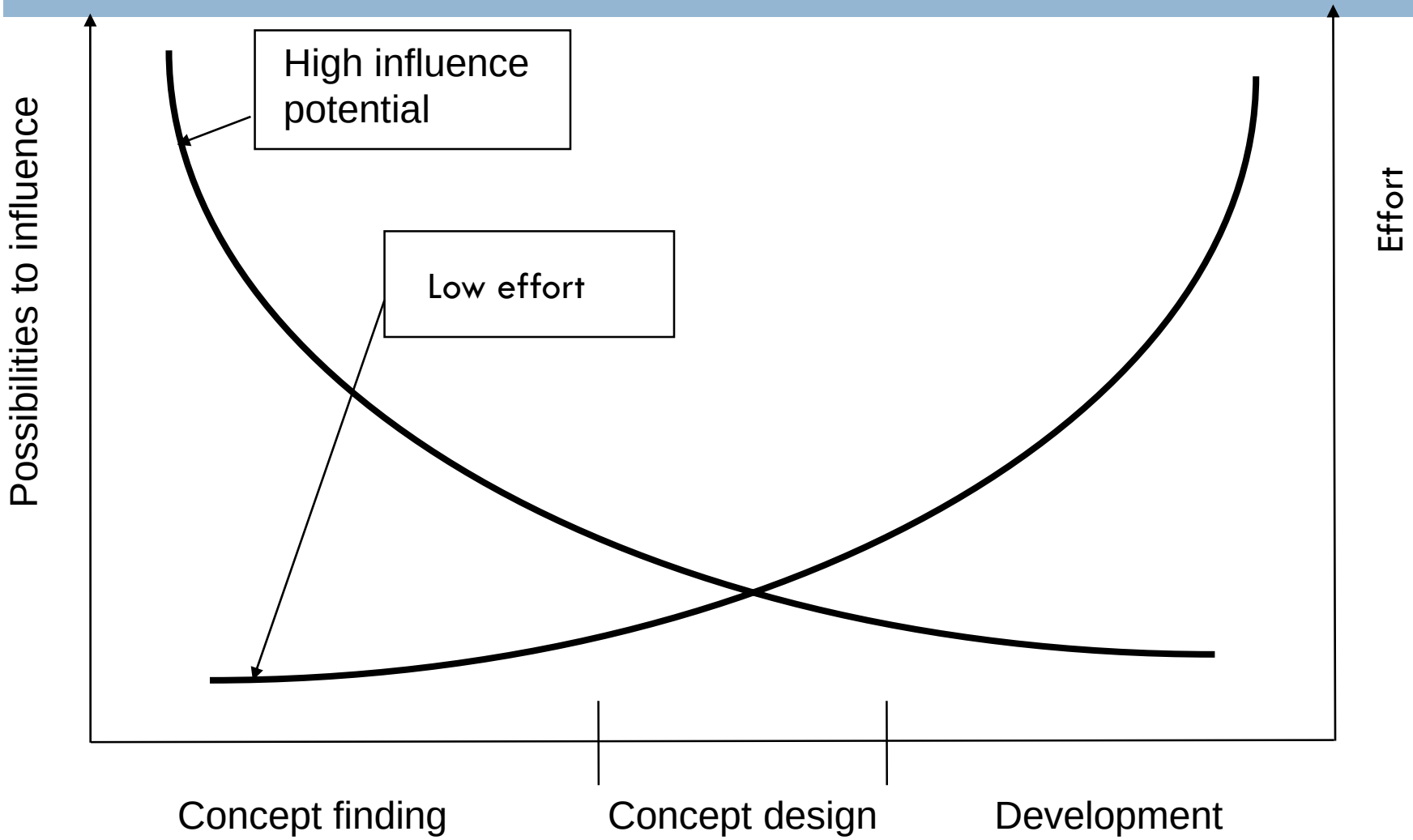
The Process of Technological Innovation



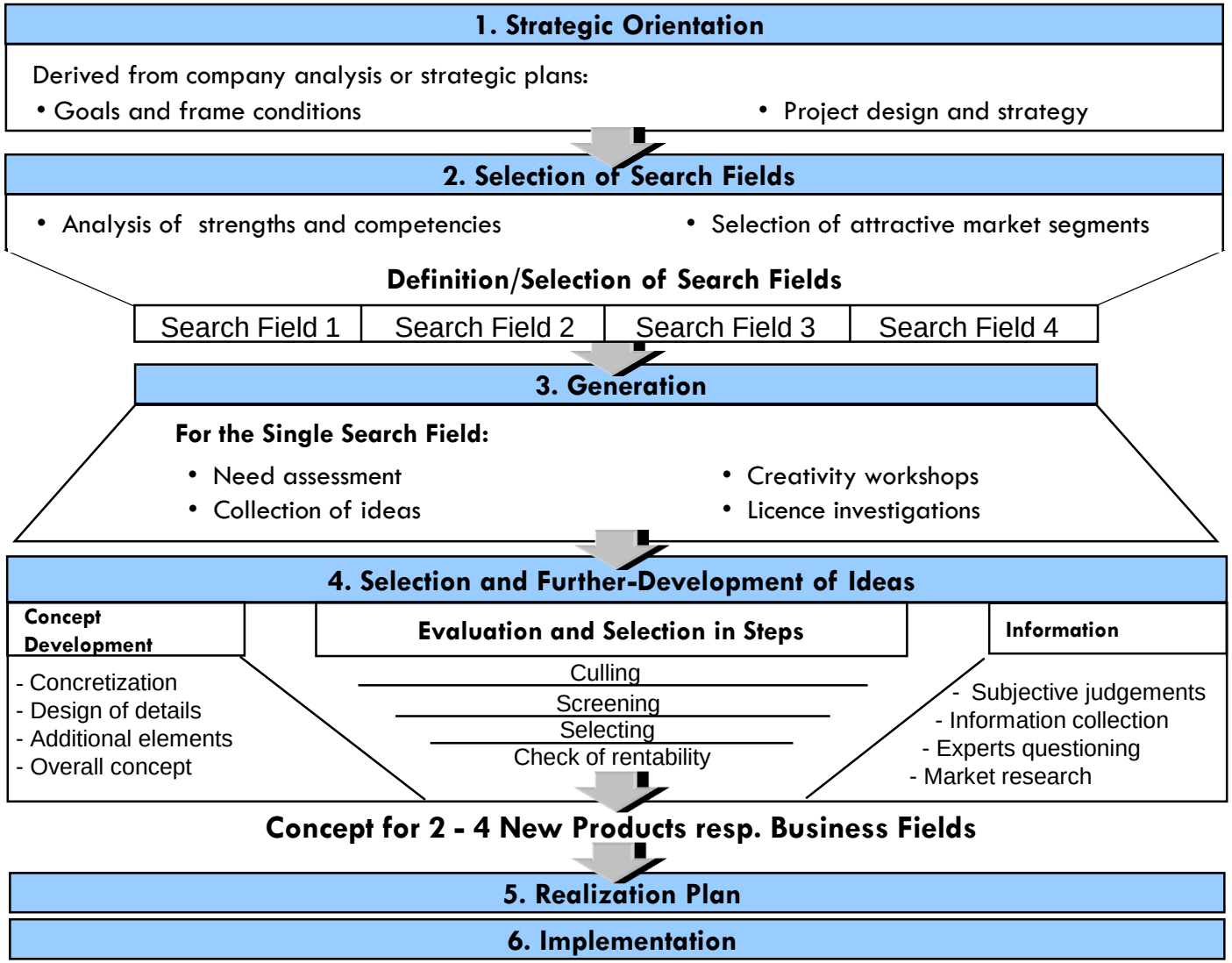
The Phases of the Innovation Process



Frontloading: Intensive Analysis and Concept Development in the „Prephase“



Innovation Planning Process



The Concept Finding Phase

The prephase of the innovation process starts with "Strategic Orientation" and lasts till the decision to start a project of technical development:

