

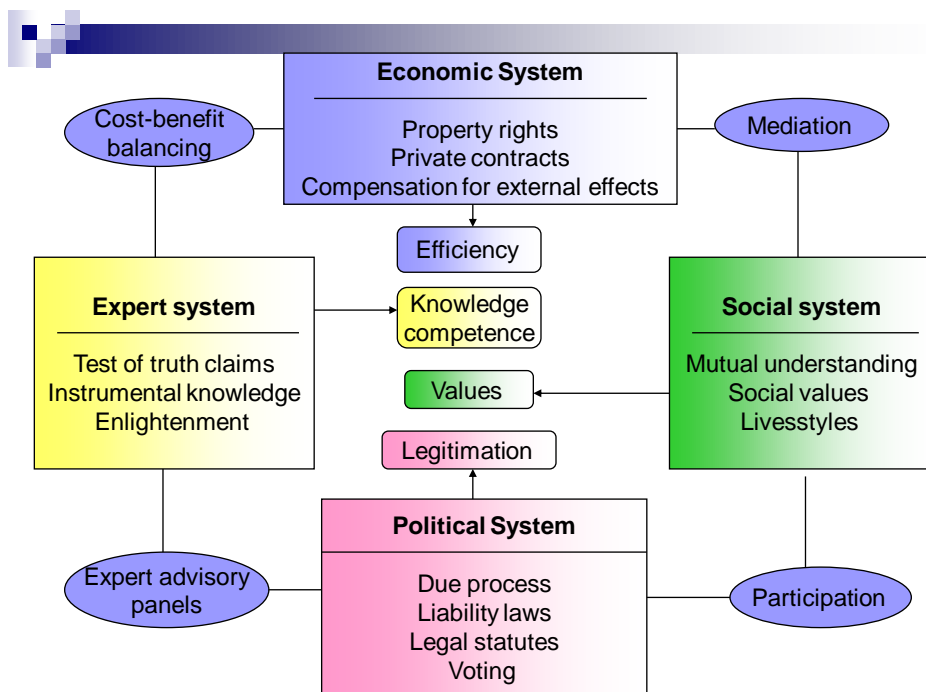
Industry risks The Complexity II

S. Radandt



Risk Management- Four Systems

- In the market system, decisions are based on the cost-benefit balance. The goal is to be efficient.
- In politics, decisions are made on the basis of institutionalized procedures of decision making and norm control. The target goal is to seek legitimacy.
- Science has at its disposal methodological rules for generating, challenging and testing knowledge claims. This helps policy makers to be effective.
- In the social system, there is a communicative exchange of interests and arguments. This creates cohesion and social acceptance

