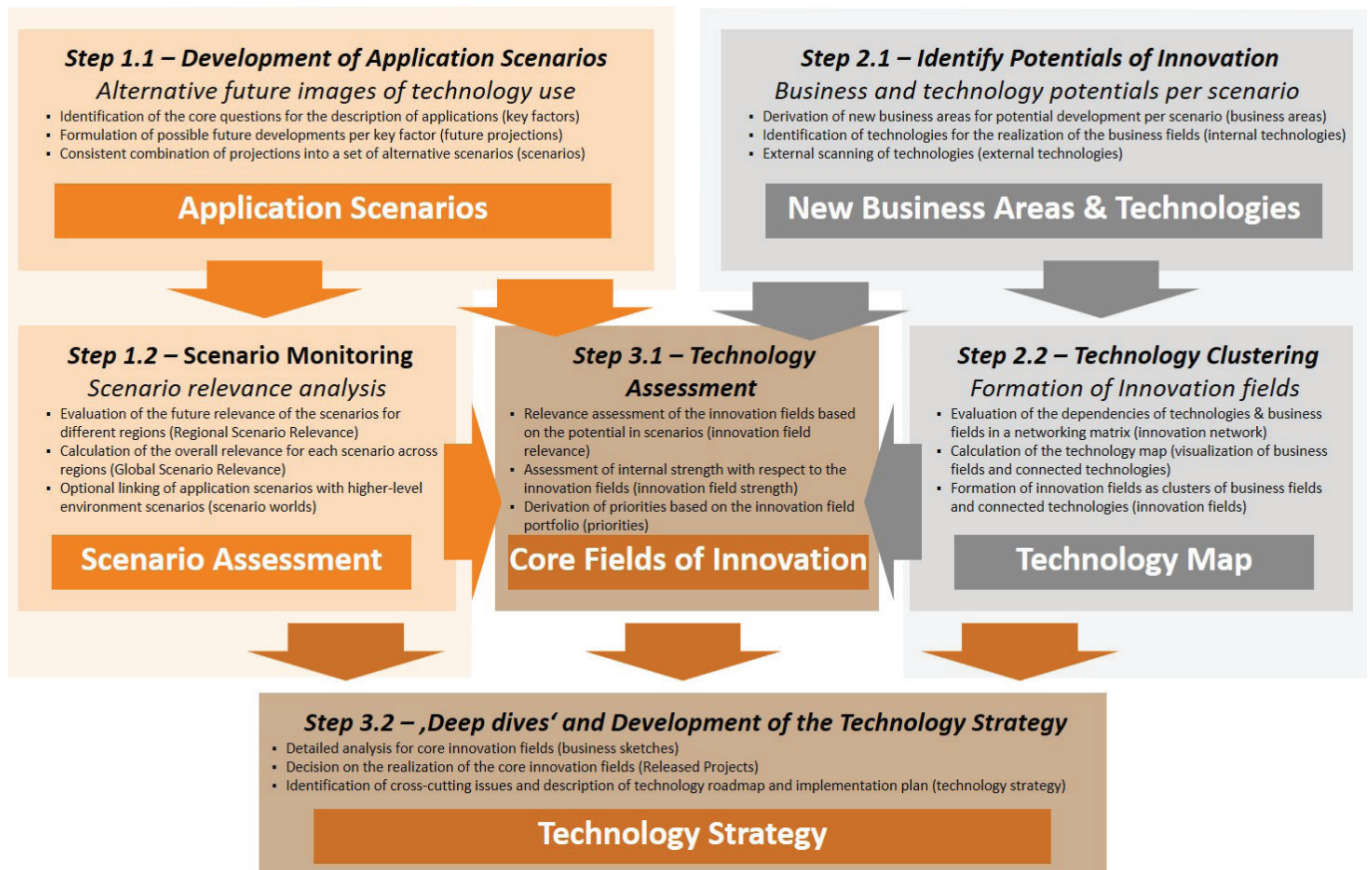


# Future-oriented Technology Management





Future-oriented technology management

## Identify innovation and technology fields with scenarios

How are the technologies on which our current success is built evolving? Which new technologies could drive or replace them? And what role do today's and future application fields play? Technology management is complex - and there is never just one technology path to rely on. That's why scenarios are a necessary tool for setting up your own technology planning in a robust way. But what can this look like in practice?