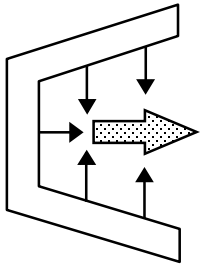
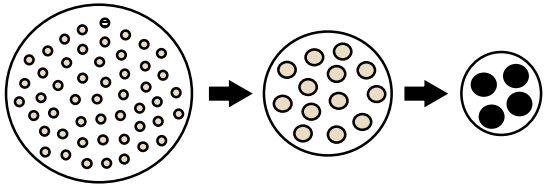
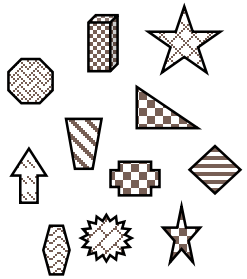
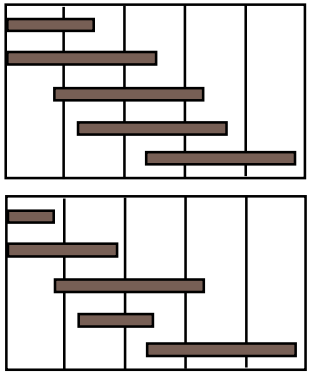
= concept finding phase

= fuzzy front end

= pre-development phase

Range, volume and professionality of these activities and structuredness of procedures in the concept finding phase are success factors for innovations.

Concept Finding Phase of the Innovation Process

Strategic Orientation	Idea Generation	Idea Selection and Conceptual Further-Development	Pre-Projects	Projects
				
Technology Monitoring **Technology Roadmaps** **Scenarios** **Laying down directions and fields for innovation**	**Need assessment** **Creativity-workshops** **Creative climate of the company**	**Screening** **Evaluation criteria** **Idea assessment** **Idea further-development** **Idea management system**	**Inquiries** **Analyses of requirements** **Quality Function Deployment (QFD)** **Specifications**	**Project management** **Multi-project-management** **R&D-controlling**

IV. Strategic Orientation; Scenario Technique

Strategic Orientation

- Innovations are an important part of a company's strategy.
- That means: Strategic orientation is necessary for defining and conceptualizing innovation.
- **Strategic planning** is an organization's process of defining its strategy, or direction, and making decisions on allocating its resources to pursue this strategy, including its capital and people.
- The outcome is normally a **strategic plan**, which is used as guidance to define functional and divisional plans, including technology, marketing, etc.

Methods Supporting Strategic Orientation

- Long-range demand trends
- Competition analysis
- SWOT-Analysis
- Gap-Analysis
- Product-market-matrix (Ansoff-matrix)
- Search-field matrices
- Scenarios

Competitor Analysis

- **Competitor analysis** in marketing and strategic management is an **assessment of the strengths and weaknesses of current and potential competitors.**
- This analysis provides both an offensive and defensive strategic context to identify **opportunities and threats.**
- Competitor analysis is an essential component of corporate strategy.
- It is argued that most firms do not conduct this type of analysis systematically enough. Instead, many enterprises operate on what is called "informal impressions, conjectures, and intuition gained through the tidbits of information about competitors every manager continually receives."
- As a result, traditional environmental scanning places many firms at risk of **dangerous competitive blindspots** due to a lack of robust competitor analysis.

Competitor array

One common and useful technique is constructing a *competitor array*.

The steps include:

- Define your industry - scope and nature of the industry
- Determine who your competitors are
- Determine who your customers are and what benefits they expect
- Determine what the key success factors are in your industry
- Rank the key success factors by giving each one a weighting - The sum of all the weightings must add up to one.
- Rate each competitor on each of the key success factors
- Multiply each cell in the matrix by the factor weighting.

Competitor Analysis

Key Industry Success Factors	Weighting	Competitor #1 rating	Competitor #1 weighted	Competitor #2 rating	Competitor #2 weighted
1 - Extensive distribution	.4	6	2.4	3	1.2
2 - Customer focus	.3	4	1.2	5	1.5
3 - Economies of scale	.2	3	.6	3	.6
4 - Product innovation	.1	7	.7	4	.4
Totals	**1.0**	**20**	**4.9**	**15**	**3.7**

SWOT ANALYSIS

SWOT Analysis is a strategic planning tool used to evaluate the ***S***trengths, ***W***eaknesses, ***O***pportunities, and ***T***hreats involved in a project or in a business venture or in any other situation of an organization or individual requiring a decision in pursuit of an objective. It involves monitoring the marketing environment internal and external to the organization or individual.

The technique is credited to Albert Humphrey, who led a research project at Stanford University in the 1960s and 1970s using data from the Fortune 500 companies.

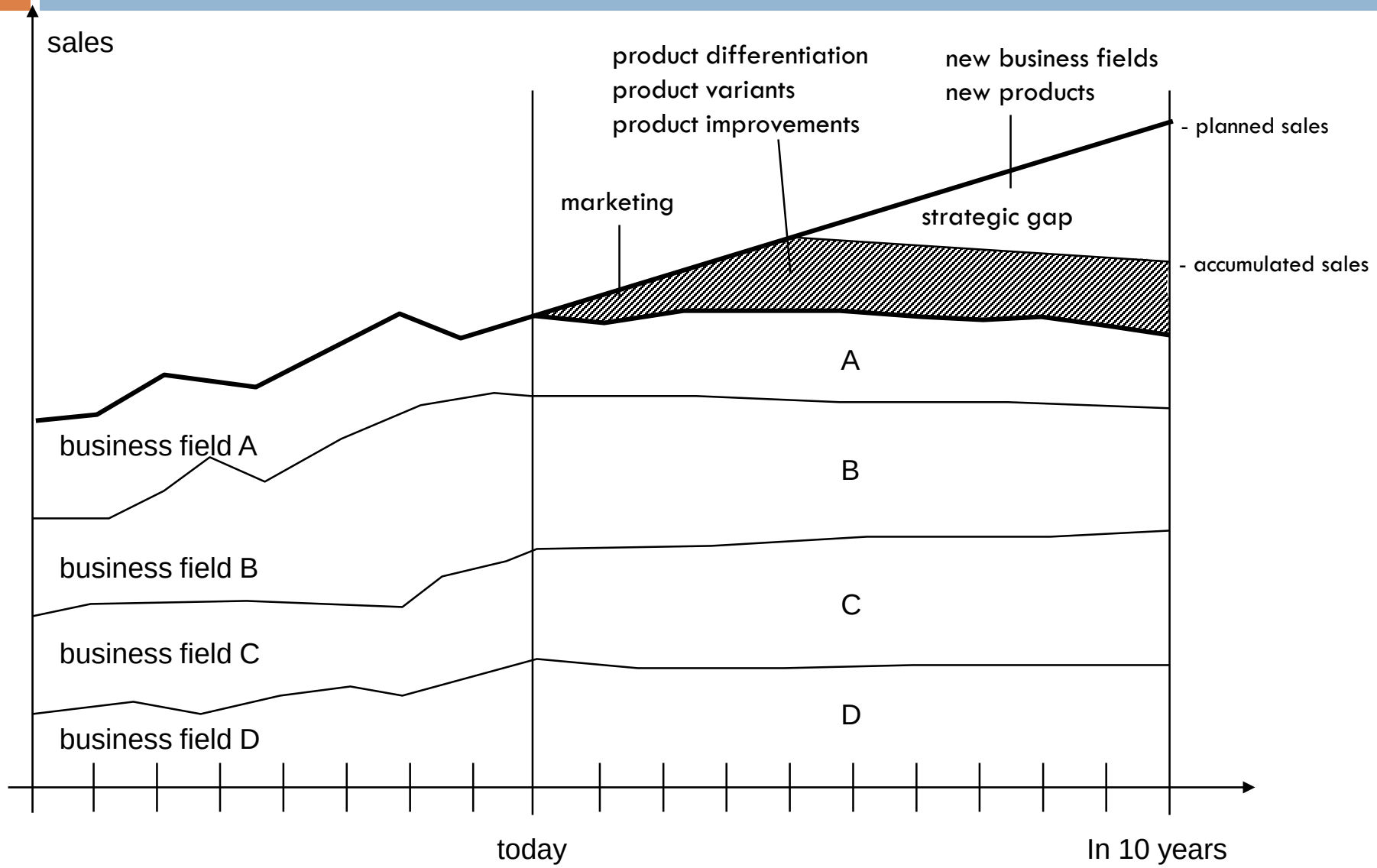
- **W**eaknesses: are characteristics that place the team at a disadvantage relative to others
- **O**pportunities: elements that the project could exploit to its advantage
- **T**hreats: elements in the environment that could cause trouble for the business or project
- **S**trengths: characteristics of the business or project that give it an advantage over others