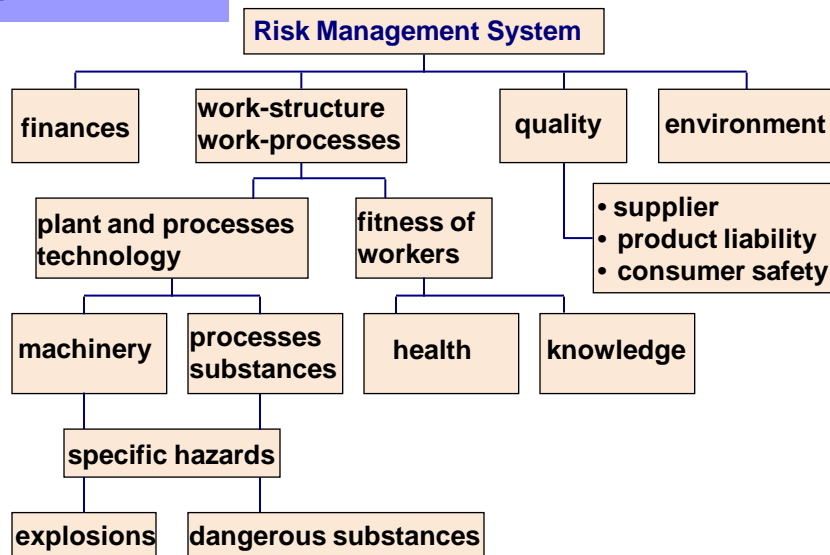


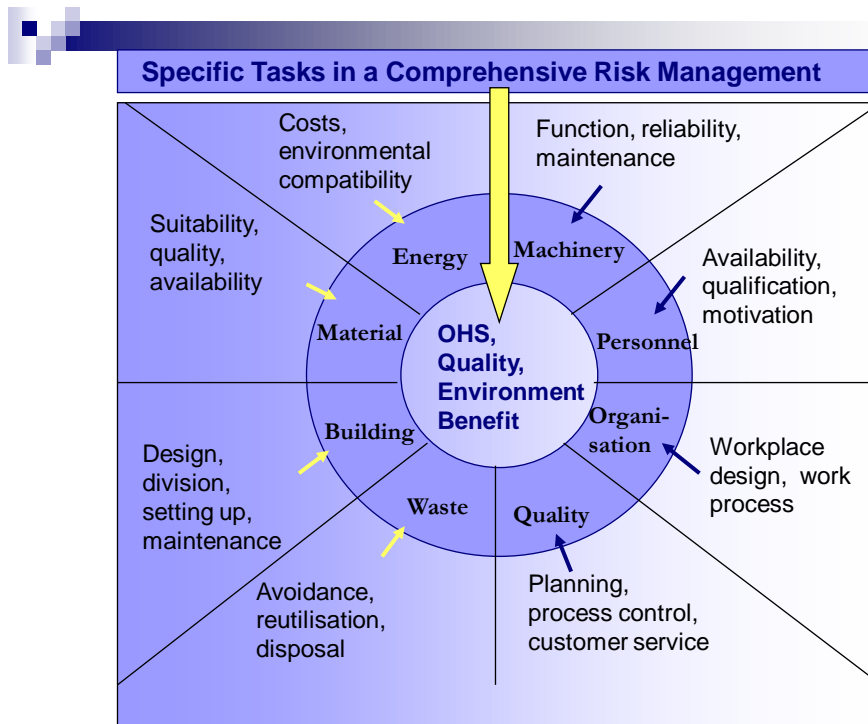
Companies- Risk fields

- branch risks, branch-related risks in competition (purchase, sales)
- financial risks (exchange-rates, changes of interest-rates)
- company-specific risks (losses, accident- related, in production, product-related, behavior)
- surroundings-related (politics, laws, nature-environment)

018

Management System for company specific risks





Findings for causes of risks in industry

- 1. Technical failure:
 - devices, mountings, container, flange, mechanical damage, corrosion, pipes
- 2. Human failure:
 - operating error, organisational failure, during repair work
- 3. Chemical reaction
- 4. Physical reaction
- 5. Environmental cause

New emerging risks

More and more new risks are emerging for instance in connection with new technologies, such as **nanotechnologies** and **mechatronics**.

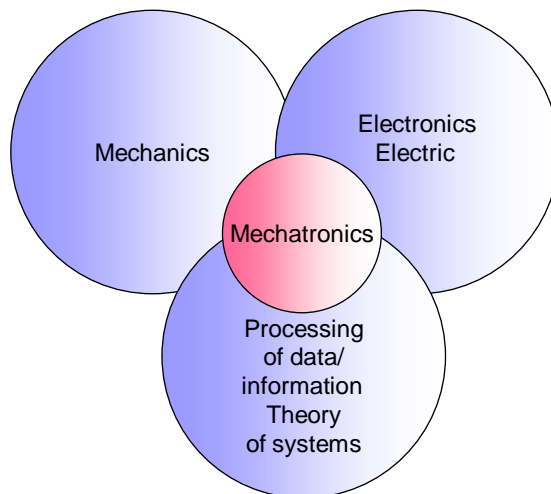
Currently, nanotechnological products are used e.g. in paints, energy products, electronics, medical implants, sunscreen products, cosmetics, food.

In general, free particles in the nanometer range raise health and safety concerns because these tiny particles have a much larger surface to mass ratio compared with larger particles.

Consequently, they are likely to penetrate cells in the body and take on different structures than they would in their larger scale.

Up to now the research having been done is not sufficient to evaluate the toxicity of novel particles created by these new technologies.

Another example for new emerging risks is the field of mechatronic systems which are in particular new through their growing complexity





Occupational health

As the previous mono-causal, mono-mechanism, mono-outcome setting has shifted in the direction of multi-causality, multiple mechanisms and multi-outcomes, the assessment of risks has become more complex.

The risk assessment of occupational diseases starts from exposure assessment.

There are new methods for making exposure matrices for various occupations and various work tasks.

The risk of occupational diseases varies substantially between sectors of economies and occupational groups.



Influence of economics

One of the assumptions of perfectly competitive markets is that there are many producers, none of whom can influence prices or act independently of market forces.

In virtual markets, buyer and seller are not present and trade via intermediates and electronic information.

Industrial organization studies the strategic behavior of firms, the structure of markets and their interactions and reacts on it.

Financial economics is concerned with the allocation of financial resources in an uncertain (or risky) environment.

Thus, its focus is on the operation of financial markets, the pricing of financial instruments, and the financial structure of companies

Risks of market failure

Market failure encompasses several problems which may undermine standard economic assumptions.

If **costs of production** are not borne by producers but are by the environment, accident victims or others, then prices are distorted.

The **economics of information** has relevance in many fields, including finance, insurance, contract law, and decision-making under risk and uncertainty. Information asymmetries arise where one party has more or better information than the other.

Incomplete markets exist in a situation where buyers and sellers do not know enough about each other's positions to price goods and services properly.

Externalities occur where there are significant social costs or benefits from production or consumption that are not reflected in market prices.