Based on our model of scenario-based development of innovation strategies, three essential steps for identifying future relevant technology fields can be described and combined in a process model:

### Development and evaluation of application scenarios

(step 1): Alternative images of the future are developed for the technological application field using the scenario technique. By describing these scenarios, the conceivable future market needs first become tangible for planners in alternatives. In addition, an evaluation of these scenarios is carried out. This makes it possible to estimate the uncertainty regarding the future development and to filter out the most relevant future scenarios.

### Collection and systematization of fields of innovation

(step 2): The development of the technology strategy must enable the prioritization of existing technologies as well as the generation of innovative ideas. The collection of technology fields therefore includes external technology scanning as well as creativity techniques. The application scenarios in particular provide essential impetus for this. In order to maintain transparency, the identified fields are additionally consolidated and structured. In practice, we often work in this phase with partners who can contribute the relevant technology expertise.

### Identification of core innovation fields/technologies and implementation

(step 3): Strategic thinking requires a clear focus on essential core topics and own strengths. Accordingly, a prioritization and filtering of the identified innovation fields and thus of the technologies contained therein takes place. In a two-stage process, the application potentials of the technologies are first roughly estimated with the help of the scenarios. In a second stage, a detailed analysis, also quantitative, of the essential core topics can then be carried out in preparation for decision-making and implementation.



*Robert Bosch GmbH, Stuttgart*

### **Development of scenarios on the future environments of manufacturing technologies and derivation of strategic thrusts for manufacturing at Bosch Diesel Systems (DS)**

The Diesel Systems business unit was faced with the task of also aligning itself technologically to be future-proof. The first question was how the production environment for diesel manufacturing could change. The corresponding environment scenarios addressed issues such as access to resources, environmental requirements and global site conditions. An expectation range could be derived from the evaluation of the total of nine scenarios. In addition, the scenarios provided the framework for more detailed early technology identification..

**DAIMLER**

*DaimlerChrysler AG, Stuttgart:*

### **Development and application of a technology attractiveness portfolio**

Conventional technology management tools are often insufficient for identifying and evaluating individual technology fields. For this reason, a new type of technology attractiveness portfolio has been developed, which is based on separate consideration of external and company-specific technology attractiveness. This allows individual aspects to be added or weighted in a „modular“ manner. The methodology was verified on the basis of the specific technology field of »Polymere«.



*INPRO Innovation company for advances production systems in the automotive industry, Berlin*

### **Future flexible car body production**

INPRO is a subsidiary of German automotive manufacturers and suppliers. It develops and tests novel production technologies, predominantly for the circle of its shareholders. INPRO's innovative performance consists in identifying new topics and transferring results of basic research to applications in production practice. As part of a scenario project, the subject area of future car body production was analyzed in detail against the background of growing market requirements. One focus was on describing conceivable technical design options for future vehicle concepts and production processes in the form of alternative scenarios. In a workshop with experts from various automotive manufacturers and suppliers, these concepts were evaluated on the basis of different market, sector and global scenarios and directions for future technology development in body construction were derived.



*Österreichische Nationalbank, Wien*

### **Development of environment and strategy scenarios for the orientation of the Oesterreichische Nationalbank in the field of information technology**

The development of the central banks in the Eurosystem has a significant impact on the information technology infrastructure of the Oesterreichische Nationalbank. Issues such as the division of tasks among the national central banks within the Eurosystem, the extent of sourcing activities, the future competitive situation, competition on the external market and the development of data centers in Europe, become key decision-making questions in this context. Against this backdrop, the OeNB applied ScMI's scenario technique to anticipate environment developments and to find out which strategic orientations could be chosen in the respective environment scenarios in order to best meet the situational requirements of the future. The assessment of possible future environmental conditions on the basis of environmental and strategic scenarios, which were developed and interlinked in two scenario conferences, serves as the basis for decisions on adjusting the strategic orientation of the OeNB's information technology.