SWOT ANALYSIS

- Below is an example SWOT analysis of a market position of a small management consultancy with specialism in HRM.

Strengths	Weaknesses	Opportunities	Threats
Reputation in marketplace	Shortage of consultants at operating level rather than partner level	Well established position with a well defined market niche	Large consultancies operating at a minor level
Expertise at partner level in HRM consultancy	Unable to deal with multi-disciplinary assignments because of size or lack of ability	Identified market for consultancy in areas other than HRM	Other small consultancies looking to invade the marketplace

Strategic Gap Analysis



Product-Market-Matrix (Ansoff-matrix)

Markets / Products	**Present customer groups**	**New customer groups**
Present product program	Market penetration P:75%	Market development P:25%
New products	Product development P:50%	Diversification P:5%

Source: Booz, Allen & Hamilton 1982

P = probability of success

Product-Market-Matrix (Ansoff-matrix)

Ansoff, Igor, Strategies for Diversification, *Harvard* Business Review, *Vol. 35, Sep-Oct 1957, pp.113-124*

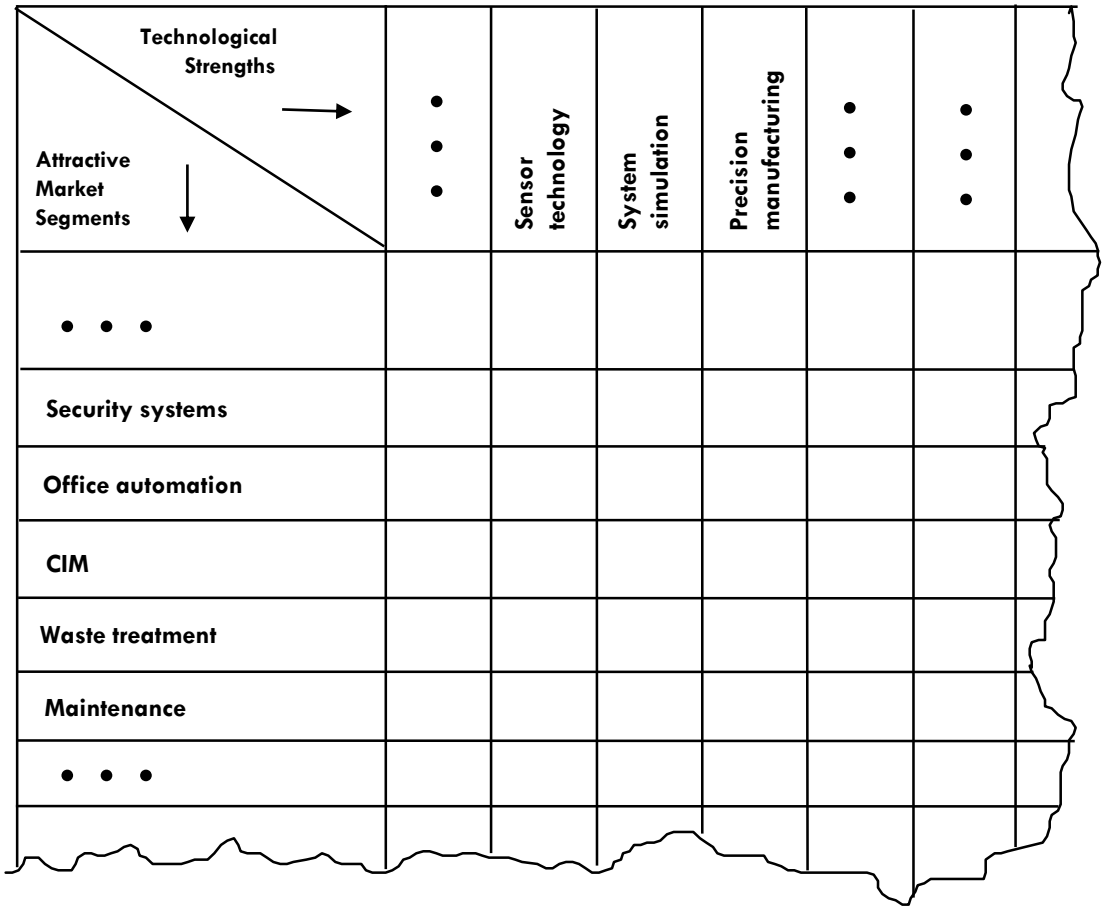
•**Market Penetration** (existing markets, existing products): Market penetration occurs when a company enters/penetrates a market with current products. The best way to achieve this is by gaining competitors' customers (part of their market share). Other ways include attracting non-users of your product or convincing current clients to use more of your product/service, with advertising or other promotions.

•**Product Development** (existing markets, new products): A firm with a market for its current products might embark on a strategy of developing other products catering to the same market. *For example, McDonalds is always within the fast-food industry, but frequently markets new burgers.* Frequently, when a firm creates new products, it can gain new customers for these products. Hence, new product development can be a crucial business development strategy for firms to stay competitive.

•**Market Development** (new markets, existing products): An established product in the marketplace can be tweaked or targeted to a different customer segment, as a strategy to earn more revenue for the firm. For example, *Lucozade (energy drink) was first marketed for sick children and then rebranded to target athletes. It is a good example developing a new market for an existing product.*