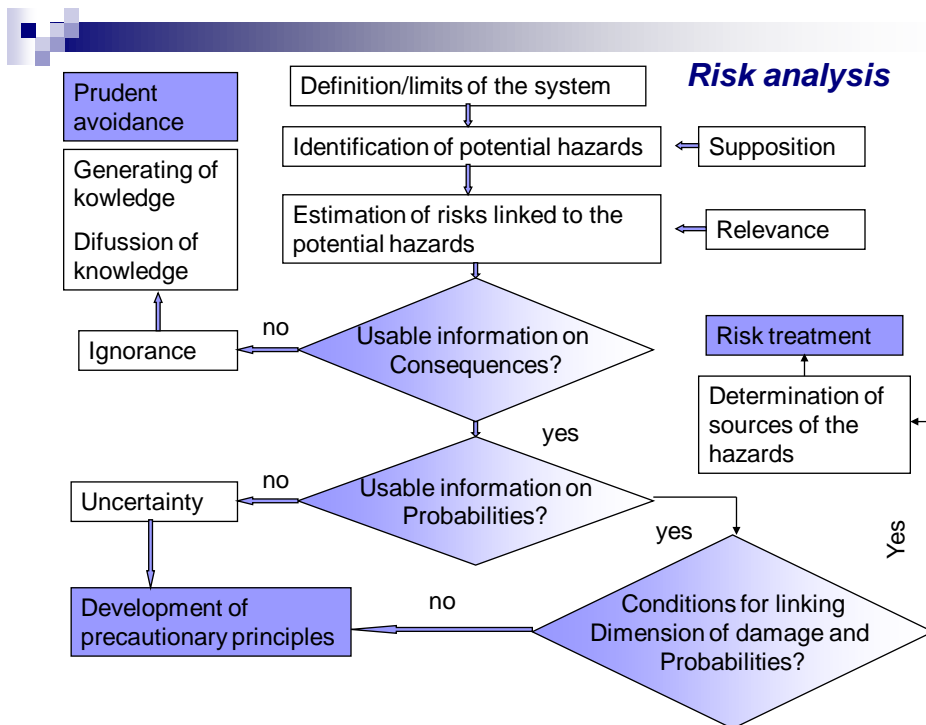
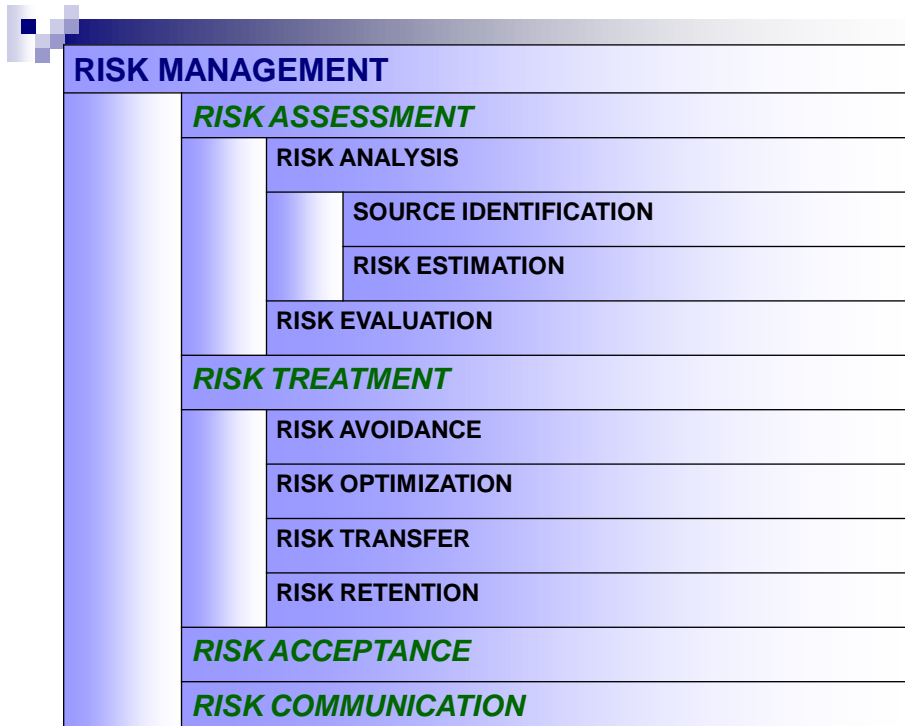
Macroeconomic instability is a prime source of market failure, whereby a general loss of business confidence or external shock can grind production and distribution to a halt, undermining ordinary markets that are otherwise sound.

Treating the risks in industry and economy needs risk management strategies.

Therefore one has to understand what the definition of risk and risk management means

The definition of Risk :

Risk is a combination of a probability (not frequency) of occurrence and associated unwelcome outcome or impact of a risk element





Risk-Terminology = Strategies to treat Risks

Risk treatment : process of selection and implementation of measures to modify risk

Risk avoidance : decision not to become involved in , or action to withdraw, a risk situation

Risk optimization : process to minimize the negative and to maximize the positive consequences and their respective probabilities

Risk transfer : sharing with another party the benefit of gain,or burden of loss , for a particular risk

Risk retention : acceptance of the burden of loss , or benefit of gain,from a particular risk

Risk communication : exchange or sharing of information about risk between the decision-maker and other stakeholders