*Otto Fuchs*

### **Szenario »Schmiede 4.0™«**

### **Future developments in the corporate environment of OTTO FUCHS KG - Scenarios and strategic consequences**

OTTO FUCHS KG is a leading, internationally active company in the non-ferrous metals industry. Based on its own materials, OTTO FUCHS KG manufactures high-quality semi-finished products, in particular metallurgically sophisticated forgings, extruded products and rolled rings for the aerospace, automotive & transport, construction and industrial technology sectors. In a first phase of the project, scenarios were developed which represented possible developments of industrial forging in the environment of Industry 4.0. In a second phase, possible own technology and digitization strategies were developed. These strategy scenarios were visualized in a strategy map and linked to form strategy paths. The link with the environment scenarios ultimately provided indications for an integrative and robust strategy approach..

*Sulzer Innotec, Winterthur*

### **Strategic technology planning based on future market developments for Sulzer Innotec**

Sulzer Innotec as part of Sulzer Markets and Technology Ltd has been the research and development center of the Sulzer Corporation for more than 50 years. In addition to the Sulzer divisions, customers include external clients, mainly industrial manufacturers and original equipment manufacturers in the energy, transportation, chemical, process, and medical technology sectors. Sulzer Innotec faces the challenge of identifying and developing new technologies today that will enable it to succeed in tomorrow's markets. The goal of the project was to anticipate future developments in Sulzer Innotec's markets and to develop environment scenarios for the promising medical and automotive technology markets. Scenarios were developed together with key customers and, based on these, new fields of application and new technologies were identified. Finally, a strategy was developed based on a strategic analysis of the current business areas as well as the strengths and future opportunities in the application fields.

*TRUMPF Werkzeugmaschinen GmbH + Co. KG,  
Ditzingen*

### **The future of sheet metal working**

The TRUMPF Group is one of the world's leading companies in manufacturing technology. Its core business is sheet metal processing. It is the direct field of activity of the largest Machine Tool Business Division, which is also the central customer for the services of the second largest Laser Technology Business Division. In order to identify future developments from a technology, market and competitive perspective, including changes in the value chain and possible substitutions, the key factors were systematically identified, thought through in advance and condensed into consistent scenarios. Representatives of various business and functional areas as well as the management were involved in the scenario development process.

*SWU Energie GmbH, Ulm*

### **The future environment of the measurement and metering system of Stadtwerke Ulm/Neu-Ulm**

WU Energie GmbH is part of the SWU Stadtwerke Ulm/Neu-Ulm group of companies and, together with its subsidiaries, covers a wide spectrum: from power generation to network operation and from power trading to telecommunications. In the course of the liberalization of the energy industry, metering and counting will be separated from network operation in Germany. At the same time, changes in the European metering system and in the billing modalities are becoming apparent. In order to identify the associated changes in SWU's business model and organization at an early stage, a two-part scenario conference was held to develop alternative scenarios for the future of metering and billing in Germany up to the year 2015. The conference was attended not only by SWU but also by representatives of the housing industry and equipment manufacturers. In a transfer workshop, the scenarios were evaluated, indicators identified and strategic consequences for SWU discussed.

*VDMA / Förderverein mobile Arbeitsmaschinen e.V.:*

### **Mobile Machinery 2030**

The Förderverein mobile Arbeitsmaschinen e.V. is a research cooperation within the VDMA research network. Under the initiative of twelve renowned industrial companies and the VDMA, the Endowed Chair »Mobile Arbeitsmaschinen« (Mobima) was constituted at the Karlsruhe Institute of Technology (KIT) in 2005. Since its foundation, the chair has been dealing with application-specific research and development topics from the industrial environment of the foundation companies in the sense of pre-competitive cooperations. The aim of the scenario project was to support the client in identifying common research fields and topics that are of overriding interest to all participating companies.

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