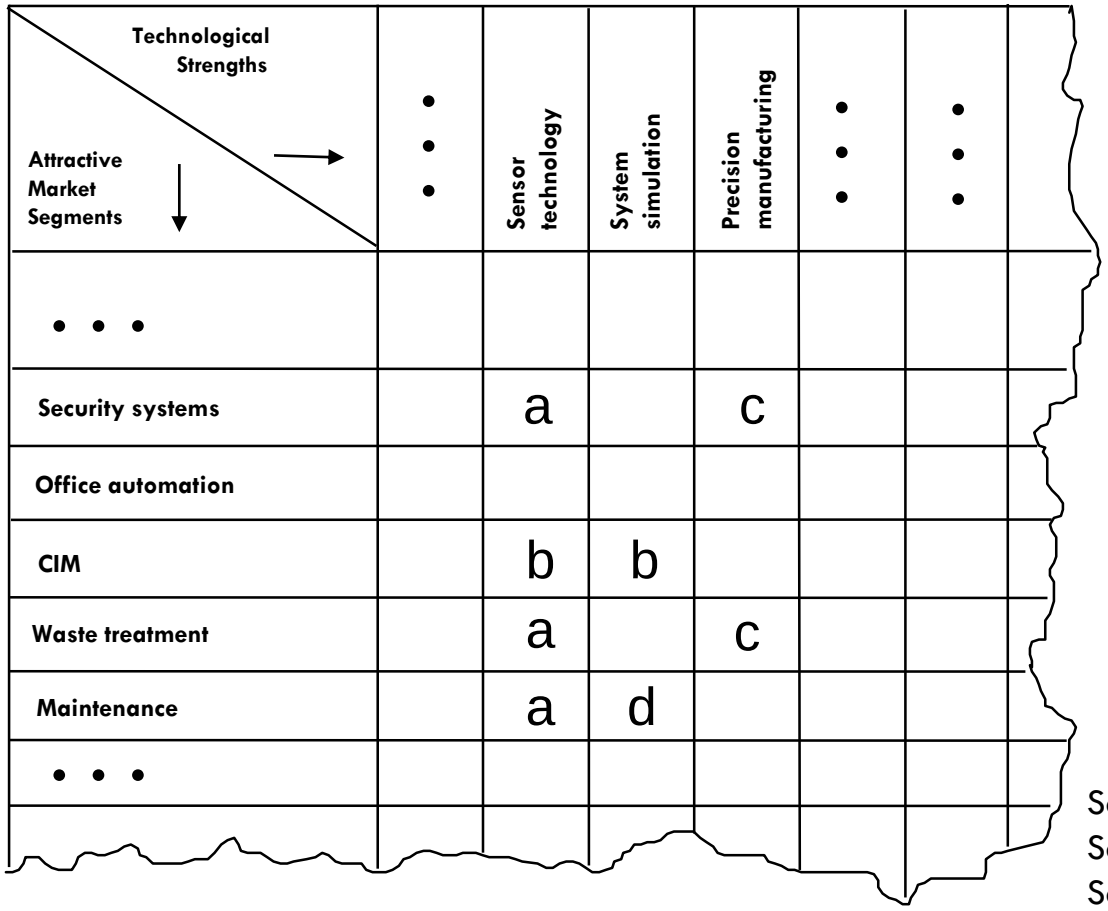
•**Diversification** (new markets, new products): *Virgin Cola, Virgin Megastores, Virgin Airlines, Virgin Telecommunications are examples of new products created by the Virgin Group of UK, to leverage the Virgin brand. This resulted in the company entering new markets where it had no presence before.*

Search-Field-Matrix



The search-field-matrix supports the process of **identifying new business fields.** It is formed by crossing the technological or functional strengths with attractive market segments in a matrix.

Search-Field-Matrix



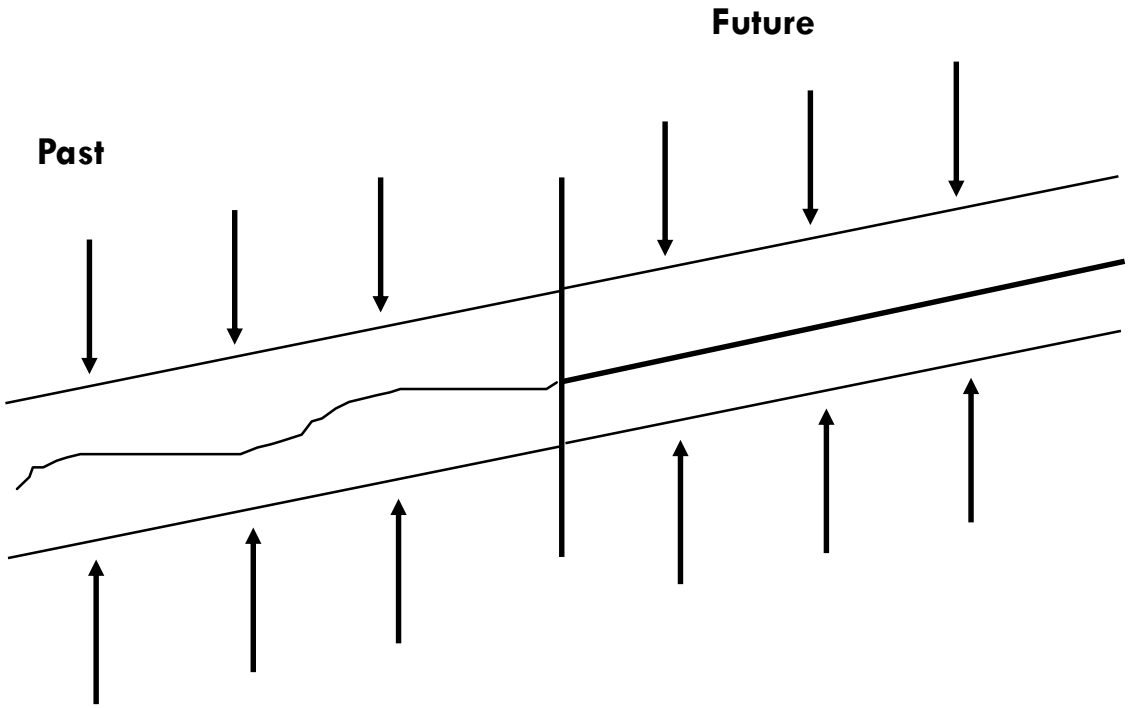
Technological Strengths / Attractive Market Segments	• • •	Sensor technology	System simulation	Precision manufacturing	• • •	• • •	
• • •							
Security systems		a		c			
Office automation							
CIM		b	b				
Waste treatment		a		c			
Maintenance		a	d				
• • •							

A search-field is formed by one (or more) technology-market-combination(s). It is supposed to be promising as it combines company strengths with attractive markets. A search-field is a potential new business line.

Search-field a: advanced warning systems
Search-field b: flexible manufacturing systems
Search-field c: special locking systems
Search-field d: forecasting machine lifetimes

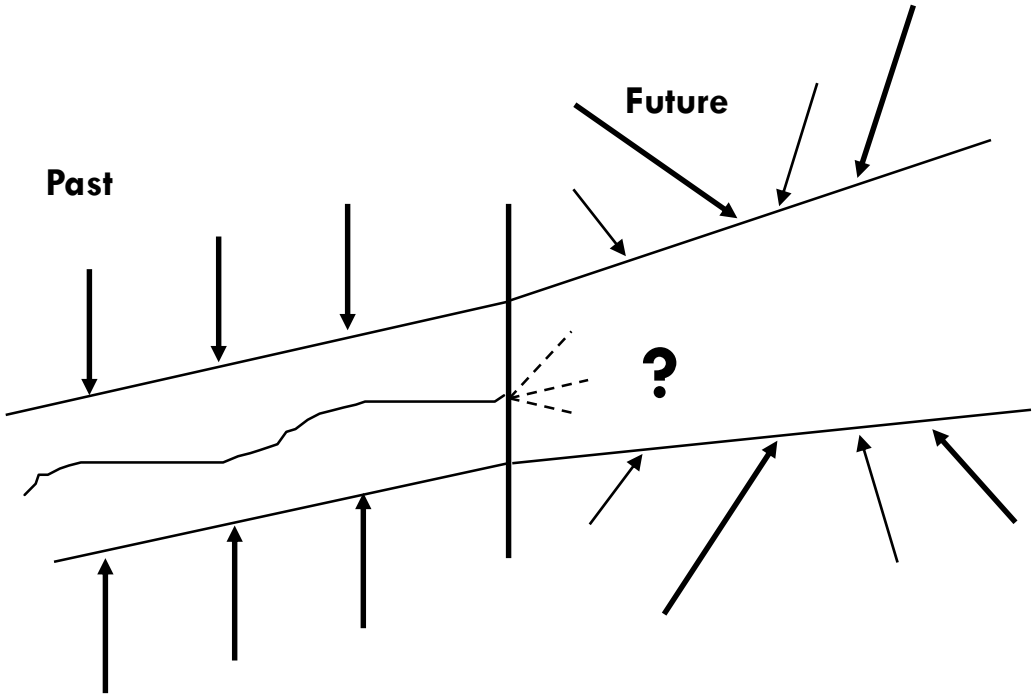
Forecasts in a stable Environment

Conventional forecast methods assume that correlations between the **impacting factors** (independent variables) and the **topic factors** (dependent variables) detected for the past are also valid for the future.



Forecasts in a Turbulent Environment

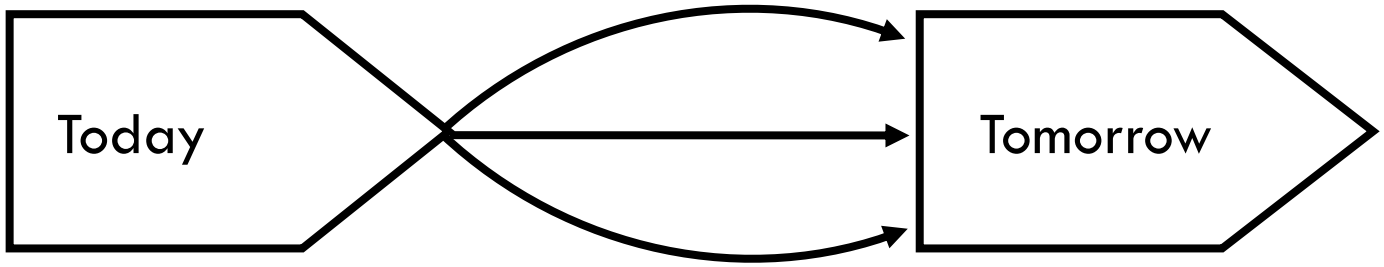
When the influencing environment on a topic is changing, forecasts cannot be based on correlations valid for the past. The influencing factors of the future have to be identified and characterized with respect to strength and direction; then the impacts on the topic have to be deducted.



What is a Scenario?

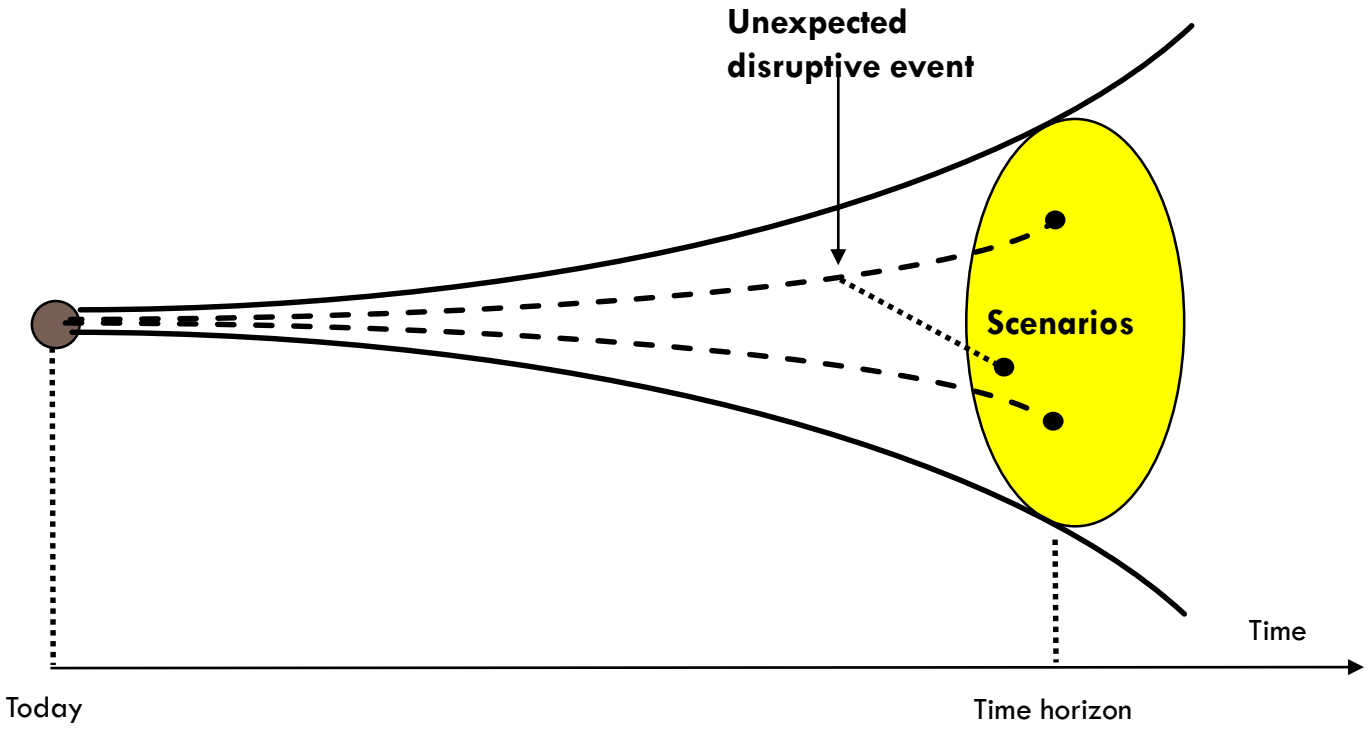
A scenario is

- the depiction of a possible future situation and
- an outline of the development lines leading into the future



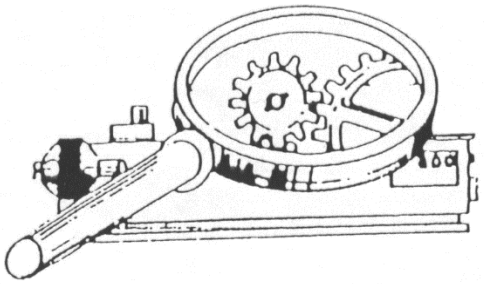
Pathways into the future

Model for Scenarios

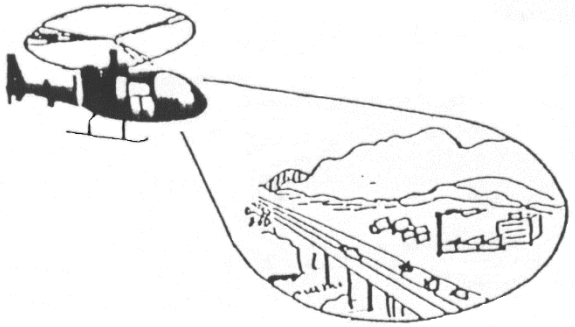


Philosophy of the Scenario-Technique

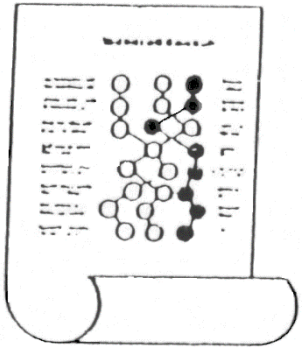
1- Defining the topic



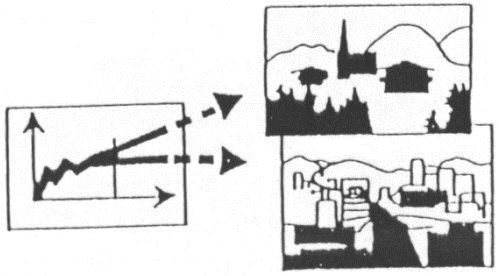
2- Take off from topic



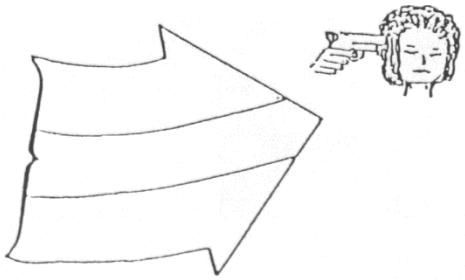
4- Designing pictures of the future



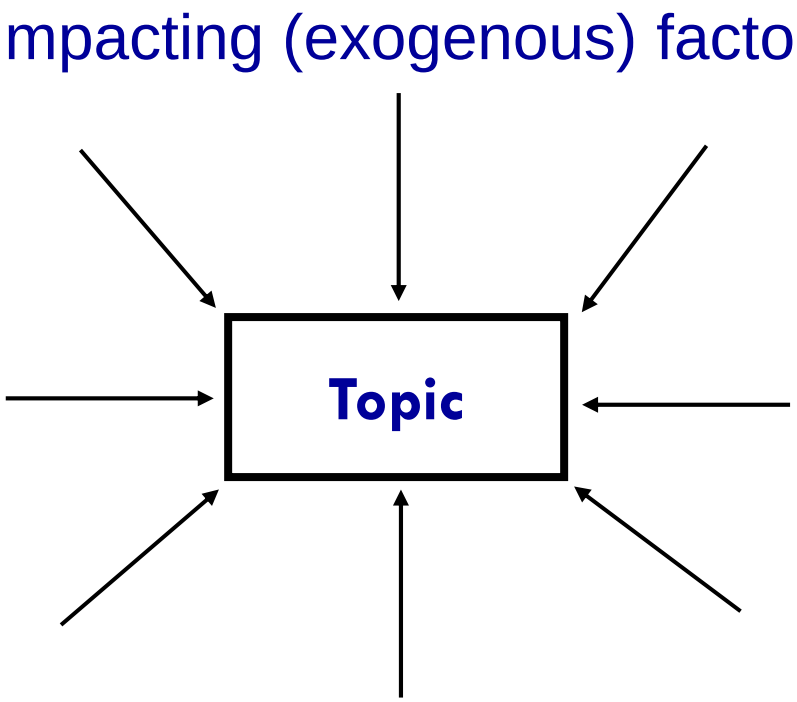
3- Developing alternative projections/assumptions



5- Drawing consequences and conclusions

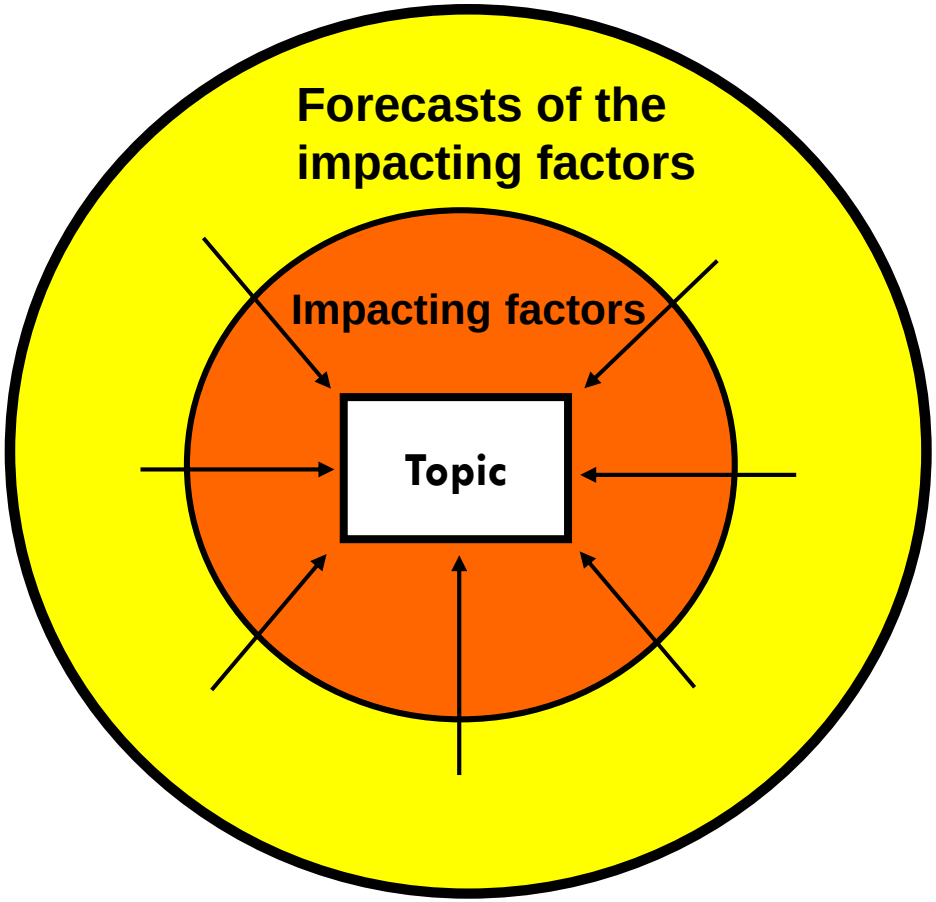


How a Scenario is developed?



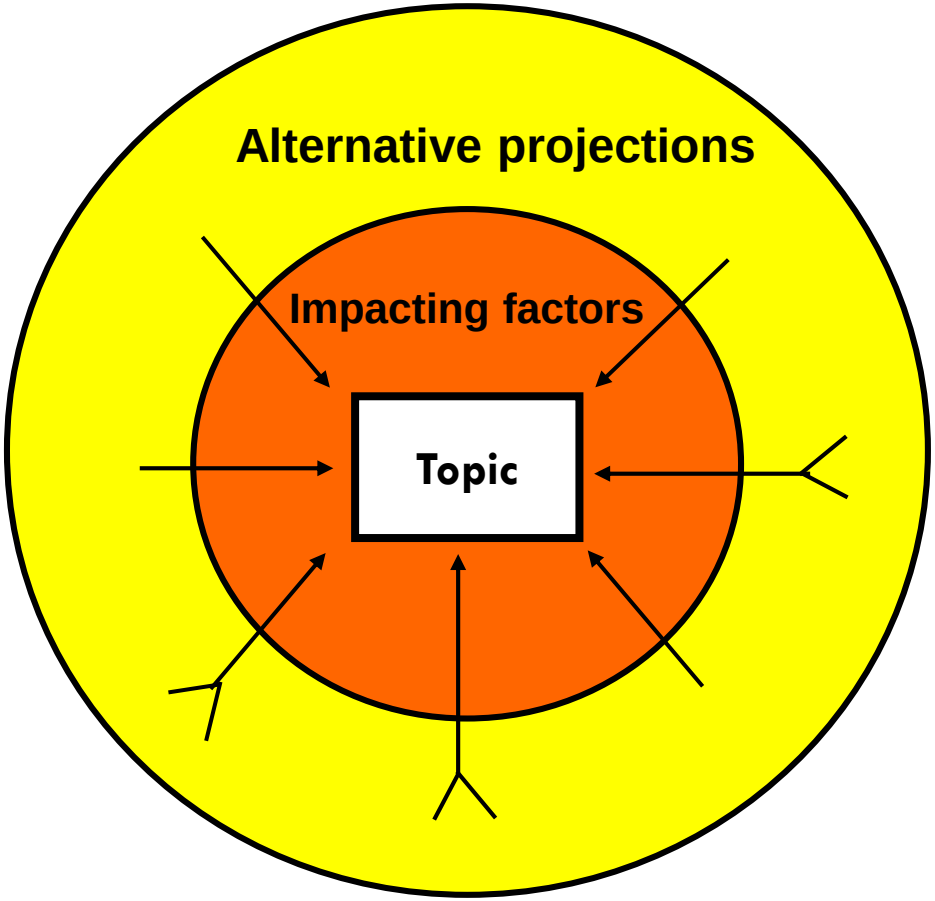
Development of most social or economic topics as well as markets and technologies are essentially determined by external (exogenous) factors.

How a Scenario is developed?



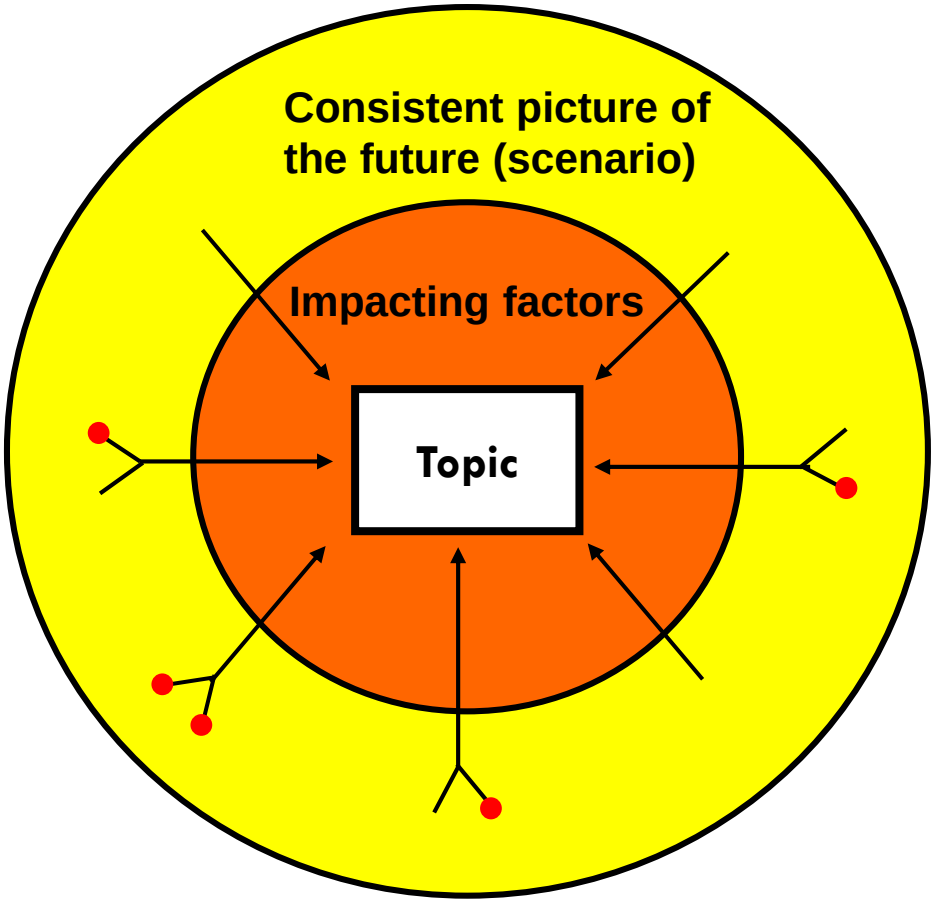
The future situation of a topic is derived from the future projections of its impacting factors. Forecasts of the single factors are made.

How a Scenario is developed?



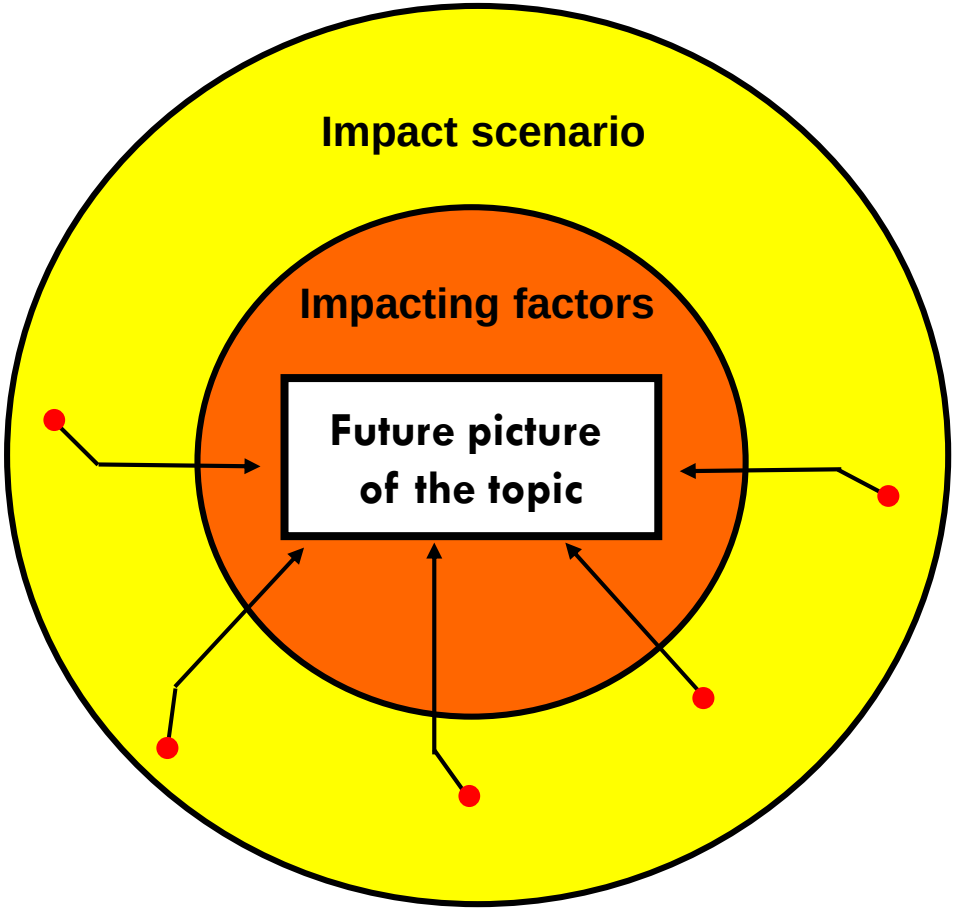
For the single impacting factors **alternative projections** are possible and can be justified reasonably.

How a Scenario is developed?



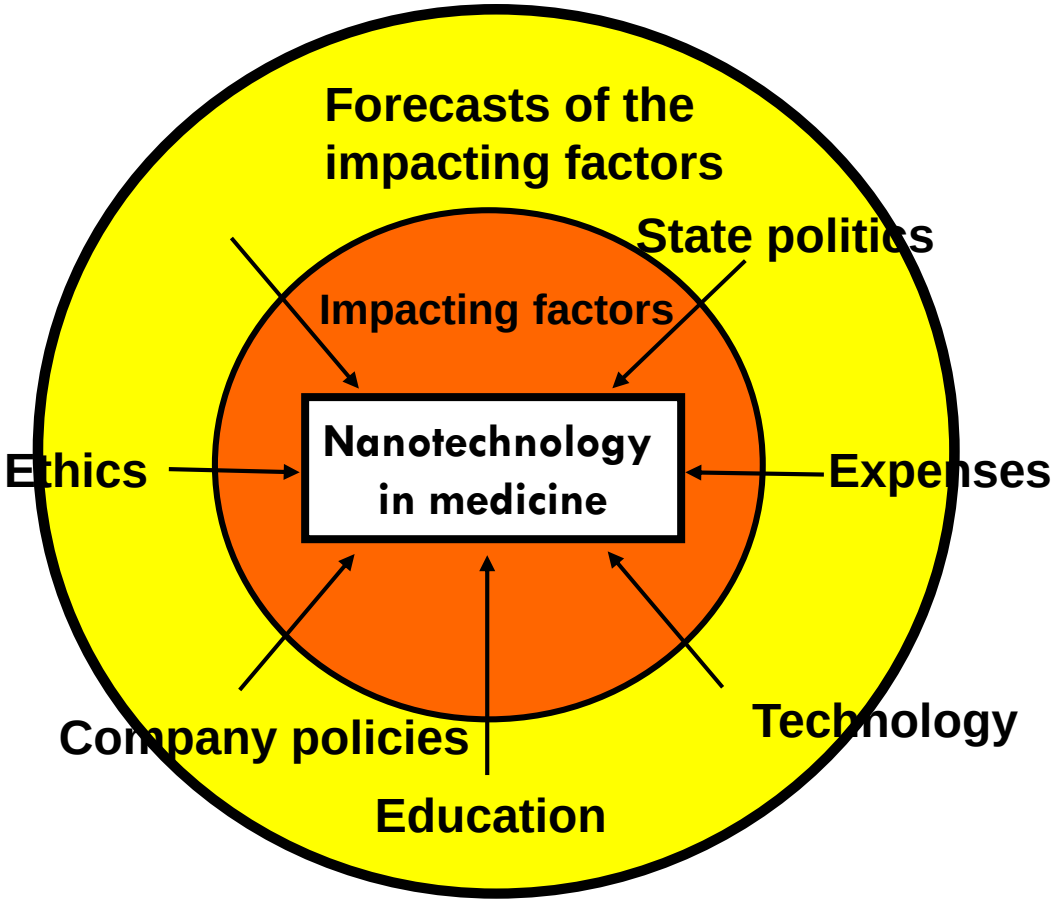
The forecasts generated independently are partly contradictory or inconsistent. A consistent picture of the future (scenario) has to be built up.

How a Scenario is developed?

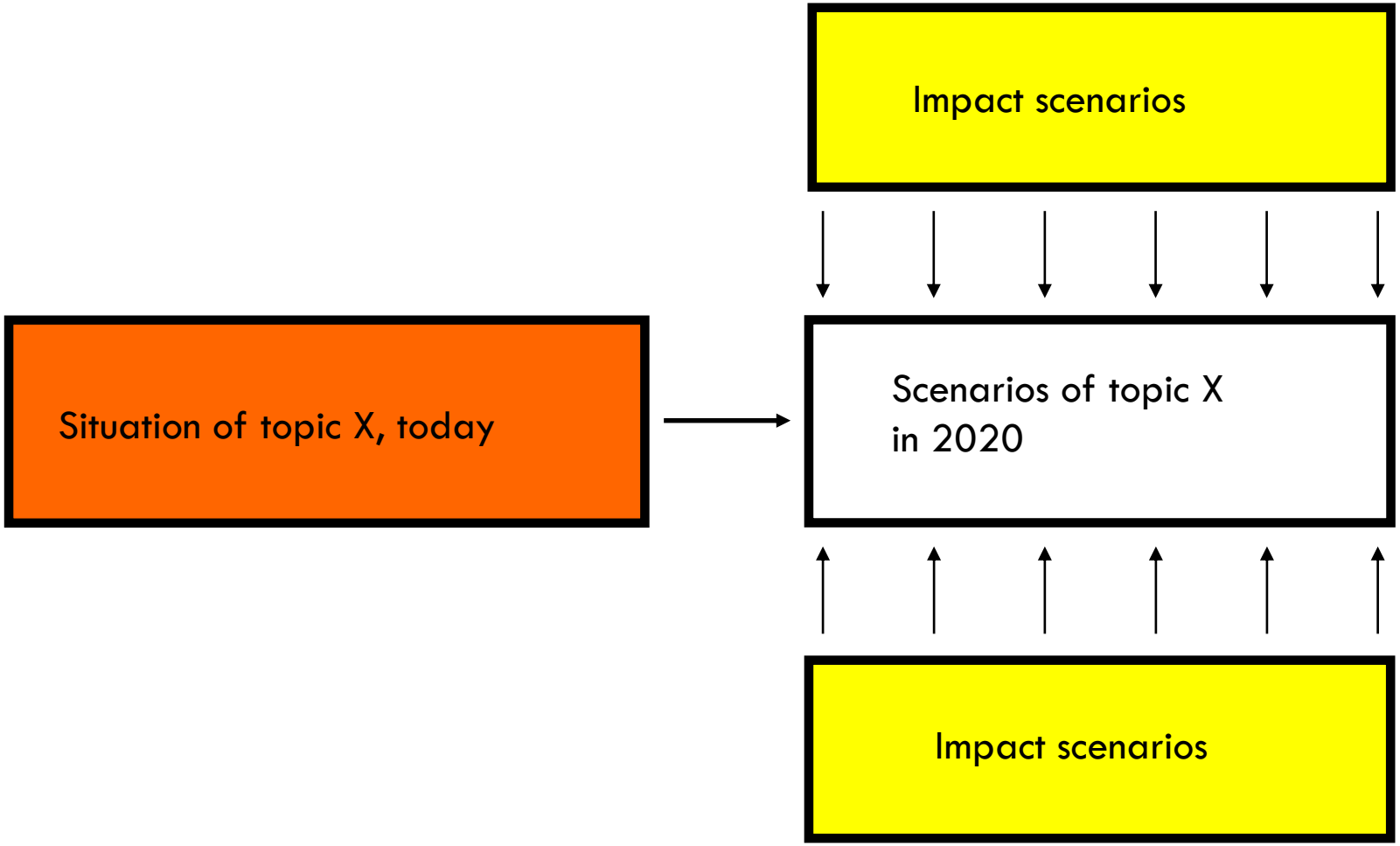


From the scenario of the impacting environment a future picture of the topic is derived

How a Scenario is developed?



Topic Scenarios Result from two Development Lines



The Eight Steps of the Scenario-Technique

Step 1 Defining and structuring the topic

Step 2 Collection and structuring the impacting factors

Step 3 Formulation of descriptors; projections and assumptions

Step 4 Formation and selection of alternative sets of assumptions

Step 5 Development and interpretation of selected impact scenarios

Step 6 Introduction and impact analysis of unexpected disruptive events

Step 7 Writing the topic scenarios resp. deducting consequences for the task

Step 8 Development of measures and (strategic) plans

Characteristics of the Scenario-Technique

- Not a better forecasting method; just another approach
- Dealing with uncertainties, but not reducing them
- Complex methodology combining analytic and creative elements
- Qualitative aspects are treated as well as quantitative factors
- Results are alternative pictures of the future for a topic (not for single indicators)
- The development of scenarios is transparent in all phases
- Training in bold and flexible thinking

Case: New Impulses for R&D-Planning

Situation

- The R&D head of a consumer brand producer was not satisfied with the yearly composed R&D plan.
- Most proposals were extensions of ongoing projects or went into further details of well-known research fields.
- Scenarios should help to bring fresh ideas and topics into the planning procedure.

Case: New Impulses for R&D Planning

Scenario Development

- A core team was formed: Two department heads of R&D: R&D planner, R&D controller; two marketing specialists from different divisions; market researcher moderator.
- Two sessions to define the topic and task and to analyse the fields of exogenous influence.
- Then experts were chosen: 13 internal and external specialists.
- In two workshops of two days duration the essential inputs for the scenario-technique were worked out.
- The core group did all the detail work. The group met eight times.

Case: New Impulses for R&D Planning

Conclusions and transfer of scenario contents

- The scenarios were presented to the head of R&D. Then several transfer actions were decided:
  - Presentation to the management board
  - Workshop with the middle management of R&D with the objective to formulate porposals for R&D projects
  - Workshops with the two marketing categories with the objective to develop marketing strategies and actions

Results

- The scenarios triggered a totally new research area and a number of new views to known problem fields.
- They confirmed most ongoing research lines and brought up many improvement ideas for current projects.